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April 13, 2021

Via Electronic Filing

Rosemary Chiavetta, Secretary
PA Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Pennsylvania Public Utility Commission v. Pittsburgh Water and Sewer Authority
Docket Nos. R-2021-3024773 (water); R-2021-3024774 (wastewater); and
R-2021-3024779 (stormwater)

Dear Secretary Chiavetta:

On behalf of the Pittsburgh Water and Sewer Authority ("PWSA") enclosed for filing is PWSA's Initial Tariff Filings and Rate Requests.

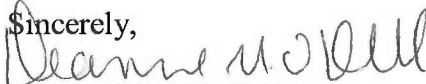
PWSA's filing is presented as follows:

Volume I: Filing Requirements
Volume II: Prepared Direct Testimony, Class Cost of Service Study and Proposed Water Tariff, Proposed Wastewater Tariff and Proposed Stormwater Tariff

Related to this filing, PWSA is also filing the following two petitions: (1) Petition for Consolidation of Water, Wastewater and Stormwater Rate Proceedings and For Authorization to Use Combined Water, Wastewater and Stormwater Revenue Requirements; and, (2) Petition for Waiver of Statutory Definition of Fully Projected Future Test Year.

PWSA is electronically filing this and mailing one hard copy along with a CD of the entire filing. Copies of this filing is being served in accordance with the attached Certificate of Service.

Sincerely,


Deanne M. O'Dell, Esq.

DMO/lww

Enclosure

cc: Certificate of Service w/enc.

CERTIFICATE OF SERVICE

I hereby certify that this day I served a copy of PWSA's Rate Filing upon the persons listed below in the manner indicated in accordance with the requirements of 52 Pa. Code Section 1.54.

Via Email Only

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Deanne M. O'Dell, Esq.

Dated: April 13, 2021

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

VOLUME I

**INDEX TO RATE FILING PACKAGE
FILING REQUIREMENTS**

PITTSBURGH WATER AND SEWER AUTHORITY
RATE FILING

Docket Numbers:

R-2021-3024773 (Water)
R-2021-3024774 (Wastewater)
R-2021-3024779 (Stormwater)

April 13, 2021

THE PITTSBURGH WATER AND SEWER AUTHORITY
Docket Nos. R-2021-3024773 (Water); R-2021-3024774 (Wastewater);
R-2021-3024779 (Stormwater)

INDEX TO RATE FILING PACKAGE

Filings Simultaneous With This Filing Package:

Petition	Consolidation Of Water and Wastewater Rate Proceedings And For Authorization To Use Combined Water And Wastewater Revenue Requirements
Petition	For Wavier Fully Projected Future Test Year

Included With This Filing Package:

Volume I	Filing Requirements	Tab 1	Statement of Reasons
		Tab 2	Customer Notice of Proposed Rate Changes
		Tab 3	Filing Requirements – 52 Pa Code § 53.52
		Tab 4	Filing Requirements I – Statement of Income
		Tab 5	Filing Requirements II – Operating Revenues
		Tab 6	Filing Requirements III – Operating Expense
		Tab 7	Filing Requirements IV – Taxes
		Tab 8	Filing Requirements V – Rate Base
		Tab 9	Filing Requirements VI – Depreciation
		Tab 10	Filing Requirements VII – Rate of Return
		Tab 11	Filing Requirements VIII– Rate Structure & Cost of Service
		Tab 12	Filing Requirements IX – Quality of Service
		Tab 13	Filing Requirements X – Balance Sheet
		Tab 14	Filing Requirements XI– Other Data

Volume II	Testimony	St. No. 1	William J. Pickering	WJP-1 to WJP-2
		St. No. 2	Edward Barca	Exh. EB-1 to EB-10
		St. No. 3	Thomas F. Huestis	Exhs. TH-1 to TH-5
		St. No. 4	Harold J. Smith	Exhs. HJS-1 to HJS-3
				Exh. HJS-4
				Exhs. HJS-1W to HJS-19W
				Exhs. HJS-1WW to HJS-18WW
				Exhs. HJS-1SW to HJS-9SW
		St. No. 5	Barry King	Exhs. BK-1 to BK-2
		St. No. 6	Julie A. Quigley	JAQ-1 to JAQ-2
				Exh. JAQ-3 Water Tariff Supp. No. 1 (clean)
				Exh. JAQ-4 Water Tariff Supp. No. 1 (red-lined)
				Exh. JAQ-5 Wastewater Tariff Supp. No. 1 (clean)
				Exh. JAQ-6 Wastewater Tariff Supp. No. 1 (red-lined)
		St. No. 7	Tony Igwe	Exhs. TI-1 to TI-3
				Exhs. TI-4 Stormwater Tariff
		Exhs. TI-5		
St. No. 8	Keith Readling	KR-1		

**Pittsburgh Water and Sewer Authority
2021 Rate Filing**

**Docket Nos.
R-2021-3024772 (water)
R-2021-2034774 (wastewater)
R-2021-3024779 (stormwater)**

INDEX OF FILING REQUIREMENTS

Tab No.	Requirements
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THE PITTSBURGH WATER AND SEWER AUTHORITY

Tariff Filings and Rate Requests

Docket Nos. R-2021-3024773(water), R-2021-3024774 (wastewater), R-2021-3024779 (stormwater)

STATEMENT OF REASONS

PWSA is requesting a total increase to base rates for 2022 in the amount of \$32.20 million or 17.1%. The proposed base rate increase also includes the introduction of a new stormwater rate and adjustments to the wastewater conveyance rates where stormwater related costs are currently recovered. In consideration of the current COVID-19 pandemic, PWSA is proposing the most minimal rate increase necessary to continue to fund operations and to just barely satisfy its rate covenants. In further recognition of the ongoing economic effects of the Pandemic, PWSA is proposing to phase-in the overall increase over a two year period with \$22.0 million to be recovered in 2022 and the additional \$10.20 million to be recovered in 2023. PWSA's proposal also includes additional features (including the manner in which it is proposing to structure and assess the new stormwater fee and further enhancements to our low income customer assistance programs) intended to mitigate the rate impact for PWSA's customers. The proposed increase in revenues is the minimum necessary to enable PWSA to cover operating and capital costs to permit it to continue invest in the infrastructure needed to maintain and improve its safety, reliability and customer service levels.

There are three overarching reasons why PWSA continues to need a substantial rate increase at this time:

- PWSA continues to need to increase operations to a level that is sufficient to maintain PWSA's large system. \$9.8 million (or roughly 30%) of the requested \$32.2 million is needed to continue to increase operations within the Operating Budget including salaries and benefits (\$3.2 million, or 33%) and increases in the costs of washout disconnection and combined sewer overflow ("CSO") flow monitoring (\$3.8 million or 39%).
- To fund its substantial Capital Improvement Plan, which includes numerous capital projects necessary to meet regulatory requirements, PWSA must issue new long term bonds, which, together with increased debt service from existing bonds, will cause PWSA to incur an additional \$22.8 million in debt service alone.
- The COVID-19 pandemic continues to put stress on the financial health of PWSA. PWSA continues to experience decreased collections and consumption caused by the effects of the COVID-19 pandemic. For example, PWSA's year-over-year collections through February 28, 2021 are down \$3.7 million or -10%.

NOTICE OF PROPOSED RATE CHANGES

To Our Customers:

The Pittsburgh Water and Sewer Authority (PWSA) has filed a request with the Pennsylvania Public Utility Commission (PUC) on April 13, 2021 to increase your water and wastewater conveyance rates and establish a new stormwater fee. This notice provides more information about the stormwater fee and describes the Authority's rate request, the PUC's role, and what actions you can take.

If the Authority's entire request is approved as filed, the total bill for water, wastewater conveyance, and stormwater service for a typical Residential customer using 3,000 gallons per month and charged the base rate for stormwater services would increase from \$79.34 to \$87.19 per month or by 9.89% in 2022 and increase from \$87.19 to \$91.05 or by 4.43% in 2023.

STORMWATER FEE

The stormwater fee is included in the totals above and is based on the amount of impervious surface on a property. Impervious surface is the hard surface on a property such as roofs, sidewalks, and parking areas that does not absorb stormwater. These hard surfaces generate stormwater runoff that collect trash and send polluted water into local waterways. It can also overwhelm our sewer system causing streets to flood, basements to backup, and sewage to overflow into rivers and streams.

In Pittsburgh, the average amount of impervious surface on a property is approximately 1,650 square feet. This is equal to one equivalent residential unit (ERU) of impervious surface, which is the unit of measure for calculating the stormwater fee and is accepted as the industry standard for determining a stormwater fee. If approved, the stormwater fee will be applied to all residential and non-residential properties in Pittsburgh in the following way:

Stormwater Monthly Fees	ERUs	2022	2023
Residential Tier 1 (>=400 to <1,015 sf)	.5	\$2.99	\$3.98
Residential Tier 2 (>=1,015 to <2,710 sf)	1	\$5.96	\$7.95
Residential Tier 3 (>=2,710 sf)	2	\$11.93	\$15.90
Non-Residential	Per ERU	\$5.96	\$7.95

RATE REQUEST

PWSA has requested a total rate increase of 17.1% to be recovered through an 11.7% rate increase, or \$22.0 million, beginning in 2022 and a 5.4% rate increase or \$10.2 million in 2023 for its water and wastewater conveyance operations and stormwater management.

For a typical Residential customer using 3,000 gallons per month with a 5/8-inch meter and generating stormwater from one ERU, the total bill would increase from \$79.34 to \$87.19 per month or by 9.89% in 2022, and from \$87.19 to \$91.05 per month or by 4.43% in 2023, as shown in the table below:

Residential	Current Rates	2022 Rates	2023 Rates
Water	54.36	58.09	61.79
Wastewater	24.98	23.14	21.30
Stormwater	N/A	5.96	7.95
Total	79.34	87.19	91.05

For a typical Residential customer enrolled in PWSA's Bill Discount Program using 3,000 gallons per month with a 5/8-inch meter and a reduced stormwater fee, the total bill would increase from \$41.77 to \$45.34 per month or by 8.54% in 2022, and from \$45.34 to \$47.90 per month or by 5.64% in 2023, as shown in the table below:

Residential Bill Discount	Current Rates	2022 Rates	2023 Rates
Water	25.73	29.17	32.59
Wastewater	16.04	14.68	13.31
Stormwater	N/A	1.49	1.99
Total	41.77	45.34	47.90

For a typical Commercial customer using 13,000 gallons per month with a 1-inch meter and generating stormwater runoff from 8 ERU's, the total bill would increase from \$294.27 to \$351.21 per month or by 19.35% in 2022, and from \$351.21 to \$376.31 per month or by 7.15% in 2023, as shown in the table below:

Commercial	Current Rates	2022 Rates	2023 Rates
Water	194.69	216.48	238.18
Wastewater	99.58	87.06	74.53
Stormwater	N/A	47.68	63.60
Total	294.27	351.21	376.31

For an Industrial customer using 680,000 gallons per month with a 4-inch meter and generating stormwater runoff from 30 ERU's, the total bill would increase from \$12,267.35 to \$13,079.05 per month or by 6.62% in 2022, and from \$13,079.05 to \$13,758.83 per month or by 5.20% in 2023, as shown in the table below:

Industrial	Current Rates	2022 Rates	2023 Rates
Water	7,742.05	8,768.38	9,788.30
Wastewater	4,525.30	4,131.87	3,732.03
Stormwater	N/A	178.80	238.50
Total	12,267.35	13,079.05	13,758.83

For a Health and Education customer using 50,000 gallons per month with a 2-inch meter and generating stormwater runoff from 32 ERU's, the total bill would increase from \$1,276.07 to \$1,459.07 per month or by 14.34% in 2022, and from \$1,459.07 to \$1,514.67 per month or by 3.81% in 2023, as shown in the table below:

Health/Education	Current Rates	2022 Rates	2023 Rates
Water	833.40	900.76	968.13
Wastewater	442.67	367.58	292.14
Stormwater	N/A	190.72	254.40
Total	1,276.07	1,459.07	1,514.67

PWSA's rate request is scheduled to go into effect on June 12, 2021; however, in most cases, the PUC suspends the increase for up to an additional seven (7) months.

Since 2017, PWSA has invested approximately \$328 million in capital improvements including necessary upgrades to water and sewer facilities, storage tanks, and pumping stations. In 2021, a total of approximately \$233 million is budgeted for much needed upgrades to critical water and sewer infrastructure. This investment will improve drinking water quality, improve system reliability, and meet all regulatory standards.

PWSA has been focusing on improved stormwater management for several years. Currently, several initiatives are underway that will establish a comprehensive approach to managing stormwater. This includes developing a stormwater master plan, updating city codes and ordinances, and constructing innovative stormwater solutions across the city.

After deliberate analysis and input from stakeholders, the stormwater fee, if approved, would begin to address the wet weather challenges experienced in Pittsburgh. It would provide a dedicated funding source to improve stormwater management, build innovative stormwater infrastructure, reduce sewer overflows, and lessen the amount of pollution entering our rivers and streams.

A stormwater fee based on impervious surface is a more equitable way to charge for stormwater. Our rates are currently based on water usage, which does not consider the amount of runoff generated by a property. Using impervious surface as the standard unit of measure, will ensure that each parcel within the city of Pittsburgh is contributing a proportional share to help address our most pressing wet weather challenges.

To find out your customer class or how the requested increase may affect your water and wastewater conveyance bill, contact PWSA at 412-255-2423. The rates requested by the Authority may be found in the Tariff Water – PA. P.U.C. No.1 Supp. No. 7, Tariff Wastewater – PA. P.U.C. No.1 Supp. No. 6, and Tariff Stormwater – PA. P.U.C. No. 1. You may also examine the material filed with the PUC, which explains the requested increase and the reasons for it. A copy of these documents is kept at PWSA's office. Upon request, the Authority will send you the Statement of Reasons for these Tariffs, explaining why the rate increase has been requested.

PUC ROLE

The state agency which now approves rates for PWSA is the PUC. The PUC will examine the requested rate increase and can prevent existing rates from changing until it investigates and/or holds hearings on the request. The Authority must prove that the requested rates are reasonable. After examining the evidence, the PUC may grant all, some, or none of the request or may reduce existing rates.

The PUC may change the amount of the rate increase or decrease requested by the utility for each customer class. As a result, the rate charged to you may be different than the rate requested by the utility as shown above.

ACTIONS YOU CAN TAKE

There are three ways to support or challenge PWSA's request to change its rates:

1. You can be a witness at a public input hearing. Public input hearings are held if the PUC opens an investigation of the utility's rate increase request and if there is a large number of customers interested in the case. At these hearings, you have the opportunity to present your views in person to the PUC judge hearing the case and to the PWSA representatives. All testimony given "under oath" becomes part of the official rate case record. These hearings are held in the service area of the utility.
2. You can send the PUC a letter telling why you support or object to the requested rate increase. At times there is information in these letters that makes the PUC aware of successes or problems with the utility's service or management. This information can be helpful when the PUC investigates the rate request.
3. You can file a formal complaint. If you want a hearing before a judge, you must file a formal complaint. By filing a formal complaint, you assure yourself the opportunity to take part in hearings about the rate increase request. All complaints should be filed with the PUC before June 12, 2021. If no formal complaints are filed, the Commission may grant all, some, or none of the request without holding a hearing before a judge. Send your letter or request for a formal complaint form to the Pennsylvania Public Utility Commission, Post Office Box 3265, Harrisburg, PA 17105-3265.

For more information, call the PUC's Bureau of Consumer Services at 1-800-692-7380. You may leave your name and address so you can be notified of any public input hearings that may be scheduled in this case. You may also contact the Pennsylvania Office of Consumer Advocate (OCA). The OCA represents the interests of consumers in cases before the PUC. You may contact the OCA with questions or requests for public input hearings at 1-800-684-6560 or by email at consumer@paoca.org.

The Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, PA 15222
412-255-2423



April 13, 2021

*****AUTO**5-DIGIT 15212
Central Northside Neighborhood Coun
PO Box 6255
Pittsburgh, PA 15212-0255

1.1

RE: Introduction to the Pittsburgh Water and Sewer Authority's Proposed Stormwater Fee

Dear Future Pittsburgh Water and Sewer Authority Stormwater Customer:

On Tuesday, April 13th, the Pittsburgh Water and Sewer Authority (PWSA) filed a request with the Pennsylvania Public Utility Commission (PUC) to establish a stormwater fee that would be applied to all properties located within the city of Pittsburgh.

Our records indicate that you own one or more property(ies) within Pittsburgh and would be subject to the stormwater fee if approved by the PUC. Our proposal for the stormwater fee is currently under review by the PUC and if it should be approved, would go into effect in January 2022.

The fee is based on the amount of impervious surface on a property. Impervious surface is the hard surface on a property such as roofs, sidewalks, and parking areas that does not absorb stormwater. These hard surfaces generate stormwater runoff that collect trash and send polluted water into local waterways. It can also overwhelm our sewer system causing streets to flood, basements to backup, and sewage to overflow into rivers and streams.

In Pittsburgh, the average amount of impervious surface on a property is approximately 1,650 square feet. This is equal to one equivalent residential unit (ERU) of impervious surface, which is the unit of measure for calculating the stormwater fee and is accepted as the industry standard. If approved, the stormwater fee will be applied to all residential and non-residential properties located within the city.

The fee will be applied to non-residential properties using the following formula:

$$\text{Total ERU's/Property} \times \text{Monthly Stormwater Rate} = \text{Property's Total Stormwater Fee}$$

After deliberate analysis and input from stakeholders, the stormwater fee, if approved, would begin to address the wet weather challenges experienced in Pittsburgh. It would provide a dedicated funding source to improve stormwater management, build innovative stormwater infrastructure, reduce sewer overflows, and lessen the amount of pollution entering our rivers and streams.

A stormwater fee based on impervious surface is a more equitable way to charge for stormwater. Our rates are currently based on water usage, which does not consider the amount



of runoff generated by a property. Using impervious surface as the standard unit of measure will ensure that each parcel within the city of Pittsburgh is contributing a proportional share to help address our most pressing wet weather challenges.

Our next outreach to you will take place in the coming months to provide information about the affected property(ies) under your ownership, the proposed rate for these properties, and the proposed credit and incentive program that is part of our proposal to the PUC.

More information about the proposed rate filing, including ways to support or challenge the proposal, is available in the enclosed Public Notice. You can learn more about the stormwater fee and our stormwater program by visiting www.pgh2ostormwater.com or register for a virtual informational meeting through the website.

Thank you for taking the time to review this information. If you have any questions about the stormwater fee, please contact Customer Service by calling (412) 255-2423 and press 5.

Sincerely,

William J. Pickering

William J. Pickering
Chief Executive Officer

Pittsburgh Water and Sewer Authority Base Rate Filing

52 Pa. Code § 53.52**§ 53.52. Applicability; public utilities other than canal, turnpike, tunnel, bridge and wharf companies.**

(a) Whenever a public utility, other than a canal, turnpike, tunnel, bridge or wharf company files a tariff, revision or supplement effecting changes in the terms and conditions of service rendered or to be rendered, it shall submit to the Commission, with the tariff, revision or supplement, statements showing all of the following:

(1) The specific reasons for each change.

RESPONSE:

Please see Statement of Reasons and testimony of PWSA witnesses Barca, Huestis, King, Igwe, Readling, Pickering, and Smith for additional information. PWSA is proposing an increase in minimum charges and volumetric charges for all customer classes (Residential, Commercial, Industrial, Health & Education, Municipal, and Private Fire) in addition to introducing a Stormwater charge. Please see the testimony of PWSA witness Smith and Readling for an explanation of the minimum charge and volumetric charge increases/decreases in each customer rate class as well as the Stormwater charge.

(2) The total number of customers served by the utility.

RESPONSE:

Please see the schedules attached to response § 53.52(b).

(3) A calculation of the number of customers, by tariff subdivision, whose bills will be affected by the change.

RESPONSE:

Please see the schedules attached to response § 53.52(b).

(4) The effect of the change on the utility's customers.

RESPONSE:

Please see the schedules attached to response § 53.52(b).

Pittsburgh Water and Sewer Authority Base Rate Filing

52 Pa. Code § 53.52

(10) Plans the utility has for introducing or implementing the changes with respect to its ratepayers.

RESPONSE:

The Company is notifying customers of the proposed changes as required by 53 Pa. Code § 53.45.

(11) FCC, FERC or Commission orders or rulings applicable to the filing.

RESPONSE:

There are no FCC, FERC, or Commission orders or rulings applicable to this filing.

Pittsburgh Water and Sewer Authority Base Rate Filing

52 Pa. Code § 53.52

RESPONSE:

Please see attached.

(5) A calculation of the number of customers, by tariff subdivision, whose bills will be decreased.

RESPONSE:

Please see the response to § 53.52(b)(3).

(6) A calculation of the total decreases, in dollars, by tariff subdivision, projected to an annual basis.

RESPONSE:

Please see the response to § 53.52(b)(3).

Pittsburgh Water and Sewer Authority Base Rate Filing

52 Pa. Code § 53.52

(4) A statement showing the amount of the depreciation reserve, at the date of the balance sheet required by paragraph (2), applicable to the property, summarized as required by paragraph (3).

RESPONSE:

Please see attached.

(5) A statement of operating income, setting forth the operating revenues and expenses by detailed accounts for the 12-month period ending on the date of the balance sheet required by paragraph (2).

RESPONSE:

Please see attached.

(6) A brief description of a major change in the operating or financial condition of the utility occurring between the date of the balance sheet required by paragraph (2) and the date of transmittal of the tariff, revision or supplement. As used in this paragraph, a major change is one which materially alters the operating or financial condition of the utility from that reflected in paragraphs (1)—(5).

RESPONSE:

There has not been any major change in the operating or financial condition of the utility since the balance sheet dated December 31, 2019.

**Pittsburgh Water & Sewer Authority
Rate Case 2021
EPFTY Pro Forma Revenue at Current Rates**

	FY 2022			PUC Approved Prior Tariff Rates		FY 2022			Total Rate Revenue
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (5%)	
1 Water Revenues									
2 Residential									
3 5/8"	57,973	695,677	1,655,805	\$ 27.27	\$ 12.25	\$ 18,971,113	\$ 20,283,612	\$ 1,962,736	\$ 41,217,461
4 3/4"	2,553	30,635	118,317	44.37	12.25	1,359,271	1,449,384	140,433	2,949,088
5 1"	2,382	28,586	131,352	89.82	12.25	2,567,604	1,609,062	208,833	4,385,500
6 1 1/2"	7	84	764	175.30	12.25	14,725	9,363	1,204	25,293
7 2"	2	26	682	289.14	12.25	7,518	8,356	794	16,667
8 Unmetered	344	4,132	-	64.02		264,531	-	13,227	277,757
9 Total: Residential	63,262	759,140	1,906,921			\$ 23,184,762	\$ 23,359,776	\$ 2,327,227	\$ 48,871,765
10									
11 Residential - CAP									
12 5/8"	4,025	48,295	115,833	\$ -	\$ 12.25	\$ -	\$ 1,418,953	\$ 70,948	\$ 1,489,901
13 3/4"	33	395	659	-	12.25	-	8,069	403	8,473
14 1"	18	218	216	-	12.25	-	2,644	132	2,776
15 Unmetered	1	12	-	36.75	-	441	-	22	463
16 Volume Discount Customers	-	-	7,449	-	9.80	-	73,004	3,650	76,654
17 Total: Residential - CAP	4,077	48,920	124,157			\$ 441	\$ 1,502,670	\$ 75,156	\$ 1,578,267
18									
19 Commercial									
20 5/8"	2,612	31,349	125,375	\$ 27.27	\$ 11.95	\$ 854,878	\$ 1,498,235	\$ 117,656	\$ 2,470,769
21 3/4"	658	7,891	43,850	44.37	11.95	350,124	524,012	43,707	917,843
22 1"	1,317	15,806	138,137	89.82	11.95	1,419,695	1,650,733	153,521	3,223,949
23 1 1/2"	844	10,131	242,667	175.30	11.95	1,775,906	2,899,872	233,789	4,909,567
24 2"	785	9,421	417,343	289.14	11.95	2,723,892	4,987,243	385,557	8,096,692
25 3"	242	2,908	344,890	641.48	11.95	1,865,210	4,121,430	299,332	6,285,972
26 4"	184	2,209	571,035	1,084.28	11.95	2,395,536	6,823,874	460,970	9,680,380
27 6"	84	1,012	386,685	2,558.16	11.95	2,588,858	4,620,885	360,487	7,570,230
28 8"	9	105	151,523	4,596.96	11.95	481,148	1,810,698	114,592	2,406,439
29 10" & Above	-	-	-	7,515.81	11.95	-	-	-	-
30 Unmetered	2	24	-	75.07		1,802	-	90	1,892
31 Total: Commercial	6,738	80,855	2,421,505			\$ 14,457,048	\$ 28,936,983	\$ 2,169,702	\$ 45,563,733
32									
33 Industrial									
34 5/8"	17	209	1,625	\$ 27.27	\$ 10.31	\$ 5,699	\$ 16,750	\$ 1,122	\$ 23,572
35 3/4"	10	120	229	44.37	10.31	5,339	2,364	385	8,089
36 1"	20	245	3,163	89.82	10.31	22,006	32,615	2,731	57,352
37 1 1/2"	4	52	213	175.30	10.31	9,174	2,193	568	11,935
38 2"	11	137	19,620	289.14	10.31	39,612	202,286	12,095	253,993
39 3"	2	24	16,406	641.48	10.31	15,396	169,142	9,227	193,765
40 4"	8	90	65,986	1,084.28	10.31	97,585	680,318	38,895	816,798
41 6"	2	23	46,077	2,558.16	10.31	59,690	475,057	26,737	561,485
42 8"	3	40	29,620	4,596.96	10.31	183,878	305,379	24,463	513,720
43 10" & Above	2	24	-	7,515.81	10.31	180,379	-	9,019	189,398
44 Total: Industrial	80	965	182,939			\$ 618,760	\$ 1,886,105	\$ 125,243	\$ 2,630,107
45									
46 Health or Education									
47 5/8"	34	409	1,238	\$ 27.27	\$ 15.29	\$ 11,144	\$ 18,935	\$ 1,504	\$ 31,583
48 3/4"	8	102	631	44.37	15.29	4,511	9,653	708	14,872
49 1"	24	293	1,530	89.82	15.29	26,287	23,394	2,484	52,165
50 1 1/2"	64	774	6,479	175.30	15.29	135,624	99,057	11,734	246,415
51 2"	145	1,736	64,030	289.14	15.29	501,947	979,021	74,048	1,555,017
52 3"	97	1,160	139,347	641.48	15.29	744,117	2,130,622	143,737	3,018,476
53 4"	70	835	255,320	1,084.28	15.29	905,012	3,903,841	240,443	5,049,296
54 6"	37	441	389,186	2,558.16	15.29	1,128,149	5,950,656	353,940	7,432,744
55 8"	3	36	55,923	4,596.96	15.29	165,491	855,063	51,208	1,071,581
56 10" & Above	2	24	45,243	7,515.81	15.29	180,379	691,765	43,607	915,751
57 Total: Health or Education	484	5,808	958,928			\$ 3,802,661	\$ 14,662,007	\$ 923,233	\$ 19,387,901
58									
59 Municipal									
60 5/8"	91	1,094	6,418	\$ 16.36	\$ 7.17	\$ 17,900	\$ 46,016	\$ 3,196	\$ 67,112
61 3/4"	6	71	439	26.62	7.17	1,890	3,150	252	5,292
62 1"	27	321	18,067	53.89	7.17	17,299	129,537	7,342	154,178
63 1 1/2"	28	335	4,654	105.18	7.17	35,235	33,366	3,430	72,032
64 2"	33	397	20,839	173.48	7.17	68,873	149,417	10,914	229,204
65 3"	11	133	7,726	384.89	7.17	51,190	55,395	5,329	111,915
66 4"	3	35	3,770	650.57	7.17	22,770	27,031	2,490	52,291
67 6"	3	36	135,820	1,534.90	7.17	55,256	973,832	51,454	1,080,542
68 8"	-	-	-	2,758.18	7.17	-	-	-	-
69 10" & Above	-	-	-	4,509.49	7.17	-	-	-	-
70 Total: Municipal	202	2,422	197,733			\$ 270,414	\$ 1,417,744	\$ 84,408	\$ 1,772,566
71									
72 Private Fire System									
73 1" or Less	1,238	14,856	7,915	\$ 33.24	\$ 14.01	\$ 493,813	\$ 110,886	\$ 30,235	\$ 634,934
74 1 1/2"-3"	48	581	5,225	101.97	14.01	59,245	73,202	6,622	139,069
75 4"	5	60	82	314.42	14.01	18,865	1,149	1,001	21,015
76 6" or Greater	16	192	1,337	626.83	14.01	120,351	18,732	6,954	146,037
77 Total: Private Fire System	1,307	15,689	14,559			\$ 692,275	\$ 203,969	\$ 44,812	\$ 941,055
78									
79 Public Fire (Hydrants)	7,508	90,096	-	\$ 5.65	\$ -	\$ 509,042	\$ -	\$ -	\$ 509,042
80									
81 Total: Water (Units & Sales)	83,658	1,003,895	5,806,741			\$43,535,403	\$71,969,253	\$5,749,781	\$ 121,254,437

(1) Represents billable customer usage above minimum allowance included in minimum charge

Pittsburgh Water & Sewer Authority
Rate Case 2021
Rate Revenue at Proposed Rates

Table with columns: FY 2022 (Number of Meters, Number of Annual Bills, Billable Usage (Kgal) (1)), Proposed Rates (Monthly Min. Charge, Volume Charge (Kgal)), FY 2022 (Min. Charge Revenue, Vol. Charge Revenue, DSIC (5%)), Total Rate Revenue. Rows include Residential, Residential - CAP, Commercial, Industrial, Health or Education, Municipal, and Private Fire System.

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority
Rate Case 2021
Rate Revenue at Current Rates**

	FY 2022			PUC Approved Prior Tariff Rates		FY 2022			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (5%)	Total Rate Revenue
1 Wastewater Revenues									
2 Residential									
3 5/8"	79,877	958,530	2,265,010	\$ 8.51	\$ 7.64	\$ 8,157,086	\$ 17,304,678	\$ 1,273,088	\$ 26,734,853
4 3/4"	2,578	30,942	119,280	17.23	7.64	533,125	911,296	72,221	1,516,642
5 1"	2,403	28,830	133,077	40.92	7.64	1,179,728	1,016,710	109,822	2,306,260
6 1 1/2"	7	84	764	84.51	7.64	7,099	5,840	647	13,585
7 2"	2	26	682	143.07	7.64	3,720	5,211	447	9,378
8 Unmetered	344	4,132	-	31.43	-	129,869	-	6,493	136,362
9 Total: Residential	85,212	1,022,543	2,518,813			\$ 10,010,627	\$ 19,243,735	\$ 1,462,718	\$ 30,717,080
11 Residential - CAP									
12 5/8"	5,667	68,003	185,242	\$ -	\$ 7.64	\$ -	\$ 1,415,246	\$ 70,762	\$ 1,486,008
13 3/4"	38	451	788	-	7.64	-	6,021	301	6,322
14 1"	18	218	216	-	7.64	-	1,649	82	1,731
15 Unmetered	1	12	-	22.92	-	275	-	14	289
16 Volume Discount Customers	-	-	11,888	-	6.11	-	72,660	3,633	76,293
17 Total: Residential - CAP	5,724	68,684	186,246			\$ 275	\$ 1,495,575	\$ 74,793	\$ 1,570,643
19 Commercial									
20 5/8"	3,623	43,473	182,818	\$ 8.51	\$ 6.74	\$ 369,952	\$ 1,232,195	\$ 80,107	\$ 1,682,255
21 3/4"	775	9,306	61,643	17.23	6.74	160,337	415,472	28,790	604,599
22 1"	1,565	18,776	220,885	40.92	6.74	768,314	1,488,763	112,854	2,369,931
23 1 1/2"	883	10,599	270,231	84.51	6.74	895,721	1,821,355	135,854	2,852,930
24 2"	880	10,558	481,552	143.07	6.74	1,510,485	3,245,660	237,807	4,993,953
25 3"	241	2,890	344,520	326.33	6.74	943,094	2,322,063	163,258	3,428,414
26 4"	201	2,410	580,796	558.31	6.74	1,345,713	3,914,565	263,014	5,523,292
27 6"	101	1,210	398,052	1,338.15	6.74	1,619,162	2,682,873	215,102	4,517,137
28 8"	9	112	158,125	2,424.04	6.74	272,300	1,065,764	66,903	1,404,967
29 10" & Above	5	62	-	3,991.08	6.74	247,447	-	12,372	259,819
30 Unmetered	2	24	-	35.47	-	851	-	43	894
31 Total: Commercial	8,285	99,420	2,698,622			\$ 8,133,377	\$ 18,188,710	\$ 1,316,104	\$ 27,638,191
33 Industrial									
34 5/8"	17	199	1,621	\$ 8.51	\$ 6.15	\$ 1,691	\$ 9,971	\$ 583	\$ 12,245
35 3/4"	9	112	229	17.23	6.15	1,924	1,410	167	3,501
36 1"	20	245	3,163	40.92	6.15	10,025	19,455	1,474	30,955
37 1 1/2"	4	52	213	84.51	6.15	4,423	1,308	287	6,017
38 2"	13	161	22,888	143.07	6.15	23,082	140,759	8,192	172,033
39 3"	2	24	16,406	326.33	6.15	7,832	100,895	5,436	114,163
40 4"	9	102	71,038	558.31	6.15	56,948	436,887	24,692	518,526
41 6"	2	23	46,077	1,338.15	6.15	31,224	283,376	15,730	330,329
42 8"	3	40	29,620	2,424.04	6.15	96,962	182,161	13,956	293,079
43 10" & Above	2	24	-	3,991.08	6.15	95,786	-	4,789	100,575
44 Total: Industrial	82	982	191,255			\$ 329,895	\$ 1,176,221	\$ 75,306	\$ 1,581,422
46 Health or Education									
47 5/8"	34	409	1,238	\$ 8.51	\$ 8.44	\$ 3,478	\$ 10,452	\$ 696	\$ 14,626
48 3/4"	8	102	631	17.23	8.44	1,752	5,328	354	7,434
49 1"	24	293	1,530	40.92	8.44	11,976	12,913	1,244	26,134
50 1 1/2"	64	774	6,479	84.51	8.44	65,383	54,679	6,003	126,065
51 2"	145	1,736	64,030	143.07	8.44	248,370	540,415	39,439	828,223
52 3"	97	1,160	139,343	326.33	8.44	378,543	1,176,059	77,730	1,632,332
53 4"	70	835	255,296	558.31	8.44	466,003	2,154,697	131,035	2,751,735
54 6"	37	441	389,267	1,338.15	8.44	590,124	3,285,412	193,777	4,069,313
55 8"	3	36	55,923	2,424.04	8.44	87,265	471,990	27,963	587,218
56 10" & Above	2	24	45,243	3,991.08	8.44	95,786	381,851	23,882	501,518
57 Total: Health or Education	484	5,808	958,980			\$ 1,948,679	\$ 8,093,795	\$ 502,124	\$ 10,544,598
59 Municipal									
60 5/8"	149	1,786	6,740	\$ 5.11	\$ 4.04	\$ 9,119	\$ 27,256	\$ 1,819	\$ 38,194
61 3/4"	11	134	439	10.34	4.04	1,385	1,777	158	3,320
62 1"	32	385	18,107	24.55	4.04	9,453	73,225	4,134	86,811
63 1 1/2"	28	335	4,654	50.71	4.04	16,987	18,819	1,790	37,596
64 2"	36	432	20,839	85.84	4.04	37,084	84,273	6,068	127,425
65 3"	11	133	7,726	195.80	4.04	26,041	31,244	2,864	60,149
66 4"	3	35	3,770	334.99	4.04	11,725	15,246	1,349	28,319
67 6"	4	48	130,738	802.89	4.04	38,539	528,706	28,362	595,607
68 8"	-	-	-	1,454.42	4.04	-	-	-	-
69 10" & Above	-	-	-	2,394.65	4.04	-	-	-	-
70 Total: Municipal	274	3,288	193,013			\$ 150,332	\$ 780,546	\$ 46,544	\$ 977,421
72 Total: Wastewater (Units & Sales)	100,060	1,200,726	6,758,818			\$ 20,573,185	\$ 48,978,582	\$ 3,477,588	\$ 73,029,355

(1) Represents billable customer usage above minimum allowance included in minimum charge

Pittsburgh Water & Sewer Authority
Rate Case 2021
Rate Revenue at Proposed Rates

	FY 2022		Proposed Rates			FY 2022			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (5%)	Total Rate Revenue
1 Wastewater Revenues									
2 Residential									
3 5/8"	79,877	958,530	2,265,010	\$ 7.61	\$ 6.34	\$ 7,294,410	\$ 14,360,165	\$ 1,082,729	\$ 22,737,303
4 3/4"	2,578	30,942	119,280	12.16	6.34	376,251	756,232	56,624	1,189,107
5 1"	2,403	28,830	133,077	25.22	6.34	727,095	843,710	78,540	1,649,345
6 1 1/2"	7	84	764	47.97	6.34	4,029	4,846	444	9,319
7 2"	2	26	682	79.24	6.34	2,060	4,325	319	6,704
8 Unmetered	344	4,132	-	26.63	-	110,035	-	5,502	115,537
9 Total: Residential	85,212	1,022,543	2,518,813			\$ 8,513,881	\$ 15,969,277	\$ 1,224,158	\$ 25,707,316
11 Residential - CAP									
12 5/8"	5,667	68,003	185,242	\$ -	\$ 6.34	\$ -	\$ 1,174,432	\$ 58,722	\$ 1,233,153
13 3/4"	38	451	788	-	6.34	-	4,997	250	5,246
14 1"	18	218	216	-	6.34	-	1,368	68	1,437
15 Unmetered	1	12	-	19.02	-	228	-	11	240
16 Volume Discount Customers	-	-	11,888	-	3.17	-	37,685	1,884	39,569
17 Total: Residential - CAP	5,724	68,684	198,134			\$ 228	\$ 1,218,482	\$ 60,935	\$ 1,279,645
19 Commercial									
20 5/8"	3,623	43,473	182,818	\$ 7.61	\$ 5.72	\$ 330,827	\$ 1,045,720	\$ 68,827	\$ 1,445,375
21 3/4"	775	9,306	61,643	12.16	5.72	113,157	352,596	23,288	489,041
22 1"	1,565	18,776	220,885	25.22	5.72	473,531	1,263,461	86,850	1,823,841
23 1 1/2"	883	10,599	270,231	47.97	5.72	508,434	1,545,719	102,708	2,156,861
24 2"	880	10,558	481,552	79.24	5.72	836,590	2,754,477	179,553	3,770,620
25 3"	241	2,890	344,520	179.74	5.72	519,449	1,970,652	124,505	2,614,606
26 4"	201	2,410	580,796	309.11	5.72	745,058	3,322,153	203,361	4,270,572
27 6"	101	1,210	398,052	754.13	5.72	912,497	2,276,860	159,468	3,348,825
28 8"	9	112	158,125	1,383.05	5.72	155,363	904,476	52,992	1,112,830
29 10" & Above	5	62	-	2,306.57	5.72	143,007	-	7,150	150,158
30 Unmetered	2	24	-	30.49	5.72	732	-	37	768
31 Total: Commercial	8,285	99,420	2,698,622			\$ 4,738,644	\$ 15,436,116	\$ 1,008,738	\$ 21,183,498
33 Industrial									
34 5/8"	17	199	1,621	\$ 7.61	\$ 5.32	\$ 1,512	\$ 8,625	\$ 507	\$ 10,644
35 3/4"	9	112	229	12.16	5.32	1,358	1,220	129	2,707
36 1"	20	245	3,163	25.22	5.32	6,179	16,830	1,150	24,159
37 1 1/2"	4	52	213	47.97	5.32	2,510	1,131	182	3,824
38 2"	13	161	22,888	79.24	5.32	12,784	121,762	6,727	141,273
39 3"	2	24	16,406	179.74	5.32	4,314	87,278	4,580	96,172
40 4"	9	102	71,038	309.11	5.32	31,529	377,925	20,473	429,927
41 6"	2	23	46,077	754.13	5.32	17,596	245,131	13,136	275,864
42 8"	3	40	29,620	1,383.05	5.32	55,322	157,577	10,645	223,544
43 10" & Above	2	24	-	2,306.57	5.32	55,358	-	2,768	58,126
44 Total: Industrial	82	982	191,255			\$ 188,462	\$ 1,017,479	\$ 60,297	\$ 1,266,238
46 Health or Education									
47 5/8"	34	409	1,238	\$ 7.61	\$ 6.03	\$ 3,110	\$ 7,468	\$ 529	\$ 11,106
48 3/4"	8	102	631	12.16	6.03	1,236	3,807	252	5,295
49 1"	24	293	1,530	25.22	6.03	7,381	9,226	830	17,437
50 1 1/2"	64	774	6,479	47.97	6.03	37,113	39,066	3,809	79,987
51 2"	145	1,736	64,030	79.24	6.03	137,561	386,102	26,183	549,846
52 3"	97	1,160	139,343	179.74	6.03	208,498	840,241	52,437	1,101,176
53 4"	70	835	255,296	309.11	6.03	258,004	1,539,434	89,872	1,887,310
54 6"	37	441	389,267	754.13	6.03	332,571	2,347,279	133,992	2,813,842
55 8"	3	36	55,923	1,383.05	6.03	49,790	337,216	19,350	406,356
56 10" & Above	2	24	45,243	2,306.57	6.03	55,358	272,815	16,409	344,581
57 Total: Health or Education	484	5,808	958,980			\$ 1,090,622	\$ 5,782,652	\$ 343,664	\$ 7,216,938
59 Municipal									
60 5/8"	149	1,786	6,740	\$ 4.57	\$ 3.43	\$ 8,162	\$ 23,131	\$ 1,565	\$ 32,858
61 3/4"	11	134	439	7.30	3.43	978	1,508	124	2,610
62 1"	32	385	18,107	15.13	3.43	5,825	62,143	3,398	71,367
63 1 1/2"	28	335	4,654	28.79	3.43	9,645	15,971	1,281	26,897
64 2"	36	432	20,839	47.54	3.43	20,537	71,520	4,603	96,660
65 3"	11	133	7,726	107.84	3.43	14,343	26,516	2,043	42,901
66 4"	3	35	3,770	185.47	3.43	6,491	12,939	972	20,402
67 6"	4	48	130,738	452.48	3.43	21,719	448,694	23,521	493,934
68 8"	-	-	-	829.83	3.43	-	-	-	-
69 10" & Above	-	-	-	1,383.94	3.43	-	-	-	-
70 Total: Municipal	274	3,288	193,013			\$ 87,700	\$ 662,422	\$ 37,506	\$ 787,628
72 Total: Wastewater (Units & Sales)	100,060	1,200,726	6,758,818			\$ 14,619,537	\$ 40,086,428	\$ 2,735,298	\$ 57,441,263

(1) Represents billable customer usage above minimum allowance included in minimum charge

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

(Dollars expressed in thousands)

YEARS ENDED DECEMBER 31, 2019 AND 2018

	2019	2018
Operating Revenues:		
Residential, commercial, and industrial water sales	\$ 171,681	\$ 159,506
Wastewater treatment	70,970	67,261
Other	6,398	4,967
Total operating revenues	249,049	231,734
Operating Expenses:		
Direct operating expenses	89,512	72,633
Wastewater treatment	72,389	71,822
Reimbursement for City of Pittsburgh services	1,991	4,911
Expense of water provided by other entities:		
Subsidy of customers located in the City	1,338	3,814
Depreciation	18,011	16,894
Total operating expenses	183,241	170,074
Operating Income	65,808	61,660
Non-operating Revenues (Expenses):		
Federal and private grants	6,922	-
Donated property	110	13,649
Interest revenue	719	469
Investment income (loss) - change in fair value of swap	(4,180)	2,542
Interest and amortization	(38,740)	(34,365)
Bond issuance costs	(2,462)	-
Total non-operating revenues (expenses)	(37,631)	(17,705)
Net Income before Special Item	28,177	43,955
Special Item:		
Private lead line replacement	(22,283)	(4,478)
Net Income	5,894	39,477
Net Position:		
Beginning of year	(4,359)	(43,836)
End of year	\$ 1,535	\$ (4,359)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

	2019	2018
Assets		
Current assets:		
Cash and cash equivalents	\$ 64,680	\$ 46,920
Accounts receivable, net:		
Water:		
Billed	7,138	8,537
Unbilled	8,965	8,583
Total water	16,103	17,120
Wastewater treatment:		
Billed	2,130	7,014
Unbilled	3,725	3,719
Total wastewater treatment	5,855	10,733
Other receivables	2,450	1,510
Total accounts receivable, net	24,408	29,363
Prepaid expenses	707	520
Inventory	1,597	1,984
Total current assets	91,392	78,787
Noncurrent assets:		
Restricted assets:		
Cash and cash equivalents	16,360	13,970
Investments	9,604	9,356
Total restricted assets	25,964	23,326
Hedging derivative - interest rate swap	-	4,750
Capital assets, not being depreciated	135,287	139,303
Capital assets, net of accumulated depreciation	695,291	618,177
Total noncurrent assets	856,542	785,556
Total Assets	947,934	864,343
Deferred Outflows of Resources		
Deferred charge on refunding	99,012	102,534
Accumulated decrease in fair value of hedging derivatives	13,351	757
Total Deferred Outflows of Resources	112,363	103,291

(Continued)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

(Continued)

	2019	2018
Liabilities		
<hr/>		
Current liabilities:		
Bonds and loans payable	27,022	23,400
Accrued payroll and related obligations	989	1,373
Accounts payable wastewater treatment	19,017	19,349
Accounts payable and other accrued expenses	22,720	20,911
Accrued interest payable from restricted assets	9,618	4,629
Total current liabilities	79,366	69,662
Noncurrent liabilities:		
Unearned revenue	121	143
Accrued payroll and related obligations	621	558
Swap liability	13,351	13,254
Bonds and loans payable, net	965,303	883,626
Total noncurrent liabilities	979,396	897,581
Total Liabilities	1,058,762	967,243
Deferred Inflows of Resources		
<hr/>		
Accumulated increase in fair value of hedging derivatives	-	4,750
<hr/>		
Net Position		
<hr/>		
Net investment in capital assets	(15,365)	(14,892)
Restricted	19,320	16,388
Unrestricted	(2,420)	(5,855)
Total Net Position	\$ 1,535	\$ (4,359)

(Concluded)

The notes to financial statements are an integral part of this statement.

**Pittsburgh Water & Sewer Authority
Utility Plant in Service
As of December 31, 2020**

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2020 Beginning Balance</u>	<u>Additions</u>	<u>2020 Ending Balance</u>
<u>General Water</u>					
Utility - Machine - Equipment	300	1803	\$ -	\$ -	\$ -
<u>Water Quality</u>					
Utility - Building	321	1802	644,181	-	644,181
Utility - Machine - Equipment	321	1803	619,739	-	619,739
Utility - Computer Equipment	321	1805	20,148	-	20,148
Utility - Vehicles	321	1806	48,400	-	48,400
Utility - Miscellaneous	321	1807	<u>145,378</u>	<u>-</u>	<u>145,378</u>
<i>Subtotal: Water Quality</i>			1,477,845	-	1,477,845
<u>Water Quality</u>					
Utility - Building	322	1802	1,919,711	(41,363)	1,878,348
Utility - Machine - Equipment	322	1803	93,005,874	6,716,044	99,721,917
Utility - Computer Equipment	322	1805	2,619,928	-	2,619,928
Utility - Vehicles	322	1806	1,467,675	(343,751)	1,123,924
Utility - Miscellaneous	322	1807	<u>8,025,066</u>	<u>(286,934)</u>	<u>7,738,132</u>
<i>Subtotal: Water Quality</i>			107,038,255	6,043,996	113,082,250
<u>Pumping</u>					
Utility - Building	323	1802	92,128,633	(19,481)	92,109,152
Utility - Computer Equipment	323	1805	49,092	-	49,092
Utility - Miscellaneous	323	1807	<u>21,183</u>	<u>-</u>	<u>21,183</u>
<i>Subtotal: Pumping</i>			92,198,908	(19,481)	92,179,427
<u>Membrane Plant</u>					
Utility - Building	324	1802	20,355,348	-	20,355,348
<u>Distribution</u>					
Utility - Building	325	1802	291,001,131	63,582,468	354,583,599
Utility - Machine - Equipment	325	1803	31,864,819	1,180,125	33,044,944
Utility - Furniture - Fixtures	325	1804	7,500	-	7,500
Utility - Vehicles	325	1806	3,828,018	2,144,222	5,972,240
Utility - Miscellaneous	325	1807	12,130,958	(44,233)	12,086,725
Non-Utility - Building	325	1822	<u>-</u>	<u>-</u>	<u>-</u>
<i>Subtotal: Distribution</i>			338,832,426	66,862,583	405,695,009
<u>Sewer Operations</u>					
Utility - Building	424	1802	390,475,418	18,008,853	408,484,271
Utility - Machine - Equipment	424	1803	41,802,011	559,842	42,361,853
Utility - Furniture - Fixtures	424	1804	-	-	-
Utility - Computer Equipment	424	1805	3,185	-	3,185
Utility - Vehicles	424	1806	2,804,707	(286,674)	2,518,033
Utility - Miscellaneous	424	1807	<u>3,907,340</u>	<u>(110,777)</u>	<u>3,796,563</u>
<i>Subtotal: Sewer Operations</i>			438,992,662	18,171,244	457,163,905
<u>Sewer Miscellaneous</u>					
Utility - Miscellaneous	425	1807	-	-	-

Pittsburgh Water & Sewer Authority
Utility Plant in Service
As of December 31, 2020

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2020</u> <i>Beginning</i> <i>Balance</i>	<i>Additions</i>	<u>2020</u> <i>Ending</i> <i>Balance</i>
Other Miscellaneous					
Non-Utility - Furniture - Fixtures	800	1824	-	-	-
Utility - Computer Equipment	900	1805	-	-	-
Non-Utility - Computer Equipment	900	1825	-	-	-
<i>Subtotal: Other Miscellaneous</i>			-	-	-
Executive Director					
Non-Utility - Building	910	1822	853,138	-	853,138
Non-Utility - Furniture - Fixtures	910	1824	102,352	-	102,352
Non-Utility - Vehicles	910	1826	-	-	-
<i>Subtotal: Executive Director</i>			955,491	-	955,491
Customer Service					
Non-Utility - Furniture - Fixtures	911	1824	165,426	-	165,426
Non-Utility - Computer Equipment	911	1825	831,567	-	831,567
Non-Utility - Miscellaneous	911	1827	9,472	(6,710)	2,762
<i>Subtotal: Customer Service</i>			1,006,465	(6,710)	999,755
Management Information Systems					
Non-Utility - Furniture - Fixtures	912	1824	8,773	-	8,773
Non-Utility - Computer Equipment	912	1825	3,206,584	(73,978)	3,132,607
Non-Utility - Miscellaneous	912	1827	10,492	-	10,492
<i>Subtotal: Management Information Systems</i>			3,225,849	(73,978)	3,151,872
Finance					
Non-Utility - Furniture - Fixtures	913	1824	73,472	-	73,472
Non-Utility - Computer Equipment	913	1825	-	-	-
<i>Subtotal: Finance</i>			73,472	-	73,472
Warehouse					
Utility - Machine - Equipment	918	1803	-	-	-
Non-Utility - Furniture - Fixtures	918	1824	35,332	-	35,332
Non-Utility - Computer Equipment	918	1825	-	-	-
Non-Utility - Vehicles	918	1826	150,639	-	150,639
Non-Utility - Miscellaneous	918	1827	3,958,999	(70,503)	3,888,496
<i>Subtotal: Warehouse</i>			4,144,970	(70,503)	4,074,467
Engineering					
Non-Utility - Building	930	1822	277,190	-	277,190
Non-Utility - Furniture - Fixtures	930	1824	328,349	-	328,349
Non-Utility - Computer Equipment	930	1825	1,516,841	(25,444)	1,491,397
Non-Utility - Vehicles	930	1826	457,225	(26,947)	430,278
Non-Utility - Miscellaneous	930	1827	195,138	-	195,138
<i>Subtotal: Engineering</i>			2,774,743	(52,392)	2,722,352
<i>Total: Fixed Assets</i>			\$ 1,011,076,434	\$ 90,854,759	\$ 1,101,931,193
Other Assets					
Construction in Progress		1840	\$ 124,756,028	\$ 16,955,748	\$ 141,711,776
Capitalized Interest		1841	-	-	-
CIP Accrual		1842	14,578,246	2,773,580	17,351,826
Total Utility Plant			\$ 1,150,410,708	\$110,584,087	\$ 1,260,994,795

Pittsburgh Water & Sewer Authority
Depreciation by PWSA Department & Code
As of December 31, 2020

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2020</u> <i>Beginning Balance</i>	<i>Depreciation</i>	<u>2020</u> <i>Ending Balance</i>
General Water					
Utility - Machine - Equipment	300	1813	\$ -	\$ -	\$ -
Water Quality					
Utility - Building	321	1812	(644,181)	-	(644,181)
Utility - Machine - Equipment	321	1813	(492,393)	(10,206)	(502,598)
Utility - Computer Equipment	321	1815	(730)	(4,036)	(4,766)
Utility - Vehicles	321	1816	(4,849)	(4,849)	(9,699)
Utility - Miscellaneous	321	1817	(63,405)	(13,961)	(77,366)
<i>Subtotal: Water Quality</i>			(1,205,557)	(33,053)	(1,238,610)
Water Quality					
Utility - Building	322	1812	(613,899)	3,264	(610,635)
Utility - Machine - Equipment	322	1813	(25,486,639)	(3,184,729)	(28,671,368)
Utility - Computer Equipment	322	1815	(929,772)	(508,483)	(1,438,255)
Utility - Vehicles	322	1816	(1,109,798)	675,691	(434,106)
Utility - Miscellaneous	322	1817	(3,066,487)	95,535	(2,970,953)
<i>Subtotal: Water Quality</i>			(31,206,595)	(2,918,721)	(34,125,317)
Pumping					
Utility - Building	323	1812	(45,705,609)	(1,925,389)	(47,630,998)
Utility - Computer Equipment	323	1815	(21,305)	(2,300)	(23,605)
Utility - Miscellaneous	323	1817	(21,183)	-	(21,183)
<i>Subtotal: Pumping</i>			(45,748,098)	(1,927,689)	(47,675,786)
Membrane Plant					
Utility - Building	324	1812	(7,108,056)	(381,213)	(7,489,269)
Distribution					
Utility - Building	325	1812	(71,228,072)	(4,427,566)	(75,655,638)
Utility - Machine - Equipment	325	1813	(14,231,137)	(1,602,711)	(15,833,848)
Utility - Furniture - Fixtures	325	1814	(7,500)	-	(7,500)
Utility - Vehicles	325	1816	(633,224)	(327,655)	(960,879)
Utility - Miscellaneous	325	1817	(5,885,192)	(175,730)	(6,060,923)
Non-Utility - Building	325	1832	-	-	-
<i>Subtotal: Distribution</i>			(91,985,125)	(6,533,663)	(98,518,788)
Sewer Operations					
Utility - Building	424	1812	(108,018,231)	(7,026,156)	(115,044,387)
Utility - Machine - Equipment	424	1813	(20,465,279)	(649,611)	(21,114,890)
Utility - Furniture - Fixtures	424	1814	-	-	-
Utility - Computer Equipment	424	1815	(1,382)	(74)	(1,456)
Utility - Vehicles	424	1816	(1,597,225)	429,555	(1,167,670)
Utility - Miscellaneous	424	1817	(1,591,824)	(43,529)	(1,635,354)
<i>Subtotal: Sewer Operations</i>			(131,673,942)	(7,289,815)	(138,963,757)
Sewer Miscellaneous					
Utility - Miscellaneous	425	1817	-	-	-
Other Miscellaneous					
Non-Utility - Furniture - Fixtures	800	1834	-	-	-
Utility - Computer Equipment	900	1815	-	-	-
Non-Utility - Computer Equipment	900	1835	-	-	-

Pittsburgh Water & Sewer Authority
Depreciation by PWSA Department & Code
As of December 31, 2020

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2020 Beginning Balance</u>	<u>Depreciation</u>	<u>2020 Ending Balance</u>
<i>Subtotal: Other Miscellaneous</i>					
Executive Director					
Non-Utility - Building	910	1832	(257,129)	(19,749)	(276,878)
Non-Utility - Furniture - Fixtures	910	1834	(74,501)	(3,988)	(78,489)
Non-Utility - Vehicles	910	1836	-	-	-
<i>Subtotal: Executive Director</i>			(331,630)	(23,737)	(355,367)
Customer Service					
Non-Utility - Furniture - Fixtures	911	1834	(146,236)	(4,811)	(151,047)
Non-Utility - Computer Equipment	911	1835	(189,607)	(144,700)	(334,307)
Non-Utility - Miscellaneous	911	1837	(9,472)	6,710	(2,762)
<i>Subtotal: Customer Service</i>			(345,315)	(142,800)	(488,115)
Management Information Systems					
Non-Utility - Furniture - Fixtures	912	1834	(8,773)	-	(8,773)
Non-Utility - Computer Equipment	912	1835	(1,778,134)	(251,196)	(2,029,331)
Non-Utility - Miscellaneous	912	1837	(6,298)	(2,103)	(8,401)
<i>Subtotal: Management Information Systems</i>			(1,793,205)	(253,299)	(2,046,504)
Finance					
Non-Utility - Furniture - Fixtures	913	1834	(53,471)	(3,341)	(56,812)
Non-Utility - Computer Equipment	913	1835	-	-	-
<i>Subtotal: Finance</i>			(53,471)	(3,341)	(56,812)
Warehouse					
Utility - Machine - Equipment	918	1813	-	-	-
Non-Utility - Furniture - Fixtures	918	1834	(35,332)	-	(35,332)
Non-Utility - Computer Equipment	918	1835	-	-	-
Non-Utility - Vehicles	918	1836	(150,639)	-	(150,639)
Non-Utility - Miscellaneous	918	1837	(2,382,497)	(2,786)	(2,385,283)
<i>Subtotal: Warehouse</i>			(2,568,467)	(2,786)	(2,571,254)
Engineering					
Non-Utility - Building	930	1832	(127,742)	(6,486)	(134,228)
Non-Utility - Furniture - Fixtures	930	1834	(201,192)	(22,152)	(223,344)
Non-Utility - Computer Equipment	930	1835	(826,433)	(6,460)	(832,893)
Non-Utility - Vehicles	930	1836	(457,225)	26,947	(430,278)
Non-Utility - Miscellaneous	930	1837	(152,294)	(27,896)	(180,190)
<i>Subtotal: Engineering</i>			(1,764,887)	(36,046)	(1,800,933)
Total: Accumulated Depreciation			\$ (315,784,349)	\$ (19,546,164)	\$ (335,330,513)

Pittsburgh Water & Sewer Authority
Comparative Income Statements
As of December 31, 2020

System Operating Statement	HTY Per Books 12/31/2020
<u>System Revenues</u>	
Water Sales	\$ 106,488,339
Wastewater Sales	\$ 57,817,445
Wastewater Treatment	68,226,853
Sale for Resale & Contract Sales	886,916
Miscellaneous Revenues and Fees	7,361,091
	\$ -
<i>System Operating Revenues</i>	\$ 240,780,644
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 2,652,942
Customer Service	7,069,743
Management Information Systems	2,589,691
Finance	12,870,730
Procurement	-
Human Resources	707,475
Legal	4,295,018
Community Outreach / Public Affairs	1,049,867
Operations Division	
Environmental Compliance	1,403,532
Warehouse	400,607
General Administration	18,435
Water Quality (Lab)	1,740,900
Water Treatment Plant	17,132,272
Sewer Operations	3,459,048
Water Distribution	13,061,180
Engineering & Construction Division	
Engineering & Construction	26,087,632
	-
<i>Subtotal: Direct Operating Expenses</i>	\$ 94,539,074
<i>Other Operating Expenses</i>	
ALCOSAN	\$ 73,188,108
Co-Op Agreement Op. Expenses - Water	-
Co-Op Agreement Op. Expenses - Sewer	-
Non-City Water Payments	-
Affordability Program Placeholder	-
	-
<i>Subtotal: Other Operating Expenses</i>	\$ 73,188,108
<i>Subtotal: Operating Expenses</i>	\$ 167,727,183
Operating Income	\$ 73,053,461
<u>Debt Service</u>	
Senior and Subordinate Debt	\$ 59,970,291
Revolving Line of Credit Interest	1,670,708
	-
<i>Subtotal: Debt Service</i>	\$ 61,640,999
<u>Capital Expenditures & Transfers</u>	
Transfers to Reserves	-
	-
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ -
Revenue Surplus/(Deficit)	\$ 11,412,462

I. STATEMENT OF INCOME

Exhibit D – Water and Wastewater Utilities

I.1. Provide comparative operating statements for the historic test year and the immediately preceding 12 months showing increases and decreases between the two periods. These statements should supply detailed explanation of the causes of the major (greater than 15%) variances between the historic test year and preceding year by detailed account number. Limit the explanation to differences of \$10,000 or greater.

RESPONSE:

Please see the attached schedule (Descriptions on schedule).

**Pittsburgh Water & Sewer Authority
Comparative Income Statements
Twelve Months Ended December 31, 2019 & 2020**

System Operating Statement	HTY		Variance	% Variance	Explanation of Variance (15% and \$10K)
	Per Books 12/31/2019	Per Books 12/31/2020			
System Revenues					
Water Sales	\$ 108,229,249	\$ 106,488,139	\$(1,740,911)	-1.61%	Consumption down due to pandemic
Wastewater Sales	\$ 59,913,839	\$ 57,817,445	\$(2,096,394)	-3.50%	Consumption down due to pandemic
Wastewater Treatment	\$ 73,522,941	\$ 68,226,853	\$(5,296,088)	-7.20%	Consumption down due to pandemic
Sale for Resale & Contract Sales	\$ 3,040,794	\$ 886,916	\$(2,153,877)	-70.83%	Consumption down due to pandemic
Miscellaneous Revenues and Fees	\$ 5,867,458	\$ 7,361,091	\$ 1,493,633	25.46%	Tap fee collections were significantly higher in 2020
System Operating Revenues	\$ 250,574,281	\$ 240,780,644	\$(9,793,637)		
Direct Operating Expenses					
Administrative Division					
Executive Director	\$ 3,479,233	\$ 2,652,942	\$(826,291)	-23.75%	Some costs were reclassified to Finance
Customer Service	\$ 7,457,579	\$ 7,069,743	\$(387,836)	-5.20%	Overall reduction in spending
Management Information Systems	\$ 2,801,283	\$ 2,589,691	\$(211,592)	-12.53%	Increased staffing and professional services spending
Finance	\$ 3,186,898	\$ 3,218,730	\$ 31,832	303.86%	Costs reclassified to Finance from other departments
Procurement	\$ 370,556	\$ (370,556)	\$(741,112)	-100.00%	Costs reclassified to Finance
Human Resources	\$ 951,558	\$ 707,475	\$(244,083)	-25.65%	Increased staffing and professional services spending
Legal	\$ 3,616,831	\$ 4,295,018	\$ 678,187	18.75%	Increased staffing and professional services spending
Community Outreach / Public Affairs	\$ 1,080,407	\$ 1,049,867	\$(30,540)	-2.83%	Increased staffing and professional services spending
Operations Division					
Warehouse	\$ 663,281	\$ 400,607	\$(262,674)	-39.60%	Inventory was better allocated to department level in 2020
Ops Capital Assets	\$ 24,939	\$ 18,435	\$(6,504)	-26.08%	Ops Capital Assets reflects increases in freight shipping spending
Water Quality (Lab)	\$ 2,254,974	\$ 1,740,900	\$(514,074)	-22.80%	Decreased contract staffing
Environmental Compliance	\$ 1,491,438	\$ 1,403,532	\$(87,906)	-5.89%	Overall decrease in spending
Water Treatment Plant	\$ 17,099,660	\$ 17,132,272	\$ 32,612	0.19%	Slight overall increase in spending
Sewer Operations	\$ 11,487,340	\$ 3,459,048	\$(8,028,292)	-69.89%	Costs reclassified to Engineering
Water Distribution	\$ 25,251,612	\$ 13,061,180	\$(12,190,432)	-48.28%	Costs reclassified to Engineering
Engineering & Construction Division					
Engineering & Construction	\$ 8,824,994	\$ 26,087,632	\$ 17,262,638	195.61%	Costs reclassified from Sewer Operations and Water Distribution
Subtotal: Direct Operating Expenses	\$ 89,542,583	\$ 94,539,074	\$ 4,996,491		
Other Operating Expenses					
ALCOSAN	\$ 71,397,509	\$ 73,188,108	\$ 1,790,599	2.51%	ALCOSAN rate increase combined with decrease in consumption
Co-Op Agreement Op. Expenses - Water	\$ 2,300,237	\$ (2,300,237)	\$(4,600,474)	-100.00%	Costs reclassified to Finance based on invoice billing actual expense type
Co-Op Agreement Op. Expenses - Sewer	\$ 2,300,237	\$ (2,300,237)	\$(4,600,474)	-100.00%	Costs reclassified to Finance based on invoice billing actual expense type
Non-City Water Payments	\$ 1,404,861	\$ (1,404,861)	\$(2,809,722)	-100.00%	Costs reclassified to Finance and Customer Service
Affordability Program Placeholder				0.00%	
Subtotal: Other Operating Expenses	\$ 77,402,843	\$ 73,188,108	\$(4,214,735)		
Subtotal: Operating Expenses	\$ 166,945,426	\$ 167,727,183	\$ 781,757		
Operating Income	\$ 83,628,855	\$ 73,053,461	\$(10,575,394)		
Debt Service					
Senior and Subordinate Debt	\$ 56,554,366	\$ 59,970,291	\$ 3,415,925	6.04%	New bonds and loans issued
Revolving Line of Credit Interest	\$ 2,725,400	\$ 1,670,708	\$(1,054,692)	-38.70%	Function of balance and rate
Subtotal: Debt Service	\$ 59,279,766	\$ 61,640,999	\$ 2,361,233		
Capital Expenditures & Transfers					
Transfers to Reserves	\$ 2,510,983	\$ (2,510,983)	\$(5,021,966)	-100.00%	Required transfer decreased due to combination of reserve balance and budgeted expenses
Subtotal: Capital Expenditures & Transfers	\$ 2,510,983	\$ (2,510,983)	\$(5,021,966)		
Revenue Surplus/(Deficit)	\$ 21,838,106	\$ 11,412,462	\$(10,425,643)		

Pittsburgh Water and Sewer Authority's Base Rate Filing

I. STATEMENT OF INCOME

I.2. Prepare an income statement for the various time frames of the rate proceeding including:

Col. 1—Book recorded income statement for the test year.

Col. 2—Adjustments to book recorded income statement to annualize and normalize under present rates.

Col. 3—Income statement under present rates after adjustments in Col. 2.

Col. 4—Adjustments to Col. 3 for revenue increase requested.

Col. 5—Income statement under proposed rates.

RESPONSE:

Please see the attached schedule.

Pittsburgh Water & Sewer Authority
Statement of Projected Income at Present and Proposed Rates
Twelve Months Ending December 31, 2022

System Operating Statement	(1) Annualized 12 Months Ended 12/31/2022	(2) Adjustments Under Annualized Rates	(3) Annualized 12 Months Ended 12/31/2022	(4) Adjustments Under Proposed Rates	(5) Adjustments 12 Months Ended 12/31/2022
Operating Revenues					
Water Sales	\$ 121,254,437	\$ -	\$ 121,254,437	\$ 23,948,199	\$ 145,202,636
Wastewater Sales	73,029,355	-	73,029,355	(15,588,092)	57,441,263
Stormwater					24,300,462
Sale for Resale & Contract Sales	3,192,713	-	3,192,713	497,419	3,690,132
Other Revenues	2,112,667	-	2,112,667	-	2,112,667
<i>System Operating Revenues</i>	\$ 199,589,172	\$ -	\$ 199,589,172	\$ 8,857,526	\$ 232,747,160
Operating Expenses					
<i>Direct Operating Expenses</i>					
Administrative Divisions	\$ 37,373,512	\$ -	\$ 37,373,512	\$ -	\$ 37,373,512
Operations Divisions	47,792,832	-	47,792,832	-	47,792,832
Engineering & Construction Division	38,530,420	-	38,530,420	-	38,530,420
<i>Direct Operating Expenses</i>	\$ 123,696,763	\$ -	\$ 123,696,763	\$ -	\$ 123,696,763
<i>Other Operating Expenses</i>					
Loss on ALCOSAN Billings	\$ 1,571,968	\$ -	\$ 1,571,968	\$ -	\$ 1,571,968
City Services	-	-	-	-	-
Non-City Water Payments	-	-	-	-	-
<i>Other Operating Expenses</i>	\$ 1,571,968	\$ -	\$ 1,571,968	\$ -	\$ 1,571,968
<i>Subtotal: Operating Expenses</i>	\$ 125,268,731	\$ -	\$ 125,268,731	\$ -	\$ 125,268,731
Operating Income	\$ 74,320,441	\$ -	\$ 74,320,441	\$ 8,857,526	\$ 107,478,428
Debt Service					
Existing Debt	\$ (66,073,964)	\$ -	\$ (66,073,964)	\$ -	\$ (66,073,964)
Proposed Debt	(23,333,308)	-	(23,333,308)	-	(23,333,308)
<i>Subtotal: Debt Service</i>	\$ (89,407,273)	\$ -	\$ (89,407,273)	\$ -	\$ (89,407,273)
Capital Expenditures & Transfers					
Internally Generated Funds / PAYGO	\$ (1,000,000)	\$ -	\$ (1,000,000)	\$ -	\$ (1,000,000)
Internally Generated Funds / PAYGO (DSIC)	(9,599,856)	-	(9,599,856)	-	(9,599,856)
Other Transfers to Reserves	(1,000,000)	-	(1,000,000)	-	(1,000,000)
Reimbursements (Municipalities & Pennvest)	-	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-	-
Bad Debt Expense	(5,718,077)	-	(5,718,077)	-	(5,718,077)
Stormwater Credit Program Cost	(696,685)	-	(696,685)	-	(696,685)
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ (18,014,618)	\$ -	\$ (18,014,618)	\$ -	\$ (18,014,618)
Revenue Surplus/(Deficit)	\$ (33,101,450)	\$ -	\$ (33,101,450)	\$ 8,857,526	\$ 56,538

Pittsburgh Water and Sewer Authority's Base Rate Filing

I. STATEMENT OF INCOME

I.3. If a company has separate operating divisions, an income statement must be shown for each division, plus an income statement for the company as a whole.

RESPONSE:

Please see the response to I.2.

Pittsburgh Water and Sewer Authority's Base Rate Filing

I. STATEMENT OF INCOME

I.4. Provide operating income claims under:

- a. Present rates.
- b. Pro forma present rates (annualized & normalized).
- c. Proposed rates (annualized & normalized).

RESPONSE:

Please see the response provided to I.2.

Pittsburgh Water and Sewer Authority's Base Rate Filing

I. STATEMENT OF INCOME

I.5. Provide rate of return on original cost under:

- a. Present rates.
- b. Pro forma present rates.
- c. Proposed rates.

RESPONSE: Not Applicable.

II. OPERATING REVENUES

II.1. Prepare a summary of operating revenues for the historic test year and the year preceding the historic test year, providing the following information:

a. For each classification of customers:

(i) Number of customers as of year-end.

(ii) Gallons sold.

(iii) Revenues.

b. Customers' penalties and miscellaneous water revenues.

RESPONSE:

Please see the attached schedule.

**Pittsburgh Water & Sewer Authority
Summary of Operating Revenues**

	Water					Wastewater Conveyance				
	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021	12 Months Ended 12/31/2022	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021	12 Months Ended 12/31/2022
a. Operating Revenues										
(i) <u>Number of Customers</u>										
Residential	65,099	64,843	64,368	63,903	63,262	88,101	87,289	86,601	86,112	85,212
Residential - CAP	923	1,800	2,568	3,436	4,077	1,697	2,740	3,604	4,823	5,723
Commercial	6,697	6,731	6,786	6,738	6,738	8,273	8,273	8,308	8,285	8,285
Industrial	98	97	43	80	80	98	98	46	82	82
Health or Education	494	484	474	484	484	494	484	474	484	484
Municipal	-	-	202	202	202	-	-	274	274	274
Fire System	1,223	1,269	1,307	1,307	1,307	-	-	-	-	-
Wholesale and Contract	9	10	11	12	13	1	1	1	1	1
Total	74,543	75,232	75,759	76,162	76,163	98,665	99,308	100,060	100,060	100,060
(ii) <u>Gallons Billed (kgals)</u>										
Residential	2,041,350	1,874,771	1,951,570	1,951,165	1,906,921	2,703,956	2,491,965	2,599,739	2,589,928	2,518,813
Residential - CAP	31,049	55,055	74,953	98,353	116,707	66,466	93,829	118,166	156,955	186,246
Commercial	2,723,585	2,517,870	2,053,059	2,053,405	2,421,505	3,006,528	2,799,696	2,289,641	2,323,985	2,698,622
Industrial	183,343	192,645	172,830	175,423	182,939	192,007	199,971	181,789	184,516	191,255
Health or Education	1,068,428	975,581	832,774	845,266	958,928	1,068,859	975,430	832,652	845,142	958,980
Municipal	-	-	197,733	197,733	197,733	-	-	193,013	195,909	193,013
Fire System	7,913	21,423	14,340	14,555	14,559	-	-	-	-	-
Wholesale and Contract	1,395,834	1,291,840	1,079,773	850,243	844,205	-	-	-	-	-
Total	7,451,502	6,929,185	6,347,032	6,186,143	6,643,497	7,037,816	6,560,891	6,215,001	6,296,435	6,746,930
(iii) <u>Revenues</u>										
Residential	\$ 38,579,097	\$ 43,252,238	\$ 45,083,259	\$ 47,205,563	\$ 53,833,534	\$ 27,430,607	\$ 28,124,881	\$ 29,210,901	\$ 29,859,176	\$ 24,483,158
Residential - CAP	415,907	750,907	1,050,407	1,261,976	1,869,666	529,338	762,959	974,298	1,198,142	1,181,025
Commercial	36,325,976	39,812,830	35,885,302	38,879,158	54,061,247	25,736,772	25,908,467	22,889,397	23,772,561	20,174,760
Industrial	1,808,653	2,154,449	2,002,470	2,417,246	3,185,547	1,312,788	1,442,517	1,339,990	1,463,123	1,205,941
Health or Education	16,305,136	17,361,218	15,681,552	16,695,240	21,346,292	9,940,680	9,798,783	8,709,760	9,072,188	6,873,274
Municipal	-	-	504,586	1,105,027	2,108,798	-	-	301,998	617,859	750,115
Private Fire Systems	592,251	873,794	819,484	893,357	886,072	-	1	2	3	4
Public Fire	-	-	-	509,042	1,046,916	-	-	-	-	-
Wholesale and Contract	3,675,106	3,068,663	3,044,694	3,192,713	3,690,132	-	-	-	-	-
DSIC	-	-	-	5,422,878	6,864,558	464,052	232,029	-	-	-
Total Water Sales	\$ 97,702,125	\$ 107,274,099	\$ 104,071,754	\$ 117,582,202	\$ 148,892,761	\$ 65,414,237	\$ 66,269,638	\$ 63,426,345	\$ 65,983,052	\$ 54,668,277

**Pittsburgh Water & Sewer Authority
Summary of Operating Revenues**

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021	12 Months Ended 12/31/2022
b. Customer Penalties & Misc. Revenues					
Dye Testing	\$ 169,710	\$ 174,154	\$ 180,379	\$ 183,987	\$ 187,667
Fire Hydrant Line Use	135,567	82,777	149,026	152,007	155,047
Fire Hydrant Sales	1,000	10,049	6,120	6,242	6,367
Map Fees	-	-	367	375	382
Backflow Fee	85,048	66,978	81,349	82,976	84,635
Meter Sales	85,500	133,778	91,530	-	-
Meter Test Fees	4,400	3,940	5,247	5,352	5,459
Non-Sufficient Funds Fees	39,463	31,107	40,680	41,493	42,323
Shut Fees	149,963	13,495	176,033	179,554	183,145
Tap Fees	4,774,236	5,874,258	3,457,698	-	-
Bid Fees	343	-	-	-	-
Lien Satisfaction Fees	4,134	-	1,836	1,873	1,910
Miscellaneous Fees (300)	927,674	974,665	1,140,360	1,163,167	1,186,431
Miscellaneous Fees (400)	15,817	-	17,153	17,496	17,846
Penalties & Interest	278,546	1,165,567	832,320	848,966	865,946
Total	6,671,401	8,530,769	6,180,099	2,683,488	2,737,157

II. OPERATING REVENUES

II.2. Prepare a summary of operating revenues for the historic test year, providing the following information:

a. For each classification of customers and for customers' penalties and miscellaneous water or wastewater revenues:

(i) Revenues.

(ii) Annualizing and normalizing adjustments to arrive at adjusted operating revenues for ratemaking.

(iii) Proposed increase in operating revenues.

(iv) Percent increase in operating revenues.

(v) Operating revenues under proposed rates.

RESPONSE:

Please see the attached schedule.

Pittsburgh Water & Sewer Authority
Statement of Actual and Projected Revenues at Present and Proposed Rates
Twelve Months Ending December 31, 2020, 2021, & 2022

	HTY 12 Months Ended 12/31/2020	FTY 12 Months Ended 12/31/2021	FPFTY Revenues at Present Rates 12/31/2022	Proposed Increase	Percent Increase	FPFTY Revenues at Proposed Rates 12/31/2022
Water						
<u>Customer Class</u>						
Residential	\$ 45,083,259	\$ 47,205,563	\$ 48,871,765	\$ 7,653,445	15.7%	\$ 56,525,210
Residential - CAP	1,050,407	1,261,976	1,578,267	384,882	24.4%	1,963,149
Commercial	35,885,302	38,879,158	45,563,733	11,200,577	24.6%	56,764,310
Industrial	2,002,470	2,417,246	2,630,107	714,717	27.2%	3,344,824
Health or Education	15,681,552	16,695,240	19,387,901	3,025,706	15.6%	22,413,607
Municipal	504,586	1,105,027	1,772,566	441,679	24.9%	2,214,245
Private Fire System	819,484	893,357	941,055	(10,680)	-1.1%	930,376
Public Fire Charges	-	509,042	509,042	537,873	105.7%	1,046,916
Total Water Revenues	101,027,060	108,966,611	121,254,437	23,948,199	19.8%	145,202,636
Wastewater						
<u>Customer Class</u>						
Residential	29,210,901	29,859,176	30,717,080	(5,009,764)	-16.3%	25,707,316
Residential - CAP	974,298	1,259,310	1,570,643	(290,998)	-18.5%	1,279,645
Commercial	22,889,397	23,772,561	27,638,191	(6,454,693)	-23.4%	21,183,498
Industrial	1,339,990	1,463,123	1,581,422	(315,184)	-19.9%	1,266,238
Health or Education	8,709,760	9,072,188	10,544,598	(3,327,660)	-31.6%	7,216,938
Municipal	301,998	617,859	977,421	(189,793)	-19.4%	787,628
Total Wastewater Revenues	63,426,343	66,044,216	73,029,355	(15,588,092)	-21.3%	57,441,263
Stormwater						
<u>Customer Class</u>						
Residential	-	-	-	9,707,824	100.0%	9,707,824
Residential - CAP	-	-	-	88,115	100.0%	88,115
Commercial	-	-	-	11,006,867	100.0%	11,006,867
Industrial	-	-	-	149,541	100.0%	149,541
Health or Education	-	-	-	1,119,933	100.0%	1,119,933
Municipal (Metered & Unmetered)	-	-	-	551,821	100.0%	551,821
Other	-	-	-	1,105,539	100.0%	1,105,539
Total Wastewater Revenues	-	-	-	23,729,641	100.0%	23,729,641
Wholesale & Contracts						
Allegheny	-	-	-	-	0.0%	-
Aspinwall	216,266	218,833	218,833	1,925	0.9%	220,759
Bay Valley / Riverbend (Water)	-	-	-	-	0.0%	-
Fox Chapel	2,119,902	2,272,727	2,272,727	445,673	19.6%	2,718,400
Hampton	22,251	-	-	-	0.0%	-
PAWC	77,411	83,062	83,062	-	0.0%	83,062
RSRV - 10"	400,668	419,358	419,358	20,644	4.9%	440,001
RSRV - 6"	64,107	67,180	67,180	3,327	5.0%	70,507
Sharpsburg	-	-	-	-	0.0%	-
Westview	144,089	131,553	131,553	25,850	19.7%	157,404
Bay Valley / Riverbend (Sewer)	-	-	-	-	0.0%	-
Total Wholesale & Contract Revenues	3,044,694	3,192,713	3,192,713	497,419	16.3%	3,690,132
Other Operating Revenue						
Dye Testing	\$ 174,154	\$ 180,379	\$ 183,987	\$ -	0.0%	\$ 183,987
Fire Hydrant Line Use	82,777	149,026	152,007	-	0.0%	152,007
Fire Hydrant Sales	10,049	6,120	6,242	-	0.0%	6,242
Map Fees	-	367	375	-	0.0%	375
Backflow Fee	66,978	81,349	82,976	-	0.0%	82,976
Meter Sales	133,778	91,530	-	-	0.0%	-
Meter Test Fees	3,940	5,247	5,352	-	0.0%	5,352
Non-Sufficient Funds Fees	31,107	40,680	41,493	-	0.0%	41,493
Shut Fees	13,495	176,033	179,554	-	0.0%	179,554
Tap Fees	5,874,258	3,457,698	-	-	0.0%	-
Bid Fees	-	-	-	-	0.0%	-
Lien Satisfaction Fees	-	1,836	1,873	-	0.0%	1,873
Miscellaneous Fees (300)	974,665	1,140,360	1,163,167	-	0.0%	1,163,167
Miscellaneous Fees (400)	-	17,153	17,496	-	0.0%	17,496
Penalties & Interest	1,165,567	832,320	848,966	-	0.0%	848,966
Prior-Year Collections	-	-	-	-	0.0%	-
Total Other Operating Revenues	8,530,769	6,180,099	2,683,488	-	0.0%	2,683,488
Total Operating Revenues	176,028,866	184,383,639	200,159,993	32,587,167	16.3%	232,747,160

II. OPERATING REVENUES

II.3. Provide a schedule of present and proposed tariff rates showing dollar change and percent of change by block. Provide increases to customers at various monthly uses (each 5,000 gallon consumption increment) showing billings at existing and proposed rates. Provide also an explanation of any change in block structure and the reason therefore. Provide a copy of the proposed tariff or tariff supplement on a red line basis, to easily identify any changes.

RESPONSE:

Please refer to the Cost of Service analysis and the testimony of Harold J. Smith.

II. OPERATING REVENUES

II.4. Provide for the future test year a detailed customer consumption analysis and the application of rates to support present and proposed revenues by customer classification and tariff rate schedule.

RESPONSE:

Please see the attached schedules.

Pittsburgh Water & Sewer Authority
Rate Case 2021
FPFTY Pro Forma Revenue at Current Rates

Table with columns: FY 2022 (Number of Meters, Number of Annual Bills, Billable Usage (Kgal) (1)), PUC Approved Prior Tariff Rates (Monthly Min. Charge, Volume Charge (Kgal)), FY 2022 (Min. Charge Revenue, Vol. Charge Revenue, DSIC (5%), Total Rate Revenue). Rows include Residential, Residential - CAP, Commercial, Industrial, Health or Education, Municipal, and Private Fire System categories.

(1) Represents billable customer usage above minimum allowance included in minimum charge

Pittsburgh Water & Sewer Authority
Rate Case 2021
Rate Revenue at Current Rates

	FY 2022			PUC Approved Prior Tariff Rates		FY 2022			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (5%)	Total Rate Revenue
1 Wastewater Revenues									
2 Residential									
3 5/8"	79,877	958,530	2,265,010	\$ 8.51	\$ 7.64	\$ 8,157,086	\$ 17,304,678	\$ 1,273,088	\$ 26,734,853
4 3/4"	2,578	30,942	119,280	17.23	7.64	533,125	911,296	72,221	1,516,642
5 1"	2,403	28,830	133,077	40.92	7.64	1,179,728	1,016,710	109,822	2,306,260
6 1 1/2"	7	84	764	84.51	7.64	7,099	5,840	647	13,585
7 2"	2	26	682	143.07	7.64	3,720	5,211	447	9,378
8 Unmetered	344	4,132	-	31.43	-	129,869	-	6,493	136,362
9 <i>Total Residential</i>	<i>85,212</i>	<i>1,022,543</i>	<i>2,518,813</i>			<i>\$ 10,010,627</i>	<i>\$ 19,243,735</i>	<i>\$ 1,462,718</i>	<i>\$ 30,717,080</i>
10									
11 Residential - CAP									
12 5/8"	5,667	68,003	185,242	\$ -	\$ 7.64	\$ -	\$ 1,415,246	\$ 70,762	\$ 1,486,008
13 3/4"	38	451	788	-	7.64	-	6,021	301	6,322
14 1"	18	218	216	-	7.64	-	1,649	82	1,731
15 Unmetered	1	12	-	22.92	-	275	-	14	289
16 <i>Total Residential - CAP</i>	<i>5,724</i>	<i>68,684</i>	<i>186,246</i>			<i>\$ 275</i>	<i>\$ 1,422,916</i>	<i>\$ 71,160</i>	<i>\$ 1,494,350</i>
17									
18 Commercial									
19 5/8"	3,623	43,473	182,818	\$ 8.51	\$ 6.74	\$ 369,952	\$ 1,232,195	\$ 80,107	\$ 1,682,255
20 3/4"	775	9,306	61,643	17.23	6.74	160,337	415,472	28,790	604,599
21 1"	1,565	18,776	220,885	40.92	6.74	768,314	1,488,763	112,854	2,369,931
22 1 1/2"	883	10,599	270,231	84.51	6.74	895,721	1,821,355	135,854	2,852,930
23 2"	880	10,558	481,552	143.07	6.74	1,510,485	3,245,660	237,807	4,993,953
24 3"	241	2,890	344,520	326.33	6.74	943,094	2,322,063	163,258	3,428,414
25 4"	201	2,410	580,796	558.31	6.74	1,345,713	3,914,565	263,014	5,523,292
26 6"	101	1,210	398,052	1,338.15	6.74	1,619,162	2,682,873	215,102	4,517,137
27 8"	9	112	158,125	2,424.04	6.74	272,300	1,065,764	66,903	1,404,967
28 10" & Above	5	62	-	3,991.08	6.74	247,447	-	12,372	259,819
29 Unmetered	2	24	-	35.47	-	851	-	43	894
30 <i>Total Commercial</i>	<i>8,285</i>	<i>99,420</i>	<i>2,698,622</i>			<i>\$ 8,133,377</i>	<i>\$ 18,188,710</i>	<i>\$ 1,316,104</i>	<i>\$ 27,638,191</i>
31									
32 Industrial									
33 5/8"	17	199	1,621	\$ 8.51	\$ 6.15	\$ 1,691	\$ 9,971	\$ 583	\$ 12,245
34 3/4"	9	112	229	17.23	6.15	1,924	1,410	167	3,501
35 1"	20	245	3,163	40.92	6.15	10,025	19,455	1,474	30,955
36 1 1/2"	4	52	213	84.51	6.15	4,423	1,308	287	6,017
37 2"	13	161	22,888	143.07	6.15	23,082	140,759	8,192	172,033
38 3"	2	24	16,406	326.33	6.15	7,832	100,895	5,436	114,163
39 4"	9	102	71,038	558.31	6.15	56,948	436,887	24,692	518,526
40 6"	2	23	46,077	1,338.15	6.15	31,224	283,376	15,730	330,329
41 8"	3	40	29,620	2,424.04	6.15	96,962	182,161	13,956	293,079
42 10" & Above	2	24	-	3,991.08	6.15	95,786	-	4,789	100,575
43 <i>Total Industrial</i>	<i>82</i>	<i>982</i>	<i>191,255</i>			<i>\$ 329,895</i>	<i>\$ 1,176,221</i>	<i>\$ 75,306</i>	<i>\$ 1,581,422</i>
44									
45 Health or Education									
46 5/8"	34	409	1,238	\$ 8.51	\$ 8.44	\$ 3,478	\$ 10,452	\$ 696	\$ 14,626
47 3/4"	8	102	631	17.23	8.44	1,752	5,328	354	7,434
48 1"	24	293	1,530	40.92	8.44	11,976	12,913	1,244	26,134
49 1 1/2"	64	774	6,479	84.51	8.44	65,383	54,679	6,003	126,065
50 2"	145	1,736	64,030	143.07	8.44	248,370	540,415	39,439	828,223
51 3"	97	1,160	139,343	326.33	8.44	378,543	1,176,059	77,730	1,632,332
52 4"	70	835	255,296	558.31	8.44	466,003	2,154,697	131,035	2,751,735
53 6"	37	441	389,267	1,338.15	8.44	590,124	3,285,412	193,777	4,069,313
54 8"	3	36	55,923	2,424.04	8.44	87,265	471,990	27,963	587,218
55 10" & Above	2	24	45,243	3,991.08	8.44	95,786	381,851	23,882	501,518
56 <i>Total Health or Education</i>	<i>484</i>	<i>5,808</i>	<i>958,980</i>			<i>\$ 1,948,679</i>	<i>\$ 8,093,795</i>	<i>\$ 502,124</i>	<i>\$ 10,544,598</i>
57									
58 Municipal									
59 5/8"	149	1,786	6,740	\$ 5.11	\$ 4.04	\$ 9,119	\$ 27,256	\$ 1,819	\$ 38,194
60 3/4"	11	134	439	10.34	4.04	1,385	1,777	158	3,320
61 1"	32	385	18,107	24.55	4.04	9,453	73,225	4,134	86,811
62 1 1/2"	28	335	4,654	50.71	4.04	16,987	18,819	1,790	37,596
63 2"	36	432	20,839	85.84	4.04	37,084	84,273	6,068	127,425
64 3"	11	133	7,726	195.80	4.04	26,041	31,244	2,864	60,149
65 4"	3	35	3,770	334.99	4.04	11,725	15,246	1,349	28,319
66 6"	4	48	130,738	802.89	4.04	38,539	528,706	28,362	595,607
67 8"	-	-	-	1,454.42	4.04	-	-	-	-
68 10" & Above	-	-	-	2,394.65	4.04	-	-	-	-
69 <i>Total Municipal</i>	<i>274</i>	<i>3,288</i>	<i>193,013</i>			<i>\$ 150,332</i>	<i>\$ 780,546</i>	<i>\$ 46,544</i>	<i>\$ 977,421</i>
70									
71 Total: Wastewater (Units & Sales)	100,060	1,200,726	6,746,930			\$20,573,185	\$48,905,923	\$ 3,473,955	\$ 72,953,063

(1) Represents billable customer usage above minimum allowance included in minimum charge

Pittsburgh Water & Sewer Authority
Rate Case 2021
Rate Revenue at Proposed Rates

Table with columns: Number of Meters, FY 2022 Annual Bills, Billable Usage (Kgal) (1), Proposed Rates (Monthly Min. Charge, Volume Charge (Kgal)), FY 2022 (Min. Charge Revenue, Vol. Charge Revenue, DSTC (5%)), Total Rate Revenue. Rows include Wastewater Revenues, Residential, Residential - CAP, Commercial, Industrial, Health or Education, and Municipal.

(1) Represents billable customer usage above minimum allowance included in minimum charge

II. OPERATING REVENUES

II.5. Provide detailed computations of the determination of accrued revenues as of historic test year-end and year-end immediately preceding the historic test year, together with a detailed explanation of the procedures and methods used in developing accrued revenues.

RESPONSE:

PWSA's audited financial statements are prepared using the economic resources measurement focus and the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America, as prescribed by the Governmental Accounting Standards Board (GASB). Revenues are recorded when earned, regardless of the timing of related cash flows.

For the purpose of this rate filing, PWSA is utilizing a cash basis and therefore there are no adjustments for accrued revenues. Revenues for each year of this filing are calculated using actual or projected customer units and the effective, or for the FPFTY, proposed, rates for the appropriate year. A collection factor is then applied to the system revenues to reflect actual cash collections for each year. More information and detailed calculations are available upon request.

II. OPERATING REVENUES

II.6. Provide a detailed breakdown of miscellaneous water revenues for the historic test year and the two years immediately preceding the historic test year. For the historic test year, provide a monthly breakdown and an explanation of monthly variances greater than 15%.

RESPONSE:

Please see attached schedule.

Explanations of Miscellaneous Revenues Variances

Variances of 15% or more occur almost every month across many accounts. A generic explanation is provided below for all material accounts.

Dye Testing

PWSA charges dye testing fees under City Ordinance No. 3 of 2006, adopted March 28, 2006, effective July 5, 2006, as codified in Title Four, Public Places and Property, Article III Sewers, Chapter 433, Illegal Storm Water Connections, of the Pittsburgh Code, and includes any amendments thereto. Dye testing refers to commonly accepted plumbing test whereby a nontoxic, non-staining dye is introduced into the surface Storm Water collection system of real property to determine if any surface Storm Water is entering the Sanitary Sewer system. PWSA collects application and inspection fees that fluctuate monthly.

Fire Hydrant Line Use

All water used through the fire system except during fires is metered, and the associated sized meter will be installed for the requested line size for each line used. Customers using hydrants for non-firefighting purposes are assessed a monthly minimum charge and metered usage charge. These charges fluctuate based on customer needs.

Backflow Fees

Business Use Properties are required to be equipped with an approved Backflow prevention device per section 608 of the Health Department's Plumbing Code. Backflow refers to the flow of water and other liquids, mixtures, and substances into the Authority's Water Mains, or into other lines carrying domestic water, from any sources other than those intended by the Authority. PWSA collects various charges related to backflow prevention including application and administration fees as well as inspection fees. These collections fluctuate monthly based on demand.

II. OPERATING REVENUES

Meter Sales

PWSA previously charged associated costs with meters, remote reading devices, meter replacement charges, and their installation. Based on PA PUC regulation, PWSA may not be able to collect these charges, however, these revenues have been included in the FPPTY.

Non-Sufficient Funds Fees

PWSA collects non-sufficient funds fees based on returned checks and insufficient payments. These charges are based on customer payment patterns and fluctuate monthly.

Shut Fees

Customers are assessed shut off service fees when discontinuing service, whether voluntarily or involuntary. Shut fees fluctuate with service discontinuance patterns.

Tap Fees

PWSA charges tap fees to customers connecting to the system. These charges, which increase by meter size, recover both a share of the operating cost associated with connection to the system as well as a capital component of system "buy-in". These fees also fluctuate significantly based on a number of external factors. Large jumps typically indicate a tap fee assessed for a large meter (or meters) or a development paying a large number of tap fees.

Miscellaneous Fees (300)

The Miscellaneous Fees 300 account includes water miscellaneous revenues largely of immaterial amounts. Examples of these revenues include, tower rental payments from Verizon, scrap metal sales, immaterial reimbursements from vendors, ALCOSAN incidentals such as paper, ink, and materials for billing, past due reimbursements, occasional water billing adjustments, and other miscellaneous sources. These amounts fluctuate monthly based on various activity.

Miscellaneous Fees (400)

The Miscellaneous Fees 400 account includes sewer billing adjustments largely of immaterial amounts. These adjustments occur infrequently and at varying amounts.

Penalties & Interest

If current water and sewer bills are not paid in full by their due dates, interest of .0083 percent per month is applied to the outstanding balance. Unpaid water and sewer charges are a

Pittsburgh Water and Sewer Authority's Base Rate Filing

II. OPERATING REVENUES

lien on the property and any resulting fines or penalties are the responsibility of the customer. These charges are based on customer payment patterns and fluctuate monthly.

**Pittsburgh Water & Sewer Authority
Miscellaneous Utility Revenues**

	Actual 12 Months Ended 12/31/2017	Actual 12 Months Ended 12/31/2018	Actual 12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Misc Utility Revenue				
Dye Testing	\$ 168,010	\$ 170,137	\$ 169,710	\$ 174,154
Fire Hydrant Line Use	105,996	120,267	135,567	82,777
Fire Hydrant Sales	5,500	5,579	1,000	10,049
Map Fees	40	55	55	-
Backflow Fee	26,573	39,466	85,048	66,978
Meter Sales	73,955	107,549	85,500	133,778
Meter Test Fees	4,949	3,841	4,400	3,940
Non-Sufficient Funds Fees	27,053	37,435	39,463	31,107
Shut Fees	526,320	357,700	149,963	13,495
Tap Fees	1,907,576	2,858,351	4,774,236	5,874,258
Lien Satisfaction Fees	646	262	343	-
Lien Filing Fees	-	-	-	(2,886)
Miscellaneous Fees (300)	946,011	1,250,103	927,674	1,032,447
Miscellaneous Fees (400)	13,717	16,829	15,817	3,053
Penalties & Interest	895,970	1,281,726	278,546	670,281
Total: Misc. Utility Revenue	\$ 4,702,316	\$ 6,249,298	\$ 6,667,322	\$ 8,093,430

	HTY ACTUAL Jan-20	HTY ACTUAL Feb-20	HTY ACTUAL Mar-20	HTY ACTUAL Apr-20	HTY ACTUAL May-20	HTY ACTUAL Jun-20	HTY ACTUAL Jul-20	HTY ACTUAL Aug-20	HTY ACTUAL Sep-20	HTY ACTUAL Oct-20	HTY ACTUAL Nov-20	HTY ACTUAL Dec-20
Monthly Totals for HTY												
Dye Testing	\$ 12,394	\$ 15,401	\$ 11,425	\$ 12,450	\$ 7,125	\$ 11,000	\$ 21,050	\$ 16,460	\$ 18,800	\$ 17,085	\$ 15,590	\$ 15,375
Fire Hydrant Line Use	8,119	6,540	7,000	500	7,540	7,000	2,040	7,040	2,500	10,500	14,500	9,500
Fire Hydrant Sales	-	1,540	-	-	3,690	-	-	500	-	500	3,820	-
Map Fees	-	-	-	-	-	-	-	-	-	-	-	-
Backflow Fee	660	15,761	4,467	2,436	4,086	3,096	2,005	3,705	2,995	5,330	11,573	10,863
Meter Sales	5,679	10,134	7,086	564	17,257	19,651	4,527	11,667	12,575	15,443	21,244	7,952
Meter Test Fees	360	200	260	-	200	300	320	520	580	640	330	230
Non-Sufficient Funds Fees	1,816	2,771	3,197	2,101	2,132	2,436	2,162	3,045	2,741	3,106	2,284	3,317
Shut Fees	3,901	4,906	5,705	(75)	299	399	(1,018)	(588)	(259)	(382)	(942)	1,550
Tap Fees	167,957	831,601	596,280	-	1,744,190	558,192	184,777	439,724	40,657	685,172	428,768	196,939
Lien Satisfaction Fees	-	-	-	-	-	-	-	-	-	-	-	-
Lien Filing Fees	702	312	390	(4,368)	-	-	-	78	-	-	-	-
Miscellaneous Fees (300)	47,183	348,297	60,482	23,421	13,541	11,127	108,419	52,266	25,684	217,065	12,350	112,610
Miscellaneous Fees (400)	1,134	-	273	-	-	-	1,646	-	-	-	-	-
Penalties & Interest	93,502	62,026	107,167	112,097	114,603	(401,973)	98,336	125,956	134,657	(40,323)	155,232	109,000
Total: Misc. Utility Revenue	\$ 343,408	\$ 1,299,489	\$ 803,731	\$ 149,127	\$ 1,914,663	\$ 211,228	\$ 424,263	\$ 660,372	\$ 240,929	\$ 914,136	\$ 664,748	\$ 467,336

II. OPERATING REVENUES

II.7. Provide a monthly summary of customers added and lost by customer classification for the historic test year and the current year-to-date.

RESPONSE:

Please see the attached schedule.

**Pittsburgh Water & Sewer Authority
Summary of Customers Added & Lost - Water**

Historical Test Year Ended December 31, 2020												
CLASS	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Residential												
Customers Added	618	446	510	586	251	284	395	465	497	506	626	456
Customers Lost	504	632	399	352	380	561	574	494	577	725	561	589
Residential - CAP												
Customers Added	105	89	89	68	82	75	79	66	60	71	73	77
Customers Lost	19	28	12	12	13	11	16	16	12	20	10	66
Commercial												
Customers Added	182	42	96	71	42	42	28	35	40	50	39	61
Customers Lost	36	66	31	25	47	25	45	35	53	39	30	51
Industrial												
Customers Added	4	5	0	0	0	0	0	0	0	2	0	0
Customers Lost	7	48	21	0	0	0	0	0	0	0	0	0
Health and Education												
Customers Added	3	0	0	1	0	0	3	1	1	1	0	1
Customers Lost	1	0	0	0	0	3	1	1	3	0	12	2
Fire System												
Customers Added	7	14	17	9	5	9	7	4	8	7	9	12
Customers Lost	10	9	1	2	9	7	4	1	5	5	2	12
TOTAL												
Customers Added	919	596	712	735	380	410	512	571	606	637	747	607
Customers Lost	577	783	464	391	449	607	640	547	650	789	615	720

II. OPERATING REVENUES

II.8. Provide for the historic test year and the current year-to-date, the number of customers and monthly consumption for each classification of customers.

RESPONSE:

Please see the attached schedule for the customer billing information for the HTY (Jan-Dec 2020) and the FTY YTD (Jan 2020). The attached billing information was used for the customer billing analysis as a part of the Cost of Service Study and the direct testimony of Harold J. Smith. Additional year-to-date information is available upon request.

**Pittsburgh Water & Sewer Authority
HTY & YTD Customers and Consumption**

CLASS	Historical Test Year Ended December 31, 2020											
	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Residential												
Number of Accounts Billed	68,737	68,788	68,677	68,805	68,671	68,728	68,570	68,428	68,452	68,531	68,519	68,446
Total Consumption	218,862	218,628	207,559	226,375	221,970	234,502	247,678	253,551	245,884	229,806	228,124	213,552
Billable Consumption	3,634,757	3,621,600	3,514,245	3,715,246	3,671,754	3,802,056	3,936,755	3,997,192	3,912,163	3,740,848	3,733,028	3,576,087
Commercial												
Number of Accounts Billed	6,854	6,872	6,900	6,952	6,956	6,946	6,944	6,936	6,948	6,958	6,954	7,016
Total Consumption	240,392	249,176	233,806	196,864	184,319	206,379	276,316	288,271	283,041	266,175	228,007	190,726
Billable Consumption	3,071,928	3,131,413	3,060,678	2,721,814	2,623,747	2,779,459	3,352,030	3,493,300	3,358,784	3,196,780	2,893,555	2,672,445
Industrial												
Number of Accounts Billed	106	99	50	26	26	29	29	29	30	32	32	32
Total Consumption	16,727	14,753	12,357	5,267	5,807	16,118	17,096	21,585	23,876	20,823	16,843	14,616
Billable Consumption	194,057	178,033	138,565	69,157	74,038	169,511	178,356	217,649	237,983	211,382	176,327	157,042
Health and Education												
Number of Accounts Billed	476	475	475	476	476	478	476	478	469	474	476	463
Total Consumption	73,376	82,081	82,969	62,073	60,468	72,764	98,384	117,252	103,088	95,659	76,090	63,225
Billable Consumption	1,155,782	1,268,406	1,282,554	1,029,718	1,028,587	1,188,846	1,550,995	1,808,199	1,601,324	1,491,509	1,214,156	1,064,091
Fire System												
Number of Accounts Billed	1,289	1,291	1,321	1,334	1,310	1,310	1,306	1,306	1,314	1,317	1,328	1,331
Total Consumption	519	938	490	8,619	517	468	548	431	458	1,387	381	647
Billable Consumption	56,610	62,364	57,135	166,966	57,152	56,311	57,054	55,667	56,067	68,652	55,493	59,109
TOTAL												
NUMBER OF ACCOUNTS BILLED	77,462	77,525	77,423	77,593	77,439	77,491	77,325	77,177	77,213	77,312	77,309	77,288
TOTAL CONSUMPTION	549,876	565,576	537,181	499,198	473,081	530,231	640,022	681,090	656,347	613,850	549,445	482,766
BILLABLE CONSUMPTION	8,113,133	8,261,816	8,053,177	7,702,901	7,455,277	7,996,183	9,075,190	9,572,008	9,166,322	8,709,171	8,072,560	7,528,774

II. OPERATING REVENUES

II.9. Provide by customer classification for the historic test year and for the 2 prior years the number of customers and consumption, and projected number of customers and consumption for the 2 subsequent years.

RESPONSE:

Please see the attached schedule.

**Pittsburgh Water & Sewer Authority
Historical & Projected Billing Units**

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020	FTY 12 Months Ended 12/31/2021	FPFTY 12 Months Ended 12/31/2022
Water					
<u>Billed Accounts</u>					
Residential	65,099	64,843	64,368	63,903	63,262
Residential - CAP	923	1,800	2,568	3,436	4,077
Commercial	6,697	6,731	6,786	6,738	6,738
Industrial	98	97	43	80	80
Health or Education	494	484	474	484	484
Fire System	1,223	1,269	1,307	1,307	1,307
Municipal	-	-	202	202	202
Total	74,534	75,222	75,748	76,150	76,150
<u>Number of Bills</u>					
Residential	781,189	778,119	772,415	766,832	759,140
Residential - CAP	11,077	21,594	30,810	41,228	48,920
Commercial	80,365	80,767	81,432	80,855	80,855
Industrial	1,173	1,158	516	965	965
Health or Education	5,932	5,805	5,688	5,808	5,808
Fire System	14,673	15,222	15,689	15,689	15,689
Municipal	-	-	2,422	2,422	2,422
Total	894,409	902,665	908,972	913,799	913,799
<u>Billable Consumption (Kgal)</u>					
Residential	2,041,350	1,874,771	1,951,570	1,951,165	1,906,921
Residential - CAP	31,049	55,055	74,953	98,353	116,707
Residential - CAP - Tier 2	-	-	-	6,278	7,449
Commercial	2,723,585	2,517,870	2,023,059	2,053,405	2,421,505
Industrial	183,343	192,645	172,830	175,423	182,939
Health or Education	1,068,428	975,581	832,774	845,266	958,928
Fire System	7,913	21,423	14,340	14,555	14,559
Municipal	-	-	197,733	197,733	197,733
Total	6,055,668	5,637,345	5,267,259	5,342,178	5,806,741
Wastewater					
<u>Billed Accounts</u>					
Residential	88,101	87,289	86,601	86,112	85,212
Residential - CAP	1,697	2,740	3,604	4,823	5,723
Commercial	8,273	8,273	8,308	8,285	8,285
Industrial	98	98	46	82	82
Health or Education	494	484	474	484	484
Municipal	-	-	274	274	274
Total	98,664	98,884	99,307	100,059	100,059
<u>Number of Bills</u>					
Residential	1,057,206	1,047,471	1,039,211	1,033,343	1,022,543
Residential - CAP	20,369	32,883	43,244	57,872	68,672
Commercial	99,279	99,279	99,701	99,420	99,420
Industrial	1,181	1,170	548	982	982
Health or Education	5,932	5,805	5,688	5,808	5,808
Municipal	-	-	3,288	3,288	3,288
Total	1,183,967	1,186,608	1,191,680	1,200,714	1,200,714
<u>Billable Consumption (Kgal)</u>					
Residential	2,703,956	2,491,965	2,599,739	2,589,928	2,518,813
Residential - CAP	66,466	93,829	118,166	156,955	186,246
Residential - CAP - Tier 2	-	-	-	10,018	11,888
Commercial	3,006,528	2,799,696	2,289,641	2,323,985	2,698,622
Industrial	192,007	199,971	181,789	184,516	191,255
Health or Education	1,068,859	975,430	832,652	845,142	958,980
Municipal	-	-	193,013	195,909	193,013
Total	7,037,816	6,560,891	6,215,001	6,306,453	6,758,818

II. OPERATING REVENUES

II.10. Provide a breakdown of the number and size of private fire services according to the general water service class of customers.

a. Provide a listing of all public fire protection customers at historic test year-end and the pro forma billing of current rates for each customer.

RESPONSE:

Please see the table below. Private fire protection customers have been grouped by their existing rate classifications.

Line Size	HTY 2020 Actual	FTY 2021 Projected	FPFTY 2022 Projected
1" or Less	14,856	14,856	14,856
1 1/2"-3"	581	581	581
4"	60	60	60
6" or Greater	192	192	192

a. The City of Pittsburgh represents all of PWSA's public fire protection customers.

II. OPERATING REVENUES

II.11. Provide a detailed schedule of sales for resale revenues for the historic test year and 2 preceding years showing revenues and units sold by customer.

RESPONSE:

Please see the attached schedule.

Pittsburgh Water & Sewer Authority
Water Sales for Resale

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Month Ended 12/31/2020
Resale Customer Units (kgal)			
Allegheny	\$ 7,911	1,030	-
Aspinwall	81,386	59,842	64,174
Fox Chapel	612,616	632,050	671,023
Hampton	3,607	2,997	3,346
PAWC	5,400	2,800	-
Reserve - 10"	97,405	95,941	92,650
Reserve - 6"	14,663	13,532	13,316
Sharpsburg	-	-	-
WestView	6,845	8,410	2,692
<i>Total Units</i>	\$ 829,833	816,602	847,201
Resale Customer Water Billing			
Allegheny	\$ 56,723	15,191	-
Aspinwall	269,388	201,668	216,266
Fox Chapel	1,657,652	1,992,893	2,064,845
Hampton	48,089	19,930	9,487
PAWC	96,887	96,087	77,411
Reserve - 10"	398,741	413,470	374,226
Reserve - 6"	65,994	64,947	64,015
Sharpsburg	-	-	-
WestView	153,391	191,516	144,149
<i>Total Billings</i>	\$ 2,746,865	2,995,702	2,950,399

II. OPERATING REVENUES

II.12. Provide for the historic test year and the 2 prior years consumption and billings for the ten largest customers at current rates. Provide the historic and future test year consumption priced at proposed rates.

RESPONSE:

Please see the attached schedule.

	Actual		Actual		Actual		Actual	
	12 Months		12 Months		12 Months		12 Months	
	Ending	Ending	Ending	Ending	Ending	Ending	Ending	
Top 10 Customers - Usage	12/31/2018	12/31/2019	12/31/2020	12/31/2021	12/31/2022			
Allegheny County	130,795	134,909	86,191	117,298	123,163			
Allegheny Health Network	62,539	67,192	52,011	54,612	57,342			
Borough of Aspinwall	81,386	59,842	69,975	70,401	73,921			
Carnegie Mellon University	122,259	101,674	671,023	684,175	718,383			
Fox Chapel Water Authority	612,616	632,050	60,902	114,091	119,795			
Housing Authority of the City of Pittsburgh	142,109	139,261	116,067	121,870	127,964			
Reserve Township Water Department	112,068	109,473	92,650	104,730	109,967			
Riverbend Properties, LLC	462,007	263,171	48,167	308,190	323,600			
University of Pittsburgh	433,302	443,101	53,594	65,918	69,214			
Veterans Affairs	81,794	62,366	49,843	52,335	54,952			
<i>Total Units</i>	2,240,875	2,013,039	1,300,423	1,693,620	1,778,301			

	Actual		Actual		Actual		Actual	
	12 Months		12 Months		12 Months		12 Months	
	Ending	Ending	Ending	Ending	Ending	Ending	Ending	
Top 10 Customers - Billings	12/31/2018	12/31/2019	12/31/2020	12/31/2021	12/31/2022			
Allegheny County	1,180,811	1,415,590	917,573	1,171,325	1,229,891			
Allegheny Health Network	806,839	969,555	468,381	491,800	516,390			
Borough of Aspinwall	269,388	201,095	235,816	235,433	247,205			
Carnegie Mellon University	1,622,512	1,569,773	2,064,845	2,024,387	2,125,606			
Fox Chapel Water Authority	1,657,652	1,945,786	646,943	1,262,021	1,325,122			
Housing Authority of the City of Pittsburgh	1,475,641	1,663,480	232,450	244,073	256,276			
Reserve Township Water Department	464,735	477,428	374,226	438,796	460,736			
Riverbend Properties, LLC	1,392,294	356,303	690,377	4,049,941	4,252,438			
University of Pittsburgh	5,340,383	6,119,064	771,937	925,224	971,486			
Veterans Affairs	1,063,118	940,618	709,773	745,262	782,525			
<i>Total Charges</i>	15,273,373	15,658,691	7,112,321	11,588,262	12,167,675			

II. OPERATING REVENUES

II.13. Provide for the historic test year and the 2 prior years consumption and billings for the ten largest sales for resale customers if such sales are not included in sales to the ten largest customers requested in Part II.12.

RESPONSE:

Please refer to schedule II.11.

III. OPERATING EXPENSE

III.1. Prepare a summary of operating expenses by operating expense account for the historic test year and the 2 years preceding the test year.

RESPONSE:

Please see the attached schedule.

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
<u>Wages & Salaries</u>			
4001 Salary Wages	\$ 14,013,851	\$ 17,415,267	\$ 18,617,022
4005 OT Premium Pay	1,814,303	2,001,622	1,571,406
4010 Shift Differential	6,887	6,905	7,028
4015 Semi Skill	7,126	6,525	2,741
4020 Pay Adjustments	-	-	-
4025 Bonus	5,500	-	-
4030 Holiday Pay	631,302	827,894	915,618
4035 Vacation Pay	1,065,931	1,207,626	1,279,163
4040 Other	29,800	100	-
4045 Sick Pay	16,314	10,748	27,431
4050 Personal Time Pay	558,976	618,417	630,179
4055 Comp Time Taken	-	-	-
4060 Comp Time Earned	-	-	-
4065 Jury Duty	2,725	6,563	819
4070 Military Leave	-	2,885	792
4075 Supper Pay	33,047	32,728	20,104
4080 Bereavement	27,723	35,046	24,901
4081 Paid Parental Leave	-	16,600	17,939
4085 Special	60,207	72,484	76,630
4090 Admin Leave	2,061	445	955,265
4095 Severance	152,174	-	3,600
Total Wages & Salaries	\$ 18,275,754	\$ 22,261,855	\$ 24,147,039
<u>Employee Benefits</u>			
4110 Fed Ins Contr Act Tx	1,125,580	1,343,682	1,453,301
4115 Medicare	265,317	319,884	346,428
4120 Fed Unemploy Tax	-	(1)	-
4125 State Unemploy Tax	34,478	8,846	10,670
4130 Workers Comp Insur	(3,305)	305,362	-
4135 Med Health Ins	3,527,702	3,962,528	4,210,424
4140 Med Hlth Ins Waiver	57,233	83,892	72,359
4145 Short Term Disability	154,579	177,013	226,692
4150 Long Term Disability	349,239	28,738	27,775
4155 Life Ins <50k	27,504	33,419	38,413
4160 Accident Death Dismember	3,731	4,519	5,171
4165 Dental Ins	135,372	146,934	151,738
4170 Vision Insur	10,156	12,688	15,287
4174 Cust Serv Week	457	1,195	-
4175 Uniforms	167,162	209,599	155,684
4180 Tuition Reimburse	68,155	104,366	64,196
4185 Retirement Benefit	-	10,688	95,076
4195 Misc Benefits	(22,029)	(22,632)	(23,442)
4199 Payroll Upload Except	(1,456)	(21)	(1,385)
Total Employee Benefits	\$ 6,052,049	\$ 6,730,702	\$ 6,848,387
TOTAL SALARIES & BENEFITS	\$ 24,327,802	\$ 28,992,557	\$ 30,999,026

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

Direct Operating Expenses	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
<u>Chemicals</u>			
5005 Alum	-	211,788	262,617
5010 Boiler Chemicals	12,340	25,983	37,852
5015 Calcium Hypochlorite	-	-	17,000
5020 Cat Flocc TL	60,504	108,736	88,779
5025 Caustic Soda	799,616	225,780	3,978
5030 Chlorine Cylinders	-	-	-
5035 Chlorine Rail Car	-	-	-
5040 Citric Acid	-	-	9,920
5045 Copper Sulphate	-	-	-
5050 Ferric Chloride	1,411,089	1,823,669	1,504,817
5055 Hydrofluorosilicic Acid	177,308	140,479	150,933
5060 Lime	70,890	462,458	529,609
5065 Potassium Permanganate	109,855	247,338	125,776
5070 Powdered Active Carbon	-	-	-
5075 Soda Ash	986,761	820,686	732,716
5080 Sodium Hypochlorite	320,130	433,004	445,308
5085 Sodium Carbonate Peroxyhy	16,960	-	16,480
Chemicals	<u>\$ 3,965,453</u>	<u>\$ 4,499,921</u>	<u>\$ 3,925,786</u>
<u>Equipment</u>			
5120 Computer & Peripherals	890,562	688,714	337,329
5125 Computers Networking	378,556	20,577	3,860
5140 Furniture Fixture	149,447	82,981	140,096
5145 Grounds Maint	28,500	67,378	143,863
5147 Lab Equip	47,424	150,360	96,553
5150 Machinery	233,740	2,543,899	173,961
5160 Office Equipment	1,306	4,930	37,070
5190 Vehicles	1,570,946	2,341,473	577
Equipment	<u>\$ 3,300,481</u>	<u>\$ 5,900,312</u>	<u>\$ 933,309</u>
<u>Materials</u>			
5205 Asphalt Cold Patch	94,307	88,631	85,097
5210 Asphalt Cold-City	-	-	-
5215 Asphalt Hot-City	-	-	-
5220 Asphalt Hotmix	-	-	-
5225 Asphalt Patch Bit Sealer	-	-	-
5227 Brick	240	543	402
5230 Cement Bagged	1,748	1,243	811
5235 Gravel	1,325	-	-
5240 Iron Steel Brass	2,002	7,047	205
5245 Lumber	13,176	21,886	26,047
5250 Sand	13,071	9,971	2,658
5255 Slag	364,670	383,089	338,716
5260 Stone	-	8,142	-
5265 Top Soil	5,296	3,450	1,871

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
Materials	\$ 495,835	\$ 524,002	\$ 455,807
<u>Operating Contracts</u>			
5305 Annual Sewer Contract	3,127,669	6,631,750	8,056,519
5310 Boiler Compressr Elevtr	53,335	17,963	-
5315 CB Cleaning	707,837	732,709	752,218
5316 CB Repairs	-	48,514	-
5328 Curb Box Repair	-	-	-
5330 Debris Removal	198,360	271,258	302,860
5335 Drag Bucket	-	-	-
5340 Dumpster	32,518	37,574	46,827
5341 Vactor Debri Remove Cont	61,556	111,326	154,930
5342 Emergcy WaterLine Repair	3,864,919	5,777,901	5,365,542
5345 Inspection	1,313,962	1,117,628	(34,374)
5347 Inspection Field	793,856	698,229	1,424,101
5350 Key Lock Serv	1,363	11	1,230
5355 Landscape (Grounds)	87,840	90,869	118,865
5360 Meters	-	-	-
5370 Operating Contract Other	1,996,525	1,816,157	5,296,671
5375 Radionuclides	-	-	-
5380 Intr-Gov Proj Panther Hollow	-	-	-
5383 Sewage Treatment	-	-	-
5385 Temporary Help	254,245	206	-
5390 Welding	-	360	15,500
5395 Water Relay DISC	-	-	-
5396 Sewer Relay DISC	-	-	-
Operating Contracts	\$ 12,493,985	\$ 17,352,454	\$ 21,500,889
<u>Repairs & Maintenance</u>			
5402 Annual Software Support	678,146	916,955	1,424,283
5405 Bldg Property Repairs	224,240	188,512	173,305
5408 Computer Hardware	30,592	17,862	43,050
5411 Computer Software Support	-	-	48,050
5413 Concrete Repairs	6,929,923	6,318,850	5,248,496
5415 Cranes Repairs	-	18,029	40,971
5417 Electrical Repairs	143,886	269,525	175,886
5420 Fence Repairs	1,990	2,914	42,175
5422 Fence Installation	6,292	1,966	13,309
5427 GIS Hardware Software	10,760	151,652	3,068
5432 Hardware Repairs	-	-	-
5437 Heavy Equip Repair	2,781	38,853	32,326
5439 HVAC Plumbing	64,351	64,111	157,489
5444 Hydrant A Section	-	-	-
5445 Hydrant Misc Parts	-	-	-
5447 Hydrant Repair Parts	-	-	-
5452 Machinery Repairs	139,483	60,591	43,085
5457 Office Equip Repairs	-	100	1,156

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

Direct Operating Expenses	12 Months	12 Months	HTY
	Ended	Ended	12 Months
	12/31/2018	12/31/2019	Ended
			12/31/2020
5462 Plant Repairs	-	136,910	297,515
5467 Power Tool Repairs	1,506	5,948	1,736
5472 Road Repair Plant	-	-	-
5475 Scanner	-	-	-
5482 Tool Repairs	7,652	3,269	983
5484 Hand Tool Repairs	165	1,688	1,475
5486 Misc Tool Repairs	5,470	467	779
5488 CC TV Repairs	144,253	223,473	25,493
5490 Vactor Repairs	22,103	13,409	17,358
5491 Vehicle Repairs	6,630	22,476	890,330

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
5496 Repair Maint Other	399,057	618,629	108,291
Repairs & Maintenance	\$ 8,819,279	\$ 9,076,188	\$ 8,790,610
<u>Misc. Operating</u>			
5570 Testing Misc	805,853	1,025,998	448,212
Misc. Operating	\$ 805,853	\$ 1,025,998	\$ 448,212
<u>Inventory - Castings</u>			
6015 Casting Manhole CBasin	27,186	151,212	33,882
6025 Casting Risers Lids	-	15,707	8,481
6035 Casting Sewer Inlet	490	3,220	15,068
6060 Casting Water Valve Box	-	49,426	130,605
Inventory - Castings	\$ 27,675	\$ 219,564	\$ 188,036
<u>Inventory - Clarifier</u>			
6115 Clarifier Part Floc	-	-	-
6120 Clarifier Part Screw	-	-	-
6125 Clarifier Part Sludge	-	-	-
Inventory - Clarifier	\$ -	\$ -	\$ -
<u>Inventory - Equipment</u>			
6200 Inventory-Equip	2	2	-
6220 Fire Extinguishers	-	-	-
6245 Materials Handling	-	-	2,475
6260 Safety Equipment	71,687	122,056	62,634
6280 Vacuum Chlorinators	-	-	-
Inventory - Equipment	\$ 71,689	\$ 122,057	\$ 65,109
<u>Inventory - Hardware</u>			
6300 Inventory-Hardware	15,060	26,108	11,554
6315 Fittings	286,546	511,380	135,925
6320 Hardware Other	-	-	-
6325 Hose Fitting	18,310	20,070	8,331
6330 Keys & Locks	-	-	-
6335 Lights	33,848	9,278	4,180
6340 Machinery Misc	-	-	10,015
6345 Meters	516,096	39,919	10,825
6350 Plumbing Inv Exp	45,846	95,194	10,945
6355 Power Tool Inv Exp	1,320	-	9,265
6360 Tools Inv Exp	108,193	185,629	125,316
6365 Hand Tools Inv Exp	-	-	-
Inventory - Hardware	\$ 1,025,218	\$ 887,578	\$ 326,356
<u>Inventory - Heavy Equipment</u>			
6420 Backhoe	1,217	3,861	556

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
Inventory - Heavy Equipment	\$ 1,217	\$ 3,861	\$ 556
<u>Inventory - Miscellaneous</u>			
6500 Inventory-Misc	43,345	29,421	18,516
6506 Batteries	-	210	596
6515 Cleaning	45,162	59,968	14,283
6518 Concrete Accessories	-	-	-
6520 Copier Paper	-	-	-
6525 Filters	-	193	-
6526 Filters HVAC	-	-	-
6530 FirstAid	(1,102)	14,526	1,883
6540 Lamps	118	-	-
6544 Lubricating Oil	4,369	20,102	10,676
6548 Paint Oils Putty Glass	7,453	11,533	4,818
6552 Paper Products	-	-	-
6555 Pump Oil	-	-	-
6565 Sewer Matls Supplies	3,208	1,594	143
6570 Testing Dyes	-	2,023	5,364
6580 Vehicle Oil	-	-	1,588
6585 Welding Supplies-Inventory	(117)	562	-
Inventory - Miscellaneous	\$ 102,437	\$ 140,133	\$ 57,866
<u>Inventory - Parts</u>			
6645 Parts Other	152,787	136,633	36,631
6680 Yard	-	33,567	136,439
Inventory - Parts	\$ 152,787	\$ 170,199	\$ 173,070
<u>Inventory - Pipe</u>			
6705 Pipe	(6,767)	1,904	4,452
6710 Pipe Ductile	26,524	237,227	523,557
6755 Pipe Plastic	-	21	2,909
6765 Pipe Service Line	-	8,175	10,934
Inventory - Pipe	\$ 19,758	\$ 247,327	\$ 541,853
<u>Inventory - Valves</u>			
6805 Valves <12in	-	-	-
6810 Valves >16in	-	-	-
6820 Valves GA	-	-	-
6825 Valves Misc	81,813	258,003	96,029
Inventory - Valves	\$ 81,813	\$ 258,003	\$ 96,029
INVENTORY TOTAL	\$ 1,482,594	\$ 2,048,723	\$ 1,448,874
DIRECT OPERATING TOTAL	\$ 39,863,128	\$ 50,003,264	\$ 48,314,085
<u>Fees</u>			
7003 Bank Fees	278,243	263,420	269,922
7005 Certification Fees	3,319	2,718	2,759

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
7010 Membership Fees	35,381	68,104	98,652
7015 Permits	24,134	57,827	757,270
7020 Registration Fees	41	934	1,587
7030 Licenses	532	-	825
7035 Customer CC Fees	<u>424,118</u>	<u>543,823</u>	<u>518,324</u>
Total Fees	\$ 765,768	\$ 936,827	\$ 1,649,339
<u>Freight and Postage</u>			
7105 Freight Hauling	-	-	-
7110 Freight Shipping	50,990	63,490	40,208

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
7115 Postage	508,324	731,843	330,345
Total Freight and Postage	\$ 559,313	\$ 795,333	\$ 370,553
<u>Leases & Rents</u>			
7210 Copier Fax Machine	77,013	93,709	84,898
7215 Equip Rental	803,706	238,376	191,672
7255 Office Rent	707,413	912,335	971,698
7260 Pagers	-	-	-
7265 RadioLease(City)	-	-	-
Total Leases & Rents	\$ 1,588,133	\$ 1,244,419	\$ 1,248,268
<u>Professional Services</u>			
7305 Advertising	28,961	45,975	13,754
7306 Annual Report	-	-	-
7307 Advertising - Marketing	29,427	5,068	-
7310 Annual Audit	64,308	49,683	48,613
7315 Billing Contract	832,776	470,173	408,853
7321 Coll Agency Sewage	-	-	-
7323 Consultants	1,161,921	502,507	2,298,014
7325 Consumer Confidence Rpt	1,707	2,171	1,476
7328 Contingencies	11,766	148,800	134,585
7332 Consulting Engineers	147,182	26,831	69,487
7335 Misc Serv NonCapital	3,583,068	5,264,191	3,565,869
7345 Ins Auto	29,307	74,044	128,253
7348 Ins Commercial Prop	215,532	226,172	255,350
7353 Ins Gen Liability	20,798	21,637	22,500
7359 Ins Officers Director	74,349	74,528	77,306
7365 Ins WorkersComp	-	-	480,217
7366 Ins WorkersComp City	33,352	33,352	33,352
7368 Internet Connection Serv	66,656	53,334	1,568
7370 Legal	2,894,514	2,388,647	2,620,392
7371 Legal Self Ins	-	-	-
7373 Minority Women Bus Enter	-	-	-
7375 Meter Services	879,343	864,422	788,812
7382 Payroll Services	72,899	70,633	125,460
7383 Prof Service Other	5,307,168	6,083,922	6,143,089
7389 Trust Admin	71,235	30,411	77,385
7390 Water Liens	-	8,000	30,000
Total Professional Services	\$ 15,526,270	\$ 16,444,502	\$ 17,324,335
<u>Supplies</u>			
7405 Computer Software Supplies	35,175	11,722	68,804
7422 Fuel-Gasses	6,851	153,209	351,684
7423 Fuel Kerosene	-	261	1,212
7424 Fuel Propane	172,819	18,670	1,066
7435 GIS Plotter Xerox	-	-	-
7440 Grounds & Maint Supp	36,541	189,211	504,239

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
7443 ICE	-	-	-
7445 Lab Chemicals	4,218	9,561	2,673
7447 Lab Supplies	48,937	122,807	69,045
7450 Office Supplies	37,621	64,263	41,414
7490 Welding Supplies	17,885	19,397	20,209

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
Total Supplies	\$ 360,047	\$ 589,103	\$ 1,060,346
<u>Travel & Entertainment</u>			
7505 TE Airfare	6,706	11,968	13,192
7510 TE Auto Rentals	197	-	-
7520 TE Fuel	-	-	-
7540 TE Lodging	11,411	14,151	5,944
7545 TE Meals	4,427	4,884	613
7550 TE Mileage	1,439	2,259	63
7555 TE SeminarsConferences	12,254	18,457	379
7560 TE Training	25,288	120,554	23,132
7575 TE Travel Misc	20,797	24,324	30,206
7590 TE Travel Purch Orders	-	-	-
Total Travel & Entertainment	\$ 82,519	\$ 196,597	\$ 73,528
<u>Utilities</u>			
7605 Electric	4,375,878	3,998,159	3,784,526
7650 Natural Gas City	383,384	367,363	314,785
7675 Telemeter	54,631	53,542	110,655
7680 Cellular Phone	142,402	190,291	144,037
7681 Local Phones	150,376	156,337	151,083
7682 Long Distance	868	460	182
7683 Internet	-	-	39,490
Total Utilities	\$ 5,107,539	\$ 4,766,152	\$ 4,544,758
<u>Miscellaneous Admin</u>			
7705 Bad Debt	-	-	-
7710 Capital Asset Reclass	(3,150,810)	(6,568,443)	(5,917,956)
7711 DISC Asset Reclass	-	-	-
7712 Cash Discount Taken	(524)	(623)	(680)
7715 Claims Deductibles	353,049	587,017	556,304
7720 Customer Refund CSM	-	-	-
7721 Customer Refund AP	881,565	667,728	494,192
7730 Fines Penalties	15,372	20,500	24,455
7735 LienBuyBkExp	-	-	-
7742 Education & Outreach	50,512	41,116	71,710
7743 Employee Fund	-	-	-
7750 Inv Adjustments	1,373,809	240,929	-
7760 Misc Gen Admin Exp	0	5,847	19,701
7765 One Call	14,921	18,195	18,186
7770 Publication Subscription	4,288	24,884	14,089
7787 3rd Pty LW Exp	-	-	-
7789 3rd Pty Sew Trt Exp	-	-	-
7799 Grants Awarded by PWSA	95,000	112,352	-
8180 Non.City Water Reimburse	-	-	435,952
8005 City Indirect Costs (Pension & Taxes)	-	-	4,049,473
Total Miscellaneous Admin	\$ (362,819)	\$ (4,850,498)	\$ (234,573)

Pittsburgh Water & Sewer Authority
Operating Expenses by Account

	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	HTY 12 Months Ended 12/31/2020
Direct Operating Expenses			
GRAND TOTAL: DIRECT OPERATING EXPENSES	\$79,318,054	\$89,542,588	\$ 94,539,067

III. OPERATING EXPENSE

III.2. Prepare a summary of operating expenses for the historic test year providing annualizing and normalizing adjustments to arrive at adjusted future operating expenses for ratemaking, including supporting data.

RESPONSE:

Please see the attached schedule.

**Pittsburgh Water & Sewer Authority
Operating Expenses for Ratemaking**

	HTY	FTY	FPFTY	Annualizing Adjustments	FPFTY
	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021	12 Months Ended 12/31/2022		12 Months Ended 12/31/2022
System Operating Expenses					
<u>Direct Operating Expenses</u>					
Administrative Division					
Executive Director	\$ 2,652,942	\$ 2,927,978	\$ 127,456	\$ -	\$ 3,055,434
Customer Service	7,069,743	8,611,265	175,841	-	8,787,106
Management Information Systems	2,589,691	4,524,257	70,019	-	4,594,275
Finance	12,870,729	10,526,446	2,035,948	-	12,562,394
Human Resources	707,475	942,691	237,715	-	1,180,406
Legal	4,295,018	6,207,316	(296,502)	-	5,910,814
Public Affairs	1,049,867	1,155,269	127,814	-	1,283,083
Operations Division					
Environmental Compliance	\$ 1,403,532	\$ 3,217,426	\$ 760,107	\$ -	\$ 3,977,533
Warehouse	400,607	456,859	16,557	-	473,416
Ops Capital Assets	18,435	-	-	-	-
Water Quality (Lab)	1,740,900	2,272,776	(480,766)	-	1,792,010
Water Treatment Plant	17,132,272	19,442,694	3,531,214	-	22,973,908
Sewer Operations	3,459,048	3,831,101	(393,522)	-	3,437,579
Water Distribution	13,061,174	14,417,833	720,553	-	15,138,386
Engineering & Construction Division					
Engineering & Construction	\$ 26,087,632	\$ 32,309,411	\$ 6,221,008	\$ -	\$ 38,530,420
<i>Subtotal: Direct Operating Expenses</i>	\$ 94,539,067	\$ 110,843,321	\$ 12,853,442	\$ -	\$ 123,696,763
<u>Indirect Operating Expenses</u>					
Loss / (Gain) on ALCOSAN Billings	\$ 4,961,255	\$ 2,345,874	\$ (773,906)	\$ -	\$ 1,571,968
<i>Total: System Operating Expenses</i>	\$ 99,500,322	\$ 113,189,195	\$ 12,079,536	\$ -	\$ 125,268,731

III. OPERATING EXPENSE

III.3. List extraordinary property losses as a separate item, not included in operating expenses or depreciation and amortization. Sufficient supporting data must be provided, such as explanation and breakdown of costs.

RESPONSE: Not applicable.

III. OPERATING EXPENSE

III.4. Supply detailed calculations of normalization of rate case expense, including supporting data for outside services rendered. Provide the items comprising the rate case expense claim (include the actual billings or invoices in support of each kind of rate case expense) and the items comprising the actual expenses of the prior rate cases.

RESPONSE:

Rate Case & DSIC Expenses

	FTY 2021 Rate Case	FPFTY 2022 Rate Case
Legal Counsel Costs	\$ 1,200,000	\$ 1,260,000
Other Consultant	660,000	780,000
Total	\$ 1,860,000	\$ 2,040,000

The aforementioned projected rate case costs are expected to be incurred by PWSA in 2021 and 2022 if the PWSA files another base rate case proceeding in 2022. These costs are anticipated to be expensed as incurred with the full amount of the 2021 costs recognized in the FTY and the full amount of the 2022 costs recognized in the FPFTY.

III. OPERATING EXPENSE

III.5. Submit detailed computation of adjustments to operating expenses for salary, wage and fringe benefit increases (union and nonunion merit, progression, promotion and general) granted during the historic test year and during the 12 months subsequent to the historic test year. Supply data for the historic test year showing:

- a. Actual payroll expense (regular and overtime separately) by categories of operating expenses, i.e., maintenance, operating transmission, distribution, other.
- b. Date, percentage increase and annual amount of each general payroll increase during the historic test year and future test year.
- c. Dates and annual amounts of merit increases or management salary adjustments.
- d. Total annual payroll increases in the historic and future test years.
- e. Proof that the actual payroll plus the increases equal the payroll expense claimed in the supporting data by categories of expenses.
- f. Detailed list of employee benefits and cost thereof for union and nonunion personnel. Specific benefits for executives and officers should be included, and costs thereof.
- g. Support the annualized pension cost figures by providing the following:
 - (i) State whether these figures include any unfunded pension costs. Explain.
 - (ii) Provide latest actuarial study used for determining pension accrual rates.
- h. Submit a schedule showing any deferred income and consultant fee, paid to both, corporate officers and employees in historic and future test years.

RESPONSE:

III.5a Please see the attached schedule.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.5b See below.

	Date Effective	Percent Increase	Estimated FY 2021 Impact
Pittsburgh Joint Collective Bargaining Committee	2020 / 2021	3% / 3%	\$1,820,499
District Council 84 AFSCME Local 2719 & Local 2037	2020 / 2021	3% / 3%	289,502
Non-Union	2020 / 2021	3% / 3%	2,159,445

III.5c See below.

	Date Effective	Percent Increase	Estimated Annual Amount
Supervisory / Management	Jan-20	51.88%	\$58,072.35
Supervisory / Management	Jan-20	5.56%	4,999.90
Supervisory / Management	Apr-20	7.23%	2,902.64
Supervisory / Management	Jul-20	9.75%	11,549.82
Supervisory / Management	Nov-20	2.37%	1,585.37
Supervisory / Management	Dec-20	1.76%	1,052.48
Supervisory / Management	Dec-20	0.11%	66.56
Supervisory / Management	Dec-20	15.02%	7,953.92

III.5d See below.

	Estimated Annual Amount
2019 – 2020 Increase in Salaries, Wages, & Benefits	\$ 2,006,470
2020 – 2021 Increase in Salaries, Wages, & Benefits	5,245,499

III.5e See the attached schedule.

III.5f See below.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

		HTY	FTY	FPFTY
		2020	2021	2022
	Twelve Months Ended:			
4110	Federal Insurance Contract Tax	1,453,301	1,762,442	1,887,981
4115	Medicare	346,428	412,184	442,623
4120	Federal Unemployment Tax	-	-	-
4125	State Unemployment Tax	10,670	15,000	15,300
4130	Workers Compensation Insurance	-	-	-
4135	Medical Health Insurance	4,210,424	4,521,269	4,701,255
4140	Medical Health Insurance Waiver	72,359	105,399	115,512
4145	Short Term Disability	226,692	224,707	225,256
4150	Long Term Disability	27,775	133,347	149,184
4155	Life Insurance <50k	38,413	46,139	48,953
4160	Accident Death Dismemberment	5,171	6,045	6,752
4165	Dental Insurance	151,738	167,609	171,210
4170	Vision Insurance	15,287	18,809	20,322
4174	Customer Service Week	-	8,900	9,000
4175	Uniforms	155,684	207,389	210,586
4180	Tuition Reimbursement	64,196	211,640	190,160
4185	Retirement Benefit	95,076	28,892	62,721
4195	Misc. Benefits	(23,442)	(41,732)	-
4199	Payroll Upload Except	(1,385)	-	-
	Total Employee Benefits	\$ 6,848,387	\$ 7,828,039	\$ 8,256,815

III.5g Support the annualized pension cost figures

- (i) Not applicable. Please see response to III.14 for additional information.
- (ii) Please see response to III.14 for additional information.

III.5h. Submit a schedule showing any deferred income and consultant fee to corporate officers or employees.

PWSA has not paid any deferred income and consultant fee to corporate officers or employees.

Pittsburgh Water & Sewer Authority
Operating Expenses for Ratemaking

Salary, Wage, & Fringe Benefits	HTY 12 Months Ended 12/31/2020	Adjustments	FTY 12 Months Ended 12/31/2021
<i>Administrative Division</i>			
<i>Executive Director</i>			
Salary & Wages	\$ 667,558	\$ 132,766	\$ 800,323
Overtime	1,350	(1,350)	-
Other Compensation	133,089	(46,774)	86,316
Benefits	<u>164,909</u>	<u>57,704</u>	<u>222,614</u>
<i>Subtotal: Executive Director</i>	\$ 966,906	\$ 142,347	\$ 1,109,253
<i>Customer Service</i>			
Salary & Wages	\$ 2,416,050	\$ 853,752	\$ 3,269,802
Overtime	184,919	12,694	197,614
Other Compensation	536,454	(99,366)	437,088
Benefits	<u>969,931</u>	<u>139,252</u>	<u>1,109,184</u>
<i>Subtotal: Customer Service</i>	\$ 4,107,355	\$ 906,332	\$ 5,013,687
<i>Management Information Systems</i>			
Salary & Wages	\$ 685,177	\$ 573,482	\$ 1,258,659
Overtime	711	7,502	8,213
Other Compensation	80,631	5,855	86,486
Benefits	<u>177,274</u>	<u>68,509</u>	<u>245,783</u>
<i>Subtotal: Management Information Systems</i>	\$ 943,794	\$ 655,348	\$ 1,599,142
<i>Finance</i>			
Salary & Wages	\$ 1,157,460	\$ 270,130	\$ 1,427,590
Overtime	54	(54)	-
Other Compensation	150,279	(92,629)	57,649
Benefits	<u>300,274</u>	<u>3,426</u>	<u>303,700</u>
<i>Subtotal: Finance</i>	\$ 1,608,067	\$ 180,872	\$ 1,788,939
<i>Human Resources</i>			
Salary & Wages	\$ 331,068	\$ 190,219	\$ 521,287
Overtime	1,135	(1,135)	-
Other Compensation	44,329	11,788	56,117
Benefits	<u>97,284</u>	<u>17,978</u>	<u>115,261</u>
<i>Subtotal: Human Resources</i>	\$ 473,815	\$ 218,850	\$ 692,666
<i>Legal</i>			
Salary & Wages	\$ 556,012	\$ 110,828	\$ 666,840
Overtime	-	-	-
Other Compensation	80,528	(15,504)	65,024
Benefits	<u>147,079</u>	<u>(6,391)</u>	<u>140,688</u>
<i>Subtotal: Legal</i>	\$ 783,619	\$ 88,933	\$ 872,552
<i>Public Affairs</i>			
Salary & Wages	\$ 449,629	\$ 95,072	\$ 544,701
Overtime	684	4,963	5,647
Other Compensation	52,534	(17,894)	34,640
Benefits	<u>104,268</u>	<u>40,950</u>	<u>145,218</u>
<i>Subtotal: Public Affairs</i>	\$ 607,115	\$ 123,091	\$ 730,206

Pittsburgh Water & Sewer Authority
Operating Expenses for Rate-making

	HTY		FTY
	12 Months		12 Months
	Ended		Ended
Salary, Wage, & Fringe Benefits	12/31/2020	Adjustments	12/31/2021
<i>Total: Administration Division</i>	\$ 9,490,670	\$ 2,315,774	\$ 11,806,444

Pittsburgh Water & Sewer Authority
Operating Expenses for Ratemaking

	HTY		FTY
	12 Months		12 Months
	Ended		Ended
Salary, Wage, & Fringe Benefits	12/31/2020	Adjustments	12/31/2021
<u>Operations Division</u>			
<i>Environmental Compliance</i>			
Salary & Wages	\$ 302,033	\$ 293,510	\$ 595,544
Overtime	2,874	(2,874)	-
Other Compensation	33,683	10,200	43,883
Benefits	<u>115,359</u>	<u>8,767</u>	<u>124,126</u>
<i>Subtotal: Environmental Compliance</i>	\$ 453,949	\$ 309,604	\$ 763,553
<i>Warehouse</i>			
Salary & Wages	\$ 218,785	\$ 77,521	\$ 296,307
Overtime	2,716	4,349	7,066
Other Compensation	65,217	(25,619)	39,598
Benefits	<u>85,369</u>	<u>(10,871)</u>	<u>74,498</u>
<i>Subtotal: Warehouse</i>	\$ 372,088	\$ 45,381	\$ 417,469
<i>Water Quality (Lab)</i>			
Salary & Wages	\$ 345,077	\$ 98,250	\$ 443,327
Overtime	35,518	13,128	48,646
Other Compensation	57,344	8,929	66,272
Benefits	<u>137,670</u>	<u>14,345</u>	<u>152,015</u>
<i>Subtotal: Water Quality (Lab)</i>	\$ 575,609	\$ 134,651	\$ 710,260
<i>Water Treatment Plant</i>			
Salary & Wages	\$ 2,378,029	\$ 861,675	\$ 3,239,704
Overtime	437,739	(263,486)	174,253
Other Compensation	507,650	75,435	583,084
Benefits	<u>953,459</u>	<u>265,593</u>	<u>1,219,052</u>
<i>Subtotal: Water Treatment Plant</i>	\$ 4,276,877	\$ 939,217	\$ 5,216,093
<i>Sewer Operations</i>			
Salary & Wages	\$ 1,062,587	\$ 161,594	\$ 1,224,180
Overtime	115,390	5,018	120,408
Other Compensation	339,677	(120,076)	219,601
Benefits	<u>457,715</u>	<u>81,837</u>	<u>539,551</u>
<i>Subtotal: Sewer Operations</i>	\$ 1,975,368	\$ 128,372	\$ 2,103,740
<i>Water Distribution</i>			
Salary & Wages	\$ 5,261,507	\$ 1,080,867	\$ 6,342,374
Overtime	763,510	(366,466)	397,044
Other Compensation	1,485,365	(141,112)	1,344,253
Benefits	<u>2,259,047</u>	<u>306,730</u>	<u>2,565,777</u>
<i>Subtotal: Water Distribution</i>	\$ 9,769,429	\$ 880,019	\$ 10,649,448
<i>Total: Operations Division</i>	\$ 17,423,321	\$ 2,437,243	\$ 19,860,563
<u>Engineering & Construction Division</u>			
<i>Engineering & Construction</i>			
Salary & Wages	\$ 2,786,050	\$ 584,499	\$ 3,370,550
Overtime	24,805	22,763	47,568

Pittsburgh Water & Sewer Authority
Operating Expenses for Ratemaking

	HTY		FTY
	12 Months		12 Months
	Ended		Ended
Salary, Wage, & Fringe Benefits	12/31/2020	Adjustments	12/31/2021
Other Compensation	395,431	(106,602)	288,829
Benefits	878,750	(8,178)	870,572
<i>Subtotal: Engineering & Construction</i>	\$ 4,085,036	\$ 492,482	\$ 4,577,518
Total: Systemwide Salary, Wage, & Fringe Benefits	\$30,999,026	\$5,245,499	\$36,244,525

III. OPERATING EXPENSE

III.6. Supply an exhibit showing an analysis, by functional accounts, of the charges by affiliates (service corporations, etc.) for services rendered included in the operating expenses of the filing company for the historic and future test years and for the 12-month period ended prior to the historic test year:

- a. Supply a copy of contracts, if applicable.
- b. Explain the nature of the services provided.
- c. Explain the basis on which charges are made.
- d. If charges are allocated, identify allocation factors used.
- e. Supply the components and amounts comprising the expense in this account.
- f. Provide details of initial source of charge and reason thereof.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.7. Describe costs relative to leasing equipment, computer rentals, and office space, including terms and conditions of the lease. Explain the method of calculating monthly or annual payments. If allocated from the parent company, provide the method of allocation.

RESPONSE:

PWSA has leasing arrangements with various companies for the leasing of office and equipment and technology. The following table identifies the long-term leases with an explanation for the method used for calculating the monthly or annual payments.

	<u>Annual Payment</u>
<u>Name: The Buncher Company</u>	\$864,031
Under this agreement, PWSA leases office space of 45,618 square feet for the main administrative, field ops and engineering offices. Additionally, PWSA leases outdoor space of 196 square feet for a backup generator. Payments are made at a rental rate using a predetermined rental rate equation throughout the term of 243 months of the lease agreement.	
<u>Name: Sharp</u>	\$90,649
Under this agreement, PWSA leases fifteen multi-functional printers related to management information systems. Payments are made at a predetermined rental rate constant throughout the term (5 years) of the lease agreement.	
<u>Name: Pittsburgh National Bank</u>	\$1,800
Under this agreement, PWSA leases a credit card machine used in the customer service department for customer payments. Payments are made at a predetermined rental rate constant for the life of the lease agreement.	
<u>Name: Sensus USA, Inc.</u>	\$636,000
This agreement is for an advanced metering infrastructure lease that is overseen by the customer service. Payments are made at a predetermined rate constant through June 2029, of the lease agreement.	

III. OPERATING EXPENSE

III.8. Submit detailed calculations (or best estimates) of the cost resulting from storm damage.

RESPONSE:

There are no costs for storm damage included in the HTY, FTY, or FPFTY.

III. OPERATING EXPENSE

III.9. Submit details of expenditures for advertising (national, institutional and local media). Provide a schedule of advertising expense by media categories for the historic test year and the prior two comparable years with respect to:

- a. Public health and safety.
- b. Conservation of energy.
- c. Explanation of billing practices, rates, rules and regulations.
- d. Provision of factual and objective data programs in educational institutions.
- e. Other advertising programs.
- f. Total advertising expense.

RESPONSE:

Despite “advertising” line items within PWSA’s budget, the Authority does not advertise on national, institutional, or local media. The Advertising account (7305) includes costs such as: Board of Directors meeting solicitations and job postings which mostly represent payments to the New Pittsburgh Courier and the Pittsburgh Post-Gazette. The Advertising Marketing account (7307) largely consists of payments to local businesses for staff business cards, website design and support, banners, and other printed material needs. Education and Outreach (7742) consists of payments to Dollar Energy Fund for CAP costs, sponsorships, brochures, and other materials.

Public Affairs costs have been included in the HTY, FTY, and FPFTY but these costs largely include salaries for Public Affairs staff and professional services costs. Advertising-Marketing and Education & Outreach include budgeted amounts for minimal advertising. These costs are identified below.

	FTY 2021	FPFTY 2022
Educational Campaigns	30,000	43,750
Total	\$ 30,000	\$ 43,750

III. OPERATING EXPENSE

III.10. Prepare a detailed schedule for the historic test year showing types of social and service organization memberships paid for by the company and the cost thereof.

RESPONSE:

PWSA pays membership fees to water industry organizations and other industry-related associations. The payments for 2020 are included in III.24. There were no social and/or service memberships paid during the test year by PWSA.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.11. Submit a schedule showing a breakdown by the expenditures associated with outside services employed, regulatory commission expenses, showing expenses relating to rate cases separately, and miscellaneous general expenses, for the historic test year and prior 2 comparable years.

RESPONSE:

7300: Professional Services

Twelve Months Ended:	Actual 2018	Actual 2019	HTY 2020
7305 Advertising	\$ 28,961	45,975	13,754
7306 Annual Report	-	-	-
7307 Advertising - Marketing	29,427	5,068	-
7310 Annual Audit	64,308	49,683	48,613
7315 Billing Contract	832,776	470,173	408,853
7321 Coll Agency Sewage	-	-	-
7323 Consultants	1,161,921	502,507	2,298,014
7325 Consumer Confidence Report	1,707	2,171	1,476
7328 Contingencies	11,766	148,800	134,585
7332 Consulting Engineers	147,182	26,831	69,487
7335 Misc. Services - Non-Capital	3,583,068	5,264,191	3,565,869
7345 Auto Insurance	29,307	74,044	128,253
7348 Commercial Property Insurance	215,532	226,172	255,350
7353 General Liability Insurance	20,798	21,637	22,500
7359 Officers Director Insurance	74,349	74,528	77,306
7365 Workers Compensation Insurance	-	-	480,217
7366 Workers Compensation Insurance - City	33,352	33,352	33,352
7368 Internet Connection Server Insurance	66,656	53,334	1,568
7370 Legal	2,894,514	2,388,647	2,620,392
7375 Meter Services	879,343	864,422	788,812
7382 Payroll Services	72,899	70,633	125,460
7383 Prof Service - Other	5,307,168	6,083,922	6,143,089
7389 Trust Admin	71,235	30,411	77,385
7390 Water Liens	-	8,000	30,000
Total Professional Services	\$ 15,526,270	16,444,502	17,324,335

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

Regulatory Commission Expenses (7370, 7383, and 7323)

Twelve Months Ended:	Actual 2018	Actual 2019	HTY 2020
PUC Assessments (910)	\$836,801	\$953,170	\$1,132,932
PUC Support			
Finance (913)	2,245,865	1,463,403	2,104,207
Legal (916)	774,002	1,224,401	\$1,085,596
Total Regulatory & Rate Case Expenses	\$3,856,668	\$3,640,974	\$4,322,734

7700: Miscellaneous Admin

Twelve Months Ended:	Actual 2018	Actual 2019	HTY 2020
7712 Cash Discount Taken	(\$523)	(\$623)	(\$680)
7715 Claims Deductibles	353,049	587,017	556,304
7721 Customer Refund. AP	881,565	667,728	494,191
7730 Fines Penalties	15,372	20,500	24,455
7742 Education & Outreach	50,512	41,116	71,710
7743 Employee Fund	-	-	-
7750 Inventory Adjustments	1,373,808	240,929	-
7760 Misc. General Admin Expense	-	5,847	19,701
7765 One Call	14,921	18,195	18,186
7770 Publication Subscription	4,288	24,884	14,089
7799 Grants Awarded by PWSA	95,000	112,352	-
8180 Non.City Water Reimbursement	-	-	435,952
8005 City Indirect Costs (Pension & Taxes)	-	-	4,049,473
Total Miscellaneous Admin	\$2,787,991	\$1,717,944	\$5,683,381

III. OPERATING EXPENSE

III. 12. Submit details of information covering research and development expenditures, by project, within the company and note forecasted company programs.

RESPONSE:

No research and development expenditures were incurred during the HTY nor are any expected to be incurred in the FTY and FPFTY.

III. OPERATING EXPENSE

III.13. Provide a detailed schedule of all charitable and civic contributions by recipient and amount for the historic test year.

RESPONSE:

There were no charitable and civic contributions paid during the historic test year by PWSA.

III. OPERATING EXPENSE

III.14. Provide the two most recent actuarial studies for both pension expense and postretirement benefits other than pensions (OPEBs).

RESPONSE:

PWSA employees participate in the City of Pittsburgh Municipal Pension Fund Plan (Plan). Employees who became members of the Plan prior to January 1, 1988 are required to contribute 5% of pre-tax pay. Those joining thereafter are required to contribute 4%. The City's obligations relative to the Plan are determined in accordance with various Pennsylvania statutes. The extent of the Authority's participation in such obligations with respect to those former City employees whose membership continued upon becoming employees of the Authority is determined by the shared interpretation of the City and Authority of the intent of the Cooperation Agreement.

The Plan has not reported or attributed measurements of assets or the net pension liability on the basis of the group of members who are Authority employees. As of the date of this filing, the amount of the assets and liabilities of the Plan that is attributable to PWSA participants (both employees and retirees) is unknown as a detailed study has not been performed to separate the plan between the City and the Authority. As such, this information is unavailable at this time.

Eligibility for ongoing non-union employee participation in the City's Plan ended on March 1, 2019, as the Authority has introduced another retirement plan. At this time, all new non-union employees of the Authority may elect to contribute to an established 401a plan with the benefit of an employer match once vested. No new non-union employees hired after March 1, 2019 are eligible for participation in the City of Pittsburgh Municipal Pension Fund Plan.

III. OPERATING EXPENSE

III.15. Identify the total pension expense under statement of accounting standards (SFAS 87) for the historic test year and the portion charged to operation and maintenance (O & M). Include an analysis showing the contribution to the pension plan and the amount deferred or expensed for each of the past 2 years and the historic test year. Also provide any estimates for the future year.

RESPONSE:

Please see the response to III.14.

III. OPERATING EXPENSE

III.16. Provide an analysis of OPEBs showing the accrual amount under SFAS 106 and the pay-as-you-go expense.

RESPONSE:

Not applicable. PWSA does not offer other post-employment benefits.

III. OPERATING EXPENSE

III.17. Reconcile the historic and future test year SFAS No. 106 expense levels with the amount identified in the actuarial report.

RESPONSE:

Not applicable. PWSA does not offer other post-employment benefits.

III. OPERATING EXPENSE

III.18. Identify the actual or projected amounts contributed to SFAS No. 106 funds for the historic and future test years. Identify the actual or projected dates and amounts of the contributions.

RESPONSE:

Not applicable. PWSA does not offer other post-employment benefits.

III. OPERATING EXPENSE

III.19. Explain the funding options or plans which are being used for SFAS No. 106 costs. Identify the portion of costs which are eligible for tax preferred funding.

RESPONSE:

Not applicable. PWSA does not offer other post-employment benefits.

III. OPERATING EXPENSE

III.20. State whether the company is studying or anticipating any changes to its postretirement benefits offered to employees as a result of SFAS No. 106 or for other reasons. If yes, provide the study and explain the anticipated change.

RESPONSE:

We do not anticipate any changes in postretirement benefits during the FTY or FPFTY and therefore have not included any cost for such changes.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.21. State whether the historic test year expenses reflect any accruals for postemployment benefits under SFAS 112. If yes, provide complete details including supporting documentation, assumptions, and funding mechanisms.

RESPONSE:

The historical test year does not include any accruals for postemployment benefits.

III. OPERATING EXPENSE

III.22. Provide a copy of all incentive compensation and bonus plans and provide the level of related bonus payments included in the cost of service. Provide information for the preceding 2 years and any changes since the last rate case.

RESPONSE:

In 2018, PWSA extended an offer to Bob Weimar to officially become Executive Director. Per Weimar's contract, he is eligible for semi-annual bonuses of up to \$13,000. This bonus is based on performance metrics and the amount is determined at the sole discretion of the PWSA Board of Directors. Effective June 2020, Bob Weimar is no longer employed at the PWSA. Thus, PWSA will not incur the potential semi-annual bonuses associated with his contract moving forward.

There are no bonus or incentive compensation costs included in the FTY and FPFTY.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.23. Provide the most recent insurance premiums for each type of insurance coverage, both employee benefit and those purchased for the company, reflected in the company's filing. If available, provide estimated premiums for the subsequent calendar year.

RESPONSE:

Please see the tables below.

4100: Employee Benefits - Insurance

		HTY	FTY	FPFTY
	Twelve Months Ended:	2020	2021	2022
4110	Fed Insurance Contract Act Tax	\$1,453,301	1,762,442	1,887,981
4135	Med Health Insurance	4,210,424	4,521,269	4,701,255
4140	Med Health Insurance Waiver	72,359	105,399	115,512
4145	Short Term Disability	226,692	224,707	225,256
4150	Long Term Disability	27,775	133,347	149,184
4155	Life Ins <50k	38,413	46,139	48,953
4160	Accidental Death/Dismember	5,171	6,045	6,752
4165	Dental Insurance	151,738	167,609	171,210
4170	Vision Insurance	15,287	18,809	20,322
	Total Employee Benefit – Insurance	\$6,201,160	\$6,985,766	\$7,326,425

7300: Professional Services - Insurance

		HTY	FTY	FPFTY
	Twelve Months Ended:	2020	2021	2022
7345	Auto Insurance	\$128,253	45,784	135,000
7348	Commercial Prop Insurance	255,350	263,947	265,000
7353	Gen Liability Insurance	22,500	22,929	25,000
7359	Officers Director Insurance	77,306	93,079	80,000
7365	WorkersComp Insurance	480,217	450,000	455,000
7366	WorkersComp City Insurance	33,352	40,000	40,000
7368	Internet Connection Server Insurance	1,568	-	-
	Total Professional Svcs. Insurance	\$998,546	\$915,739	\$1,000,000

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.24. Provide the level of payments made to industry organizations included in the cost of service along with a description of each payee organization.

RESPONSE:

Please see below.

Organization	Per Books 12/31/2020	Description
AFRICAN AMERICAN CHAMBER OF COMMERCE OF WESTERN PA	500.00	ASSOCIATE MEMBERSHIP RENEWAL
ALLEGHENY CONFERENCE ON COMMUNITY DEVELOPMENT	3,500.00	2020 PLEDGE MEMBERSHIP
ALLEGHENY LEAGUE OF MUNICIPALITIES	440.00	YEARLY DUES
AMERICAN WATER WORKS ASSOCIATN	15,020.00	AWWA ANNUAL MEMBERSHIP
NACWA	13,690.00	2020 NACWA MEMBERSHIP
NFPA INTERNATIONAL	445.00	MEMBERSHIP RENEWAL
PA MUNICIPAL LEAGUE	65.00	L3P MEMBERSHIP
PA RURAL WATER ASSOCIATION	1,039.00	RENEWAL MEMBERSHIP DUAL SYSTEM
PAWARN	1,250.00	PA WAREN ANNUAL DUES
PENNSYLVANIA ASSOCIATION OF NOTARIES	696.00	MEMBERSHIP - 2 Paralegals
PENNSYLVANIA MUNICIPAL AUTH. ASSOC.	2,600.00	2020 MEMBERSHIP DUES

III. OPERATING EXPENSE

III.25. If the company has included any costs associated with canceled construction projects or obsolete inventory in requested rates, separately identify the items, provide the related amounts and explain the reason for the cancellation or obsolescence.

RESPONSE:

PWSA has not included any costs associated with cancelled construction or obsolete inventory.

III. OPERATING EXPENSE

III.26. Explain how the company accounts for vacation pay for book and ratemaking purposes.

RESPONSE:

For accrual-basis financial reporting (PWSA Audit), a liability for vacation, personal, and sick days is accrued when related benefits are attributable to services rendered and to the extent it is probable that the Authority will ultimately compensate employees.

PWSA is filing this rate case on a cash-basis and, accordingly, PWSA has made no claim for vacation pay for ratemaking purposes since a full cash salary and wage costs for each employee has been included in PWSA's Revenue Requirement.

III. OPERATING EXPENSE

III.27. Indicate whether any employee positions have been eliminated since the commencement of the historic test year or are expected to be eliminated during the future test year.

RESPONSE:

No employee positions have been eliminated since the commencement of the historic test year or are expected to be eliminated during the future test year.

PWSA has terminated employees and employees have resigned from various positions throughout the organization. However, it is the expectation that those position will be refilled instead of being eliminated.

Pittsburgh Water and Sewer Authority's Base Rate Filing

III. OPERATING EXPENSE

III.28. Furnish the name of each supplier, gallonage and expense for water purchased as recorded in Water Purchased for Resale-Account 706 for the historic test year and two preceding years.

RESPONSE:

PWSA has not purchased water for resale in the HTY nor the two preceding years.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.1. Provide a copy of the latest Pennsylvania Corporate Tax report and the latest Pennsylvania Corporate Tax settlement.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.2. Submit details of calculations for taxes, other than income, where a company is assessed taxes for doing business in another state, or on its property located in another state.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.3. Submit a schedule showing for the last 3 years the Income Tax refunds, plus interest, net of taxes, received from the Federal government due to prior years' claims.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.4. Provide detailed computations showing the deferred income taxes derived by using accelerated tax depreciation applicable to post-1969 utility property that increases productive capacity, and accelerated depreciation rate (ADR) rates on property (separate between State and Federal; also, rate used). If based on the historic test year, justify.

- a. State whether tax depreciation is based on all rate base items claimed as of the end of the future test year, and whether it is the annual tax depreciation at the end of the future test year.
- b. Reconcile any difference between the deferred tax balance, as shown as a reduction to measures of value (rate base), and the deferred tax balance as shown on the balance sheet.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.5. Submit a schedule showing a breakdown of accumulated investment tax credits, (3%, 4%, 7%, 10% and 11%), together with details of methods used to write-off the unamortized balances.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.6. Submit a schedule showing the adjustments for taxable net income per book, including below-the-line items, and pro-forma under existing rates, together with an explanation of any difference between the adjustments. Indicate charitable donations and contributions in the tax calculation for ratemaking purposes.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.7. Submit detailed calculations supporting historic and future taxable income before State and Federal Income Taxes where the income tax is subject to allocation due to operations in another state, or due to operation of other taxable utility or nonutility business, or by operating divisions or areas.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.8. Furnish a breakdown of major items comprising prepaid and deferred Income Tax charges and other deferred income tax credits and reserves by accounting areas.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.9. Explain the reason for the use of cost of removal of any retired plant figures in the Income Tax calculations.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.10. State whether all tax savings due to accelerated depreciation on property installed prior to 1970 have been passed through to income. If not, explain.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.11. Show any income tax loss/gain carryovers from previous years that may affect historic test year income taxes or future test year Income Taxes. Show loss or gain carryovers by years of origin and amounts remaining by years at the end of the historic test year.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.12. Provide a detailed analysis of taxes accrued per books as of the historic and future test year date. Also supply the basis for the accrual and the amount of taxes accrued monthly.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

IV. TAXES

IV.13. Under Section 1552 of the Internal Revenue Code and Regulations at 1.1552-1 if applicable, a parent company, in filing a consolidated Income Tax return for the group, must choose one of four options by which it must allocate total income tax liability of the group to the participating members to determine each member's tax liability to the Federal government. If this request is not applicable, provide an explanation.

- a. State what option has been chosen by the group.
- b. Provide, in summary form, the amount of tax liability that has been allocated to each of the participating members in the consolidated Income Tax return.
- c. Provide a schedule, in summary form, of contributions, which were determined on the basis of separate tax return calculations, made by each of the participating members to the tax liability indicated in the consolidated group tax return. Provide total amounts of actual payments to the tax depository for the tax year, as computed on the basis of separate returns of members.
- d. Provide annual Income Tax return for group, and if Income Tax return shows net operating loss, provide details of amount of net operating loss allocated to the Income Tax returns of each of the members of the consolidated group.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.14. Provide a copy of the Corporate Federal Tax Returns and supporting schedules for the preceding 3 years and, if applicable, a copy of the calculation workpapers for the company's consolidated tax savings adjustment.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.15. Provide a schedule of Federal and Pennsylvania taxes, other than Income Taxes, calculated on the basis of test year per book, pro forma at present rates, and pro forma at proposed rates, to include the following categories:

- a. Social Security.
- b. Unemployment.
- c. Capital Stock.
- d. Public Utility Realty.
- e. PUC assessment.
- f. Other property.
- g. Any other appropriate categories.

RESPONSE:

15.a. Social Security

PWSA's employer share of Social Security and Medicare Taxes is as follows:

Fiscal Year Ending December 31, 2020	\$ 1,830,883
Fiscal Year Ending December 31, 2021	\$ 2,174,626
Fiscal Year Ending December 31, 2022	\$ 2,330,604

15.b. Unemployment

PWSA's employer Pennsylvania Unemployment Tax is as follows:

Fiscal Year Ending December 31, 2020	\$ 14,837
Fiscal Year Ending December 31, 2021	\$ 15,000
Fiscal Year Ending December 31, 2022	\$ 15,300

15.c. Capital Stock

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

15. Public Utility Realty

Not applicable.

15.e. PUC Assessment

PWSA's PUC assessment is expensed as follows:

Fiscal Year Ending December 31, 2020	\$1,132,932
Fiscal Year Ending December 31, 2021	\$1,300,000
Fiscal Year Ending December 31, 2022	\$1,500,000

15.f. Other Property

Not applicable.

15.g. Any Other Appropriate Categories

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.16. Submit a schedule showing a breakdown of the deferred Income Taxes by State and Federal per book, pro forma, existing rates, and under proposed rates.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.17. With respect to determination of income taxes, Federal and State:

- a. Show Income Tax results of the annualizing and normalizing adjustments to the historic test year before any rate increase.
- b. Show Income Taxes for the annualized and normalized test year.
- c. Show Income Tax effect of the rate increase requested.
- d. Show Income Taxes for the normalized and annualized test year after application of the full rate increase.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

IV. TAXES

IV.18. State amount of debt interest utilized for Income Tax calculations, and details of debt interest computations, under each of the following rate case bases:

- a. Actual per book test year.
- b. Annualized historic test year-end.
- c. Proposed future test year-end.

RESPONSE:

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.1. Provide a schedule showing the measures of value and the rates of return at the original cost in the current case. All claims made on this exhibit should be cross-referenced to appropriate exhibits.

RESPONSE: Not applicable.

V. RATE BASE

V.2. If a claim is made for construction work in progress, include, in the form of an exhibit, the summary page from all work orders, amount expended at the end of the historic and future test year and anticipated in-service dates. Indicate if any of the construction work in progress will result in insurance recoveries, reimbursements, or retirements of existing facilities. Describe in exact detail the necessity of each project claimed if not detailed on the summary page from the work order. Include final completion dates and estimated total amounts to be spent on each project. This exhibit should be updated at the conclusion of these proceedings.

RESPONSE: Not applicable.

V. RATE BASE

V.3. If a claim is made for nonrevenue producing construction work in progress, include, in the form of an exhibit, the summary page from all work orders, amount expended at the end of the historic and future test year and anticipated in-service dates. Indicate if any of the construction work in progress will result in insurance recoveries, reimbursements, or retirements of existing facilities. Describe in exact detail the necessity of each project claimed if not detailed on the summary page from the work order. Include a list of items needed to complete each project, such as landscaping and fencing, and estimated total amounts to be spent to complete each project. These exhibits should be updated at the conclusion of these proceedings.

RESPONSE:

Not applicable.

V. RATE BASE

V.4. If a claim is made for plant held for future use, supply the following:

- a. A brief description of the plant or land site and its original cost.
- b. expected date of use for each item claimed.
- c. Explanation as to why it is necessary to acquire each item in advance of its date of use.
- d. Date when each item was acquired.
- e. Date when each item was placed in the plant held for future use account.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.5. If fuel stocks comprise part of the cash working capital claim, provide an exhibit showing the actual book balances, noting quantity and price for the fuel inventories by type of fuel for the 13 months prior to the end of the historic test year by location, station, etc. Explain the method of determining the claim if other than that described above.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.6. Explain in detail by statement or exhibit the appropriateness of claiming any additional items, not previously mentioned, in the measures of value.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.7. Provide schedules and data in support of the following working capital items:

- a. Prepayments—list and identify all items.
- b. Federal Income Tax accrued or prepaid.
- c. Pennsylvania State Income Tax accrued or prepaid.
- d. Pennsylvania Capital Stock Tax accrued or prepaid.
- e. Pennsylvania Public Utility Realty Tax accrued or prepaid.
- f. Payroll taxes accrued or prepaid.
- g. Any adjustments related to the above items for ratemaking purposes.

RESPONSE:

- 7.a. Prepayments—list and identify all items – See the response to FR X.6.
- 7.b. Federal Income Tax accrued or prepaid - Not applicable.
- 7.c. Pennsylvania State Income Tax accrued or prepaid - Not applicable.
- 7. Pennsylvania Capital Stock Tax accrued or prepaid - Not applicable.
- 7.e. Pennsylvania Public Utility Realty Tax accrued or prepaid - Not applicable.
- 7.f. Payroll taxes accrued or prepaid – Not applicable.
- 7.g. Any adjustments related to the above items for ratemaking purposes - Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.8. Supply an exhibit supporting the claim for cash working capital requirement based on the lead-lag method.

a. Pro forma expenses and revenues are to be used in lieu of book data for computing lead-lag days.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.9. Indicate if amortized expenses have been removed from the lead-lag study. If so, please provide documentation showing such removal. If not, provide a list of such amortization expenses included.

RESPONSE: Not applicable.

V. RATE BASE

V.10. Identify the funds availability arrangements or terms which the company has with its banks with respect to deposits of customer checks. For example, does the company have same day or next day access to funds deposited?

RESPONSE:

PWSA has a number of payment options for the collection of customer accounts receivables. Payments for PWSA service are accepted by customer check, credit card, ACH (electronic) transfer, in-person at 7-Eleven, Family Dollar, Dollar General, or CVS Pharmacy stores, or with Zipcheck.

The following excerpt is from the PNC Bank, PWSA's primary checking and deposit account, Corporate Funds Availability Policy for PWSA regarding the availability of customer deposits.

Same Day Availability

Funds from the following deposits are available on the same business day as the day of their deposit:

- All cash deposits made to a PNC Bank teller
- Wire Transfers
- Electronic Deposits

Next Day Availability

If you make a deposit before the cut-off time on a business day that we are open, funds from deposits of checks or money orders identified below will be available on the first business day after the business day of your deposit for all purposes.

- Checks and money orders drawn on PNC Bank
- U.S. Treasury checks payable to you
- Federal Reserve Bank checks, Federal Home Loan Bank checks and U.S. Postal Service money orders payable to you
- State and local government checks that are payable to you, if you use a special deposit ticket available upon request at a PNC Bank branch office
- Non-PNC Bank cashier's, certified and teller's checks that are payable to you, if you use a special deposit ticket available upon request at a PNC Bank branch office

You are required to separate checks requiring special deposit tickets from other checks you are depositing.

V. RATE BASE

Longer Delays May Apply

Funds you deposit by check may be delayed for a longer period under the following circumstances:

- We believe a check you deposited will not be paid.
- You deposit checks in any one day totaling more than \$5,000.
- You redeposit a check that has been returned unpaid.
- You have overdrawn your account repeatedly in the last six months.
- There is an emergency such as a failure of communications or computer equipment.

We will notify you of the delay in your ability to withdraw funds for any of the reasons listed, and we will tell you when the funds will be available. In this case, funds from items deposited as set forth above under "Other Check Deposits" will usually be available no later than the fifth business day after the business day of your deposit for all purposes.

V. RATE BASE

V.11. In reference to materials and supplies:

- a. What method of inventory valuation was used to develop the claim for materials and supplies?
- b. Does the utility use a material and supply model to calculate needed material and supply levels?
- c. If so, provide the model. Supply an illustrative example of how the monthly balances are derived.
- d. Provide the actual monthly value for the inventory of materials and supplies for the past 12 months. Supply as of the end of the historic test year, a 13-month average, by month, for the material and supply account.
- e. Provide the monthly level of materials and supplies for 3 years prior to the conclusion of the historic test year.

RESPONSE:

11.a. What method of inventory valuation was used to develop the claim for materials and supplies?

Not applicable to a cash-basis utility.

11.b. Does the utility use a material and supply model to calculate needed material and supply levels?

No, it does not.

11.c. If so, provide the model. Supply an illustrative example of how the monthly balances are derived.

Please refer to response to question 11b.

V. RATE BASE

- 11.d** Provide the actual monthly value for the inventory of materials and supplies for the past 12 months. Supply as of the end of the historic test year, a 13-month average, by month, for the material and supply account.

PWSA expenses materials and supplies as incurred and does not track materials and supplies in a balance sheet account. In addition, PWSA is filing on a cash basis and, therefore, is not making a claim for materials and supplies.

- 11.e.** Provide the monthly level of materials and supplies for 3 years prior to the conclusion of the historic test year.

Please see the response to 11d.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.12. For each nonblanket or projected plant addition to cost the greater of \$100,000 or 0.5% of current rate base, included in the future test year, please provide:

- a. Description of the project.
- b. Original budgeted cost broken down by allowance for funds used during construction (AFUDC) and non-AFUDC components.
- c. Current budgeted cost broken down by AFUDC and non-AFUDC components.
- d. Reason for change in budgeted cost.
- e. Original estimated date of completion and in service.
- f. Current estimated date of completion and in service.
- g. Reason for change in completion date.
- h. Anticipated retirement related to the plant addition.
- i. Starting date of project.
- j. Amount expended to date.
- k. Percent of project currently complete.
- l. The depreciation rate applicable.
- m. Identify which projects are due to a Pennsylvania Department of Environmental Protection (PA-DEP) or Federal Environmental Protection Agency (EPA) requirement.

RESPONSE:

PWSA's Capital Improvement's Plan (CIP) is addressed in the written testimony of Barry King and Edward Barca. The testimonies include summary level descriptions of the key projects as well as the CIP itself. A detailed listing of planned capital projects and information related to their intended use is included as part of the LTIIP, which was approved on August 27, 2020.

V. RATE BASE

V.13. Explain how the future test year plant balances were projected and provide supporting workpapers and documentation.

RESPONSE:

PWSA is filing on a cash-basis fully projected test year. Due to the nature of a cash basis filing, projected plant balances do not directly impact the revenue requirement and resulting rates. However, utilizing the five-year CIP, PWSA has projected future plant and fixed asset balances. The objective of this projection is to show the magnitude of the CIP and it's means for financing. For the CIP and projected plant balances, please refer to the written testimony of Barry King and Edward Barca.

V. RATE BASE

V.14. Are all of the assets used in the plant-in-service claim used exclusively by the water or wastewater utility? If not, provide the estimated percentage that each shared asset is used by other entities.

RESPONSE:

All assets in the plant-in-service claim are used by the water or wastewater utility.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.15. Is all plant included in rate base currently being used in providing water or wastewater service? If not, provide a schedule which presents those plant items which are not, and indicate the corresponding amounts and account numbers. Further, provide a detailed narrative explaining the reason why such plant is not being used and the anticipated future disposition of the plant.

RESPONSE:

All plant in service included in the rate base is used and useful. All projected investments during 2022 will be placed in service by the end of 2022 and be used and useful. All projected investments during 2023 will be placed into service by the end of 2023 and will be used and useful.

Pittsburgh Water and Sewer Authority's Base Rate Filing

V. RATE BASE

V.16. Provide all workpapers and supporting documentation showing the derivation of the projected balances of contributions in aid of construction, customer advances for construction and company service line and customer deposits for the future test year.

RESPONSE:

In 2020, PWSA received donated property, or contributions in aid of construction, of \$76,012. For the purposes of this rate filing and since PWSA is filing on a cash basis, PWSA has not projected balances contributions in aid of construction, customer advances for construction and company service line and customer deposits. Projects identified in the CIP are assumed to be funded through the issuance of debt or available utility cash from operations and reserve funds.

VI. DEPRECIATION

If any of the following questions under this section have been previously answered pursuant to 52 Pa. Code Chapter 73, please note in your response. It is not necessary to provide responses to questions previously answered.

VI.1. Provide a description of the depreciation methods used to calculate annual depreciation amounts and depreciation reserves, together with a discussion of the factors which were considered in arriving at estimates of service life and dispersion by account. Supply a comprehensive statement of any changes made in method of depreciation. Provide dates of all field inspections and facilities visited.

RESPONSE:

Depreciation of capital assets owned by the Authority is provided on the straight-line method based on the estimated useful lives of the various classes of assets with no salvage value. Utility assets (such as treatment plant and distribution fixed assets) have estimated useful lives ranging from 30 to 70 years. Non-utility assets (such as administration fixtures) have estimated useful lives ranging from five to 10 years.

The Authority also receives donated property relating mostly to dedicated water and sewer lines. These assets are capitalized at acquisition value at the date of the donation and depreciated in accordance with the estimated useful lives noted above.

The water and sewer system represents assets leased from the City. Amortization of capital lease assets is provided on the straight-line basis applying an estimated average remaining useful life from the inception of the lease.

VI. DEPRECIATION

VI.2. Set forth, in exhibit form, charts depicting the original and estimated survivor curves and a tabular presentation of the original life table plotted on the chart for each account where the retirement rate method of analysis is utilized.

RESPONSE:

Not applicable.

VI. DEPRECIATION

VI.3. Provide the surviving original cost at historic test year-end by vintage by account and include applicable depreciation reserves and accruals. These calculations should be provided for plant in service as well as other categories of plant, including contributions in aid of construction and customers' advances for construction.

RESPONSE:

Please see attached schedule.

Pittsburgh Water & Sewer Authority
Utility Plant in Service Net of Accumulated Depreciation
As of December 31, 2020

Description	Department	GL Account	ACTUAL 2020		ACTUAL 2020	ACTUAL 2020	ACTUAL 2020	
			Beginning Plant Balance	Additions	Ending Plant Balance	Accumulated Depreciation	Net Plant In Service	
General Water								
Utility - Machine - Equipment	300	1803	\$ -	\$ -	\$ -	\$ -	\$ -	
Water Quality								
Utility - Building	321	1802	644,181	-	644,181	(644,181)	-	
Utility - Machine - Equipment	321	1803	619,739	-	619,739	(502,598)	117,140	
Utility - Computer Equipment	321	1805	20,148	-	20,148	(4,766)	15,382	
Utility - Vehicles	321	1806	48,400	-	48,400	(9,699)	38,701	
Utility - Miscellaneous	321	1807	145,378	-	145,378	(77,366)	68,011	
<i>Subtotal: Water Quality</i>			1,477,845	-	1,477,845	(1,238,610)	239,235	
Water Quality								
Utility - Building	322	1802	1,919,711	(41,363)	1,878,348	(610,635)	1,267,714	
Utility - Machine - Equipment	322	1803	93,005,874	6,716,044	99,721,917	(28,671,368)	71,050,550	
Utility - Computer Equipment	322	1805	2,619,928	-	2,619,928	(1,438,255)	1,181,673	
Utility - Vehicles	322	1806	1,467,675	(343,751)	1,123,924	(434,106)	689,818	
Utility - Miscellaneous	322	1807	8,025,066	(286,934)	7,738,132	(2,970,953)	4,767,180	
<i>Subtotal: Water Quality</i>			107,038,255	6,043,996	113,082,250	(34,125,317)	78,956,934	
Pumping								
Utility - Building	323	1802	92,128,633	(19,481)	92,109,152	(47,630,998)	44,478,153	
Utility - Computer Equipment	323	1805	49,092	-	49,092	(23,605)	25,487	
Utility - Miscellaneous	323	1807	21,183	-	21,183	(21,183)	-	
<i>Subtotal: Pumping</i>			92,198,908	(19,481)	92,179,427	(47,675,786)	44,503,640	
Membrane Plant								
Utility - Building	324	1802	20,355,348	-	20,355,348	(7,489,269)	12,866,078	
Distribution								
Utility - Building	325	1802	291,001,131	63,582,468	354,583,599	(75,655,638)	278,927,961	
Utility - Machine - Equipment	325	1803	31,864,819	1,180,125	33,044,944	(15,833,848)	17,211,096	
Utility - Furniture - Fixtures	325	1804	7,500	-	7,500	(7,500)	-	
Utility - Vehicles	325	1806	3,828,018	2,144,222	5,972,240	(960,879)	5,011,361	
Utility - Miscellaneous	325	1807	12,130,958	(44,233)	12,086,725	(6,060,923)	6,025,803	
Non-Utility - Building	325	1822	-	-	-	-	-	
<i>Subtotal: Distribution</i>			338,832,426	66,862,583	405,695,009	(98,518,788)	307,176,221	
Sewer Operations								
Utility - Building	424	1802	390,475,418	18,008,853	408,484,271	(115,044,387)	293,439,884	
Utility - Machine - Equipment	424	1803	41,802,011	559,842	42,361,853	(21,114,890)	21,246,963	
Utility - Furniture - Fixtures	424	1804	-	-	-	-	-	
Utility - Computer Equipment	424	1805	3,185	-	3,185	(1,456)	1,729	
Utility - Vehicles	424	1806	2,804,707	(286,674)	2,518,033	(1,167,670)	1,350,363	
Utility - Miscellaneous	424	1807	3,907,340	(110,777)	3,796,563	(1,635,354)	2,161,210	
<i>Subtotal: Sewer Operations</i>			438,992,662	18,171,244	457,163,905	(138,963,757)	318,200,148	
Sewer Miscellaneous								
Utility - Miscellaneous	425	1807	-	-	-	-	-	
Other Miscellaneous								
Non-Utility - Furniture - Fixtures	800	1824	-	-	-	-	-	
Utility - Computer Equipment	900	1805	-	-	-	-	-	
Non-Utility - Computer Equipment	900	1825	-	-	-	-	-	
<i>Subtotal: Other Miscellaneous</i>			-	-	-	-	-	
Executive Director								
Non-Utility - Building	910	1822	853,138	-	853,138	(276,878)	576,260	
Non-Utility - Furniture - Fixtures	910	1824	102,352	-	102,352	(78,489)	23,863	
Non-Utility - Vehicles	910	1826	-	-	-	-	-	
<i>Subtotal: Executive Director</i>			955,491	-	955,491	(355,367)	600,123	
Customer Service								
Non-Utility - Furniture - Fixtures	911	1824	165,426	-	165,426	(151,047)	14,379	
Non-Utility - Computer Equipment	911	1825	831,567	-	831,567	(334,307)	497,261	
Non-Utility - Miscellaneous	911	1827	9,472	(6,710)	2,762	(2,762)	-	
<i>Subtotal: Customer Service</i>			1,006,465	(6,710)	999,755	(488,115)	511,640	
Management Information Systems								
Non-Utility - Furniture - Fixtures	912	1824	8,773	-	8,773	(8,773)	-	
Non-Utility - Computer Equipment	912	1825	3,206,584	(73,978)	3,132,607	(2,029,331)	1,103,276	
Non-Utility - Miscellaneous	912	1827	10,492	-	10,492	(8,401)	2,092	

Pittsburgh Water & Sewer Authority
Utility Plant in Service Net of Accumulated Depreciation
As of December 31, 2020

Description	Department	GL Account	<u>ACTUAL 2020</u> Beginning Plant Balance	Additions	<u>ACTUAL 2020</u> Ending Plant Balance	<u>ACTUAL 2020</u> Accumulated Depreciation	<u>ACTUAL 2020</u> Net Plant In Service
<i>Subtotal: Management Information Systems</i>			3,225,849	(73,978)	3,151,872	(2,046,504)	1,105,368
Finance							
Non-Utility - Furniture - Fixtures	913	1824	73,472	-	73,472	(56,812)	16,660
Non-Utility - Computer Equipment	913	1825	-	-	-	-	-
<i>Subtotal: Finance</i>			73,472	-	73,472	(56,812)	16,660
Warehouse							
Utility - Machine - Equipment	918	1803	-	-	-	-	-
Non-Utility - Furniture - Fixtures	918	1824	35,332	-	35,332	(35,332)	-
Non-Utility - Computer Equipment	918	1825	-	-	-	-	-
Non-Utility - Vehicles	918	1826	150,639	-	150,639	(150,639)	-
Non-Utility - Miscellaneous	918	1827	3,958,999	(70,503)	3,888,496	(2,385,283)	1,503,213
<i>Subtotal: Warehouse</i>			4,144,970	(70,503)	4,074,467	(2,571,254)	1,503,213
Engineering							
Non-Utility - Building	930	1822	277,190	-	277,190	(134,228)	142,962
Non-Utility - Furniture - Fixtures	930	1824	328,349	-	328,349	(223,344)	105,006
Non-Utility - Computer Equipment	930	1825	1,516,841	(25,444)	1,491,397	(832,893)	658,504
Non-Utility - Vehicles	930	1826	457,225	(26,947)	430,278	(430,278)	-
Non-Utility - Miscellaneous	930	1827	195,138	-	195,138	(180,190)	14,947
<i>Subtotal: Engineering</i>			2,774,743	(52,392)	2,722,352	(1,800,933)	921,419
<i>Total: Fixed Assets</i>			\$ 1,011,076,434	\$ 90,854,759	\$ 1,101,931,193	\$ (335,330,513)	\$ 766,600,680
Other Assets							
Construction in Progress		1840	\$ 124,756,028	\$ 16,955,748	\$ 141,711,776	\$ -	\$ 141,711,776
Capitalized Interest		1841	-	-	-	-	-
CIP Accrual		1842	14,578,246	2,773,580	17,351,826	-	17,351,826
Total Utility Plant			\$ 1,150,410,708	\$ 110,584,087	\$ 1,260,994,795	\$ (335,330,513)	\$ 925,664,282

VI. DEPRECIATION

VI.4. Provide a comparison of the calculated depreciation reserve used for ratemaking purposes v. the book reserve by account at the end of the test year, if they differ.

RESPONSE:

Not applicable.

VI. DEPRECIATION

VI.5. Supply a schedule by account and depreciable group showing the survivor curve and annual accrual rate estimated to be appropriate:

- a. For the purposes of this filing.
- b. For the purposes of the most recent rate increase filing prior to the current proceedings.

RESPONSE:

5.a. For the purposes of this filing.

Please see response for VI.3.

5.b. For the purposes of the most recent rate increase filing prior to the current proceedings.

Not applicable.

VI. DEPRECIATION

VI.6. Provide an exhibit showing gross salvage, cost of removal, and net salvage for the 5 most recent calendar or fiscal years by account.

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.1. Provide capitalization and capitalization ratios for the last 5-year period and projected through the next 2 years (with short-term debt and without short-term debt) for the company, parent and consolidated system.

a. Provide year-end interest coverages before and after taxes for the last 3 years and at the latest date, including indenture and Securities and Exchange Commission (SEC) bases, for the company, parent and consolidated system.

b. Provide year-end preferred stock dividend coverages for the last 3 years and at latest date, including charter and SEC bases.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.2. Provide latest prospectus for the company and the parent.

RESPONSE: Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.3. Supply projected capital requirements and the sources of company, parent and consolidated system for the historic test year and each of 3 comparable future years.

RESPONSE:

Attached are PWSA's sources and uses of cash for capital improvement expenditures for Fiscal Years 2020-2025.

	HTY	FTY	FPFTY	Projected	Projected	Projected
	12 Months	12 Months	12 Months	12 Months	12 Months	12 Months
	Ending	Ending	Ending	Ending	Ending	Ending
Capital Requirements	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024	12/31/2025
Water Treatment Plant	\$ 8,959,256	15,112,066	16,422,149	45,559,717	23,358,443	26,105,966
Water Pumping and Storage	7,304,722	56,863,770	70,939,529	106,366,346	49,645,737	51,176,787
Water Distribution	64,838,953	76,245,552	36,345,826	66,150,837	119,049,668	169,246,024
Wastewater System	8,767,047	35,741,675	45,109,155	29,580,401	34,664,259	38,980,692
Stormwater	15,791,622	34,696,272	21,721,607	13,237,377	14,764,949	11,479,750
Other	16,446,590	14,670,000	1,100,000	2,500,000	2,500,000	1,500,000
	\$ 122,108,191	233,329,335	191,638,266	263,394,678	243,983,056	298,489,218
Funding Sources						
Debt (Revenue Bonds)	\$ 72,353,853	169,262,753	173,670,904	249,823,825	233,482,080	287,988,242
Debt (Project Fund)	-	17,219,270	7,466,387	3,069,877	-	-
DSIC - Water (Source of PAYGO)	-	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488
DSIC - Sewer (Source of PAYGO)	-	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488
PENNVEST	40,495,240	37,038,708	-	-	-	-
PAYGO	9,259,098	-	-	-	-	-
	\$ 122,108,191	233,329,335	191,638,266	263,394,678	243,983,056	298,489,218

VII. RATE OF RETURN

VII.4. Provide a schedule of debt and preferred stock of company, parent and consolidated system as of historic test year-end and latest date, detailing for each issue (if applicable):

- a. Date of issue.
- b. Date of maturity.
- c. Amount issued.
- d. Amount outstanding.
- e. Amount retired.
- f. Amount required.
- g. Gain on reacquisition.
- h. Coupon rate.
- i. Discount or premium at issuance.
- j. Issuance expenses.
- k. Net proceeds.
- l. Sinking fund requirements.
- m. Effective interest rate.
- n. Dividend rate.
- o. Effective cost rate.
- p. Total average weighted effective cost rate.

RESPONSE:

Please see the attached FY 2021 debt schedules for the response to: a, b, c, d, e, h, i, j, k, l, and m.

In order to accurately reflect the PWSA's debt portfolio, additional columns have been added to provide information related to the variable rate debt and the related swap agreements, currently outstanding. The debt structure of the Authority is very

VII. RATE OF RETURN

complicated and includes fixed rate debt, hedged and unhedged variable rate debt, senior and subordinate lien debt. The summary attempts to summarize all aspects of the Authority's debt.

4.f. Not applicable.

4.g. Not applicable.

4.n. Not applicable.

4.o. Not applicable.

4.p. Not applicable.

The Pittsburgh Water and Sewer Authority Debt Summary
Outstanding Bonds and Loans Payable (\$000's)

As of February 1, 2021

PGH60

	A	B	C	D	E	F	G	H	I	J	K	L	M
Senior Lien													
Series Name	Date of Issue	Date of Maturity	Amount Issued	Amount Outstanding	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses ¹	Net Proceeds
Series B of 1998 ²	Mar-1998	9-1/2030	\$ 36,440	\$ 63,352	\$ 70,655	5.18-5.31%	N/A	N/A	N/A	\$ -	\$ -	\$ -	\$ 32,400
Series 2013A	Dec-2013	9-1/2033	130,215	67,420	62,795	0.75%-5.00%	N/A	N/A	N/A	-	10,903	13,436	127,682
Series 2013B	Dec-2013	9-1/2040	86,695	38,760	47,935	3.00%-5.25%	N/A	N/A	N/A	-	3,926	613	90,008
Series 2017A	Dec-2017	9-1/2032	159,795	129,610	30,185	3.00%, 5.00%	N/A	N/A	N/A	-	23,374	1,778	181,391
Series 2017C-1 (JPM Swap) ^{3,4}	Dec-2017	9/1/2039	72,748	72,748	-	SIFMA + 0.65%	3.784%	SIFMA - 0.118%	4.5520%	-	-	693	72,054
Series 2017C-2 (MLC S Swap) ^{3,4}	Dec-2017	9/1/2039	72,748	72,748	-	SIFMA + 0.65%	3.770%	SIFMA - 0.118%	4.5380%	-	-	693	72,054
Series 2017C-3 (JPM Swap) ^{3,4}	Dec-2017	9/1/2040	71,225	71,225	-	SIFMA + 0.65%	3.826%	SIFMA - 0.118%	4.5935%	-	-	679	70,546
Series 2017C-4 (Unhedged) ⁵	Dec-2017	9/1/2035	2,085	2,085	-	SIFMA + 0.65%	N/A	N/A	2.5000%	-	-	20	2,065
Series 2019A	July-2019	9/1/2044	109,855	107,560	2,295	5.00%	N/A	N/A	N/A	-	22,468	1,123	131,200
Series 2020A	Dec-2020	9/1/2022	890	890	-	0.70%	N/A	N/A	N/A	-	-	13	877
Series 2020B	Dec-2020	9/1/2050	91,520	91,520	-	3.00%-5.00%	N/A	N/A	N/A	-	16,665	1,185	107,000
Subordinate Lien													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses ^{1,6}	Net Proceeds
Series 2019B	July-2019	9/1/2035	104,290	104,290	-	4.00%-5.00%	N/A	N/A	N/A	-	22,621	28,952	103,660
Third Lien													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses	Net Proceeds
Pennvest Loans	Various	4/1/2045	157,024	120,014	37,010	1.00% - 2.97%	N/A	N/A	N/A	-	-	-	-
PNC Capital Line of Credit ⁷	June-2020	6/23/2023	150,000	26,665	N/A	79% LIBOR + 1.61%	N/A	N/A	N/A	-	-	-	-

¹ Includes legal and professional costs, underwriters' discount, bond insurance premium, surety premium and/or swap termination payments, if applicable, to respective series of bonds.

² Column C is the Initial Stated Amount (Capital Appreciation Bonds), Column D is based on accreted value as of 02/01/2021 and Column E is the total amount paid and/or refunded as of 02/01/2021.

³ Column C represents the portion of the Series C of 2017 which is connected to certain swap agreements or is unhedged.

⁴ The Authority entered into a SIFMA vs. 70% of 1M LIBOR overlay basis swap with Merrill Lynch Capital Services to manage variable rate interest payments associated with the 2017C Bonds. The overlay basis swap effectively converts the floating leg receipts of the Authority's three fixed payer swaps from 70% of 1M LIBOR to SIFMA in order to match the floating leg payment of the remarketed 2017C Bonds for the three year remarketed period. The overlay basis swap also contains a fixed leg component, payable by the Authority to the swap counterparty, of 0.1180% which effectively increases the fixed rates paid by the Authority on its three fixed payer swaps while the overlay basis swap is outstanding.

⁵ Net rate is assumed of 2.5000% for the purposes of this summary.

⁶ Issuance expense includes \$27,605 million for a swap termination payment.

⁷ Has unutilized fee of 0.40% if less than 50% is drawn on the LOC and an unutilized fee of 0.25% if more than 50% is drawn on the LOC.

VII. RATE OF RETURN

VII.5. Supply financial data of company and/or parent for last 5 years:

- a. Earnings-price ratio (average).
- b. Earnings-book value ratio (per share basis) (average book value).
- c. Dividend yield (average).
- d. Earnings per share (dollar).
- e. Dividends per share (dollars).
- f. Average book value per share yearly.
- g. Average yearly market price per share (monthly high-low basis).
- h. Pre-tax funded debt interest coverage.
- i. Post-tax funded debt interest coverage.
- j. Market price-book value ratio.

RESPONSE:

Not applicable to a municipally-owned, cash flow method.

VII. RATE OF RETURN

VII.6. Provide AFUDC charged by company at historic test year-end and latest date, explain method by which rate was calculated and provide workpaper showing derivation of the company's current AFUDC rate.

RESPONSE:

PWSA does not utilize a AFUDC accrual in its accounting system. PWSA has not utilized capitalized interest in the HTY nor do they anticipate utilizing any in the FTY and FPFTY. Financing costs incurred during construction are expensed as they occur.

VII. RATE OF RETURN

VII.7. Set forth provisions of company's and parent's charter and indentures, if applicable, which describe coverage requirements, limits on proportions of types of capital outstanding, and restrictions on dividend payouts.

RESPONSE:

The following documents are attached:

- Amended and Restated Senior Trust Indenture
- 2019-1 Supplemental Senior Trust Indenture
- 2020-1 Supplemental Senior Trust Indenture
- Amended and Restated Supplemental Subordinate Trust Indenture

AMENDED AND RESTATED TRUST INDENTURE

BETWEEN

THE PITTSBURGH WATER AND SEWER AUTHORITY

and

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.
as Successor Trustee

Originally dated as of October 15, 1993
Amended and Restated as of November 1, 2017
And Effective on the First Effective Date
(December 28, 2017)

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AMENDED AND RESTATED TRUST INDENTURE

THIS AMENDED AND RESTATED TRUST INDENTURE dated as of the 1st day of November, 2017 (as amended and supplemented from time to time, the "Indenture"), is by and between THE PITTSBURGH WATER AND SEWER AUTHORITY, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania, having its principal office in the City of Pittsburgh, Allegheny County, Pennsylvania (the "Authority"), and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., a national banking corporation organized and existing under and by virtue of the laws of the United States of America, having power and authority to accept and execute trusts and having a corporate trust office in the City of Pittsburgh, Allegheny County, Pennsylvania, as successor trustee (the "Trustee").

WHEREAS, the Authority makes the following findings and statements:

1. The Act. The Authority is a public body, corporate and politic, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth of Pennsylvania (the "Commonwealth"), Title 53 of the Pennsylvania Consolidated Statutes, Section 5601, et seq., as amended (the "Act").

2. Relationship with the City. The Authority was organized in February 1984 by the City of Pittsburgh, Allegheny County, Pennsylvania (the "City") for the purpose of assuming the responsibility for the operation of the City's water supply and distribution and wastewater collection systems (as further modified as defined herein, the "System"). Pursuant to a Lease and Management Agreement dated as of March 29, 1984 between the City and the Authority (the "Lease and Management Agreement"), the System was leased by the City to the Authority. The Authority then designated the City as its agent to operate and maintain the System. The City and the Authority entered into a Capital Lease Agreement dated as of July 15, 1995 (the "Capital Lease Agreement") under which the Lease and Management Agreement was terminated and the Authority was granted the option to acquire the portion of the System owned by the City. Pursuant to the Capital Lease Agreement, which has a term of 30 years, the Authority made three payments totaling \$101,416,974.60 during the first three years, and on September 1, 2025, upon the payment of \$1.00, the Authority will acquire title to the System. At the same time the City and the Authority entered into the Capital Lease Agreement, they also entered into a Cooperation Agreement dated as of June 15, 1995, effective January 1, 1995, as amended by a First Amendment to Cooperation Agreement dated March 21, 2011 (the "Cooperation Agreement"). The Cooperation Agreement provides for the following matters: the Authority agreed to assume responsibility for management and operation of the System, with some sewer functions remaining with the City. The City provides certain specified services to the Authority on a fee for services basis and the Authority makes certain payments to the City to reimburse it for costs incurred by the City in regard to the operation and maintenance of the System. The Authority agrees to provide the City with water without charge to be used by the City, its departments, agencies and instrumentalities, and the Authority agrees to reimburse the City for equalization payments made by the City to a private utility which serves customers in a portion of the City. In the 2011 amendment to the Cooperation Agreement, the City agreed to subordinate the payments it is entitled to under the Cooperation Agreement to the Authority's debt obligations.

3. Existing Senior Indenture. The Authority's senior lien debt has been issued under a Trust Indenture dated as of October 15, 1993 (the "Original Indenture") with a bond trustee, now being The Bank of New York Mellon Trust Company, N.A. (the "Trustee"), as amended and supplemented by a First Supplemental Indenture dated as of July 15, 1995 (the "First Supplemental Indenture"), a Second Supplemental Indenture dated as of March 1, 1998 (the "Second Supplemental Indenture"), a Third Supplemental Indenture dated as of March 1, 2002 (the "Third Supplemental Indenture"), a Fourth Supplemental Indenture dated as of September 15, 2003 (the "Fourth Supplemental Indenture"), a Fifth Supplemental Indenture dated as of June 1, 2005 (the "Fifth Supplemental Indenture"), a Sixth Supplemental Indenture dated as of March 1, 2007 (the "Sixth Supplemental Indenture"), a Seventh Supplemental Indenture dated as of June 1, 2008 (the "Seventh Supplemental Indenture"), an Amending Supplement to the Initial First Lien Indenture and the Seventh Supplemental Indenture dated as of October 15, 2009 (the "2009 Supplemental Indenture"), a Second Amendment to the Seventh Supplemental Indenture dated as of August 1, 2010 (the "2010 Supplemental Indenture"), a Second Amending Supplement to the Initial First Lien Indenture and the Third Amending Supplement to the Seventh Supplemental Indenture dated as of October 22, 2013 (the "2013 Supplemental Indenture"), an Eighth Supplemental First Lien Indenture dated as of December 1, 2013 (the "Eighth Supplemental Indenture"), a Third Amending Supplement to the First Lien Indenture and Fourth Amending Supplement to the Seventh Supplemental Indenture dated as of October 19, 2016 (the "2016 Supplemental Indenture"), a 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture"), and a 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") (the Original Indenture, as amended and supplemented by the First Supplemental Indenture, the Second Supplemental Indenture, the Third Supplemental Indenture, the Fourth Supplemental Indenture, the Fifth Supplemental Indenture, the Sixth Supplemental Indenture, the Seventh Supplemental Indenture, the 2009 Supplemental Indenture, the 2010 Supplemental Indenture, the 2013 Supplemental Indenture, the Eighth Supplemental Indenture, the 2016 Supplemental Indenture, the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, collectively, the "Existing Senior Indenture").

4. Existing Subordinate Indenture. The Authority's subordinate lien bond debt has been issued to date under a Subordinate Trust Indenture dated as of July 15, 1995 (the "Original Subordinate Indenture") between the Authority and a bond trustee, now being The Bank of New York Mellon Trust Company, N.A. (the "Subordinate Trustee"), as amended and supplemented by a First Supplemental Subordinate Indenture dated as of March 1, 1998 (the "First Supplemental Subordinate Indenture"), a Second Supplemental Subordinate Indenture dated as of June 1, 2008 (the "Second Supplemental Subordinate Indenture"), an Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 1, 2009 (the "2009-1 Supplemental Subordinate Indenture"), an Amendment to the Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 15, 2009 (the "2009-2 Supplemental Subordinate Indenture"), a Second Amending Supplement to the Second Supplemental Indenture dated as of September 1, 2012 (the "2012 Supplemental Subordinate Indenture"), a Third Amending Supplement to the Second Supplemental Subordinate Indenture dated as of September 1, 2013 (the "Third Supplemental Subordinate Indenture"), a Fourth Amending Supplement to the Second Supplemental Indenture dated as of November 3, 2014 (the "2014 Supplemental Subordinate Indenture"), and a Fifth Amending Supplement to the Second Supplemental

Indenture dated as of September 1, 2015 (the “2015 Supplemental Subordinate Indenture”) (the Original Subordinate Indenture, as amended and supplemented by the First Supplemental Subordinate Indenture, the Second Supplemental Subordinate Indenture, the 2009-1 Supplemental Subordinate Indenture, the 2009-2 Supplemental Subordinate Indenture, the 2012 Supplemental Subordinate Indenture, the 2013 Supplemental Subordinate Indenture, the 2014 Supplemental Subordinate Indenture and the 2015 Supplemental Subordinate Indenture, as amended and supplemented (the “Existing Subordinate Indenture”).

5. 1998B Bonds. In 1998, the Authority issued its \$36,440,069.70 Water and Sewer System First Lien Revenue Bonds, Series B of 1998 (the “1998B Bonds”) pursuant to the Second Supplemental Indenture. The 1998B Bonds are capital appreciation bonds that funded capital projects. The 1998B Bonds were initially insured by Financial Guaranty Insurance Company (“FGIC”). FGIC also provided a debt service reserve fund policy for the 1998B Bonds; such debt service reserve fund policy for the 1998B Bonds was terminated on November 29, 2017 and the debt service reserve requirement for the 1998B Bonds is now being satisfied by a policy issued by Assured Guaranty Municipal Corp. (“AGM”; formerly known as Financial Security Assurance Inc.). Pursuant to a Novation Agreement dated as of September 14, 2012 entered into between FGIC and National Public Finance Guarantee Corporation (“National”), the bond insurance policy relating to the 1998B Bonds and the debt service reserve fund policy for the 1998B Bonds were transferred by novation to National, with the effect that National is the designated successor in interest to, and substituted in place of, FGIC as if it were the original insurer for each such policy. Pursuant to side letters dated October 22, 2009 and October 13, 2016 between National and the Authority, National has certain approval rights related to the relationship between the Authority and the letter of credit banks securing the 2008B-1 Bonds (hereinafter defined) and the 2008B-2 Bonds (hereinafter defined).

6. 2008 Bonds. In 2008, the Authority issued \$310,355,000 of senior bonds, including the \$68,970,000 (Fixed Rate) Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2008 Taxable (the “2008A Bonds”), \$145,495,000 (Variable Rate Demand) Water and Sewer System First Lien Revenue Refunding Bonds, Series B of 2008 (the “2008B Bonds”), \$24,665,000 (Fixed Rate) Water and Sewer System First Lien Revenue Bonds, Series D-1 of 2008 (the “2008D-1 Bonds”), and \$71,225,000 (Variable Rate Demand) Water and Sewer System First Lien Revenue Bonds, Series D-2 of 2008 (the “2008D-2 Bonds”) pursuant to the Seventh Supplemental Indenture.

7. 2008A Bonds. The 2008A Bonds are fixed rate bonds and were issued to refund certain prior bonds, fund capital projects, and fund swap termination payments. The 2008A Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2008A Bonds.

8. 2008B-1 Bonds, 2008B-2 Bonds and Swaps. The 2008B Bonds are variable rate bonds that currently refunded certain prior bonds, funded a swap termination payment, and funded capital projects. The 2008B Bonds were initially insured by AGM, but, in 2009, the 2008B Bonds were divided into two subseries, the \$72,750,00 Series B-1 of 2008 (the “2008B-1 Bonds”) and the \$72,745,000 Series B-2 of 2008 (the “2008B-2 Bonds”), the AGM insurance was terminated, and the bonds were secured by direct draw letters of credit, pursuant to the 2009 Supplemental Indenture. AGM provides the debt service reserve fund policy for the

2008B Bonds. There were subsequent adjustments to the letter of credit banks securing the 2008B-1 Bonds and 2008B-2 Bonds as reflected in the 2013 Supplemental Indenture and the 2016 Supplemental Indenture. The current letter of credit providers are Bank of America, N.A. for the 2008B-1 Bonds and PNC Bank, National Association for the 2008B-2 Bonds. Pursuant to side letters dated October 22, 2009 and October 13, 2016 between National and the Authority, National has certain approval rights related to the relationship between the Authority and the letter of credit banks securing the 2008B-1 Bonds and the 2008B-2 Bonds. In 2008, with respect to the 2008B Bonds, the Authority entered into long-term interest rate swap agreements with Merrill Lynch Capital Services, Inc. and J.P. Morgan Chase Bank, National Association. The swap payments are insured by AGM.

9. 2008D-1 Bonds. The 2008D-1 Bonds are fixed rate bonds that funded capital projects. The 2008D-1 Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2008D-1 Bonds.

10. 2008D-2 Bonds and Swap. The 2008D-2 Bonds are variable rate bonds that funded capital projects. The 2008D-2 Bonds are insured by AGM. The liquidity facility for the 2008D-2 Bonds is a standby bond purchase agreement with PNC Bank, National Association. AGM also provides the debt service reserve fund policy for the 2008D-2 Bonds. In 2008, with respect to the 2008D-2 Bonds, the Authority entered into a long-term interest rate swap agreement with J.P. Morgan Chase Bank, National Association. The swap payments are insured by AGM. Pursuant to the 2010 Supplemental Indenture, a minor amendment was made to the redemption provisions related to the 2008D-2 Bonds.

11. 2008C-1 Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2008, the Authority issued its \$51,910,000 (Variable Rate Demand) Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1 of 2008 (the “2008C-1 Subordinate Bonds”) and its \$51,885,000 (Variable Rate Demand) Water and Sewer System Subordinate Revenue Refunding Bonds, Series C of 2008 (the “2008C-2 Subordinate Bonds”) pursuant to the Second Supplemental Subordinate Indenture. The 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds are variable rate bonds issued to refund certain prior debt. With respect to such bonds, the Authority entered into long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. These swaps are insured by AGM. AGM provides the debt service reserve fund policy for the 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds.

12. Subseries of 2008C-1 Subordinate Bonds. The 2008C-1 Subordinate Bonds were initially insured by AGM with a liquidity facility provided by Dexia Credit Local. In 2009, the Authority, pursuant to the 2009-1 Supplemental Subordinate Indenture and an Amendment to the Amending Supplement to the Initial Subordinate Indenture and the 2009-2 Supplemental Subordinate Indenture, divided the 2008C-1 Subordinate Bonds into four subseries: the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1A of 2008 (the “2008C-1A Subordinate Bonds”); the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1B of 2008 (the “2008C-1B Subordinate Bonds”); the \$5,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1C of 2008 (the “2008C-1C Subordinate Bonds”); and the \$26,910,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1D of 2008 (the “2008C-1D

Subordinate Bonds”). All of these bonds were converted into a term mode. Dexia Credit Local was removed as the liquidity facility for all of these bonds. New banks were designated as liquidity facility providers for the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds. The 2008C-1D Subordinate Bonds were remarketed without a liquidity facility. In 2012, the 2008C-1D Subordinate Bonds were remarketed again without a liquidity facility and the Authority entered into the 2012 Supplemental Subordinate Indenture.

13. 2008C-2 Subordinate Bonds. The 2008C-2 Subordinate Bonds are insured by AGM with a liquidity facility furnished by PNC Bank, National Association.

14. Direct Placement of 2008C-1ABC Subordinate Bonds. In 2013, the Authority began a process in which all of the subordinate bonds would eventually be put into direct placements by 2016. Pursuant to the Third Supplemental Subordinate Indenture, the AGM insurance on the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds (collectively, the “2008C-1ABC Subordinate Bonds”) was terminated, and the 2008C-1ABC Subordinate Bonds were directly placed with Banc of America Preferred Funding Corporation. In connection with the direct placement, the Authority and Banc of America Preferred Funding Corporation entered into a Continuing Covenant Agreement dated as of September 1, 2013 (the “2008C-1ABC Continuing Covenant Agreement”).

15. 2013A Bonds and 2013B Bonds. Also in 2013, the Authority issued additional senior bonds, the \$130,215,000 (Fixed Rate) Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2013 (the “2013A Bonds”) and the \$86,695,000 (Fixed Rate) Water and Sewer System First Lien Revenue Bonds, Series B of 2013 (the “2013B Bonds”), pursuant to the Eighth Supplemental Indenture. The 2013A Bonds are fixed rate bonds that refunded certain prior bonds and paid termination payments in order to terminate interest rate swap agreements. The 2013B Bonds are fixed rate bonds that funded capital projects. The 2013A Bonds and the 2013B Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2013A Bonds and the 2013B Bonds.

16. Direct Placement of 2008C-2 Subordinate Bonds; LIBOR Rates for 2008C-1ABC Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2014 and 2015, the rest of the subordinate bonds were put into direct placements. Pursuant to the 2014 Supplemental Indenture, the 2008C-1ABC Subordinate Bonds, which were directly placed with the Banc of America Preferred Funding Corporation in 2013, were converted to a LIBOR-based interest rate mode; and the 2008C-2 Subordinate Bonds were directly placed with DNT Asset Trust (an affiliate of J.P. Morgan Chase Bank, N.A.) in a LIBOR-based interest rate mode. The Authority and Banc of America Preferred Funding Corporation entered into a First Amendment to Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-1ABC First Amendment to Continuing Covenant Agreement”). The Authority and DNT Asset Trust entered into a Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-2 Continuing Covenant Agreement”). In connection with these actions, the Authority entered into amendments to the long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. to provide for LIBOR-based payments by the counterparties under the swap agreements (with respect to all of the 2008C Subordinate Bonds).

17. Direct Placement of 2008C-1D Subordinate Bonds. In 2015, pursuant to the 2015 Supplemental Indenture, the 2008C-1D Subordinate Bonds were directly placed with Bank of America, N.A. in a LIBOR-based interest rate mode. The Authority and Bank of America, N.A. entered into a Continuing Covenant Agreement dated as of September 1, 2015 (the “2008C-1D Continuing Covenant Agreement”).

18. Agreements with AGM Regarding Swap Insurance. The Authority has two agreements with AGM regarding the interest rate swap agreements that AGM insures related to the 2008C Subordinate Bonds: an Agreement Regarding Insured Swap Transaction dated as of September 1, 2013, as amended by an Amendment dated as of July 11, 2017 (collectively, the “AGM 2008C-1ABC and 2008C-1D Agreement”), and an Agreement Regarding Insured Swap Transaction dated as of November 1, 2014 (the “AGM 2008C-2 Agreement”). These agreements require the swaps or the insurance thereof to be terminated in certain circumstances.

19. Non-Bond Subordinate Debt: PENNVEST Loans and 2016 Revolving Credit Agreement. In addition to the senior and subordinate bonds, the Authority has two other types of debt which are subordinate to both the senior and the subordinate bonds, but are on parity with each other with respect to the Authority’s Revenues (as hereinafter defined). The first type of debt consists of multiple loans (the “PENNVEST Loans”) from the Pennsylvania Infrastructure Investment Authority (“PENNVEST”). The PENNVEST Loans were entered into by the Authority between 2001 and 2014 and have an outstanding principal amount of approximately \$33 million. The second type of debt is an \$80 million maximum principal amount revolving construction loan evidenced by a Revenue Note, Series of 2016 (the “2016 Note”). The 2016 Note was issued pursuant to a Revolving Credit and Security Agreement dated as of July 1, 2016 (the “2016 Revolving Credit Agreement”) between the Authority and the lender, JPMorgan Chase Bank, National Association. In connection with the execution of the 2016 Revolving Credit Agreement, the Authority, PENNVEST, JPMorgan Chase Bank, National Association and The Bank of New York Mellon Trust Company, N.A., as collateral trustee, entered into an Intercreditor Agreement dated as of July 1, 2016 (the “2016 Intercreditor Agreement”) setting forth their respective rights with respect to the Revenues.

20. Bondholder Consent for this Indenture. The Authority is determined to improve both its operations and its capital assets. As part of these improvements, the Authority intends to improve and modernize its financing documents and to refund and restructure much of its outstanding debt. The Authority has obtained the consent of 66 2/3% of the bondholders under the Existing Senior Indenture and other required consents in order to have this Indenture become effective as of the First Effective Date (defined herein). The Authority, upon consultation with its counsel, has determined that the consents referenced in the previous sentence are sufficient to permit the actions contemplated herein. If and when 100% bondholder approval is obtained, one additional provision of this Indenture will become effective (see Section 11.02).

21. 2017A Bonds and 2017B Bonds. The Authority has issued its \$159,795,000 Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2017 (the “2017A Bonds”) and its \$5,595,000 Water and Sewer System First Lien Revenue Refunding Bond, Series B of 2017 (Federally Taxable) (the “2017B Bonds”) to finance the refunding of a portion of the 1998B Bonds and the 2013B Bonds and all of the 2008A Bonds and the 2008D-1

Bonds pursuant to the 2017-1 Supplemental Indenture. \$53,887,917 principal amount (accrued value) of the 1998B Bonds remain outstanding, and \$38,760,000 principal amount of the 2013B Bonds remain outstanding.

22. 2017C Bonds. The Authority has issued its \$218,805,000 Water and Sewer System First Lien Revenue Refunding Bonds, Series C of 2017 (the “2017C Bonds”) to finance the refunding of the 2008B-1 Bonds, the 2008B-2 Bonds and the 2008D-2 Bonds pursuant to the 2017-2 Supplemental Indenture.

23. Need for Amended and Restated Trust Indenture. The Authority has determined that this Amended and Restated Trust Indenture is necessary to update and modernize provisions and covenants, including those related to financing structures and bondholder security.

24. First Effective Date. This Indenture as amended by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture is effective as of the First Effective Date; and

WHEREAS, the Authority determined that substantial changes were needed in the Existing Senior Indenture to provide the Authority, among other things, greater flexibility in conducting its operations and in financing its capital needs; as a result, the Authority is amending and restating the provisions of the Existing Senior Indenture by entering into this Indenture, which is now effective as described in Section 1.03 hereof, and the Authority has requested the Trustee to participate in this Indenture; and

WHEREAS, the execution and delivery of this Indenture have been duly authorized by a resolution of the Authority; and

WHEREAS, all acts, conditions and things required by the Constitution and laws of the Commonwealth, including the Act, to happen, exist and be performed precedent to and in the execution and delivery of this Indenture have happened, exist and have been performed as so required, in order to make this Indenture a valid and binding trust indenture for the security of the Bonds, subject to the lien on Revenues created under this Indenture, in accordance with its terms;

NOW, THEREFORE, THIS AMENDED AND RESTATED TRUST INDENTURE WITNESSETH: that in consideration of the premises and of the acceptance by the Trustee of the trusts hereby created, and of the purchase and acceptance of the Bonds by the registered Owners thereof, and for the purpose of fixing and declaring the terms and conditions upon which the Bonds are or may be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become Owners thereof, and to declare the terms and conditions upon which the Bonds are secured, and to secure equally and on parity the payment of (i) the principal of, and interest and premium (if any) on all Bonds at any time issued and outstanding hereunder, according to their tenor, purport and effect, and (ii) Other Senior Parity Indebtedness and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, the Authority, intending to be legally bound, has executed and delivered this Indenture and by these presents does hereby sell, assign, transfer, set

over, grant a security interest in and pledge unto The Bank of New York Mellon Trust Company, N.A., as Trustee, its successors in the trust and its assigns forever, to the extent provided in this Indenture, the Revenues (as defined in this Indenture), after payment of the Current Expenses (as defined in this Indenture), together with all cash and investments from time to time held in any fund (other than the Rebate Fund) by the Trustee hereunder or held by the Authority in the Revenue Fund, the Operating Reserve Fund or the Rate Stabilization Fund (collectively, the “Trust Estate”).

TO HAVE AND TO HOLD the same unto the Trustee, its successors and assigns in trust forever, IN TRUST, NEVERTHELESS, upon the terms and trusts herein set forth, to secure the payment of all Bonds issued hereunder and the interest thereon and the observance and performance of all the terms, provisions and conditions of this Indenture, and for the equal and ratable benefit and security of all and singular the present and future holders of the Bonds and Other Senior Parity Indebtedness Parties, without preference, priority or distinction as to lien or otherwise, except as otherwise hereinafter provided, of any one Bond or Other Senior Parity Indebtedness over any other Bond or Other Senior Parity Indebtedness by the reason of priority in the issue, sale or authentication thereof or otherwise and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, including the payment of Other Senior Parity Indebtedness, and it is hereby covenanted and agreed by and between the parties hereto that the terms and conditions upon which the Bonds are to be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become registered Owners thereof, and the trusts and conditions upon which the pledged Revenues are to be held and disposed of, are as follows:

ARTICLE I

DEFINITIONS AND GENERAL INDENTURE MATTERS

Section 1.01 Definitions.

(a) The following terms defined in the Recitals of this Indenture shall have the meanings as defined therein for all purposes of this Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Act
 AGM
 AGM 2008C-1ABC and 2008C-1D Agreement
 AGM 2008C-2 Agreement
 Capital Lease Agreement
 City
 Commonwealth
 Cooperation Agreement
 Eighth Supplemental Indenture
 Existing Senior Indenture
 Existing Subordinate Indenture
 FGIC
 Fifth Supplemental Indenture

First Supplemental Indenture
First Supplemental Subordinate Indenture
Fourth Supplemental Indenture
Lease and Management Agreement
National
Original Indenture
Original Subordinate Indenture
PENNVEST
PENNVEST Loans
Second Supplemental Indenture
Second Supplemental Subordinate Indenture
Seventh Supplemental Indenture
Sixth Supplemental Indenture
Third Supplemental Indenture
Third Supplemental Subordinate Indenture
1998B Bonds
2008A Bonds
2008B-1 Bonds
2008B-2 Bonds
2008C-1 Subordinate Bonds
2008C-1A Subordinate Bonds
2008C-1ABC Subordinate Bonds
2008C-1ABC Continuing Covenant Agreement
2008C-1ABC First Amendment to Continuing Covenant Agreement
2008C-1B Subordinate Bonds
2008C-1C Subordinate Bonds
2008C-1D Subordinate Bonds
2008C-1D Continuing Covenant Agreement
2008C-2 Subordinate Bonds
2008C-2 Continuing Covenant Agreement
2009 Supplemental Indenture
2009-1 Supplemental Subordinate Indenture
2009-2 Supplemental Subordinate Indenture
2010 Supplemental Indenture
2012 Supplemental Subordinate Indenture
2013 Supplemental Indenture
2013A Bonds
2013B Bonds
2014 Supplemental Subordinate Indenture
2015 Supplemental Subordinate Indenture
2016 Intercreditor Agreement
2016 Note
2016 Revolving Credit Agreement
2016 Supplemental Indenture
2017A Bonds
2017B Bonds

2017C Bonds
2017-1 Supplemental Indenture
2017-2 Supplemental Indenture

(b) Terms defined below in this Article I shall have the meanings set forth below for all purposes of this Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Account

The term “Account” shall mean any of the various accounts, sometimes created within a Fund, under this Indenture including in a Supplemental Indenture.

Accreted Values

The term “Accreted Values” with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall mean an amount equal to the Principal Amount of such Bonds (determined on the basis of the Principal Amount per \$5,000 at maturity thereof) plus the amount assuming semiannual compounding of earnings which would be produced on the investment of such Principal Amount, beginning on the dated date of such Bonds and ending at the maturity date thereof, at a yield which if produced until maturity will produce \$5,000 at maturity. As of any Valuation Date, the Accreted Value of any such Bonds shall mean the amount set forth for such date in the Supplemental Indenture and as of any date other than a Valuation Date, the sum of (a) the Accreted Value on the preceding Valuation Date and (b) the product of (i) a fraction, the numerator of which is the number of days having elapsed from the preceding Valuation Date and denominator of which is the number of days from such preceding Valuation Date to the next succeeding Valuation Date, and (ii) the difference between the Accreted Values for such Valuation Dates. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Additional Bonds

The term “Additional Bonds” shall mean Bonds authenticated and delivered hereunder of any Series other than the First Effective Date Outstanding Bonds.

Additional Indebtedness Test

The term “Additional Indebtedness Test” shall mean the certification requirement set forth in Section 3.02(g)(ii) or 3.02(h)(ii) for the issuance of Additional Bonds, in Section 3.03(a) for the issuance of Other Senior Parity Indebtedness.

Additional Indebtedness Test Net Revenues

The term "Additional Indebtedness Test Net Revenues" shall mean Net Revenues adjusted for the purpose of determining fulfillment of the Additional Indebtedness Test to exclude for the relevant Test Period any Revenues consisting of Grants, proceeds of any business interruption insurance, and investment income earned on the Construction Fund and Rate Stabilization Fund.

Annual Budget

The term "Annual Budget" shall mean the budget required by Section 7.12 herein.

Annual Debt Service

The term "Annual Debt Service" shall mean the amount of payments scheduled to come due within a specified Fiscal Year for principal of and interest on any specified Indebtedness. For purposes of calculating Annual Debt Service, the following assumptions are to be used to calculate the principal and interest due in such specified Fiscal Year:

(a) In determining the Principal Amount due in the Fiscal Year, except to the extent that another subparagraph of this definition applies, payment shall be assumed to be made in accordance with any amortization schedule established for such Indebtedness, including any scheduled redemption of such specified Indebtedness and, for such purpose, the redemption payment shall be deemed a principal payment. In determining the amount of interest due in each Fiscal Year, except to the extent subparagraphs (b) through (h) of this definition apply, (i) interest payable at a fixed rate shall be assumed to be made at such fixed rate and on the required payment dates and (ii) the interest rate to be used for Variable Rate Indebtedness that has been Outstanding for at least twelve (12) months shall be the average rate over the twelve (12) months immediately preceding the date of calculation, or for Variable Rate Indebtedness that has been Outstanding less than twelve (12) months the interest rate to be used shall be the actual rate on the date of calculation, or, for Variable Rate Indebtedness proposed to be issued the interest rate to be used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

For the purpose of verifying compliance with the rate covenant contained in Section 7.01 hereof, Variable Rate Indebtedness shall be deemed to bear interest at the actual rate or rates borne during any applicable Fiscal Year.

The amount of Capitalized Interest on deposit in the Debt Service Fund shall be subtracted from the amount of interest due for any related Fiscal Year, but only to the

extent that such Capitalized Interest is dedicated to a particular interest payment coming due during such Fiscal Year.

(b) Each maturity of Indebtedness that constitutes Balloon Indebtedness shall be treated as if it were to be amortized over a term of not more than forty (40) years and with substantially level annual debt service payments commencing not later than the year following the year in which such Balloon Indebtedness was issued, and extending not later than forty (40) years from the date such Balloon Indebtedness was originally issued. For fixed rate obligations, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above in this sentence. For Balloon Indebtedness that also constitutes Variable Rate Indebtedness, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Bonds of a corresponding term issued under this Master Bond Resolution on the date of such calculation, with no credit enhancement and taking into consideration whether such Bonds bear interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

(c) Notwithstanding subparagraph (b) above, if any stated maturity date of Indebtedness that constitutes Balloon Indebtedness occurs within twelve (12) months from the date of the calculation of Annual Debt Service, the principal amount maturing shall be assumed to become due and payable on the stated maturity date unless there is delivered a certificate of an Authorized Representative of the Authority stating that (i) the Authority intends to refinance such maturity and (ii) the probable terms of such refinancing. Upon delivery of such certificate, such Balloon Indebtedness shall be assumed to be refinanced, and Annual Debt Service shall be calculated, in accordance with the probable terms set out in such certificate, except that such assumption shall not result in an interest rate lower than that which would be assumed under subparagraph (b) above and such Balloon Indebtedness shall be amortized over a term of not more than forty (40) years from the date of refinancing.

(d) If any Indebtedness that is then proposed to be issued constitutes Tender Indebtedness, then Tender Indebtedness shall be treated as if the principal amount of such Bonds were to be amortized over a term of not more than 40 years from the date such Tender Indebtedness was originally issued, except that if any principal maturity or amortization schedule is set forth in a Supplemental Indenture or other applicable agreement, such schedule shall be used to determine the principal maturity or

amortization of such Indebtedness. The interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. For all principal and interest payments becoming due prior to the year in which such Tender Indebtedness is first subject to tender, such payments shall be treated as described in the other applicable subparagraphs of this definition.

(e) With respect to any Interim Indebtedness, it shall be assumed that the principal amount of the Interim Indebtedness will be continuously refinanced and will remain Outstanding until the first Fiscal Year for which interest on the Interim Indebtedness has not been capitalized or otherwise funded or provided for. For such first Fiscal Year, it shall be assumed that (i) the Outstanding principal amount of the Interim Indebtedness will be refinanced with a Series of Additional Bonds that will be amortized over a period not to exceed forty (40) years in such manner as will cause the maximum annual debt service payments applicable to such Series in any twelve (12) month period not to exceed 110% of the minimum annual debt service payments applicable to such Series for any other twelve (12) month period, and (ii) the Series of Additional Bonds will bear interest at a fixed interest rate estimated by (1) a Qualified Independent Consultant to be the interest rate such Series of Additional Bonds would bear if issued on such terms on the date of such estimate to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. Indebtedness which is Interim Indebtedness shall not be treated as Balloon Indebtedness.

(f) Except for Hedge Agreements, Qualified Interest Rate Swap Agreements are to be disregarded in calculating the Series Debt Service Reserve Requirement. Upon incurrence of a Hedge Agreement, all calculations, including for the annual amount on account of principal and interest on Indebtedness subject to the Hedge Agreement, shall be made using the Hedge Fixed Rate for the applicable period and such Indebtedness shall not be considered as Variable Rate Indebtedness for such period.

(g) If money that is not included in the definition of "Revenues" has been used to pay or has been irrevocably deposited with and is held by the Authority to pay principal and/or interest on Indebtedness, then the principal and/or interest paid from such money shall be excluded from the computation of Annual Debt Service.

(h) For any Indebtedness for which a binding commitment, letter of credit or other credit arrangement providing for the extension of such Indebtedness beyond its original maturity date exists, the computation of the annual amount payable on account of principal and interest on such Indebtedness shall, at the option of the Authority, be made on the assumption that such Indebtedness will be amortized in accordance with such credit arrangement.

Approval Amount

The term "Approval Amount" shall mean (a) prior to the Second Effective Date, sixty-six and two-thirds per centum (66-2/3 %) in aggregate Principal Amount of the applicable Bonds then Outstanding, and (b) on and after the Second Effective Date, a majority in aggregate Principal Amount of the applicable Bonds then Outstanding.

Authority

The term "Authority" shall mean The Pittsburgh Water and Sewer Authority, a body corporate and politic existing and operating under the Act.

Authorized Depository

The term "Authorized Depository" shall mean any incorporated bank or trust company doing business in the Commonwealth, which is insured by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing functions similar to the Federal Deposit Insurance Corporation (provided such an agency shall be in existence), which has a combined capital and surplus of not less than Fifty Million Dollars (\$50,000,000), and which is not unsatisfactory to the Trustee, and shall include the Trustee; provided that the Authority may deposit funds in any bank or trust company doing business in the Commonwealth to the extent that such funds are insured, by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing similar functions to the Federal Deposit Insurance Corporation.

Authorized Representative of the Authority

The term "Authorized Representative of the Authority" shall mean the Chairperson, the Vice Chairperson, the Secretary, the Assistant Secretary, the Executive Director, the Chief Financial Officer, the Director of Finance or any such other person or persons as may be designated to act on behalf of the Authority by a certificate executed by the Chairperson of the Authority and on file with the Trustee.

Balloon Indebtedness

The term "Balloon Indebtedness" shall mean all or any portion of any Indebtedness 25% or more of the initial principal of which matures on the same date or within such Fiscal Year. For purposes of this definition, the principal amount maturing on any date shall be reduced by the amount of such Indebtedness scheduled to be amortized by prepayment or redemption prior to its stated maturity date. If any indebtedness consists partially of Variable Rate Indebtedness and partially of indebtedness bearing interest at a fixed rate, the portion

constituting Variable Rate Indebtedness and the portion bearing interest at a fixed rate shall be treated as separate issues for purposes of determining whether any such indebtedness constitutes Balloon Indebtedness.

Board

The term "Board" shall mean the governing body of the Authority.

Bond or Bonds

The term "Bond" or "Bonds" shall mean any bond or all the bonds, as the case may be, authenticated and delivered under this Indenture, but not including Subordinate Debt.

Bond Counsel

The term "Bond Counsel" shall mean an attorney or firm of attorneys selected by the Authority which is a nationally recognized and experienced bond counsel relating to the financing of facilities through the issuance of tax-exempt or taxable bonds.

Bond Insurance Policy

The term "Bond Insurance Policy" shall mean a municipal bond insurance policy or policies, including any endorsements thereto, issued by a Bond Insurer guaranteeing the scheduled payment of the principal of and interest on Bonds.

Bond Insurer or Insurer

The term "Bond Insurer" or "Insurer" shall mean an insurance company guaranteeing the payment of principal and interest on Bonds when due.

Bond Year

The term "Bond Year" shall mean, each year, the twelve (12) month period commencing on the date of issuance of a Series of Bonds or the anniversary date thereof, or as otherwise provided in the Supplemental Indenture or the Tax Regulatory Certificate for a Series of Bonds.

Business Day

Except as otherwise defined in a Supplemental Indenture related to a Series of Bonds, the term "Business Day" shall mean a day on which banking business is transacted, but not including a Saturday, Sunday or legal holiday, or any day on which banks located in each of the cities in which the offices of the Trustee and the Paying Agent responsible for the administration of this Indenture are located are authorized by law to close, or any day on which the New York Stock Exchange is closed.

Capital Additions

The term "Capital Additions" shall mean all new or additional property, which the Authority has authority to, or is required to, construct or acquire with respect to the System, and any and all permanent improvements, replacements, additions, extensions and betterments to real or fixed property of the Authority with respect to the System.

Capital Appreciation Bonds

The term "Capital Appreciation Bonds" shall mean Bonds as to which the Accreted Value is payable only at the maturity or prior redemption of the Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation Bonds shall be valued at their Accreted Values.

Capital Appreciation and Income Bonds

The term "Capital Appreciation and Income Bonds" shall mean Bonds as to which interest is deferred and compounded prior to the date after which interest ceases to be deferred and compounded and the interest becomes currently payable. For purposes of consents, voting rights, Bondowner rights, or any other matter in herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation and Income Bonds shall be valued at their Accreted Values.

Capitalized Interest

The term "Capitalized Interest" shall mean the amount of interest on Bonds, if any, funded from the proceeds of the Bonds or other money that are deposited with the Trustee in the Debt Service Fund as shall be described in a Supplemental Indenture upon issuance of Bonds to be used to pay interest on the Bonds.

Code

The term "Code" shall mean the Internal Revenue Code of 1986, as amended, including applicable regulations, rulings and revenue procedures promulgated or applicable thereunder.

Common Debt Service Reserve Requirement

The term "Common Debt Service Reserve Requirement" shall mean, for all Common Debt Service Reserve Secured Bonds, the least of (i) 10% of the aggregate original stated Principal Amount of all Common Debt Service Reserve Secured Bonds (provided that if any Common Debt Service Reserve Secured Bonds have more than a *de minimis* (2%) amount of original issue discount or premium, the issue price of such Common Debt Service Reserve Secured Bonds (net of pre-issuance accrued interest) is used to measure the 10% limitation in lieu of its stated Principal Amount), (ii) the maximum amount of aggregate Annual Debt Service

on all Common Debt Service Reserve Secured Bonds in any Fiscal Year, or (iii) 125% of average aggregate Annual Debt Service on all Common Debt Service Reserve Secured Bonds.

Common Debt Service Reserve Secured Bonds

The term "Common Debt Service Reserve Secured Bonds" shall mean any Series of Bonds for which the Supplemental Indenture authorizes said Bonds to be secured by the Common Debt Service Reserve Requirement.

Construction Fund

The term "Construction Fund" shall mean the Construction Fund designated and established pursuant to Section 5.01 hereof.

Construction Project

The term "Construction Project" shall mean the acquisition or construction of Capital Additions or other improvements to the System, as the same may be amended from time to time.

Consulting Engineer

The term "Consulting Engineer" shall mean a person who is a registered professional engineer under the laws of the Commonwealth qualified to pass on engineering questions relating to the operation and maintenance of water, stormwater and sewer systems, who is appointed by the Board, who is in fact independent (although such person may be regularly retained by the Authority) and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board or an officer or employee of the Authority or the City. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority or the City. The Consulting Engineer may perform similar services for the City.

Continuing Disclosure Undertaking

The term "Continuing Disclosure Undertaking" shall mean the continuing disclosure undertaking or continuing disclosure agreement, if any, relating to a Series of Bonds.

Cost

The term "Cost", when used with reference to a Construction Project or with reference to Capital Additions, shall mean the amounts required to be paid to construct and complete the Construction Project or to construct or otherwise acquire such Capital Additions, and shall include, in addition to such other items as are included within any proper definition of cost, allowances or charges for interest during construction and for a reasonable period thereafter, which is not otherwise provided for, taxes, engineering, legal, fiscal and superintendence expenses and premiums for casualty and other insurance and all expenses

incurred by the Authority in connection with the preparation, issue and sale of the Bonds or other Indebtedness including discounts (if any) incurred on the sale of the Bonds or other Indebtedness.

Counsel

The term "Counsel" shall mean legal counsel admitted to practice before the Supreme Court of the Commonwealth, who may but need not be counsel regularly retained by the Authority, and not unsatisfactory to the Trustee.

Counsel's Opinion

The term "Counsel's Opinion" shall mean an opinion signed by an attorney or firm of attorneys selected by the Authority or the Trustee, respectively.

Counterparty

The term "Counterparty" shall mean any counterparty (the party other than the Authority) on a Qualified Interest Rate Swap Agreement.

Credit Facility

The term "Credit Facility" shall mean a letter of credit, liquidity facility, a bond insurance policy, surety bond or similar arrangement securing any obligation of the Authority with respect to any Indebtedness.

Current Expenses

The term "Current Expenses" shall mean all current expenses directly or indirectly attributable to the ownership or operation of the System, including reasonable and necessary usual expenses of administration, operation, maintenance and repair; costs for billing and collecting the rates; insurance premiums; costs and expenses of any Credit Facility; and legal, engineering, auditing and financial advisory expenses; all as determined (except as otherwise specified in this Indenture) in accordance with GAAP for entities such as the Authority consistently applied, excluding (a) any payments payable by the Authority to the City under the Cooperation Agreement, (b) any payments in lieu of taxes or allowance for depreciation or amortization, and (c) expenses which constitute extraordinary, nonrecurring and non-continuing expenses of the System in the written opinion of the Qualified Independent Consultant.

Current Interest Capital Appreciation Bonds

The term "Current Interest Capital Appreciation Bonds" shall mean Bonds as to which a portion of interest is currently payable and a portion of the interest is deferred and compounded until the Accreted Value is payable only at the maturity or prior redemption of the Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Debt Service Fund

The term “Debt Service Fund” shall mean the fund so designated and created by Section 6.01(3).

Debt Service Reserve Fund

The term “Debt Service Reserve Fund” shall mean the fund so designated and created by Section 6.01(4).

Debt Service Reserve Fund Policy

The term “Debt Service Reserve Fund Policy” shall mean a Municipal Bond Debt Service Reserve Fund Policy or Policies issued by a Bond Insurer and deposited into the Debt Service Reserve Fund.

Debt Service Reserve Requirement

The term “Debt Service Reserve Requirement” shall mean the applicable Common Debt Service Reserve Requirement or the Series Debt Service Reserve Requirement.

Default Rate

The term “Default Rate” shall mean the “Default Rate” as defined in a Credit Facility.

Disbursement Date

The term “Disbursement Date” shall have the meaning set forth in Section 6.02 hereof.

DTC

The term “DTC” shall have the meaning set forth in Section 2.10 hereof.

DTC Representation Letter

The term “DTC Representation Letter” shall have the meaning set forth in Section 2.10 hereof.

EMMA

The term “EMMA” shall mean the Electronic Municipal Market Access system operated by the MSRB, or any successor system.

First Effective Date

The term “First Effective Date” shall mean the date on which at least sixty-six and two-thirds per centum (66-2/3 %) in aggregate Principal Amount of the applicable Bonds Outstanding shall have approved this Amended and Restated Trust Indenture, as described in Section 1.03 hereof. The First Effective Date is December 28, 2017.

First Effective Date Outstanding Bonds

The term “First Effective Date Outstanding Bonds” shall mean the Bonds Outstanding on the First Effective Date (being the then Outstanding 1998B Bonds, 2013A Bonds, 2013 B Bonds, 2017A Bonds, 2017B Bonds and 2017C Bonds).

Fiscal Year

The term "Fiscal Year" shall mean the period of twelve months beginning on January 1 of each year or such other twelve month period as may be designated by the Authority.

Fund

The term “Fund” shall mean any of the various funds created under this Indenture including in a Supplemental Indenture.

GAAP

The term “GAAP” shall mean generally accepted accounting principles.

Grant

The term “Grant” shall mean a grant provided by any entity to or for the Authority for the payment of Current Expenses.

Hedge Agreement

The term “Hedge Agreement” shall mean an Interest Rate Swap, cap, collar, floor, forward or other hedging agreement, arrangement or security however denominated, expressly identified pursuant to its terms as being entered into in connection with and in order to hedge interest rate fluctuations on all or a portion of any Indebtedness where (a) interest on such Indebtedness or such portion of such Indebtedness is payable at a variable rate of interest for any future period of time or is calculated at a varying rate per annum, and (b) a fixed rate is specified by the Authority in such agreement, or such Indebtedness, taken together with such agreement results in a net fixed rate payable by the Authority for such period of time (the “Hedge Fixed Rate”), assuming the Authority and the party(ies) with whom the Authority has entered into the agreement make all payments required to be made by the terms of the agreement, provided that no such agreement may be entered into by the Authority unless any termination or similar payment which may be payable by the Authority thereunder is expressly subordinate to the obligation of the Authority on the Indebtedness.

Hedge Fixed Rate

The term “Hedge Fixed Rate” shall have the meaning set forth in the definition of Hedge Agreement above.

Holder of Bonds

The term “Holder of Bonds” or “Bondholder” or “Holder” or “Owner of Bonds” or “Owner” or “Bondowner” or any similar term shall mean any registered owner of any Bond.

Indebtedness

The term “Indebtedness” shall mean (a) Senior Debt, (b) Subordinate Debt, and (c) other debt of the Authority not secured by the Revenues. The term shall include all debt of the Authority outstanding as of the First Effective Date.

Indenture

The term “Indenture” or “this Indenture” shall mean this amended and restated trust indenture and all indentures supplemental hereto.

Independent Auditor

The term “Independent Auditor” shall mean a person who is engaged in the accounting profession, who is a nationally recognized certified public accountant under the laws of the Commonwealth, who is in fact independent (although such person may be regularly retained by the Authority) who is appointed by the Board and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board, or an officer or employee of the Authority. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority.

Interest Account

The term “Interest Account” shall mean the Interest Account in the Debt Service Fund so designated and created by Section 6.01(3) hereof.

Interest Payment Date

The term “Interest Payment Date” shall mean the interest payment dates specified in any Supplemental Indenture with respect to Bonds issued thereunder, or the applicable interest payment dates for any other Indebtedness.

Interim Indebtedness

The term “Interim Indebtedness” shall mean any Indebtedness (i) for or with respect to which no principal payments are required to be made other than on the maturity date thereof, which date shall be no later than five (5) years from the date of its delivery to the initial purchasers, and (ii) which are authorized by an agreement that declares the Authority’s intent, at

the time of issuance, to refund or refinance all or a part of the same prior to or on such maturity date, including commercial paper, notes, and similar obligations

Letter of Credit

The term “Letter of Credit” shall mean an irrevocable transferable direct-pay letter of credit or standby letter of credit issued for a Series of Bonds by a Letter of Credit Bank for the account of the Authority in favor of the Trustee supporting a Series of Bonds as set forth in a Reimbursement Agreement.

Letter of Credit Bank

The term “Letter of Credit Bank” shall mean the issuer of a Letter of Credit pursuant to a Reimbursement Agreement.

Liquidity Facility

The term “Liquidity Facility” shall mean a standby bond purchase agreement or other liquidity facility pursuant to which the provider or providers agree to purchase Bonds issued pursuant to this Indenture tendered for purchase in accordance with a Supplemental Indenture, (ii) the provider of which has short-term ratings of at least “A-1” from S&P and “P-1” from Moody’s (unless such requirement is waived by the applicable Bond Insurer or Letter of Credit Bank) and (iii) which is acceptable to the applicable Bond Insurer or Letter of Credit Bank and each Rating Service and otherwise satisfying the requirements of a Supplemental Indenture pursuant to which Bonds supported by such Liquidity Facility were issued.

Liquidity Facility Issuer

The term “Liquidity Facility Issuer” shall mean the issuer of a Liquidity Facility pursuant to a Reimbursement Agreement.

Moody's

The term "Moody's" shall mean Moody's Investors Service, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

MSRB

The term “MSRB” shall mean the Municipal Securities Rulemaking Board, or any successor agency.

Net Revenues

The term "Net Revenues", when used with reference to any period, shall mean the Revenues of the Authority for such period, less all Current Expenses for such period.

Operating Fund

The term "Operating Fund" shall mean the Operating Fund designated and created by Section 6.01(2) hereof.

Operating Reserve Fund

The term "Operating Reserve Fund" shall mean the Operating Reserve Fund designated and created by Section 6.01(5) hereof.

Operating Reserve Requirement

The term "Operating Reserve Requirement" shall mean an amount equal to one-sixth (1/6th) of the Current Expenses reflected in the most recent annual audited financial statements of the Authority.

Other Senior Parity Indebtedness

The term "Other Senior Parity Indebtedness" shall mean any other Indebtedness incurred by the Authority under this Indenture or secured by this Indenture that the Authority is required, or has elected, to treat as payable on a parity with the Bonds with respect to the pledge of Revenues, including Reimbursement Obligations under Reimbursement Agreements and Periodic Payments under Qualified Interest Rate Swap Agreements.

Other Senior Parity Indebtedness Party

The term "Other Senior Parity Indebtedness Party" shall mean the other party (not the Authority) on Other Senior Parity Indebtedness, including, without limitation, any Letter of Credit Bank, Liquidity Facility Issuer, or Counterparty (but only with respect to Periodic Payments).

Outstanding

The term "Outstanding under this Indenture" or "Outstanding hereunder" or "Outstanding", when used with reference to Bonds, shall mean, at any date as of which the amount of Outstanding Bonds is to be determined, the aggregate of all Bonds authenticated and delivered under this Indenture, except

- (i) Bonds cancelled at or prior to such date;

- (ii) Bonds for the payment of which funds shall have been theretofore deposited in trust with the Trustee and which shall have matured by their terms but shall not have been surrendered for payment;
- (iii) Bonds for the redemption or payment of which funds in the full amount required, either alone or together with the interest to be earned thereon, but without the need to reinvest interest or principal, shall then be irrevocably held in trust by the Trustee, provided that notice of such redemption shall have been provided as set forth in Article IV or provisions satisfactory to the Trustee shall have been made for providing such notice;
- (iv) Bonds deemed to be paid pursuant to the provisions of Article XII hereof.

With respect to Indebtedness other than Bonds, "Outstanding" shall mean Indebtedness which has not been paid and with respect to which payment has not been provided for.

Paying Agent

The term "Paying Agent" shall initially mean The Bank of New York Mellon Trust Company, N.A., its successors and assigns, and any successor paying agent or co-paying agent appointed by the Authority.

Periodic Payments

The term "Periodic Payments" shall mean any regularly scheduled fixed payment payable by the Authority to the Counterparty pursuant to the terms of any Qualified Interest Rate Swap Agreement(s); however, Periodic Payments shall not include any termination payments or any other sums payable under the Qualified Interest Rate Swap Agreement that are not regularly scheduled payments payable by the Authority.

Policy Costs

The term "Policy Costs" shall mean, collectively, the repayment of any draws under a Debt Service Reserve Fund Policy and related reasonable expenses incurred by a Bond Insurer (together with interest thereon).

Prime Rate

The term "Prime Rate" means the rate of interest announced, from time to time, by the Trustee as its prime rate.

Principal Account

The term "Principal Account" shall mean the Principal Account in the Debt Service Fund so designated and created by Section 6.01(3) hereof.

Principal Amount

The term “Principal Amount” with respect to any Indebtedness, shall mean the stated principal thereon, the Accreted Value thereof, as applicable, or such other amount payable on any Indebtedness that is designated as principal pursuant to a Supplemental Indenture.

Principal Office of the Trustee

The term “Principal Office” shall mean the designated corporate trust office of the Trustee responsible for the administration of this Indenture or at the office of any successor trustee or paying agent appointed under this Indenture.

Qualified Independent Consultant

The term “Qualified Independent Consultant” shall mean an independent professional consultant having the skill and experience necessary to provide the particular certificate, report or approval required by the provision of this Indenture or any Supplemental Indenture in which such requirement appears, including without limitation a Consulting Engineer and an Independent Auditor.

Qualified Interest Rate Swap Agreement

The term “Qualified Interest Rate Swap Agreement” shall mean any agreement relating to any Bonds issued or to be issued under this Indenture with a Counterparty whereby the Authority will pay to the Counterparty periodic fixed amounts based upon a fixed percentage of a notional amount specified in such agreement and such Counterparty will pay to the Authority certain periodic floating amounts based upon a variable percent of the same notional amount; provided, that the underwriter for the applicable Bonds or the Authority's financial advisor has certified to the Authority and the Trustee that (based upon then current market conditions) such Qualified Interest Rate Swap Agreement creates an overall lower Debt Service Requirement than would be attained through the issuance of Additional Bonds in an amount equal to such notional amounts at a fixed rate without such Qualified Interest Rate Swap Agreement. Periodic Payments under a Qualified Interest Rate Swap Agreement may be on parity with the Bonds to which the Qualified Interest Rate Swap Agreement relates.

Rate Covenant

The term “Rate Covenant” shall mean the obligation of the Authority to fix, charge, collect and revise rates, fees and other charges for the use of, and the services furnished by, the System sufficient to meet the requirements of this Indenture, including without limitation Section 7.01.

Rate Covenant Net Revenues

The term “Rate Covenant Net Revenues” shall mean Net Revenues, provided that Net Revenues shall be adjusted for the purpose of determining compliance with the Rate Covenant as follows: (i) to include transfers from the Rate Stabilization Fund to the Revenue Fund (as provided in Section 6.08 hereof), and (ii) to exclude transfers to the Rate Stabilization Fund from the Revenue Fund (as provided in Section 6.08 hereof).

Rate Stabilization Fund

The term “Rate Stabilization Fund” shall mean the fund so designated and created pursuant to Section 6.01(8) hereof.

Rating Agency

The term “Rating Agency” shall mean Moody’s or S&P, or either of them, and their successors, or any other nationally recognized statistical rating organization selected by the Authority.

Rebate Fund

The term “Rebate Fund” shall mean the Rebate Fund designated and created pursuant to Section 6.01(10) hereof.

Record Date

The term “Record Date” shall mean the fifteenth day of (whether or not such day is a Business Day) immediately preceding any Interest Payment Date or such other date set forth in a Supplemental Indenture.

Redemption Fund

The term “Redemption Fund” shall mean the fund so designated and created pursuant to Section 6.01(9) hereof.

Reimbursement Agreement

The term “Reimbursement Agreement” shall mean an agreement between the Authority and a Letter of Credit Bank or between the Authority and a Liquidity Facility Issuer, which agreements may be amended from time to time in accordance with the terms hereof and thereof.

Reimbursement Obligations

The term “Reimbursement Obligations” shall mean the obligations to reimburse the Letter of Credit Bank for draws on such Letter of Credit Bank’s Letter of Credit, or to reimburse a Liquidity Facility Issuer making liquidity payments pursuant to a Liquidity Facility and to pay all other amounts due or to become due under the applicable Reimbursement Agreement.

Reserve Determination Date

The term “Reserve Determination Date” shall mean any date established in writing by an Authorized Representative of the Authority for the valuation of investments,

including any Debt Service Reserve Fund Policy and other applicable credit facilities, in the Debt Service Reserve Fund, which valuation shall be at least annually.

Resolution of the Board or Resolution of the Authority

The term "Resolution of the Board" or "Resolution of the Authority" shall mean a resolution certified by the Secretary or Assistant Secretary of the Authority to have been duly adopted by the Board and to be in full force and effect on the date of such certification.

Revenue Fund

The term "Revenue Fund" shall mean the fund so designated and created by Section 6.01(1) hereof.

Revenues

The term "Revenues" shall mean any and all rates, fees, rents and charges established or to be established, levied and collected in connection with, and all other payments, revenues of whatever kind or character arising from, the operation or ownership of any property of the Authority or any part thereof (except tap or connection fees and charges to the extent such fees or charges are pledged in accordance with the Act as a refund to such person who has paid for the construction of any extension of the System), any income earned on the moneys or investments on deposit in the Debt Service Fund, Debt Service Reserve Fund, Construction Fund, Revenue Fund, Operating Fund, Operating Reserve Fund, Rate Stabilization Fund and any sinking, purchase or analogous fund created hereunder and any Periodic Payments received by the Authority from the Counterparty pursuant to any Qualified Interest Rate Swap Agreement which, upon receipt, shall be transferred to and deposited in the Revenue Fund, all as determined (except as otherwise specified in this Indenture) in accordance with GAAP for entities such as the Authority consistently applied. Revenues shall not include refundable customer deposits or other payments solely in aid of construction, any Grants, payments from PENNVEST or similar payments, or the proceeds resulting from the sale of all or a portion of the System.

Second Effective Date

The term "Second Effective Date" shall mean the date on which one hundred per centum (100%) in aggregate Principal Amount of the applicable Bonds Outstanding shall have approved this Amended and Restated Trust Indenture, as described in Section 1.04 hereof.

Senior Debt

The term "Senior Debt" shall mean Bonds and Other Senior Parity Indebtedness. The term shall include all bonds of the Authority outstanding under the Existing Senior Indenture as of the First Effective Date.

Separate Series Debt Service Reserve Requirement

The term “Separate Series Debt Service Reserve Requirement” shall mean, for any Series of Additional Bonds for which the Supplemental Indenture authorizes a Separate Series Debt Service Reserve Requirement, the amount, if any, specified in such Supplemental Indenture as the Separate Series Debt Service Reserve Requirement; provided, however, that such amount shall not exceed the maximum amount permitted by the Code. Such amount may be zero.

Separate Series Debt Service Reserve Secured Bonds

The term “Separate Series Debt Service Reserve Secured Bonds” shall mean any Series of Bonds for which the Supplemental Indenture authorizes said Bonds to be secured by funds constituting a Separate Series Debt Service Reserve Requirement.

Series or Series of Bonds

The term “Series” or “Series of Bonds” shall mean a separate series or subseries of Bonds issued under a Supplemental Indenture.

Series Debt Service Reserve Account

The term “Series Debt Service Reserve Account” shall mean each account in the Debt Service Reserve Fund related to a particular Series of Bonds that is required to be funded as required in a Supplemental Indenture.

Series Debt Service Reserve Requirement

The term “Series Debt Service Reserve Requirement” shall mean for any Series of the Bonds, the Common Debt Service Reserve Requirement or the Separate Series Debt Service Reserve Requirement set forth in the Supplemental Indenture authorizing such Series of Bonds.

Sinking Fund Account

The term “Sinking Fund Account” shall mean the Sinking Fund Account in the Debt Service Fund created in Section 6.01(3) hereof.

S&P

The term “S&P” shall mean Standard & Poor's Corporation, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "S&P" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

Subordinate Debt

The term “Subordinate Debt” shall mean any bonds, notes or other obligations issued in connection with the System (a) which are designated by the Authority as Subordinate Debt, and (b) which may have pledged to their payment Net Revenues, alone or in conjunction with other sources, as a subordinate lien pledge after the pledge of Net Revenues to Senior Debt. Subordinate Debt shall include amounts owed to letter of credit banks or liquidity facility providers securing Subordinate Debt or periodic payments due on interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(3) hereof, or termination or other payments (other than periodic payments) due under interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(5) hereof.

Subordinate Debt Service Fund

The term “Subordinate Debt Service Fund” is the fund so designated and created by Section 6.01(6) hereof.

Subordinate Debt Service Reserve Fund

The term “Subordinate Debt Service Reserve Fund” is the fund so designated and created by Section 6.01(7) hereof.

Supplemental Indenture

The term "Supplemental Indenture" or "Indenture supplemental hereto" shall mean any indenture now or hereafter duly authorized and entered into in accordance with the provisions of this Indenture.

System

The term "System" shall mean and include, as of any particular time, (i) all tangible property, fixed or moveable, then owned or operated by the Authority and used in the rendering of water service, stormwater service, and sewer service by the Authority, (ii) all Capital Additions then constructed or otherwise acquired relating to water service, stormwater service, and sewer service, and (iii) all franchises used or useful to the Authority at such particular time in the rendering of water service, stormwater service, and sewer service by the Authority.

Tax Regulatory Certificate

The term “Tax Regulatory Certificate” shall mean a Tax Regulatory Certificate, Tax Regulatory Agreement, Non-Arbitrage Certificate or similar tax certificate of the Authority executed and delivered by the Authority in respect of a Series of Bonds issued under this Indenture.

Tender Indebtedness

The term “Tender Indebtedness” shall mean any Indebtedness a feature of which is an option or obligation on the part of the holders of such Indebtedness to tender all or a portion of such Indebtedness to a fiduciary for payment or purchase and requiring that such Indebtedness or a portion of such Indebtedness be purchased if properly tendered.

Term Bonds

The term “Term Bonds” shall mean any Bonds stated to mature on a specified date and required to be redeemed in part prior to maturity according to a sinking fund schedule.

Test Period

The term “Test Period” shall mean any 12 consecutive months of the last 24 months prior to the testing date.

Tested Fiscal Year

The term “Tested Fiscal Year” shall have the meaning set forth in Section 7.01 hereof.

Trust Estate

The term “Trust Estate” shall have the meaning set forth in the Granting Clause hereto.

Trustee

The term “Trustee” shall mean The Bank of New York Mellon Trust Company, N.A., its successors in the trust hereunder.

Valuation Date

The term “Valuation Date” with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds, shall mean the date or dates set forth in the Supplemental Indenture on which specific Accreted Values are assigned to such Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds.

Variable Rate Indebtedness

The term “Variable Rate Indebtedness” shall mean any Indebtedness the interest rate on which is not fixed to maturity at the time of calculation, or other relevant time.

Section 1.02 Rules of Interpretation. Except where the context otherwise requires, (i) words importing one gender shall include all genders and words importing the singular number shall include the plural and vice versa, (ii) references to any entities shall

include their successors and assigns, and (iii) references to any documents shall include any subsequent amendments and supplements thereto.

Section 1.03 Certification and Effect of First Effective Date. The Authority hereby certifies to the Trustee that the Holders of in excess of 66 2/3% principal amount of the Bonds Outstanding under the Existing Senior Indenture have consented to this Amended and Restated Trust Indenture and therefore the First Effective Date is December 28, 2017, and this Amended and Restated Trust Indenture, as supplemented by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, is now effective. The Authority has provided the Trustee with a separate certificate setting forth the relevant calculations. This Amended and Restated Trust Indenture is now in full force and effect, and it supersedes the Existing Senior Indenture, except for the provisions incorporated by reference in Section 1.05 below and, through December 31, 2018, the Rate Covenant as described in Section 7.01 hereof.

Section 1.04 Second Effective Date. When 100% of Bondholders have consented to this Amended and Restated Indenture, the Authority will certify that fact to the Trustee. Thereupon, the amendment reflected in the definition of Approval Amount will become effective.

Section 1.05 First Effective Date Outstanding Bonds. The following First Effective Date Outstanding Bonds were issued under the Existing Senior Indenture, prior to the First Effective Date:

(a) The portion of the 1998B Bonds not refunded by the 2017A Bonds. These bonds are capital appreciation bonds. The following provisions of the Second Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(a) as if fully set forth herein: the provisions related to the accreted valuation of the 1998B Bonds, the maturities, redemption provisions, payment dates and interest rates on the 1998B Bonds, the form of the 1998B Bonds set forth in Exhibit A, the debt service schedule on the 1998B Bonds set forth in Exhibit B, and the compound accreted value table set forth in Exhibit C.

(b) The portion of the 2008A Bonds not refunded by the 2017A Bonds and the 2017B Bonds. These are fixed rate bonds. The following provisions of the Seventh Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(b) as if fully set forth herein: the provision related to the maturities, redemption provisions, payment dates and interest rates on the 2008A Bonds, the form of the 2008A Bonds set forth in Exhibit B, and the debt service schedule for the 2008A Bonds set forth in Exhibit D.

(c) The 2013A Bonds. These bonds are fixed rate bonds. The following provisions of the Eighth Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(c) as if fully set forth herein: the provisions related to the maturities, redemption provisions, payment dates and interest rates on the 2013A Bonds, the form of the 2013A Bonds in Exhibit A, and the debt service schedule for the 2013A Bonds set forth in Exhibit B.

(d) The portion of the 2013B Bonds not refunded by the 2017A Bonds. These bonds are fixed rate bonds. The following provisions of the Eighth Supplemental Indenture remain in

full force and effect and are incorporated by reference in this Section 1.05(d) as if fully set forth herein: the provisions related to the maturities, redemption provisions, payment dates and interest rates on the 2013B Bonds, the form of the 2013A Bonds in Exhibit A, and the debt service schedule for the 2013B Bonds set forth in Exhibit B.

(e) The 2017A Bonds and the 2017B Bonds. The 2017-1 Supplemental Indenture remains in full force and effect as a Supplemental Indenture with respect to this Indenture.

(f) The 2017C Bonds. The 2017-2 Supplemental Indenture remains in full force and effect as a Supplemental Indenture with respect to this Indenture.

ARTICLE II

DESCRIPTION, EXECUTION AND REGISTRATION OF BONDS

Section 2.01 Issuance of Bonds; Form and Terms thereof. The Bonds may, at the election of the Authority, be issued in one or more Series and shall be designated generally as the “Water and Sewer System First Lien Revenue Bonds” of the Authority or similar designation. Subject to applicable provisions hereof, all Bonds shall be issued and shall contain such maturities, payment terms, interest rate provisions, redemption or prepayment features and other provisions as shall be set forth in the Supplemental Indenture providing for the issuance of such Bonds.

The Bonds shall be limited obligations of the Authority, payable solely from the Trust Estate. The Bonds shall constitute a valid claim of the respective Owners thereof against the Trust Estate, which is pledged to secure the payment of the principal of, redemption premium, if any, and interest on the Bonds, and which shall be utilized for no other purpose, except as expressly authorized in this Indenture. The Bonds shall not constitute general obligations of the Authority and under no circumstances shall the Bonds be payable from, nor shall the registered Owners thereof have any rightful claim to, any income, revenues, funds or assets of the Authority other than those pledged hereunder as security for the payment of the Bonds.

Section 2.02 Registration of Bonds. The Authority shall keep or cause to be kept at the Principal Office of the Trustee books for the registration and transfer of Bonds; and the Authority will register or transfer or cause to be registered or transferred therein, as hereinafter provided and under such reasonable regulations as it may prescribe, any Bond entitled to be so registered or transferred, upon presentation for such purpose. The Trustee is hereby appointed as registrar of the Authority for the purpose of registering, transferring and exchanging the Bonds. A Bond Insurer shall, upon the occurrence of an event of default triggering an obligation to make payments under the Insurance Policy, have the right to inspect the registration books maintained pursuant to this Section 2.02.

Section 2.03 Uniform Commercial Code. The Bonds shall be securities under the Pennsylvania Uniform Commercial Code Investment Securities and shall be negotiable instruments to the extent provided therein.

Section 2.04 Transfers and Exchanges of Bonds. Upon surrender for transfer of any fully registered Bond at the Principal Office of the Trustee, the Trustee shall authenticate and deliver in the name of the transferee or transferees one or more new fully registered Bonds of authorized denominations for the aggregate Principal Amount which the Bondholder is entitled to receive.

Any Bond shall be exchangeable for Bonds of any authorized denomination, in an aggregate Principal Amount equal to the Principal Amount of the Bond presented for exchange.

All Bonds presented for transfer or exchange shall be accompanied by a written instrument or instruments of transfer or authorization for exchange, in form satisfactory to the Trustee, duly executed by the Bondholder or by his duly authorized attorney. No transfer of any Bond shall be valid unless made on the registration books by the registered Owner in person, or by his duly authorized attorney. Such registrations, exchanges and transfers shall be without expense to the Holders of the Bonds, but any taxes, fees or other governmental charges required to be paid with respect to the same shall be paid by the Holder requesting any such registration, exchange or transfer as a condition precedent to the exercise of such privilege. Bonds may be presented for exchange or transfer only at the Principal Office of the Trustee or at the office of any Paying Agent as the Authority may hereafter appoint.

The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

Section 2.05 Form of Bonds; Temporary Bonds. Bonds in definitive form shall be printed or typewritten. Until Bonds in definitive form of any Series are ready for delivery, the Authority may execute and upon its request in writing the Trustee shall initially authenticate and deliver in lieu of any thereof, and subject to the same provisions, limitations and conditions, one or more printed, or typewritten Bonds in temporary form, substantially of the tenor of the Bonds hereinbefore described, and with appropriate omissions, variations and insertions, with regard to the Bonds. Such Bonds or Bonds in temporary form may be for the amount of \$5,000 or any multiple or multiples thereof, as the Authority may determine. Until exchanged for Bonds in definitive form such Bonds in temporary form shall be entitled to the lien and benefit of this Indenture. The Authority shall, without unreasonable delay, prepare, execute and deliver to the Trustee, and thereupon, upon the presentation and surrender of any Bond or Bonds in temporary form, the Trustee shall authenticate and deliver, in exchange therefor, a Bond or Bonds in definitive form of the same Series and same maturity for the same aggregate Principal Amount as the Bond or Bonds in temporary form surrendered. Such exchange shall be made by the Authority at its own expense and without making any charge therefor. Until such Bonds in definitive form are ready for delivery, the Holder of one or more Bonds in temporary form may, with the consent of the Authority, exchange the same, upon the surrender thereof to the Trustee for cancellation, for Bonds in temporary form of like aggregate Principal Amount, of the same Series and maturity, in authorized denominations.

Section 2.06 Numbering of Bonds. Any Bond may bear such numbers, letters, or other marks of identification or designation, and may be endorsed with or have incorporated in the text thereof such legends or recitals with respect to transferability or in respect of the Bond or Bonds for which it is exchangeable and may contain such provisions, specifications and descriptive words, not inconsistent with the provisions of this Indenture, as may be determined by the Authority and approved by the Trustee.

Section 2.07 Execution of Bonds. All the Bonds shall, from time to time, be executed on behalf of the Authority by the manual or facsimile signature of its Chairperson or its Vice Chairperson and its corporate seal (which may be in facsimile) shall be thereunto affixed or thereon imprinted and attested by the manual or facsimile signature of its Secretary or its Assistant Secretary. If any of the officers whose signature shall be upon the Bonds shall cease to be such officers of the Authority before the Bonds so signed and sealed shall have been actually authenticated by the Trustee or delivered by the Authority, such Bonds nevertheless may be authenticated, issued, and delivered with the same force and effect as though the person or persons whose signature shall be upon such Bonds had not ceased to be such officer or officers of the Authority; and also any such Bond may be signed and sealed on behalf of the Authority by the signature of such persons as at the actual date of the execution of such Bond shall be the proper officers of the Authority, although at the nominal date of such Bond any such person shall not have been such officer of the Authority.

Section 2.08 Mutilated, Lost, Stolen or Destroyed Bonds. Upon receipt by the Authority and the Trustee of evidence satisfactory to all of them that any Outstanding Bond has been mutilated, destroyed, lost or stolen, and of indemnity satisfactory to all of them, the Authority, in its discretion, may execute and thereupon the Trustee shall authenticate and deliver, a new Bond of the same Series and same maturity and of like tenor in exchange and substitution for, and upon surrender and cancellation of, the mutilated Bond or in lieu of and in substitution for the Bond so destroyed, lost or stolen. The Authority may, for each new Bond authenticated and delivered under the provisions of this Section, require the payment of the expenses, including counsel fees, which may be incurred by the Trustee in the premises. Any Bond issued under the provisions of this Section in lieu of any Bond alleged to be destroyed, lost or stolen, shall constitute an original additional contractual obligation on the part of the Authority whether or not the Bond so alleged to be destroyed, lost or stolen be at any time enforceable by anyone; and shall be equally and proportionately entitled to the benefits of this Indenture with all other Bonds issued under this Indenture.

Section 2.09 Certificate of Authentication. Subject to the qualifications hereinbefore set forth, the Bonds to be secured hereby shall be substantially of the tenor and effect hereinbefore recited, and no Bonds shall be secured hereby or entitled to the benefit hereof, or shall be or become valid or obligatory for any purpose, unless there shall be endorsed thereon a certificate of authentication, substantially set forth in the form of the Bond as shall be set forth in the Supplemental Indenture providing for the issuance of such Bonds, executed by the Trustee; and such certificate on any Bond issued by the Authority shall be conclusive evidence and the only competent evidence that it has been duly authenticated and delivered hereunder. The Bonds shall be authenticated by the Trustee.

Section 2.10 Book-Entry Only Bonds. Unless a Supplemental Indenture shall provide otherwise with respect to a Series of Bonds, the Bonds of a Series shall be initially issued in book-entry only form. Unless a Supplemental Indenture shall provide otherwise with respect to a Series, in the event that any provision of this Section 2.10 is inconsistent with other provisions of this Indenture, so long as the Bonds shall be in book-entry only form, the provisions of this Section 2.10 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the Bonds. The ownership of one fully registered Bond for each maturity set forth in this Indenture, each in the aggregate Principal Amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the Bonds for an equal aggregate Principal Amount of Bonds registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a Bond or any other evidence of ownership of the Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under this Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the Bonds so redeemed, but DTC or its nominee may retain such Bonds and make an appropriate notation on the Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the Bonds, selecting the Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under this Indenture, registering the transfer of Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such participant of any amount in respect of the principal or redemption price of or interest on the Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under this Indenture; or (v) the selection by

DTC or any such participant of any person to receive payment in the event of a partial redemption of the Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under this Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to this Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under this Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the Bonds in registered certificate form in denominations of \$5,000 and integral multiples thereof (or such other denominations as are applicable to a Series as set forth in a Supplemental Indenture), at the expense of the Authority, to such persons, and in such maturities and Principal Amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the Bonds.

ARTICLE III

AUTHENTICATION AND DELIVERY OF BONDS

Section 3.01 Purposes of Bonds. The Authority may issue Additional Bonds from time to time under this Indenture. Bonds may be issued (a) to pay Costs, (b) to refund

Bonds or any other Indebtedness (including Senior Debt or Subordinate Debt or other debt not secured by the Revenues), (c) to pay costs of issuance, (d) to fund reserves and/or pay costs associated with Capitalized Interest or terminating Qualified Interest Rate Swap Agreements, or (e) for a combination of such purposes. The provisions in this Article III relating to the issuance of Bonds do not apply to the issuance of the 2017A Bonds, the 2017B Bonds or the 2017C Bonds, which bonds were issued in compliance with the requirements of the Existing Senior Indenture.

In the event that any Policy Costs are due and owing at the time of issuance of the Additional Bonds, for the purpose of the debt tests required by Section 3.02 hereof, Revenues of the Authority shall be reduced by the amount of any Policy Costs then due and owing.

No Additional Bonds may be issued without the prior written consent of a Bond Insurer if any Policy Costs are past due and owing to the Bond Insurer.

Section 3.02 Conditions for Issuing Bonds. Before the issuance and authentication of any Series of Bonds by the Trustee, there shall be filed with the Trustee:

- (a) In connection with the initial execution of this Indenture:
 - (i) A certified copy of this Indenture;
 - (ii) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that this Indenture has been duly authorized, executed and delivered to the Trustee and is a valid, binding and enforceable obligation of the Authority.
- (b) A certified copy of a Supplemental Indenture which (1) shall include: (A) provisions authorizing the issuance, fixing the Principal Amount and setting forth the details of such Bonds, including their date, the interest rate or rates and the manner in which the Bonds are to bear and pay interest (including whether such Bonds constitute Capital Appreciation Bonds, Capital Appreciation and Income Bonds or Current Interest Capital Appreciation Bonds), the principal and Interest Payment Dates of the Bonds; the purposes for which such Bonds are being issued, the manner of numbering of such Bonds, the Series designation, the denominations, the maturity dates and principal maturities, the Principal Amounts required to be redeemed pursuant to any mandatory redemption provisions or the manner for determining such Principal Amounts, any provisions for optional or extraordinary redemption before maturity, and any provisions regarding the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement; and (B) provisions for the application of the proceeds of such Bonds; and (2) may include: (A) provisions for Credit Facilities and for other Funds and Accounts to be established with respect to such Bonds; (B) provisions necessary or expedient for the issuance and administration of Bonds bearing interest at a variable rate or other manner of bearing interest, including remarketing provisions, liquidity facility provisions and provisions for establishing the variable rate and converting to a fixed rate; (C) provisions for entering into credit enhancement devices permitted by Commonwealth law; and (D) such other provisions as the Authority may deem appropriate.

(c) A certified copy of applicable Resolution of the Board authorizing, as required by law, the issuance, sale, award, execution and delivery of such Bonds and, in the case of a Series of Bonds issued to refund Indebtedness, calling for redemption or payment of the Indebtedness to be refunded, fixing any redemption date and authorizing any required notice of redemption in accordance with the provisions of this Indenture.

(d) A certificate signed by an Authorized Representative of the Authority and dated the date of such issuance, to the effect that:

(i) Either (A) upon and immediately following such issuance, no Event of Default has occurred which has not been cured or waived, and no event or condition exists which, with the giving of notice or lapse of time or both, would become an Event of Default or (B) if any such event or condition is happening or existing, specifying such event or condition, stating that the Authority will act with due diligence to correct such event or condition after the issuance of such Bonds, and describing in reasonable detail the actions to be taken by the Authority toward such correction; and

(ii) All required approvals, limitations, conditions and provisions precedent to the issuance of such Series of Bonds have been obtained, observed, met and satisfied.

(e) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that the Supplemental Indenture for such Series of Bonds has been duly authorized, executed and delivered, is binding on the Authority and complies in all respects with the requirements of this Indenture.

(f) An opinion of Bond Counsel, subject to customary exceptions and qualifications, substantially to the effect that the issuance of such Bonds has been duly authorized, that such Bonds are valid and binding limited obligations of the Authority, and with respect to Bonds to be issued on a tax-exempt basis that the interest on such Bonds is excludable from gross income for purposes of Federal income taxation.

(g) If a Series of Bonds are issued to pay Costs, the following:

(i) (A) if the Bonds are Common Debt Service Reserve Secured Bonds, evidence that upon issuance of such Bonds, the Common Debt Service Reserve Requirement will be fully funded, or (B) if the Bonds are Separate Series Debt Service Reserve Secured Bonds, evidence that, upon issuance of such Bonds, the Separate Series Debt Service Reserve Requirement for such Bonds will be fully funded or will be funded in accordance with the requirements of the applicable Supplemental Indenture; and

(ii) A certificate of (A) a Qualified Independent Consultant, stating that based on the Authority's financial records for a Test Period, the Authority would have been able to meet the Rate Covenant in Section 7.01, taking into account (i) the maximum Annual Debt Service on the proposed Series of Additional Bonds in the current or any future Fiscal Year, (ii) the additional Net Revenues from the rates, fees and other charges adjusted to reflect any rate increases that had not been in effect throughout the Test Period but that have been approved by and can be implemented by the Authority at the time of the delivery of the proposed Series of Additional Bonds to go into effect within

the following five years; and (iii) additional Net Revenues that the Authority may realize from the addition to the System of the assets it proposes to finance through the issuance of the proposed Series of Additional Bonds or other funding sources within the following five years or (B) the Authorized Representative of the Authority stating that based on the Authority's financial records for a Test Period, the Authority has met the Rate Covenant in Section 7.01, taking into account the maximum Annual Debt Service on the proposed Series of Additional Bonds. In making the certifications required under this paragraph, the Authorized Representative of the Authority or the Qualified Independent Consultant, as applicable, shall determine and utilize the Additional Indebtedness Test Net Revenues in place of the Rate Covenant Net Revenues in determining whether the Authority would have been able to meet the Rate Covenant in Section 7.01.

(h) Except in the case of the 2017A Bonds, the 2017 B Bonds and the 2017C Bonds, if any Bonds are issued to refund any Indebtedness, the following:

(i) Evidence that the Authority has made provision as required by this Indenture for the payment or redemption of all Indebtedness to be refunded;

(ii) A certificate of an Authorized Representative of the Authority demonstrating that the proposed refunding will not result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year. If the proposed refunding will result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year, then the issuance of that Series of Additional Bonds shall be subject to the same requirements as the issuance of a Series of Additional Bonds to pay Costs under Section 3.02(g)(ii).

(i) A request and authorization of the Authority, signed by an Authorized Representative of the Authority, to the Trustee to authenticate and deliver such Bonds to the purchaser upon payment to the Trustee of a specified sum plus accrued interest to the date of delivery.

Except for the requirements of subsection (d) of this Section (which may be waived by the purchasers of such Bonds by an instrument or concurrent instruments in writing signed by such purchasers), none of the requirements in this Section may be waived without the consent of the holders of not less than a majority in aggregate Principal Amount of the Outstanding Bonds.

Section 3.03 Other Senior Parity Indebtedness.

(a) The Authority may incur or refinance Other Senior Parity Indebtedness provided that:

(1) the documents relating to the Other Senior Parity Indebtedness acknowledge that such debt constitutes Other Senior Parity Indebtedness under this Indenture and is subject to the applicable terms and conditions hereof as if it were Bonds, and specify the amounts and due dates of Annual Debt Service with respect to the Other Senior Parity Indebtedness;

(2) the requirements of Sections 3.02(g) or 3.02(h), as appropriate, have been met as if the Other Senior Parity Indebtedness was an additional Series of Bonds;

(3) the Trustee receives written notice of the issuance of the Other Senior Parity Indebtedness and the material terms and conditions thereof and the Trustee shall register the holder as owner thereof as such on its books and records, and

(4) the Trustee receives a Counsel's Opinion that the documents creating the Other Senior Parity Indebtedness have been duly authorized, executed and delivered on behalf of the Authority and constitute valid, binding and enforceable obligations.

(b) The Authority shall fulfill its obligations under all contracts or agreements creating Other Senior Parity Indebtedness as they may exist from time to time.

Section 3.04 Subordinate Debt of Authority. In addition to the foregoing and in addition to any subordinate pledge granted by the Authority to a Bond Insurer in connection with a Debt Service Reserve Fund Policy, the Authority may incur or assume Subordinate Debt provided that:

(1) the security for such debt is subordinate to the lien of and security interests granted by this Indenture; and

(2) any agreement for the repayment of such subordinate debt and any instrument evidencing or securing such subordinate debt shall provide: (i) that an event of default thereunder may be an event of default under this Indenture, and (ii) that, notwithstanding the occurrence of any event of default in respect of any subordinate debt, the lender shall not be entitled to exercise any rights or remedies with respect to the Revenues until and unless the Trustee shall have instituted proceedings to exercise its rights pursuant to Article VIII hereof.

Section 3.05 Covenant as to Prior Lien Debt. The Authority will not incur or assume any debt which will be secured by a lien on the Revenues which will be prior to the lien granted by the terms of this Indenture.

Section 3.06 Deposit of Bond Proceeds. Upon receipt of the proceeds of any Series of Bonds issued under this Indenture, such moneys shall be deposited to a Clearing Fund for such Bonds and shall be disbursed for the purposes and in the amounts set forth in the closing certificate of the Authority executed on the date of issuance of such Bonds. To the extent it is determined on or before the first day of the month after the date of issuance of such Bonds that any remaining moneys in such fund will not be necessary to pay costs of issuance, such moneys shall be transferred to the Debt Service Fund and applied to pay interest on such Bonds on the next Interest Payment Date for such Bonds.

ARTICLE IV

REDEMPTION OF BONDSSection 4.01 Redemption of Bonds.

The Bonds of any Series issued under the provisions of this Indenture shall be subject to redemption, in whole or in part, and at such times and prices as may be provided in the Supplemental Indenture pursuant to which such Bonds are issued, which Supplemental Indenture shall include provisions for extraordinary redemption in accordance with Section 7.10 hereof. The Bonds of any Series to be called for redemption shall be selected as provided in the applicable Supplemental Indenture. The Trustee shall treat each Bond of a denomination greater than the minimum denomination authorized in the applicable Supplement Indenture as can be obtained by dividing the Bond's actual Principal Amount by such minimum denomination.

Section 4.02 Notice of Redemption. Whenever the Authority shall redeem all or part of the Bonds, it shall cause a written notice of intention to redeem, signed in the name of the Authority by an Authorized Representative of the Authority to be sent, by the Trustee by first class mail to each registered Owner of the Bonds to be redeemed at the last address of said registered Owner appearing upon the registration books not less than twenty (20) days or more than sixty (60) days before the redemption date (unless the applicable Supplemental Indenture provides for other timing for the notice). Failure to mail any such notice shall not affect the validity of the proceeding for redemption. Such notice shall specify the information set forth in the next following paragraph. The notice shall further state that, from and after such redemption date, interest thereon will cease to accrue. Simultaneously with the mailing of notice to Bondholders, the Trustee shall notify a Bond Insurer of any redemption, other than mandatory sinking fund redemption, of Bonds being insured by a Bond Insurer. In the case of an optional redemption, the notice may, at the Authority's discretion, state (1) that it is conditioned upon the deposit of moneys, in an amount equal to the amount necessary to effect the redemption, with the Trustee no later than the redemption date or (2) that the Authority retains the right to rescind such notice at any time prior to the scheduled redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice (in either case, a "Conditional Redemption"), and such notice and optional redemption shall be of no effect if such monies are not so deposited or if the notice is rescinded as described below.

In addition to the foregoing, the redemption notice shall contain with respect to each Bond being redeemed, (1) the CUSIP number as provided in Section 4.04 hereof, (2) the date of issue; (3) the interest rate, (4) the maturity date, and (5) any other descriptive information determined by the Trustee to be needed to identify the Bonds. If a redemption is a Conditional Redemption, the notice shall so state. The Trustee also shall send each notice of redemption to (i) any Rating Service then rating the Bonds to be redeemed; (ii) all of the registered clearing agencies known to the Trustee to be in the business of holding substantial amounts of bonds of a type similar to the Bonds; and (iii) one or more national information services that disseminate notices of redemption of bonds such as the Bonds, such services to be identified by the Trustee.

Any Conditional Redemption may be rescinded in whole or in part at any time prior to the redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice. The Trustee shall give prompt notice of such rescission to the affected Bondholders. Any Bonds subject to Conditional Redemption where redemption has been rescinded shall remain Outstanding, and the rescission shall not constitute an Event of Default. Further, in the case of a Conditional Redemption, the failure of the Authority to make funds available in part or in whole on or before the redemption date shall not constitute an Event of Default.

Section 4.03 Nonpresentment of Bonds. Notice having been given in the manner hereinbefore provided in this Article and irrevocable instructions having been given to the Trustee to pay said Bonds or portions thereof and cash equal to the redemption price of said Bonds and the interest accrued thereon to the date of redemption having been deposited in trust with the Trustee on or prior to the date set for redemption, the Bonds so called for redemption shall become due and payable on the redemption date so designated, and interest on such Bonds shall cease to accrue from such redemption date, whether such Bonds are presented for redemption or not. The Principal Amount of all Bonds so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Trustee, upon presentation and surrender thereof.

Section 4.04 CUSIP Numbers. The Trustee shall use the "CUSIP" numbers assigned to the Bonds, if then generally in use, in notices of redemption of Bonds as a convenience to Bondholders; provided that any such notice shall state that no representation is made as to the correctness of such numbers either as printed on the Bonds or as contained in any notice of redemption and that reliance may only be placed on the identification numbers established under the Indenture.

ARTICLE V

CONSTRUCTION FUND

Section 5.01 Construction Fund. There is hereby created a special fund known as the "Construction Fund", which shall be held in trust by the Trustee. Money shall be deposited to the Construction Fund pursuant to the provisions of Article II and from any other sources identified by the Authority. To the extent Costs of a Construction Project are paid for from Bonds, the Authority must deposit the construction proceeds of the Bonds in the Construction Fund and must follow the provisions of this Article V. To the extent the Authority is self-funding Costs from other than proceeds of Bonds, the Authority may use moneys in the Revenue Fund and the Operating Fund to pay such Costs, and the Authority need not use the Construction Fund or follow the provisions of this Article V.

Payment of the Costs of a Construction Project shall be made from the Construction Fund. A special account shall be created and identified for each such Construction Project, although funds, at the written direction of the Authority, may be transferred from one such account in the Construction Fund to another account in such Fund. On the date of issuance of Bonds to finance in whole or in part a Construction Project, the moneys directed, in writing, by the Authority to be transferred from the Clearing Fund shall be deposited into the

Construction Fund or an account therein. All moneys on deposit in the Construction Fund shall be held in Trust by the Trustee as security under this Indenture and disbursed by the Trustee pursuant to this Section 5.01 in payment of the Costs of the Construction Project. Before each such withdrawal and payment of the Costs of the Construction Project from the Construction Fund by the Trustee, the Authority shall deliver to the Trustee the following:

(a) A requisition, signed by any two of the Chairperson or Vice Chairperson or Secretary or Assistant Secretary or the Executive Director or the Chief Financial Officer or the Director of Finance of the Authority, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, stating in respect of each payment to be made:

- (1) the item number of the payment;
- (2) the name and address of the person to whom payment is due;
- (3) the amount to be paid and the Construction Fund from which payment is to be made;
- (4) the purpose for which the obligation was incurred;
- (5) that obligations in the stated amount have been incurred by the Authority and that each item thereof is a proper part of the Cost of the Construction Project and has not been paid;
- (6) that there has not been filed with or served upon the Authority notice of any lien, right to lien or attachment upon, or claim affecting the right to receive payment of any of the moneys payable to any persons named in such requisition;
- (7) that such requisition contains no items representing payment on account of any retained percentage which the Authority is on the date of such certificate entitled to retain;
- (8) that neither the Authority nor any of its officers or members has received any discount, rebate, commission, fee, proceeds from insurance or other abatement which is not reflected on the requisition in connection with any such expenditures or indebtedness; and
- (9) that no part of any such item has been included in any previous requisition for the withdrawal of moneys from the Construction Fund; and

(b) Except to the extent to which a requisition relates to financing costs, a certificate signed by the Consulting Engineer approving such requisition and certifying that each item to be paid as set forth in such requisition constitutes an obligation which has been properly incurred as part of the Cost of the Construction Project and is then due and unpaid.

Upon the receipt of each such requisition and the accompanying certificate, the Trustee shall pay to the persons named in such requisition, the respective amounts stated therein to be due to such persons.

Investment earnings on the amounts on deposit in the Construction Fund shall be retained in the Construction Fund unless the Authority directs the Trustee, in writing, to transfer such earnings to the Debt Service Fund.

Any moneys remaining in the Construction Fund after all amounts due in respect of the Construction Project shall have been paid (including any Costs of any amendment or revision of the Construction Project pursuant to Section 5.02 below), which fact shall be evidenced to the Trustee by delivery of a certificate of an Authorized Representative of the Authority to that effect, shall be transferred by the Trustee to the Revenue Fund and applied as directed in writing by the Authority; with respect to such application, the Authority will obtain an opinion of Bond Counsel that such application in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Bonds issued to fund such Construction Project. If an Event of Default pursuant to Section 8.01(a) or (b) occurs, and only to the extent that no other available moneys are held under this Indenture, the Trustee shall transfer moneys from the Construction Fund to the Debt Service Fund to pay principal and interest on the Bonds.

All requisitions received by the Trustee pursuant to Section 5.01(a) may be relied upon without investigation or inquiry by and shall be retained in the possession of the Trustee for a period of five (5) years, subject at all times to the inspection of the Authority, its agents and representatives, and any other person authorized by a certificate of an Authorized Representative of the Authority.

Section 5.02 Amendment of Construction Project. The Authority may from time to time amend or revise a Construction Project with the approval of the Consulting Engineer, but only if the Authority shall have first delivered to the Trustee (i) a written statement describing the proposed amendments and revisions, (ii) a Resolution of the Board approving the proposed amendments and revisions, (iii) a certificate signed by the Consulting Engineer setting forth the general effect of such proposed amendments and revisions and certifying in his opinion that such proposed amendments and revisions are in the best interests of the Authority, and (iv) an opinion of Bond Counsel that such amendment or revision in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Bonds issued to fund such Construction Project.

Section 5.03 Contract Security. All contracts which provide for the furnishing of material or the doing of work with regard to a Construction Project shall be in compliance with all federal and state statutes, rules and regulations and shall be subject to the approval of the Consulting Engineer. The Authority will require each person with whom it may contract for construction to furnish a performance security and a labor and materialmen's security each for not less than 100% of the full amount of the contract entered into with such person or such greater or lesser amount as may be required by applicable law, and to carry such insurance as may be required by law and as may be recommended by the Consulting Engineer. The proceeds of any such performance security shall forthwith, upon the receipt thereof by the Authority, be deposited to the credit of the applicable Construction Fund or account therein and applied toward

the completion of the construction covered by the contract in connection with which such performance security shall have been furnished except that any such proceeds as shall constitute liquidated damages for delay shall be deposited to the credit of the Revenue Fund.

ARTICLE VI

REVENUES, FUNDS AND INVESTMENTS

Section 6.01 Funds and Accounts. In addition to the Construction Fund established in Section 5.01 hereof, there are hereby established the following Funds and Accounts to be held by the Authority or the Trustee, as applicable:

- (1) Revenue Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;
- (2) Operating Fund to be held by the Authority in one or more Authorized Depositories, not subject to the lien of this Indenture;
- (3) Debt Service Fund, in which there shall be established an Interest Account, a Principal Account and a Sinking Fund Account, and a separate subaccount in each such Account with respect to (i) all Series of Common Debt Service Reserve Secured Bonds and (ii) each Series of Separately Secured Debt Service Reserve Fund Bonds; and (iii) Other Senior Parity Indebtedness, to be held by the Trustee, subject to the lien of this Indenture;
- (4) Debt Service Reserve Fund to be held by the Trustee, subject to the lien of this Indenture, in which there shall be established (1) a Series Debt Service Reserve Account for all Series of Common Debt Service Reserve Secured Bonds, and (2) as applicable, a Series Debt Service Reserve Account for each Series of Bonds that has a Separate Series Debt Service Reserve Requirement;
- (5) Operating Reserve Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;
- (6) Subordinate Debt Service Fund to be held by the Trustee, subject to the lien of this Indenture;
- (7) Subordinate Debt Service Reserve Fund to be held by the Trustee, subject to the lien of this Indenture;
- (8) Rate Stabilization Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;
- (9) Redemption Fund to be held by the Trustee, subject to the lien of this Indenture; and

(10) Rebate Fund to be held by the Trustee, but is not subject to the lien of this Indenture.

Section 6.02 Disposition of Revenues. All Revenues and all other amounts received by the Authority from any source (except as otherwise provided herein) shall be deposited in the Revenue Fund to be held by the Authority in one or more Authorized Depositories; provided, however, that upon an Event of Default, the Authority will transfer all amounts in all Authority held funds (other than the Operating Fund) to the Trustee, and the Trustee shall hold such moneys in trust for the beneficiaries hereunder. If and when the Event of Default is cured, such moneys shall be returned by the Trustee to the Authority.

The Authority shall transfer from the Revenue Fund to the Operating Fund from time to time the amounts needed to pay Current Expenses.

On the 20th day of each month (or, if such day is not a Business Day, then on the last Business Day prior to the 20th day of each month) (the "Disbursement Date"), Net Revenues shall be disbursed by the Authority in the following order (except that the payments into the Interest Account, the Principal Account and the Sinking Fund Account of the Debt Service Fund shall be on a parity with each other):

(1) To the Debt Service Fund:

(a) To the subaccounts established for each Series of Bonds or Other Senior Parity Indebtedness in the Interest Account, monthly, on the Disbursement Date, an amount equal to the amount of interest falling due on or before the 20th day of the following month, as set forth in the applicable Supplemental Indentures with respect to each Series of Bonds or Other Senior Parity Indebtedness (including Periodic Payments with respect to Qualified Interest Rate Swap Agreements); provided, however, that if such Other Senior Parity Indebtedness is evidenced by documents other than a Supplemental Indenture, to the related interest accounts set forth therein, as applicable; and such deposits shall be adjusted to give credit for any other available money then in such interest account or subaccount or otherwise available and designated to be used for such purpose. Moneys in the Interest Account shall be used to pay interest due on any Interest Payment Date (including any redemption date other than a mandatory sinking fund redemption date) related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable.

(b) To the subaccounts established for each Series of Bonds or Other Senior Parity Indebtedness in the Principal Account and Sinking Fund Account, monthly, on the Disbursement Date, an amount equal to the principal and sinking fund redemption amounts payable on or before the 20th day of the following month, or if principal is payable once per year on the Series of Bonds or Other Senior Parity Indebtedness, then an amount equal to one half (½) of the principal or sinking fund payments due within the next seven months, and the other one half (½) when due by the 20th day of the following month, all as shall be necessary to ensure deposits for the payment in full of principal on the next principal payment date or sinking fund redemption date, as set forth in the applicable Supplemental Indentures with respect to each Series of Bonds or Other

Senior Parity Indebtedness; provided, however, that if such Other Senior Parity Indebtedness is evidenced by documents other than a Supplemental Indenture, to the related principal and sinking fund accounts set forth therein, as applicable; and such deposits shall be adjusted to give credit for any other available money then in the principal or sinking fund account or subaccount or otherwise available and designated to be used for such purpose. Moneys in the Principal Account shall be used to pay principal required to be paid on any principal payment date related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable. Moneys in the Sinking Fund Account shall be used to pay the amount required for mandatory sinking fund redemption on the applicable redemption date (including any redemption date other than a mandatory sinking fund redemption date) related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable.

(2) To the Debt Service Reserve Fund the amounts, if any, required to be deposited pursuant to (i) Section 6.07(b) hereof, to restore the amount on deposit in each Series Debt Service Reserve Account to the related Series Debt Service Reserve Requirement or to reimburse the provider of any Credit Facility deposited in the Debt Service Reserve Fund, and (ii) a Supplemental Indenture, to fund a Series Debt Service Reserve Account to the applicable Separate Series Debt Service Reserve Requirement or Common Debt Service Reserve Requirement, and such amounts shall be transferred to the appropriate Series Debt Service Reserve Account.

(3) To the Subordinate Debt Service Fund, the amount equal to the deposits to such funds and accounts required by the related indenture or other documents evidencing such debt, which amounts shall be used to pay principal and interest or other amounts owing on Subordinate Debt. To the extent that the Subordinate Debt is issued pursuant to Subordinate Debt documents, applicable amounts shall be transferred to the respective Subordinate Debt fiduciary. In addition, to the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, moneys in the Subordinate Debt Service Fund shall be used, prior to any withdrawal from the Debt Service Reserve Fund, to cure any such deficiencies, but only after withdrawals from the Revenue Fund, the Operating Reserve Fund and any Subordinate Debt Service Reserve Fund, in that order, for that purpose.

(4) To Subordinate Debt Service Reserve Fund with respect to each Subordinate Debt issue the amounts, if any, necessary to restore the amount on deposit therein to the related Subordinate Debt Service Reserve Requirement. To the extent that the Subordinate Debt is issued pursuant to Subordinate Debt documents, applicable amounts shall be transferred to the respective Subordinate Debt fiduciary.

(5) To any Counterparty, any and all payments owed by the Authority on or before the 20th day of the following month under its Qualified Interest Rate Swap Agreement, other than Periodic Payments.

(6) To the Operating Reserve Fund the amounts, if any, necessary to restore the amounts on deposit therein to the Operating Reserve Requirement. Such amounts shall be funded within 24 months of withdrawal by depositing in such fund 1/24 of the Operating Reserve Requirement on each Disbursement Date after such withdrawal, if necessary. Moneys in the Operating Reserve Fund shall be used to pay, to the extent necessary, Current Expenses of the Authority.

(7) To the City, any amounts owed to the City on or before the 20th day of the following month under the Cooperation Agreement.

(8) Any moneys remaining in the Revenue Fund after all deposits and transfers required by subsections (1) through (7) of this Section have been made on the Disbursement Date shall be applied as follows: to the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, (i) moneys in the Revenue Fund shall be transferred to the Debt Service Fund, and then (ii) there shall be withdrawals from the Operating Reserve Fund, the Subordinate Debt Service Fund, any Subordinate Debt Service Reserve Fund, and the Debt Service Reserve Fund, in that order, to cure any such deficiencies. If not needed for that purpose, moneys in the Revenue Fund may be used for any authorized purpose, including but not limited to transfers in an amount that an Authorized Representative of the Authority may determine, in his discretion, to transfer to the Rate Stabilization Fund for rate stabilization purposes, or to the Debt Service Fund to be used to redeem Bonds as herein provided for deposit in any Account therein, or to the Operating Fund to pay Costs of Construction Projects or Capital Additions. Additionally, moneys remaining in the Revenue Fund to the extent all transfers required by subsections (1) through (7) of this Section have been made, shall be applied for any lawful purpose of the Authority.

Notwithstanding anything in this Indenture to the contrary, at any time that the Authority is required to make transfers pursuant to subsections (1) through (7) of this Section, and there are insufficient Net Revenues to make all required transfers pursuant to such subsections, the Authority, after paying Current Expenses, shall make the transfers in the order set forth above first from Net Revenues, then from any other legally available monies.

In the event this Section requires transfers to the Debt Service Fund or the Debt Service Reserve Fund from any Fund held by the Authority, the Authority shall effect that transfer to the Trustee in accordance with this Section.

The Authority's obligation to repay any Policy Costs to a Bond Insurer related to the Debt Service Reserve Fund shall have the same priority and be paid in the same manner from the Revenue Fund as the obligation to maintain and refill the Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

The Authority's obligation to repay any Policy Costs to a Bond Insurer related to the Subordinate Debt Service Reserve Fund shall have the same priority and be paid in the same

manner from the Revenue Fund as the obligation to maintain and refill the Subordinate Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Subordinate Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

The Trustee shall provide for a mandatory sinking fund redemption of any Term Bonds in accordance with the schedules set forth in the Supplemental Indenture for such Bonds; provided, however, that on or before the 45th day next preceding any such sinking fund payment date, the Authority may:

- (i) deliver to the Trustee for cancellation Term Bonds of the maturity required to be redeemed on such sinking fund payment date in any aggregate Principal Amount desired; or
- (ii) instruct the Trustee, in writing, to apply a credit against the Authority's next sinking fund redemption obligation for any such Term Bonds that previously have been redeemed (other than through the operation of the sinking fund) and canceled but not theretofore applied as a credit against any sinking fund redemption obligation.

Upon the occurrence of any of the events described in the subsections (i) or (ii) above, the Trustee shall credit against the Authority's sinking fund redemption obligation on the next sinking fund payment date the amount of such Term Bonds so delivered or previously redeemed. Any Principal Amount of such Term Bonds in excess of the Principal Amount required to be redeemed on such sinking fund payment date shall be similarly credited in such order as may be determined by the Authority against future payments to the Sinking Fund Account and shall similarly reduce the Principal Amount of the Term Bonds of the applicable Series to be redeemed on the next sinking fund payment date. Within seven days of receipt of such Term Bonds or instructions to apply as a credit, any amounts remaining in the Sinking Fund Account in excess of the amount required to fulfill the remaining required sinking fund redemption obligation on the next sinking fund payment date shall be used in such manner as determined at the direction of the Authority.

In the event the amount on deposit in the Interest Account on any Interest Payment Date exceeds the amount required to pay interest on the Senior Debt on the next Interest Payment Date, the Authority shall, if the amount on deposit in any Series Debt Service Reserve Account is less than the applicable Series Debt Service Reserve Requirement, transfer such excess to any Series Debt Service Reserve Account to the extent of such deficiency (on a *pro rata* basis if funds are not sufficient to cause the Series Debt Service Reserve Requirement to be fully funded at the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement), and otherwise retain any remaining excess in the Interest Account or transfer any remaining excess to the related Principal Account to be credited against subsequent required deposits thereto, as determined by the Authority.

In the event the amount on deposit in the Principal Account or Sinking Fund Account on any principal or mandatory redemption payment date exceeds the amount required on such date to pay Bonds at maturity or to redeem Term Bonds pursuant to mandatory sinking fund requirements, the Authority shall, if the amount on deposit in any Series Debt Service Reserve

Account is less than the applicable Series Debt Service Reserve Requirement, transfer such excess to the Series Debt Service Reserve Account to the extent of such deficiency (on a *pro rata* basis if funds are not sufficient to cause the Series Debt Service Reserve Requirement to be fully funded at the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement), and otherwise retain such excess in the Principal Account or transfer such excess to the Interest Account to be credited against subsequent required deposits thereto, as determined by the Authority.

Section 6.03 Operating Fund. The Authority shall promptly pay out of the Operating Fund its Current Expenses as the same shall become due. All withdrawals or payments from the Operating Fund shall be made in accordance with the procedures of the Authority. If all transfers required under subsections (1) through (7) of Section 6.02 have been made, the Authority may pay from the Operating Fund the Costs of Construction Projects or Capital Additions.

Section 6.04 Debt Service Fund. The Authority shall deposit and the Trustee shall apply the amounts required to be deposited in the Debt Service Fund on the applicable dates pursuant to the provisions of this Indenture including in any Supplemental Indenture for the purpose of paying the interest on and principal of Bonds and Other Senior Parity Indebtedness.

Section 6.05 Subordinate Debt Service Fund. The Authority shall deposit and the Trustee shall apply the amounts required to be deposited on the applicable dates pursuant to the provisions of this Indenture and any documents related to the Subordinate Debt for the purpose of paying the interest on and principal of Subordinate Debt.

Section 6.06 Operating Reserve Fund. Moneys in the Operating Reserve Fund shall be used by the Authority to pay, to the extent necessary, Current Expenses of the Authority. Such moneys shall also be used to make up for deficiencies in certain other funds as described in Section 6.02(6) hereof. To the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, moneys in the Operating Reserve Fund shall be used, prior to any withdrawal from any Subordinate Debt Service Reserve Fund, the Subordinate Debt Service Fund, and then the Debt Service Reserve Fund, in that order, to cure any such deficiencies, but only after withdrawals from the Revenue for that purpose.

Section 6.07 Debt Service Reserve Fund.

The Series Debt Service Reserve Account maintained for all Common Debt Service Reserve Secured Bonds shall be funded at all times to the Common Debt Service Reserve Requirement, and all other Series Debt Service Reserve Accounts shall be funded at all times to the applicable Separate Series Debt Service Reserve Requirement as set forth in a Supplemental Indenture. Amounts in each Series Debt Service Reserve Account shall be used to pay debt service on the related Series of Bonds and related Other Senior Parity Indebtedness on the date such debt service is due if insufficient funds for that purpose are available in the related Series subaccount in the Interest Account and the related Series subaccount in the Principal Account (but only to the extent amounts in such subaccounts are less than the amounts required). Amounts in each Series Debt Service Reserve Account shall be pledged to Holders of the Bonds

and Other Related Parity Indebtedness Parties secured by such Series Debt Service Reserve Account.

The Authority shall withdraw from the Revenue Fund and deposit into the Debt Service Reserve Fund:

(a) on the dates specified in this Indenture or any Supplemental Indenture, the amounts required to be deposited on such dates to the credit of the applicable accounts of the Debt Service Reserve Fund; and

(b) if a deficiency exists in any account of the Debt Service Reserve Fund, on the dates specified in this Indenture or a Supplemental Indenture, such amounts as will be sufficient to repair any deficiencies in such account of the Debt Service Reserve Fund in not more than twenty-four equal monthly payments.

In lieu of or in addition to cash or investments, at any time the Authority may cause to be deposited to the credit of the Debt Service Reserve Fund any form of Credit Facility, including a Debt Service Reserve Fund Policy, in the amount of all or a portion of the Debt Service Reserve Fund, irrevocably payable to the Trustee as beneficiary for the Holders of the respective Series of Bonds, provided that the Trustee has received evidence satisfactory to it that the provider of the Credit Facility has a credit rating in one of the three highest credit rating categories by two Rating Agencies.

If a disbursement is made pursuant to any Credit Facility, the Authority shall either (a) reinstate the maximum limits of such Credit Facility, or (b) deposit to the credit of the Debt Service Reserve Fund moneys in the amount of the disbursement made under such Credit Facility from available Net Revenues. To the extent such moneys are still insufficient, then the Authority shall transfer to the Trustee from any legally available moneys the amount of such deficiency as soon as practicable and in any event within 24 months by depositing one-twenty-fourth of the required amount each month.

Amounts, if any, released from any Debt Service Reserve Fund upon deposit to the credit of such Debt Service Reserve Fund of a Credit Facility shall, upon designation by an Authorized Representative of the Authority, accompanied by an opinion of Bond Counsel that such use in and of itself will not adversely affect the exclusion from gross income of interest on the respective Series of Bonds, be transferred (a) to the Debt Service Fund and used to pay interest on, principal of or to redeem such Bonds, or (b) to the Authority to be used to pay all or any portion of the Costs designated by the Authority and approved by Bond Counsel.

On or within five days after each Reserve Determination Date, the Trustee shall determine if the balance on deposit in each applicable account of the Debt Service Reserve Fund was, as of the Reserve Determination Date, at least equal to the applicable Debt Service Reserve Requirement. In making such determination, any obligations in the Debt Service Reserve Fund shall be valued in accordance with Section 6.12.

In the event the amount on deposit in the Debt Service Reserve Fund exceeds the applicable Debt Service Reserve Fund Requirement, the Trustee shall (a) transfer such excess to the Debt Service Fund to be used to pay interest and principal on Bonds on the next Interest

Payment Date, and (b) transfer such excess to the Authority to be used to pay all or any portion of Costs designated by the Authority and approved by Bond Counsel; provided, however, that if an Authorized Representative of the Authority calls for a Reserve Determination Date in connection with the refunding and/or defeasance of a Series of Bonds, then the Trustee is authorized to take such refunding and/or defeasance into account in valuing the Debt Service Reserve Fund securing such Series of Bonds and is further authorized to apply the amount of any surplus arising from such valuation to reduce the amount of the refunding bonds and/or to provide for the defeasance of the Bonds in such manner as the Authorized Representative of the Authority may direct.

The Trustee shall ascertain the necessity for a claim upon a Debt Service Reserve Fund Policy and provide notice to the Bond Insurer of any such claim in accordance with the Debt Service Reserve Fund Policy at least two Business Days prior to each Interest Payment Date. The Trustee shall without any direction from the Authority, transfer moneys from the Debt Service Reserve Fund to the Debt Service Fund or to any sinking, purchase or analogous fund to the extent that the moneys in the Debt Service Fund or any sinking, purchase or analogous fund may on any Interest Payment Date be insufficient to make the payments for which the Debt Service Fund or any sinking, purchase or analogous fund was established as the same shall become due. If and to the extent that cash has been deposited into the Debt Service Reserve Fund in addition to a Debt Service Reserve Fund Policy, all such cash shall be used (or investments purchased with such cash shall be liquidated and the proceeds applied as required) prior to any drawing under the Debt Service Reserve Fund Policy, and repayment of any Policy Costs shall be made prior to replenishment of any such cash amounts.

If, in addition to the Debt Service Reserve Fund Policy, any other reserve fund substitute instrument ("Additional Reserve Fund Policy") is provided, drawings on the Debt Service Reserve Fund Policy and any such Additional Reserve Fund Policy, and of repayment of Policy Costs and reimbursement of amounts due under the Additional Reserve Policy, shall be made on a pro rata basis (calculated by reference to maximum amounts available thereunder) after applying all cash available in the Debt Service Reserve Fund and prior to replenishment of any such cash draws, respectively.

If the Authority shall fail to pay any Policy Costs in accordance with the provisions of this Indenture, the Bond Insurer shall be entitled to exercise any and all remedies under this Indenture other than (i) acceleration of the maturity of the Bonds, or (ii) remedies which would adversely affect Bondholders.

The Trustee shall notify the Bond Insurer of any withdrawal from the Debt Service Reserve Fund due to a deficiency in any other fund or of any deficiency in the Debt Service Reserve Fund due to market fluctuation of the investments held therein.

Section 6.08 Rate Stabilization Fund. The Rate Stabilization Fund authorized by Section 6.01(8) shall be held by the Authority at one or more Authorized Depositories in a Fund separate and apart from all other Funds and Accounts of the Authority and payments therefrom shall be made as hereinafter provided. Moneys may be transferred by an Authorized Representative of the Authority to the Rate Stabilization Fund from the Revenue Fund as provided in Section 6.02 as determined by the Authorized Representative of the Authority. At

any time the Authority shall transfer from the Rate Stabilization Fund to the Revenue Fund an amount determined by an Authorized Representative of the Authority.

Section 6.09 Redemption Fund. The Authority may transfer to the Trustee for deposit to the credit of the Redemption Fund such amounts as it may elect for the purchase of Bonds or redemption of Bonds at the option of the Authority and the Trustee shall apply such moneys to the redemption of Bonds in the amounts directed, in writing, by the Authority. Upon any such purchase or redemption, the Trustee shall transfer from the Debt Service Fund to the Redemption Fund any amount deposited in the Debt Service Fund with respect to interest on the Bonds being redeemed and shall pay the interest due on the redemption date out of such moneys.

Section 6.10 Rebate Fund. The Rebate Fund is established with the Trustee separate and apart from the pledge of this Indenture. The Trustee shall make deposits to and disbursements from the Rebate Fund upon directions furnished by the Authority. The Authority will retain a Qualified Independent Consultant, experienced in preparing rebate reports, to assist the Authority with respect to rebate requirements related to the Bonds. The Trustee has undertaken no duty, and is under no obligation to calculate any amount due with respect to such rebate, to verify amounts contained in any written request or direction, or to make such payments.

Section 6.11 Other Funds and Accounts. The Authority may establish in each Supplemental Indenture such other Funds and Accounts as the Authority determines to be desirable.

Section 6.12 Authorized Investments. At the written direction of the Authority, signed by any two of its Chairperson or Vice Chairperson or Secretary or Assistant Secretary or Executive Director or Chief Financial Officer or Director of Finance, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, a certified copy of which shall be on file with the Trustee, moneys to the credit of the following Funds shall be invested by the Trustee in the following securities:

(a) Obligations of the United States of America or any of its agencies or instrumentalities backed by the full faith and credit of the United States of America; and short term obligations of the United States Government or its agencies or instrumentalities.

(b) Deposits in savings accounts or time deposits or share accounts of institutions insured by the Federal Deposit Insurance Corporation or the National Credit Union Share Investment Fund to the extent such accounts are so insured and for any amounts above the insured maximum if the approved collateral as provided by law shall be pledged by the depository (including pursuant to Pennsylvania Act 72 of 1971, as amended).

(c) Obligations, participations or other instruments of any Federal agency, instrumentality or United States government-sponsored enterprise, including those issued or fully guaranteed as the principal and interest by Federal agencies, instrumentalities or United States government-sponsored enterprises, if the debt obligations are rated at least "A" or its equivalent by at least two Rating Agencies.

(d) Repurchase agreements with respect to United States Treasury bills or obligations, participations or other instruments of or guaranteed by the United States or any Federal agency, instrumentality or United States government-sponsored enterprise.

(e) Negotiable certificates of deposit or other evidences of deposit, with a remaining maturity of three years or less, issued by a nationally or State-chartered bank, a Federal or State savings and loan association or a State-licensed branch of a foreign bank. For obligations with a maturity of one year or less, the debt obligations of the issuing institution or its parent must be rated in the top short-term rating category by at least two Rating Agencies. For obligations with a maturity in excess of one year, the senior debt obligations of the issuing institution or its parent must be rated at least "A" or its equivalent by at least two Rating Agencies.

(f) Bills of exchange or time drafts drawn on and accepted by a commercial bank, otherwise known as bankers' acceptances, if the bankers' acceptances do not exceed 180 days' maturity and the accepting bank is rated in the top short-term category by at least two Rating Agencies.

(g) Commercial paper issued by corporations or other business entities organized in accordance with Federal or State law, with a maturity not to exceed 270 days, if the issuing corporation or business entity is rated in the top short-term category by at least two Rating Agencies.

(h) Shares of an investment company registered under the Investment Company Act of 1940 (54 Stat. 789, 15 U.S.C. § 80a-1 et seq.) whose shares are registered under the Securities Act of 1933 (48 Stat. 74, 15 U.S.C. § 77a et seq.), if all of the following conditions are met: (1) the investments of the company are the authorized investments under this definition; (2) the investment company is managed in accordance with 17 CFR 270-2a7 (relating to money market funds); and (3) the investment company is rated in the highest category by a Rating Agency.

(i) Savings or demand deposits placed in accordance with the following conditions: (1) the money is initially deposited and invested through a federally insured institution having a place of business in the Commonwealth which is selected by the Authority; (2) the selected institution arranges for the redeposit of the money in savings or demand deposits in one or more financial institutions insured by the Federal Deposit Insurance Corporation for the account of the Authority; the full amount of principal and any accrued interest of each such deposit is insured by the Federal Deposit Insurance Corporation; and (4) on the same date that the money is redeposited pursuant to paragraph (2), the selected institution receives an amount of deposits from customers of other financial institutions equal to or greater than the amount of money initially invested through the selected institution by the Authority.

All investments shall mature or shall be subject to withdrawal, as the case may be, not later than the date required for the operation of such Fund and in no event later than the date or the number of months or years after the date of such investment or deposit as specified in the following columns:

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<u>Fund</u>	<u>Period of Investment</u>
Revenue Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Operating Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Construction Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Debt Service Reserve Fund	Not later than 5 years from the date of investment.
Operating Reserve Fund	Not later than 1 year from the date of investment.
Subordinate Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Subordinate Debt Service Reserve Fund	Not later than 5 years from the date of investment.
Rate Stabilization Fund	Not later than 1 year from the date of investment.
Redemption Fund	Not later than the day prior to the redemption date with respect to which such deposit has been made.
Rebate Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.

In any such case, the full purchase price (including accrued interest and premiums, if any) of obligations, shall be paid out of the Fund for which the investment was made. Upon a like direction by the Authority, or whenever the moneys in said Funds are to be applied and paid out pursuant to any provisions of this Indenture, or, whenever the Trustee shall deem such action to be advisable, the Trustee shall sell all or any part of the obligations in which the moneys in one or more such Funds shall be invested or withdraw moneys from such accounts or certificates of deposit, and the proceeds of such sale or the amount of such withdrawal shall be deposited to the credit of the respective Fund or Funds. Interest and income derived from any such investments or deposits shall be held and transferred as follows, unless otherwise directed by the Authority:

- (a) Revenue Fund – remain in that fund;

- (b) Operating Fund – remain in that fund;
- (c) Construction Fund – remain in that fund;
- (d) Debt Service Fund - remain in that fund;
- (e) Debt Service Reserve Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (f) Operating Reserve Fund - remain in that account to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (g) Subordinate Debt Service Fund - remain in that fund;
- (h) Subordinate Debt Service Reserve Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (i) Rate Stabilization Fund – remain in that fund;
- (j) Redemption Fund - transferred to Revenue Fund; and
- (k) Rebate Fund - remain in that fund.

Any loss resulting from any such investment shall be charged to the respective Fund or Funds, for which such investment was made. Obligations purchased as an investment of any of said Funds shall be deemed at all times to be a part of such Fund. The Trustee shall not be liable or responsible for any loss resulting from any investment made in accordance with the provisions of this Section or resulting from any sale by the Trustee of such investment made in accordance with instructions from the Authority.

Cash in each of the Funds and accounts therein and all certificates of deposit, repurchase agreements and investment agreements all as referred to in this Article, to the extent that the same is not insured or guaranteed by the Federal Deposit Insurance Corporation or other Federal agency, shall be continuously secured by a pledge of securities described in (a) and/or (b) of Section 6.12 hereof having an aggregate market value, exclusive of accrued interest in the case of certificates of deposit and including accrued interest in the case of repurchase agreements or other investment agreements, at all times at least equal to 100% (or 102 % in the case of repurchase agreements or investment agreements) of the balance on deposit (including interest earned in the case of repurchase agreements or investment agreements) in such Fund or account. Such securities shall be held by a Trustee or agent satisfactory to the Authority and to the Trustee. In the event the Authority determines that the market value of such security is determined by the Trustee to be less than the required amount, the Authority shall provide written instructions to Trustee to obtain additional security.

All Authorized Investments (except investment agreements) shall be valued by the Trustee as frequently as deemed necessary by a Bond Insurer, but not less often than annually, at the market value thereof, exclusive of accrued interest.

No later than 20 days before each Interest Payment Date, the Trustee shall advise the Authority of the amount of interest credited and to be credited to the Debt Service Fund prior to the next Interest Payment Date to enable the Authority to determine the amount to be transferred from the Revenue Fund on such Interest Payment Date.

Ratings of authorized investments shall be determined at the time of purchase of such authorized investments and the Trustee shall have no responsibility to monitor the ratings thereof. The Trustee may make any and all such investments through its own investment department or that of its affiliates or subsidiaries, and may charge its ordinary and customary fees for such trades, including cash sweep account fees. In the absence of investment instructions from the Authority, the Trustee shall not be responsible or liable for keeping the moneys held by it hereunder fully invested in authorized investments. The Trustee is not required to provide brokerage confirmations so long as the Trustee provides periodic statements that include investment activity to the Authority; provided that such statement is not required if (i) the Trustee is willing to provide broker confirmations or (ii) the investments permitted in the transaction are limited solely to investments for which brokerage confirmations are never issued or issued only at closing (i.e., state and local government obligations).

Section 6.13 Transfer of Funds and Accounts. On the First Effective Date, moneys in any Funds and Accounts in the Existing Senior Indenture maintaining the same name in this Indenture shall remain in such Funds and Accounts. The moneys in the Operation and Maintenance Account shall be transferred to the Operation Account hereunder. The moneys in the Renewal and Replacement Fund and the Depreciation Reserve Account shall be transferred to the Revenue Fund.

ARTICLE VII

RATE COVENANT AND PARTICULAR COVENANTS

Section 7.01 Authority Rate Covenant.

(a) From the First Effective Date through the Tested Fiscal Year (as hereinafter defined) ending December 31, 2018, the Rate Covenant set forth in Section 7.01 of the Existing Senior Indenture shall remain in effect. This means that in 2018, the Authority will calculate whether the Rate Covenant in Section 7.01 of the Existing Senior Indenture was complied with in the 2017 Fiscal Year, and in 2019, the Authority will calculate whether the Rate Covenant in Section 7.01 of the Existing Senior Indenture was complied with in the 2018 Fiscal Year.

(b) Beginning on January 1, 2019 and thereafter, the Rate Covenant set forth in 7.01(c) below shall be in effect. This means that in 2020, the Authority will calculate whether the Rate Covenant in Section 7.01(c) below was complied with in the 2019 Fiscal Year.

(c) The Authority shall fix, charge and collect such rates, fees and other charges for the use of and the services furnished by the System and shall, from time to time and as often as shall appear necessary, revise such rates, fees and other charges so as to satisfy all of the following three independent requirements:

(i) Rate Covenant Net Revenues shall be sufficient in each Fiscal Year (the "Tested Fiscal Year") to pay (A) Annual Debt Service on Senior Debt in such Fiscal Year, (B) any amount necessary to be deposited in any Series Debt Service Reserve Account to restore the amount on deposit therein to the applicable Series Debt Service Reserve Requirement, (C) Annual Debt Service on Subordinate Debt in such Fiscal Year (including reserves in connection therewith and the required restoration thereof), (D) any amount required to be deposited in the Operating Reserve Fund to cause the required balance therein to equal the Operating Reserve Requirement, and (E) all other amounts which the Authority may by law or contract be obligated to pay; and

(ii) Rate Covenant Net Revenues in each Fiscal Year shall equal not less than: (A) 125% of the Annual Debt Service with respect to Senior Debt for such Fiscal Year; plus (B) 110% of the aggregate Annual Debt Service with respect to Subordinate Debt for such Fiscal Year; and

(iii) Rate Covenant Net Revenues, excluding transfers from the Rate Stabilization Fund to the Revenue Fund (as provided in Section 6.08 hereof) and the proceeds of Grants, shall equal not less than 100% of Annual Debt Service on Senior Debt and Subordinate Debt for such Fiscal Year.

The Authority shall test for compliance with this Section 7.01(c) within 120 days after the end of each Fiscal Year.

(d) If, subject to the provisions of subsection (e) below, the Rate Covenant Net Revenues are less than the amounts specified in (c) above, the Authority must take appropriate action under the law and subsection (f) below within its powers to revise the Authority's rates, fees and other charges or the method of operation of the System in order to satisfy the foregoing requirements in the next Fiscal Year following the Tested Fiscal Year.

(e) For purposes of this Section, the Authority shall not be deemed to have failed to comply with the Rate Covenant and shall not be required to implement the procedures set forth in subsection (d) hereof, if an Authorized Representative of the Authority certifies in writing that the Rate Covenant Net Revenues the Authority would have received in the Tested Fiscal Year would have been sufficient to meet the requirements of subsection (c) hereof if the Revenues for the Tested Fiscal Year were determined by giving effect for the entire Tested Fiscal Year to any increase or decrease in rates, fees, rentals or other charges already authorized by the Authority to be implemented on a date that is within 120 days after the end of the Tested Fiscal Year.

(f) If the Authority fails to comply with the Rate Covenant, the Authority shall promptly request a Qualified Independent Consultant to submit a written report and recommendations with respect to increases in the Authority's rates, fees and other charges and improvements in the operations of and the services rendered by the System and the Authority's accounting and billing procedures necessary to bring the Authority into compliance with the Rate Covenant. Any failure to meet the Rate Covenant will not constitute an Event of Default under this Indenture if within 180 days after the end of the Tested Fiscal Year, (1) the report and recommendations of the Qualified Independent Consultant shall be filed with the Authority, and (2) the Authority shall revise its rates, fees and charges, and alter its operations and services to

conform with the report and recommendations of the Qualified Independent Consultant to the extent permitted by law. Notwithstanding clause (2) in the prior sentence, to the extent that the Authority's rates are governed by an external regulatory body, an Event of Default will not be deemed to have occurred if the Authority files with said regulatory body within 180 days after the end of the Tested Fiscal Year a petition to revise its rates, fees and charges to a level sufficient to achieve compliance with the Rate Covenant in future years. If, in response to such petition, the regulatory body establishes rates, fees and charges, within 180 days of the date the petition is filed, that are expected by the Authority to achieve future compliance with the Rate Covenant, then an Event of Default will not have occurred. If, in response to such petition, the regulatory body (a) does not establish rates fees and charges within 180 days of the petition being filed or (b) establishes rates, fees and charges that are not expected by the Authority to achieve future compliance with the Rate Covenant, then an Event of Default will have occurred.

(g) If the Authority fails to make a deposit required by Section 6.02 to the Interest Account or the Principal Account (or the Sinking Fund Account, as applicable), or if there is a deficiency in the Debt Service Reserve Fund for which the Authority has not made required restoration payments for three consecutive months, the Authority shall promptly request a Qualified Independent Consultant to submit a written report and recommendations with respect to increases in the Authority's rates, fees and other charges and improvements in the operations of and the services rendered by the System and the Authority's accounting and billing procedures necessary to bring the Authority into compliance with the Rate Covenant. The report and recommendations shall be filed with the Authority within 60 days from the date of discovery of failure to make the required deposits, and within 90 days from the receipt of such report, the Authority shall revise its rates, fees and charges, and alter its operations and services to conform with the report and recommendations of the Qualified Independent Consultant to the extent permitted by law.

Section 7.02 Principal and Interest; Cancellation. The Authority will punctually pay the principal of (and premium, if any) and interest on each of the Bonds issued hereunder and secured hereby on the dates, at the places and in the manner specified herein and in said Bonds. All Bonds paid, redeemed or purchased, shall be cancelled by the Trustee. All such Bonds so cancelled may at any time be destroyed by the Trustee.

Section 7.03 No Extension of Payment. The Authority will not directly or indirectly extend or assent to the extension of the time of payment of any claim for interest upon any of the Bonds by purchasing or funding such claim or by any other arrangement, and, in case the time for payment of any such claim for interest shall be extended, such claim shall not be entitled, in case of any default hereunder, to the benefits of this Indenture, or to any payment out of the assets of the Authority, except subject to the prior payment of the principal of all Bonds issued and Outstanding hereunder, and of such portion of the accrued interest thereon as shall not be represented by such extended claims.

Section 7.04 Appointment of Trustee. The Authority hereby irrevocably appoints the Trustee as its agent to maintain an office or agency at its corporate trust office in the City, where Bonds may be presented for registration and transfer and where notices, presentations and demands in respect to the Bonds, or of this Indenture, may be served. The Trustee shall not be under any liability to the Authority or to any other corporation or person in

respect of any such presentation, demand or notice. The Authority shall have the right to appoint a Paying Agent to perform any of the Trustee's duties hereunder with respect to the authentication, transfer, exchange or payment of the Bonds hereunder.

Section 7.05 Corporate Existence. The Authority is duly authorized under its certificate of incorporation and all applicable laws to issue the Bonds and execute and deliver this Indenture and to pledge the Revenues pledged hereby, and all corporate action on its part to that end has been duly and validly taken; this Indenture is and will be a legal, binding and enforceable instrument in accordance with its terms except to the extent that the enforcement of the remedies provided for herein may be limited by bankruptcy laws or the Act; and the Bonds are and will be valid and binding obligations of the Authority entitled to the benefits and security of this Indenture. The Authority will at all times preserve and protect the security of the Bonds and the rights of the Trustee and the Bondholders hereunder.

Section 7.06 Compliance with Act; Maintenance of Existence. The Authority will at all times comply with the laws of the Commonwealth applicable to the Authority, particularly the Act and its amendments and supplements, and it will take such actions and proceedings as may be required, from time to time, to preserve its corporate existence, rights and franchises.

Section 7.07 Liens; Sale of Assets. So long as any of the Bonds secured hereby are Outstanding, none of the Revenues shall be used for any purpose other than as provided in this Indenture, and no contract or contracts will be entered into or any action taken by which the rights of the Trustee or of the Bondholders might be impaired or diminished.

The Authority will not voluntarily create or permit to be created any debt, lien or charge on a parity with (except pursuant to Section 3.03 hereof) or having priority over the lien of this Indenture upon any of the Revenues pledged hereby or any other revenues or other amounts at any time pledged for the payment of the Bonds. The Authority will not sell or otherwise dispose of or encumber the System or any part thereof except as herein otherwise having provided. No sale or other disposition of fixed properties having a fair market value in excess of One Million Dollars (\$1,000,000) shall be made unless the Consulting Engineer shall first have filed his certificate with the Authority and the Trustee recommending such sale or other disposition of said fixed properties and shall have stated in such certificate that the sale or other disposition of said properties is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the System. If, after receiving the certificate of the Consulting Engineer, the Authority determines to sell or otherwise dispose of said fixed properties, it shall by Resolution of the Authority adopted by a majority vote of a quorum of the Board, authorize such sale or other disposition and shall file a certified copy of such Resolution of the Authority with the Trustee.

The proceeds from such sale or other disposition of any such fixed properties shall be deposited in the Revenue Fund.

The Authority may from time to time sell or otherwise dispose of property other than fixed property included in the System if the Authority shall determine that the sale or other

disposition of such property is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the System. The proceeds from the sale or other disposition of such property shall be deposited in the Revenue Fund.

In case the Authority shall have acquired any property constituting part of the System within or after the period for which any calculation of Net Revenues is made there shall be included in ascertaining the Net Revenues for such period, the net earnings or net losses, as the case may be, of such property for the whole of such period to the extent the same may not have been otherwise included. The net earnings or net losses, as the case may be, of such property for the period preceding its acquisition by the Authority shall be computed as if such property had been operated by the Authority during such period. If within or after the period for which any such calculation is made, the Authority shall have disposed of any property constituting part of the System, then the net earnings or net losses, as the case may be, of such property for the whole of such period shall be excluded, to the extent the same may not have been otherwise excluded, in ascertaining the Net Revenues for such period. If the rates, rents and charges during all or any part of the period for which any such calculation is made shall be different from the rates, rents and charges which are in effect at the time such calculation is made, there shall be added to or deducted from the Net Revenues so calculated, any increase or decrease of the Revenues for such period which would result from the computation of such Revenues on the basis of the rates, rents and charges in effect at the date of said calculation, rather than the rates, rents and charges which were actually in effect during that period.

Section 7.08 Payment of Taxes and other Governmental Charges. The Authority will pay all taxes, assessments and other governmental charges lawfully imposed upon its properties or the Revenues when the same shall become due as well as all lawful claims for labor, material and supplies, which, if unpaid, might by law become a lien or charge on the System or the Revenues or any part thereof prior to or on a parity with the lien hereof, or which might impair the security of this Indenture, so that the priority and security of this Indenture shall be preserved, provided that nothing in this Section contained shall require the Authority to pay and discharge any such tax, assessment, charge or claim so long as the validity thereof shall be contested in good faith by appropriate proceedings diligently conducted (unless and until foreclosure, distraint, sale or other similar proceedings shall have been commenced) and if such reserves or other appropriate provisions, if any, as shall be required by generally accepted accounting principles shall have been made therefor.

Section 7.09 Insurance of System. The Authority will at all times cause all the property of the System which is of a character usually insured by persons operating properties of a similar nature to be properly insured and kept insured by a reputable insurance company or companies against loss or damage by fire or other hazards to the extent that such properties are usually insured by persons operating properties of a similar nature in the same or similar localities. All policies shall be so written that the Trustee will be notified of cancellation or amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. In case the Trustee shall at any time notify the Authority in writing that it disapproves of any insurance company issuing a policy of insurance covering any one or more such risks, the Authority will forthwith affect other insurance with companies satisfactory to the Trustee.

All such policies shall be for the benefit of the Trustee and the Authority as their interests may appear. All policies shall provide that claims in excess of \$5,000,000 shall be made payable to the Trustee and shall be deposited with the Trustee and the Trustee shall have the sole right to receive the proceeds of such policies and to collect and receipt for claims in excess of \$5,000,000 thereunder. The Trustee may accept as conclusive the adjustment of any loss or losses by the Authority and any insurance company. The proceeds of all such policies paid to the Trustee shall be held by it as additional security hereunder until paid out by it as herein provided. All claims of \$5,000,000 or less shall be paid to the Authority.

Section 7.10 Damage, Destruction or Condemnation of System; Application of Proceeds. In the event of any damage to the System covered by insurance or condemnation or taking by eminent domain of any part of the System for which the cost of repair or replacement shall exceed \$5,000,000, the proceeds shall be deposited in the Revenue Fund and the Authority shall promptly notify the Trustee and file with the Trustee a Consulting Engineer's certificate stating whether, in the signer's opinion, it is practicable and advantageous to repair or replace the damaged or condemned property. If the certificate states that repair or replacement is practicable and advantageous, the Consulting Engineer shall, if appropriate, prepare and file with the Trustee plans and specifications therefor with an estimate of the cost thereof, and the insurance or condemnation proceeds, if any, shall be transferred to the Operating Fund and applied thereto. If the certificate states that the repair or replacement is not practical and advantageous, the proceeds shall be remain deposited in the Revenue Fund or, at the option of the Authority, be transferred to the Redemption Fund for the extraordinary redemption of Bonds as hereinafter provided.

The Bonds are subject to redemption without premium at any time, in whole or in part, within a maturity by lot, by the Authority upon the occurrence of any condemnation or taking or damage or injury of the nature set forth in this Article, from the proceeds collected as a result of such damage, injury or taking. In all cases of redemption under this Section, including redemptions resulting from the damage, destruction or condemnation of equipment, the Authority shall cause to be filed with the Trustee the certificate of the Consulting Engineer referred to above, determining that repair, reconstruction or replacement is not practicable, desirable or financially feasible. In the event that less than all of the Bonds outstanding are to be redeemed, the Authority shall furnish to the Trustee a Consulting Engineer's Certificate stating (i) that the property forming a part of the System that was damaged or injured or taken by such condemnation proceedings is not essential to the operation of the System and that the continued operation of the remaining System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption, or (ii) that the System has been restored to a condition substantially equivalent to its condition prior to the occurrence of such damage, injury or condemnation, and that continued operation of the System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption. For purposes of this Section 7.10, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Indenture.

Section 7.11 Employment of Consulting Engineer; Reports. The Authority will employ a Consulting Engineer to perform such duties as are imposed on the Consulting Engineer by the provisions of this Indenture.

It shall be the duty of the Consulting Engineer, in addition to the other duties prescribed elsewhere in this Indenture, to prepare and file with the Authority and with the Trustee on or before thirty days prior to the beginning of each Fiscal Year thereafter, a report setting forth the following:

(a) Advice and recommendations as to the proper maintenance, repair and operation of the System during the next Fiscal Year and an estimate of the amounts of money that should be expended for such purposes;

(b) Advice and recommendations as to the Capital Additions that should be made during the next Fiscal Year, and an estimate of the amount of money that is recommended for such purposes; and

(c) Whether the properties of the System have been maintained in good repair and sound operating condition and the Consulting Engineer's estimate of the amount, if any, required to place such properties in such condition and the details of such expenditures and the approximate time required therefor.

Section 7.12 Adoption of Annual Budget. The Authority covenants that it will on or before each December 31, prior to the beginning of each Fiscal Year thereafter, prepare and adopt a budget of Current Expenses for the next Fiscal Year, which budget shall contain an estimate of the Revenues to be derived for the period covered by such budget, and a copy of such budget shall be promptly filed with the Trustee and each Bond Insurer. Any budget may be amended from time to time by the Authority and such amended budget shall be promptly filed with the Trustee and each Bond Insurer. The annual budget shall also be filed, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of the annual budget with EMMA and placement of the annual budget on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section.

Until the adoption of the annual budget of Current Expenses for a particular Fiscal Year, the budget for the preceding Fiscal Year shall be deemed to be in force for such particular Fiscal Year.

Section 7.13 Maintenance of System. The Authority will at all times maintain or cause to be maintained the System and every part thereof in good repair, working order and condition, will continuously operate the same and will, from time to time, make or cause to be made all needful and proper repairs, renewals and replacements so that the aggregate efficiency and capacity of the System shall at no time be unreasonably impaired or reduced.

Section 7.14 Employment of Independent Auditor; Annual Financial Report. Authority covenants that it has employed and will continue to employ an Independent Auditor to perform such duties as are imposed on the Independent Auditor by this Indenture.

The Authority has caused an accurate system of accounts to be installed as recommended by its Independent Auditor. The Authority will keep proper books of record and accounts in which complete and correct entries shall be made of all its dealings and transactions in accordance with generally accepted accounting principles, consistently applied. On or before

May 1 of each year, the Authority will furnish to the Trustee and each Bond Insurer, and to any Holder of any of the Bonds, at the written request of such Holder, a copy of its audit report for the preceding Fiscal Year. The Authority shall also file said audit report, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of said audit with EMMA and placement of said audit on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section. Said audit report shall, in each instance, have been prepared by an Independent Auditor after having made an audit of the Authority's books and accounts pertaining to the System for such year and shall include therein for the year in question a statement as to whether the schedule of rates then in effect complies with the covenants contained in Section 7.01.

Section 7.15 Advances by Trustee. If the Authority shall fail to perform any of the covenants contained in this Article, the Trustee or any Bondholder through the Trustee may, but has no duty to, make advances to perform the same on behalf of the Authority, but shall be under no duty so to do; and all sums so advanced shall be at once repayable by the Authority and shall bear interest at the Prime Rate until paid, and shall be secured hereby, having the benefit of a lien hereby created on a parity with the Bonds, but no such advances shall be deemed to relieve the Authority from any default hereunder.

Section 7.16 Further Assurances. The Authority shall execute and deliver such further instruments and do such further acts as may be necessary or proper to carry out more effectually the purposes of this Indenture and the transfer to any new trustee of the estate, powers, instruments or funds held in trust hereunder. The Authority shall, on an ongoing basis, execute and deliver all documents and make or cause to be made all filings and recordings necessary or desirable in order to perfect, preserve and protect the interest of the Trustee in the Trust Estate to the extent possible under applicable law. The Trustee shall not be responsible for and makes no representation as to the legality, effectiveness or sufficiency of any security document or for the creation, perfection, priority or protection of any lien securing the Bonds. The Trustee shall not be responsible for filing any financing or continuation statement or recording any documents or instruments in any public office at any time or otherwise for perfecting or maintaining the perfection of any lien or security interest in the trust estate it being understood that the Authority shall be obligated to make such filings on behalf of the Trustee and provide a copy of the filed initial financing statement to the Trustee.

Section 7.17 Construction of Construction Projects; Operation of System. The Authority covenants that upon the completion of any Construction Project it will operate and maintain the same as a part of the System. The Authority further covenants that it will operate the System in an efficient and economical manner.

Section 7.18 Covenant Against Encumbrances. The Authority further covenants that it will duly observe and comply with all valid requirements of any governmental authority relative to the System, that it will not create or suffer to be created any lien or charge upon the System or any part thereof, other than as provided in this Indenture, and that it will pay or cause to be discharged, or will make adequate provision to satisfy and discharge all lawful claims and demands for labor, materials, supplies or other objects which, if unpaid, might by law become a lien upon the System or any part thereof or the Revenues; provided, however, that nothing contained in this Section shall require the Authority to pay or cause to be discharged, or make

provisions for, any such lien or charge so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings.

Section 7.19 Use of Revenues. The Authority covenants and agrees that, so long as any of the Bonds secured hereby shall be Outstanding, none of the Revenues will be used for any purpose other than as provided in this Indenture, and that no contract or contracts will be entered into or any action taken to impair or diminish the rights of Holders of the Bonds.

Section 7.20 No Free Service. Except as provided in Section 7.01 hereof, the Authority will not render or cause to be rendered any free services of any nature by the facilities of the System nor will any preferential rates be established for users of the same class, excluding (a) as provided in the Cooperation Agreement, the rates, fees or charges for services rendered to the City including its departments, agencies and instrumentalities and the Authority's reimbursement of the City for equalization payments made by the City to a private utility which serves customers in a portion of the City, and (b) the provision to several municipalities of conveyance without charge of storm water and sanitary sewer flows through Authority trunk lines to the Allegheny County Sanitary Authority.

Section 7.21 Failure of Customers to Pay; Enforcement of Collections. The Authority will diligently enforce and collect the rates, fees and other charges from customers for the services of the System; will take all steps, actions and proceedings for the enforcement and collections of such rates, fees and charges as shall become delinquent to the full extent permitted or authorized by law; and will maintain accurate records with respect thereto. All such rates, fees, charges and revenues herein pledged shall, as collected, be held in trust to be applied as provided in this Indenture and not otherwise.

Section 7.22 Covenants with Bond Insurers, Letter Credit Banks, Liquidity Facility Issuer, etc. The Authority may make such covenants and agreements in a Supplemental Indenture and related documents as it may determine to be appropriate with any Bond Insurer, Letter of Credit Bank, Liquidity Facility Issuer, or other financial institution that agrees to insure or to provide credit or liquidity support to enhance the security or the value of any Bonds.

Section 7.23 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered Owners, from time to time, of the Bonds that no part of the proceeds of the Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the Bonds, would have cause the Bonds to be arbitrage bonds within the meaning of Section 148 of the Code, and that it will comply with the requirements of that section and the regulations throughout the term of the Bonds. In the event the Authority is of the opinion that is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in any Tax Regulatory Certificate are incorporated herein.

ARTICLE VIII

EVENTS OF DEFAULT AND REMEDIES

Section 8.01 Events of Default. Each of the following events is hereby declared an "Event of Default" for any Bond issued hereunder:

(a) failure by the Authority to pay the principal of, or the premium (if any) payable upon the redemption of, any Bond when due and payable either at maturity, declaration, or by proceedings for redemption, or otherwise (no effect being given to payments made under a Bond Insurance Policy); or

(b) failure by the Authority to pay any installment of interest on any Bond when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(c) the entry of an order or decree appointing a receiver or receivers of the System or of the Revenues with the consent or acquiescence of the Authority, or, if such order or decree shall have been entered without the acquiescence or consent of the Authority, the failure of the Authority to cause such order or decree to be vacated or discharged or stayed on appeal within ninety (90) days after entry; or

(d) the institution of any proceeding with the consent or acquiescence of the Authority for the purpose of effecting a composition between the Authority and its creditors, or for the purpose of adjusting the claims of such creditors pursuant to any Federal or Commonwealth statute now or hereafter enacted, if the claims of such creditors are under any circumstances payable out of the Revenues, or if such proceeding shall have been instituted without the consent or acquiescence of the Authority, the failure of the Authority to have such proceeding withdrawn, or any order entered therein vacated or discharged, within ninety (90) days after the institution of such proceeding or the entry of such order; or

(e) the entry of a final judgment against the Authority, which judgment constitutes or could result in a lien or charge upon the System or the Revenues, or which materially and adversely affects the ownership, control or operation of the System, if such judgment shall not be discharged within ninety (90) days from the entry thereof, or if an appeal shall not be taken therefrom, or from the order, decree or process upon which or pursuant to which such judgment was granted or entered, in such manner as to conclusively set aside the execution or levy under such judgment, order, decree or process, or the enforcement thereof; or

(f) the failure or refusal of the Authority to comply with any provisions of the Act applicable to the Authority, or the rendering of the Authority, for any reason, incapable of fulfilling its obligations hereunder or thereunder; or

(g) the failure of the Authority to observe any other covenant, condition or agreement of the Authority contained in the Bonds or in this Indenture and the continuation of such failure for a period of sixty (60) days after written notice of such failure from the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then outstanding, provided that, the failure of the Authority to meet the rate covenant set forth in

Section 7.01 hereof shall not constitute an Event of Default hereunder, and provided further that if such failure is not capable of being remedied within sixty (60) days after such notice, no Event of Default shall exist if the Authority commences the actions necessary for the cure of such failure within such sixty (60) day period and diligently pursues such actions thereafter; or

(h) failure by the Authority to pay principal of, or the premium (if any) payable upon the redemption of any Subordinate Debt when due and payable either at maturity, or otherwise or to pay any installment of interest on any Subordinate Debt when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(i) the Trustee shall have received written notice from a Letter of Credit Bank that an Event of Default shall have occurred under the Reimbursement Agreement, with a direction from the Letter of Credit Bank to the Trustee to accelerate the principal and interest on the respective Series of Bonds secured by such Letter of Credit Bank's Letter of Credit; or

(j) any acceleration of the payment of principal of any Series of Bonds or the payment of Reimbursement Obligations pursuant to Section 8.02 shall have occurred; or

(k) failure by the Authority to pay the principal of any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement; or

(l) failure by the Authority to pay any installment of interest on any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement.

The Trustee shall (i) provide immediate notice to each Bond Insurer of the occurrence of an Event of Default under clause (a), (b), (i) or (j) above and (ii) provide notice to each Bond Insurer of any other Event of Default known to the Trustee within thirty (30) days of the Trustee's knowledge thereof.

Section 8.02 Acceleration of Principal. Upon the occurrence and continuance of any Event of Default described in Section 8.01, the Trustee may, and at the written request of Bondholders of not less than 25% in Principal Amount of the Bonds then Outstanding, shall by written notice to the Authority, declare the Bonds to be immediately due and payable, whereupon they shall, without further action, become and be immediately due and payable, anything in this Indenture or in the Bonds to the contrary notwithstanding, and the Trustee shall give notice thereof to the Authority and shall give notice thereof by certified mail to all Holders of Outstanding Bonds.

A Bond Insurer or a Letter of Credit Bank securing a Series of Bonds, provided the Bond Insurer or Letter of Credit Bank is not in default under its Bond Insurance Policy or Letter of Credit, may exercise all rights of the Bondholders of such Series under this Article VIII, including without limitation giving notice, making a request, giving a direction or giving a waiver under Section 8.01(g), Section 8.02, Section 8.03, Section 8.04 and Section 8.08. That is, the Bond Insurer or Letter of Credit Bank may, in such cases, vote the Bonds of the Bondholders of the Series secured by such Bond Insurer or Letter of Credit Bank, as the case may be. If a Series of Bonds is both insured by a Bond Insurance Policy and secured by a Letter of Credit, the

Bond Insurer shall exercise such rights not the Letter of Credit Bank. In any such cases, the Trustee shall not take direction by the Owners of the Bonds of such Series.

In addition, the Trustee shall be entitled to exercise any or all of the remedies granted to a trustee or under a Bond Insurance Policy, a Credit Facility or the Act.

The above provision, however, is subject to the condition that if, after the principal of said Bonds shall have been so declared to be due and payable, all arrears of interest, if any, upon the Bonds and interest on overdue installments of interest at the rate of interest specified therein, and the principal of all Bonds which have matured other than by reason of such declaration, shall have been paid by the Authority, and the Authority shall also have performed all other things in respect to which it may have been in default hereunder, and shall have paid the reasonable charges of the Trustee and its counsel and of the Holders of said Bonds, including reasonable attorneys' fees paid or incurred, then, and in every such case, the Holders of not less than a majority in aggregate Principal Amount of the Bonds then outstanding, by written notice to the Authority and to the Trustee, may waive such default and its consequences and such waiver shall be binding upon the Trustee and upon all Holders of Bonds issued hereunder; but no such waiver shall extend to or affect any subsequent default or impair any rights or remedy consequent thereon.

Section 8.03 Remedies of Trustee and Bondholders; Rights of Entry. Subject to Sections 8.02 and 9.06, upon the happening and during the continuance of any event of default specified in Section 8.01, then and in every such case, the Trustee may and, upon written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding, shall enter into and upon and take possession of the System and each and every part thereof as for a condition broken and may exclude the Authority, its agents and employees and all persons claiming under them wholly therefrom and have, hold, use, operate, manage and control the same and each and every part thereof, and in the name of the Authority or otherwise as the Trustee shall deem best, conduct the business thereof and exercise all the rights and powers of the Authority with respect to the System and use all its then existing property, assets and franchises for that purpose and out of the Revenues, maintain, restore, insure and keep insured, the System against such hazards as are ordinarily insured against by a person operating a water, stormwater and sewer system similar to the System and from time to time may make all such necessary or proper repairs as to it may seem expedient, and establish, levy, maintain and collect such rates, rents and charges in connection with the System as it may deem necessary, proper, desirable and reasonable, and collect and receive all Revenues, and after deducting therefrom the expenses of operation, maintenance and repair and all expenses incurred hereunder and all other proper outlays herein authorized and all such payments which may be made for insurance and other proper charges, including just and reasonable compensation for its own services, and for the services of such attorneys, agents and employees as it may, in the exercise of its discretion, employ for any of the purposes aforesaid, the Trustee shall apply the rest and residue of the moneys received by it, as well as all cash and investments held by the Trustee in any fund hereunder, subject to the provisions hereof with respect to claims for principal and interest, to the payment of the principal of and interest on the Bonds. Whenever all that is due upon such Bonds and installments of interest and under any of the terms of this Indenture shall have been paid or deposited with the Trustee and all defaults made good, the

Trustee in possession shall surrender possession to the Authority, its successors or assigns. However, the same right of entry shall exist upon any subsequent default or defaults.

Section 8.04 Judicial Action. In case of the breach of any of the covenants or conditions of this Indenture, the Trustee shall have the right and power to take appropriate judicial proceedings for the enforcement of its rights and the rights of the Bondholders hereunder, including, as appropriate, an action in mandamus. Upon the happening of an event of default hereunder, the Trustee may either after entry, or without entry, proceed by suit or suits, actions or special proceedings at law or in equity to enforce its rights and the rights of the Bondholders hereunder, and it shall be obligatory upon the Trustee to take action to that end, either by such proceedings or by the exercise of its powers with respect to entry or otherwise, as it may determine, upon being requested to do so by the Holders of twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder and upon being indemnified as hereinafter provided.

No remedy by the terms of this Indenture conferred upon or reserved to the Trustee or to the Bondholders is intended to be exclusive of any other remedy, but each and every such remedy shall be cumulative and shall be in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or by statute.

The Holders of a majority in aggregate Principal Amount of the Bonds then Outstanding hereunder, at any time, by an instrument in writing executed and delivered to the Trustee, may reasonably direct the method and place of conducting all proceedings to be taken for the enforcement of any of the rights of the Bondholders; provided that such direction shall not be otherwise than in accordance with the provisions of law or of this Indenture.

Section 8.05 Payments by Authority. The Authority covenants that if any default shall be made in the payment of the principal of or interest on any Bond hereby secured when the same shall become payable, the Authority will pay to the Trustee, upon demand, for the benefit of the Holders of the Bonds so in default, the whole amount then due and payable for principal and interest, with interest upon the overdue principal and upon the overdue installments of interest at the rate of interest specified in the Bonds from the date of default to the date of payment; and in case the Authority shall fail to pay the same forthwith upon such demand, the Trustee in its own name and as trustee of an express trust shall be entitled to sue for and to recover judgment for the whole amount so due and unpaid.

Section 8.06 Application of Moneys. Any moneys received by the Trustee or by any receiver from the operation of the System, shall, after payment of the costs and expenses of the operation thereof, be applied,

First: to the payment of the fees, counsel fees and expenses of the Trustee and of the receivers, if any, and all costs and disbursements allowed by the court, if there be any court action.

Second: to the payment of the whole amount of principal and interest which shall then be owing or unpaid upon the Bonds, or to the payment of the whole amount of any Reimbursement Obligations which shall then be owing or unpaid, then to the payment of such

principal and interest or Reimbursement Obligations ratably, without preference or priority of principal over interest or Reimbursement Obligations, Reimbursement Obligations over principal or interest or of interest over principal or Reimbursement Obligations or of any installment of interest over any other installment of interest and without preference or priority of any such payments over Periodic Payments (such principal and interest on Bonds, amounts owing under Reimbursement Obligations and Periodic Payments to be paid ratably).

Third: to the payment of the surplus, if any, to the Authority, or to whoever is lawfully entitled to receive the same or as a court of competent jurisdiction may direct.

Section 8.07 Trustee's Rights. Any right of action under this Indenture, or under any of the Bonds, may be enforced by the Trustee without the possession of any of the Bonds or the production thereof on any trial or other proceedings relative thereto and any such suit or proceeding instituted by the Trustee shall be brought in its name as Trustee and any recovery of judgment shall be for the equal benefit of the registered Owners of the Bonds in respect of which such judgment shall have been recovered, subject to the provisions hereof with respect to extended claims for interest.

Section 8.08 Limitations on Bondholders. No Holder of any Bonds shall have any right to institute any suit, action, or proceeding in equity or at law for the enforcement of this Indenture or for the execution of any trust hereof or for the appointment of a receiver or to exercise any other remedy hereunder, unless such Holder shall have previously given to the Trustee written notice of an event of default and of the continuance thereof as hereinbefore provided nor unless also the Holders of at least twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder shall have made written request of the Trustee and shall have offered it reasonable opportunity either to proceed to exercise the powers hereinbefore granted or to institute such action, suit or proceeding in its own name nor unless also they shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liability to be incurred therein or thereby; and such notification, request and offer of indemnity are hereby declared in every such case at the option of the Trustee to be conditions precedent to the execution of the powers and trusts of this Indenture or for the appointment of a receiver or for any other remedy hereunder; it being understood and intended that no one or more holders or registered Owners of the Bonds shall have any right in any manner whatsoever to affect, disturb or prejudice the lien of this Indenture by his own or their action or to enforce any right hereunder except in the manner herein provided, and that all such proceedings at law or in equity shall be instituted, had and maintained in the manner herein provided and for the benefit of all Holders of outstanding Bonds, subject to the provisions hereof with respect to claims for interest.

Subject to the following paragraph, nothing in this Article shall, however, affect or impair the right of any Bondholder which is absolute and unconditional, to enforce the payment of the principal and interest of such Bondholder's Bonds, or the obligation of the Authority which is also absolute and unconditional, to pay the principal of and interest on each of the Bonds issued hereunder to the respective holders or registered Owners thereof at the time and place in said Bonds expressed.

Section 8.09 Waiver by Authority. The Authority may waive any period of grace provided for in this Article.

Section 8.10 Waiver of Default; Delay or Omission of Trustee. No waiver of any default hereunder, whether by the Trustee, a Bond Insurer or the Bondholders shall extend to or shall affect any subsequent default or shall impair any rights or remedies consequent thereon. No delay or omission of the Trustee, a Bond Insurer or of any Holders of Bonds hereby secured to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default, or acquiescence therein; and every right, power and remedy given by this Indenture to the Trustee, a Bond Insurer or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee, the Bond Insurer or in an appropriate case, by the Bondholders.

In case the Trustee shall have proceeded to enforce any right under this Indenture by entry or otherwise, and such proceedings shall have been discontinued or abandoned for any reason, or shall have been determined adversely to the Trustee, then and in every such case the Authority and the Trustee shall be restored to their former positions and rights hereunder with respect to the pledged revenues, and all rights, remedies and powers of the Trustee shall continue as if no such proceedings had been taken.

Section 8.11 Appointment of Receiver. Subject to Section 8.02, as provided by the Act, as amended, the Trustee shall be entitled as a matter of right to the appointment of a receiver, and the Trustee, the Bondholders, the Bond Insurer of any Bonds, any receiver so appointed and any Letter of Credit Bank then supporting any Series of Bonds with a Letter of Credit shall have all such rights and powers and shall be subject to such limitations and restrictions as are contained in the Act.

Section 8.12 Limitation on Rights to Transfer. It is expressly understood and agreed that nothing in the provisions of the Bonds or in this Indenture shall be taken to authorize the Trustee, or any receiver appointed hereunder to operate and maintain the System, or to sell, assign, mortgage or otherwise dispose of any of the assets of whatever kind and character belonging to the Authority.

Section 8.13 Issuer of Bond Insurance Policy as Subrogee of Holders of Bonds. Any Bond delivered to the Bond Insurer pursuant to the Bond Insurance Policy shall be deemed to continue to be Outstanding under and secured by this Indenture.

ARTICLE IX

CONCERNING THE TRUSTEE

Section 9.01 Acceptance of Trust. The Trustee shall, prior to an Event of Default, and after the curing of all Events of Default which shall have occurred, perform such duties and only such duties as are specifically set forth in this Indenture and shall not be liable except for the performance of such duties and obligations as are specifically set forth in this Indenture, and no implied covenants or obligations shall be read into this Indenture against the Trustee, as the case may be. The Trustee shall, during the existence of any Event of Default

(which has not been cured), exercise such of the rights and powers vested in it by this Indenture, and use the same degree of care and skill in their exercise, as prudent persons would exercise or use under the circumstances in the conduct of their own affairs. The Trustee shall not be liable to the parties hereto or deemed in breach or default hereunder if and to the extent its performance hereunder is prevented by reason of force majeure. The term “force majeure” means an occurrence that is beyond the control of the Trustee and could not have been avoided by exercising due care. Force majeure shall include acts of God, terrorism, war, riots, strikes, floods, earthquakes, epidemics or other similar occurrences.

Section 9.02 Responsibility for Statements in Indenture or Bonds. The recitals of fact herein and in the Bonds contained, except only the Trustee's certificate of authentication upon the Bonds, shall be taken as the statements of the Authority and the Trustee assumes no responsibility for the correctness of the same. The Trustee makes no representations as to the validity or sufficiency of this Indenture or the due execution or acknowledgment thereof on the part of the Authority or in respect of the Bonds issued hereunder, and the Trustee shall incur no responsibility in respect of such matter.

Section 9.03 Maintenance of Insurance. The Trustee shall be under no obligation to effect or maintain insurance or to renew any policies of insurance or to inquire as to the adequacy of any insurance or for responsibility of insurers, or to report, make or file claims or proofs of loss for any loss or damage insured against or which may occur or to keep itself advised or informed as to the payment of any insurance premiums, taxes or assessments or to see to or require such payment to be made nor shall the Trustee be under any liability for the failure of the Authority to effect or renew any insurance; but the Trustee may, in its discretion, do any or all of the matters and things in this Section set forth, or require the same to be done.

Section 9.04 Disposition of Bonds and Proceeds. The Trustee shall be under no responsibility or duty with respect to the disposition of the Bonds authenticated and delivered hereunder or the application of the proceeds of any of the Bonds or of any other moneys deposited with it and withdrawn in the manner provided in this Indenture.

Section 9.05 Agents of Trustee; Responsibility for Default of Agents. The Trustee may execute any of the trusts or powers hereof and perform any duty hereunder by or through its attorneys or agents, and it shall not be answerable or accountable for any act, default, neglect or misconduct of any such attorney or agent, if reasonable care has been exercised in his appointment and retention, nor shall the Trustee be otherwise answerable or accountable under any circumstances whatever in connection with the Trust, except for its own gross negligence or willful misconduct.

Section 9.06 Indemnity; No Duty to Notice Default. The Trustee shall be under no obligation or duty to perform any act which would involve it in expense or liability or to institute or defend any suit in respect hereof unless properly indemnified against such expense or liability to its satisfaction. The Trustee shall not be required to take notice, or be deemed to have knowledge, of any default of the Authority hereunder, except a default pursuant to Section 8.01(a) or (b), and may conclusively assume that there has been no such default unless and until it shall have been specifically notified in writing of such default by the Authority or the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the

Bonds then Outstanding hereunder. The Trustee shall provide each Bond Insurer with immediate notice of a default pursuant to Section 8.01(a) or (b) and, within thirty (30) days of the Trustee's knowledge thereof, any other default known to the Trustee. The Trustee shall not be under any obligation to take any action in respect of any default or otherwise, or to institute, appear in or defend any suit or other proceeding in connection therewith or to ascertain or inquire as to the performance of any of the covenants or agreements herein contained on the part of the Authority, unless requested in writing so to do by the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder and indemnified to its satisfaction but this provision shall not affect any discretionary power herein given to the Trustee. The Trustee shall, however, take actions pursuant to Section 13.02 hereof, as required therein.

The foregoing provisions are intended only for the protection of the Trustee, and shall not affect any discretion or power given by any provision of this Indenture to the Trustee to take action in respect to any default without such notice or request from the Bondholders or without such security or indemnity. The Trustee may, at any time in its discretion, require of the Authority full information and advice as to the performance of any of the covenants, conditions and agreements, and may further make or cause to be made independent investigations at the expense of the Authority, concerning the affairs of the Authority insofar as such affairs are related to the System.

Section 9.07 Right to Rely Upon Documents. The Trustee shall be protected and shall incur no liability in relying, acting or proceeding in good faith upon any notice, resolution, request, consent, order, certificate, report, opinion, bond, telephonic notice, facsimile transmission, waiver, statement, affidavit, voucher, appraisal, application or other paper or document believed by it to be genuine and to have been signed, passed or presented by the proper person or authority, or to have been prepared and furnished pursuant to the provisions of this Indenture, and before acting upon any of the same the Trustee shall not be bound to make any investigation into the matters stated therein.

The Trustee may consult with legal counsel to be selected and employed by it and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it hereunder in good faith and in accordance with the opinion of such counsel.

The Trustee shall not be bound to recognize any person as the Holder of a Bond Outstanding hereunder unless and until his Bond is submitted to the Trustee for inspection, if required, and his title thereto satisfactorily established, if disputed.

Whenever in the administration of the trusts imposed upon it by this Indenture the Trustee shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action hereunder, such matter (unless other evidence in respect thereof be herein specifically prescribed) may be deemed to be conclusively proved and established by a certificate of the Authority, and such certificate shall be full warrant to the Trustee for any action taken or suffered in good faith under the provisions of this Indenture in reliance upon such Certificate, but in its discretion the Trustee may, in lieu thereof, accept other evidence of such matter or may require such additional evidence as it may deem reasonable.

Any action taken, or omitted to be taken, by the Trustee in good faith pursuant to this Indenture upon the request or authority or consent of any person who, at the time of making such request or giving such authority or consent, is a Bondholder, shall be conclusive and binding upon all future Bondholders and upon Bonds executed and delivered in exchange therefore or in place thereof. The permissive right of the Trustee to do things enumerated in this Indenture shall not be construed as a duty.

The Trustee shall have no responsibility, opinion or liability with respect to any information statement or recital found in any official statement or other disclosure material, prepared or distributed with respect to the issuance of the Bonds, except for information provided by the Trustee.

Section 9.08 Trustee Compensation; Indemnification of Trustee. The Authority shall, out of the Revenues, pay to the Trustee, from time to time, reasonable compensation for all services rendered hereunder, and shall also reimburse the Trustee for all of its reasonable expenses, charges and other disbursements and those of its attorneys, agents and employees, incurred in and about the administration and execution of the trusts hereby created, and the performance of its powers and duties hereunder, and the Trustee shall have a lien on the Revenues therefor, prior and superior to the lien of the Bonds issued hereunder. The Authority further covenants and agrees to protect, exonerate, defend, indemnify and save the Trustee and its officers, directors, employees and agents (collectively, the "Indemnitees") harmless from and against any and all liabilities, losses, damages, fines, suits, actions, demands, penalties, costs and expenses, including out-of-pocket, incidental expenses, legal fees and expenses, the allocated costs and expenses of in-house counsel and legal staff and the costs and expenses of defending or preparing to defend against any claim ("Losses") that may be imposed on, incurred by, or assessed against, the Indemnitees or any of them for following any instruction or other direction upon which the Trustee is authorized to rely pursuant to the terms of this Indenture. In addition to and not in limitation of the immediately preceding sentence, the Authority also covenants and agrees to indemnify and hold the Indemnitees and each of them harmless from and against any and all Losses that may be imposed on, incurred by, or asserted against the Indemnitees or any of them in connection with or arising out of the Trustee's performance, as applicable, under the Indenture provided that such party has not acted with negligence or engaged in willful misconduct. The provisions of this Section shall survive the termination of this Indenture and the resignation or removal of the Trustee.

Section 9.09 Trustee's Right to Make Advances. If the Authority shall fail to perform any of the covenants or agreements contained in this Indenture, the Trustee may, in its discretion and without notice to the Bondholders, at any time and from time to time, make advances to effect performance of the same on behalf of the Authority, but the Trustee shall be under no obligation so to do; and any and all moneys paid or advanced by the Trustee for any such purpose, together with interest thereon at the rate equal to 102% of the Prime Rate in effect at the time of such advance, shall be a lien in favor of the Trustee upon the Revenues prior and superior to the lien of the Bonds issued hereunder; but no such advance shall operate to relieve the Authority from any default hereunder. Nothing herein shall be construed to require the Trustee to expend its own funds.

Section 9.10 Right to Own and Deal in Bonds. The Trustee may become the Owner of Bonds issued hereunder and secured hereby, with the same rights it would have if it were not Trustee. The Trustee may also engage in, or be interested in any financial or other transaction with the Authority and may act as depositary for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or to effect or aid any reorganization growing out of the enforcement of the Bonds or this Indenture, whether or not any such committee shall represent the Holders of a majority in Principal Amount of the Bonds Outstanding hereunder.

Section 9.11 Construction of Provisions of Indenture. The Trustee may construe any of the provisions of this Indenture insofar as the same may appear to be ambiguous or inconsistent with any other provisions hereof; and any construction of any such provisions hereof by the Trustee in good faith shall be binding upon the Bondholders.

Section 9.12 Resignation or Replacement of Trustee. The Trustee may resign on its motion or may be removed at any time by an instrument or instruments in writing signed by (1) the Authority, provided no Event of Default has occurred and is continuing or (2) the Holders of not less than fifty percent (50%) of the Principal Amount of Bonds then Outstanding, if an Event of Default has occurred and is continuing. No such resignation or removal shall become effective unless and until a successor Trustee (or temporary successor trustee as provided below) has been appointed and has assumed the trusts created hereby. Written notice of such resignation or removal shall be given to each Holder of a Bond then Outstanding to the address then reflected on the books of the Trustee and such resignation or removal shall take effect upon the appointment, qualification and acceptance of a successor Trustee. A successor Trustee may be appointed at the direction of the Authority, or if the Authority shall fail to appoint a successor Trustee, a successor Trustee may be appointed at the direction of the Holders of not less than fifty percent (50%) in aggregate Principal Amount of Bonds Outstanding. In the event a successor Trustee has not been appointed and qualified within sixty (60) days of the date notice of resignation or removal is given, the Trustee or any Bondholders may apply to any court of competent jurisdiction for the appointment of a temporary successor Trustee to act until such time as a successor is appointed as above provided. No resignation or removal of the Trustee shall be effective until a successor has been appointed and has accepted the duties of the Trustee hereunder.

Every successor shall always be a bank or trust company in good standing, qualified to act hereunder, and having a combined capital, surplus and undivided profits of not less than Fifty Million Dollars (\$50,000,000). Any successor appointed hereunder shall execute, acknowledge and deliver to the Authority an instrument accepting such appointment hereunder, and thereupon such successor shall, without any further act, deed or conveyance, become vested with all the estates, properties, rights, powers and trusts of its predecessor in the trust hereunder with like effect as if originally named as Trustee herein; but the Trustee retiring shall, nevertheless, on the written demand of its successor, execute and deliver an instrument conveying and transferring to such successor, upon the trusts herein expressed, all the estates, properties, rights, powers and trusts of the predecessor, who shall duly assign, transfer and deliver to the successor all properties and moneys held by it under this Indenture. Should any instrument in writing from the Authority be required by any successor for more fully and certainly vesting in and confirming to it all of such estates, properties, rights, powers and trusts,

the Authority shall, on request of such successor, make, execute, acknowledge and deliver the deeds, conveyances and necessary instruments in writing.

The notices herein provided for shall be given by mailing a copy thereof to the registered Owners at their addresses as the same shall last appear on the Bond register. A copy shall be provided to each Bond Insurer.

The instruments evidencing the resignation or removal of the Trustee and the appointment of a successor hereunder together with all instruments provided for in this Section shall be filed and/or recorded by the successor Trustee in each recording office, if any, where this Indenture shall have been filed and/or recorded.

Section 9.13 Successor Trustee by Merger. Any bank or trust company having power to execute the trusts of this Indenture and otherwise qualified to act as Trustee hereunder, with or into which the Trustee may be merged or consolidated or any such bank or trust company resulting from any merger or consolidation to which the Trustee shall be a party, shall be the successor trustee under this Indenture, without the execution or filing of any paper or the performance of any further act on the part of any other parties hereto, anything herein to the contrary notwithstanding.

Section 9.14 Appointment of Paying Agent. The Authority may appoint a successor Paying Agent or a co-paying agent at any time upon written notice to each Bond Insurer and the Trustee.

Section 9.15 Trustee to Notify S&P and Moody's. The Trustee hereby agrees to notify S&P and Moody's of (i) any change of the Trustee, (ii) any change in the Bond Insurance Policy, and (iii) any mandatory redemption of Bonds other than mandatory sinking fund redemption. Notices shall be sent to Moody's Investors Service, 7 World Trade Center, 250 Greenwich Street, New York, New York 10007, Attention: Municipal Department/Structured Finance Group.

ARTICLE X

CONCERNING THE HOLDERS OF THE BONDS

Section 10.01 Execution of Instruments. Whenever in this Indenture it is provided that the Holders of a specified percentage or a majority of the Bonds Outstanding hereunder may take any action (including the making of any demand or request, the giving of any notice, consent or waiver or the taking of any other action) the fact that at the time of taking any such action the Holders of such specified percentage or majority have joined therein may be evidenced by any instrument or any number of instruments of similar tenor executed by Bondholders in person or by agent or proxy appointed in writing.

Section 10.02 Proof of Ownership. Subject to the provisions of Article IX, proof of the execution of any instrument by a Bondholder or his agent or proxy and proof of the holding by any persons of any of the Bonds shall be sufficient if made in the following manner:

(1) The fact and date of the execution by any such persons of any instrument may be proved by the certificate of any notary public or other officer authorized to take acknowledgments of deeds to be recorded in any State within the United States, that the person executing such instrument acknowledged to him the execution thereof, or by an affidavit of a witness to such execution sworn to before any such notary or other such officer; and

(2) The ownership of Bonds may be proved by the registration books for such Bonds maintained by the Authority at the Principal Office of the Trustee.

The Trustee and any Paying Agent may require such additional proof of any matter referred to in this Section as it shall deem necessary or may accept such other proof as it may deem appropriate.

ARTICLE XI

AMENDMENTS AND MODIFICATIONS

Section 11.01 Waivers and Supplemental Indentures Not Requiring Consent of Bondholders. In addition to any Supplemental Indenture otherwise authorized by this Indenture, the Authority, and the Trustee may, from time to time and at any time, enter into such indentures or agreements supplemental hereto as shall not be inconsistent with the terms and provisions hereof and which shall not adversely affect the rights of the Holders of the Bonds Outstanding hereunder (which supplemental indentures or agreements shall thereafter form a part thereof) for the following purposes:

(a) to cure any ambiguity, formal defect or omission in this Indenture or any Supplemental Indenture; or

(b) to grant or confer upon the Trustee for the benefit of the Bondholders any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Bondholders, or the Trustee; or

(c) to add to the covenants and agreements of the Authority in this Indenture contained, other covenants and agreements thereafter to be observed, or to surrender any right or power herein reserved to or conferred upon the Authority; or

(d) to modify any of the provisions of this Indenture or to relieve the Authority of any of the obligations, conditions or restrictions contained in this Indenture, provided that such modification or relief shall not, by the express terms of the particular Supplemental Indenture, become effective until all Bonds Outstanding on the date of the execution and delivery of such Supplemental Indenture shall no longer be Outstanding; or

(e) to make such provision in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture; or

(f) to close this Indenture against, or to restrict, in addition to the limitations and restrictions herein contained, the issue of Additional Bonds hereunder, by imposing additional conditions and restrictions to be thereafter observed, whether applicable in respect to all Bonds issued and to be issued hereunder or in respect of one or more Series of Bonds, or otherwise; or

(g) to modify, amend or supplement this Indenture in such manner as required to permit the Authority to comply with the provisions of the Code relating to the rebate to the United States of America of earnings derived from the investment of the proceeds of Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Bonds; or

(h) to modify, amend or supplement this Indenture in such manner as may be required by a Rating Agency to maintain or enhance its rating on the Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Bonds; or

(i) to modify, amend or supplement this Indenture to implement any covenants or agreements contemplated by Section 7.22; or

(j) to authorize the issuance of, to describe the terms of, and to secure one or more Series of Additional Bonds pursuant to Article III; or

(k) to amend any agreement with a securities depository relating to a book-entry system to be maintained with respect to any Bonds; or

(l) to modify, amend or supplement this Indenture in any manner that the Trustee concludes is not materially adverse to the Holders of all Outstanding Bonds; or

(m) to modify, amend or supplement the exhibits to this Indenture containing Bond Insurer provisions, provided the Authority and the Bond Insurers consent to such modifications, amendments or supplements.

Section 11.02 Supplemental Indentures Requiring Consent of Bondholders. With the consent, evidenced as provided in Section 10.01, of the Holders of not less than the Approval Amount or, in the case one or more but less than all of the Series of the Bonds then Outstanding are affected, then, in addition, with the consent of the Holders of the Approval Amount of each Series so affected, and with the consent of any guarantor of principal and interest of any Series of Bonds issued under a supplemental Indenture, the Authority and the Trustee may from time to time and at any time enter into an Indenture or Indentures Supplemental hereto for the purpose of eliminating any of the provisions of this Indenture or of any Supplemental Indenture or of modifying in any manner the rights of the Holders of the Bonds so affected; provided, however, that no such supplemental Indenture shall (i) extend the fixed maturity date of any Bond, or reduce the Principal Amount thereof, or reduce the rate or extend the time of payment of interest thereon, or reduce any premium payable upon the redemption thereof, without the consent of the Holder of each Bond so affected, or (ii) permit the creation by the Authority of any lien prior to the lien of this Indenture upon any part of the Revenues, or reduce the Approval Amount, without the consent of the Holders of all Bonds then Outstanding. It shall not be necessary for

the consent of the Bondholders under this Section to approve the particular form of any proposed Supplemental Indenture, but it shall be sufficient if such consent shall approve the substance thereof. Nothing herein contained, however, shall be construed as making necessary the approval by the Bondholders of the execution of any Supplemental Indenture or agreement as authorized in Section 11.01.

Section 11.03 Authorization to Trustee; Opinion of Counsel. The Trustee shall join with the Authority in the execution of any Supplemental Indenture which the Authority is authorized to execute under the provisions of Section 11.01 or Section 11.02 upon the delivery by the Authority to the Trustee of the following:

(a) (i) A certified copy of a Resolution of the Board authorizing such Supplemental Indenture and requesting the execution thereof by the Trustee and (ii) evidence of consent to such amendment by any party whose consent is required hereunder;

(b) An opinion of counsel (i) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.01 and that all other conditions precedent have been satisfied, or (ii) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, that the consent of the Bondholders required has been secured and is evidenced by specified documents meeting the requirements of Section 10.01, and that all other conditions precedent have been satisfied; and

(c) If the opinion of counsel shall state that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, the documents evidencing the consent of the Bondholders as specified in said opinion;

provided, however, that the Trustee shall not be obligated to join in any such Supplemental Indenture which, in its opinion, adversely affects its own duties, rights or immunities under the Indenture.

Section 11.04 Effectiveness of Amendments, Modifications. Upon the execution of any Supplemental Indenture pursuant to the provisions of this Article, the Indenture shall be and be deemed to be modified and amended in accordance therewith and the respective rights, limitations of rights, obligations, duties and immunities under this Indenture of the Trustee, the Authority and the Holders of Bonds shall thereafter be determined, exercised and enforced hereunder subject in all respect to such modifications and amendments, and all the terms and conditions of any such Supplemental Indenture shall be and be deemed to be part of the terms and conditions of this Indenture for any and all purposes. The Authority shall provide each Bond Insurer with a full transcript of all proceedings relating to the execution of any supplement or amendment to this Indenture. The Authority shall provide Moody's and S&P with a notice of each amendment to this Indenture and a copy thereof at least fifteen (15) days in advance of its execution.

ARTICLE XII

DISCHARGE OF INDENTURE

Section 12.01 Release of Indenture. If the Authority, its successors or assigns, shall pay or cause to be paid unto the Holders of all Bonds Outstanding hereunder the principal and interest to become due thereon and the premium thereon, if any, at the times and in the manner stipulated therein, then this Indenture and the estate and rights hereby granted shall cease, determine and be void, and thereupon the Trustee shall, upon the request of the Authority, deliver to the Authority such instruments as shall be requisite to satisfy the lien hereof, and reconvey to the Authority the estate and title hereby conveyed, and assign and deliver to the Authority any property at the time subject to the lien of this Indenture which may then be in the possession of the Trustee; but the Trustee shall take any such action only upon the receipt of an officer's certificate and an opinion of counsel, each stating in substance that in the opinion of the respective signers all conditions precedent provided for in this Indenture relating to such release, cancellation and discharge have been complied with. In addition, this Indenture shall not be discharged until all Policy Costs owing to any Bond Insurer shall have been paid in full.

Bonds for the payment or redemption of which there shall have been deposited with the Trustee cash or Defeasance Obligations (which shall mean direct non-callable obligations of the United States of America and securities fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America, to which direct obligation or guarantee the full faith and credit of the United States of America has been pledged, Refcorp interest strips, CATS, TIGRS, STRPS, or defeased municipal bonds rated "AAA" by S&P or "Aaa" by Moody's, any combination thereof or any other security approved by the applicable Bond Insurer), the principal of and interest on which when due, will, without reinvestment of principal or interest, provide sufficient moneys to pay the Bonds in full at maturity or the date fixed for redemption, shall be deemed to be paid within the meaning of this Article. In the event of an advance refunding, the Authority shall cause to be delivered a verification report of a Qualified Independent Consultant experienced in delivering verification reports. For purposes of determining whether any Outstanding Variable Rate Indebtedness is deemed paid and discharged pursuant to this Article XII, such Variable Rate Indebtedness shall be deemed to bear interest at the maximum rate of interest such Variable Rate Indebtedness may bear pursuant to the applicable Supplemental Indenture.

The release, cancellation and discharge of this Indenture, however, shall be without prejudice to the right of the Trustee to be paid any compensation then due to it hereunder and to be protected and saved harmless by the Authority from any and all losses, liabilities, costs and expenses, including counsel fees, at any time incurred by the Trustee hereunder or connected with any Bond issued hereunder, of and from which, if this Indenture had not been released, cancelled and discharged, the Authority would have been obligated by the terms of this Indenture to protect and save the Trustee harmless, and the Authority hereby covenants to protect and save the Trustee harmless of and from such losses, liabilities, costs and expenses.

If any Bond shall not be presented for payment when the principal thereof shall become due, either at maturity or otherwise, or at the date fixed for the redemption thereof, and if the Authority shall have deposited with the Trustee, for the purpose, or left with it in trust if

previously so deposited, funds sufficient to pay the principal of such Bond (and the premium, if any payable upon the redemption thereof), together with all interest due thereon, to the date of maturity thereof or to the date fixed for redemption thereof, for the benefit of the Holder or Holders thereof, respectively, all liability of the Authority to the Holder of such Bond for the payment of the principal thereof, the interest thereon, and the premium, if any, shall forthwith cease, determine and be completely discharged, and thereupon it shall be the duty of the Trustee, to hold said fund or funds, without liability for interest thereon, for the benefit of the Holder of such Bond who shall thereafter be restricted exclusively to said fund or funds for any claim of whatsoever nature on his part under this Indenture or on, or with respect to, said Bond.

Any moneys deposited with the Trustee, by the Authority, pursuant to the terms of this Indenture, for the payment or redemption of Bonds which remain unclaimed by the Holders of the Bonds for five (5) years after the date of maturity or the date fixed for redemption, as the case may be, shall upon the written request of the Authority if the Authority is not at that time, to the knowledge of the Trustee, in default hereunder be paid to the Authority. Thereafter, such Holders of the Bonds shall thereafter look only to the Authority for payment and then only to the extent of the amounts so received without interest thereon.

ARTICLE XIII

MISCELLANEOUS

Section 13.01 Limitation of Rights, Remedy or Claim. With the exception of rights herein expressly conferred, nothing in this Indenture, expressed or implied, is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the parties hereto and the Holders of the Bonds outstanding hereunder, any rights, remedy or claim under or by reason of this Indenture or any covenant, condition or stipulation hereof; and all the covenants, stipulations, promises and agreements in this Indenture contained by and on behalf of the Authority shall be for the sole and exclusive benefit of the parties hereto, and of the Holders of the Bonds Outstanding hereunder.

Section 13.02 Notices to Rating Agencies. The Authority shall instruct the Trustee to give notice to the Rating Agencies upon an occurrence of any of the following that relates to the Bonds:

- (i) expiration of any credit enhancement;
- (ii) termination of any credit enhancement;
- (iii) extension of any credit enhancement;
- (iv) substitution of any credit enhancement;
- (v) redemption;
- (vi) acceleration;
- (vii) conversion;

- (viii) changes in bond documents;
- (ix) changes in any credit facility;
- (x) changes in Trustee and/or any remarketing agent; or
- (xi) defeasance.

Section 13.03 Invalidity of Provisions. If any one or more of the covenants or agreements provided in this Indenture on the part of the Authority or the Trustee to be performed should be finally determined by a court of competent jurisdiction to be contrary to law, then such covenant or covenants or agreement or agreements shall be null and void and shall be deemed separable from the remaining covenants and agreements, and shall in no way affect the validity of the Indenture.

Section 13.04 Governing Law. This Indenture shall be deemed to be and shall be construed as a Pennsylvania contract and wherever enforced shall be construed in accordance with the laws of the Commonwealth.

Section 13.05 Limitation of Liability. No covenant, agreement or obligation contained in the Bonds or in this Indenture shall be deemed to be the covenant, agreement or obligation of any member, agent or employee of the Authority in his individual capacity and neither the members of the Board of the Authority nor any official executing the Bonds shall be liable personally on the Bonds or be subject to any personal liability or accountability by reason of the issuance thereof.

Section 13.06 Execution in Counterparts. This Indenture may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original; but such counterparts shall constitute but one and the same instrument.

Section 13.07 Payment on Saturday, Sunday or Legal Holiday. If any case where the date of maturity of interest on or principal of any Bond or the date fixed for redemption or tender of any Bond shall be a Saturday, Sunday or a legal holiday or a day on which banking institutions in the Commonwealth are authorized by law to close, then payment of such interest or principal and premium, if any, need not be made on such date but may be made on the next succeeding Business Day not a Saturday, Sunday nor a legal holiday nor a day upon which banking institutions are authorized by law to close, with the same force and effect as if made on the date of maturity or the date fixed for redemption, and no interest shall accrue for the period after such date.

Section 13.08 Notices. Except as otherwise expressly provided in this Indenture, or in any Indenture supplemental hereto, any request, opinion, consent, demand, notice, order, appointment, or other direction required or permitted to be made or given by the Authority, shall be deemed to have been sufficiently made or given if executed on behalf of the Authority by its Chairperson or Vice Chairperson or Secretary or Assistant Secretary or Executive Director or Chief Financial Officer or Director of Finance, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board.

Any notice to or demand upon the Trustee may be served, presented, or made at the Principal Office of the Trustee at The Bank of New York Mellon Trust Company, N.A., 500 Ross Street, 12th Floor, Pittsburgh, PA 15262, Attention: Corporate Trust Administration. Any notice to or demand upon the Authority shall be deemed to have been sufficiently given or served by the Trustee for all purposes, by being sent by certified or registered United States mail, postage prepaid, to the Authority at The Pittsburgh Water and Sewer Authority, 1200 Penn Avenue, Pittsburgh, Pennsylvania 15222, Attention: Executive Director or at such other address as may be filed in writing by the Authority with the Trustee.

The Trustee shall have the right to accept and act upon instructions, including funds transfer instructions ("Instructions") given pursuant to this Indenture and delivered using Electronic Means; provided, however, that the Authority shall provide to the Trustee an incumbency certificate listing Authorized Representatives of the Authority to provide such Instructions and containing specimen signatures of such Authorized Representatives of the Authority, which incumbency certificate shall be amended by the Authority whenever a person is to be added or deleted from the listing. If the Authority elects to give the Trustee Instructions using Electronic Means and the Trustee in its discretion elects to act upon such Instructions, the Trustee's understanding of such Instructions shall be deemed controlling. The Authority understands and agrees that the Trustee cannot determine the identity of the actual sender of such Instructions and that the Trustee shall conclusively presume that directions that purport to have been sent by an Authorized Representative of the Authority listed on the incumbency certificate provided to the Trustee have been sent by such Authorized Representative of the Authority. The Authority shall be responsible for ensuring that only Authorized Representatives of the Authority transmit such Instructions to the Trustee and that the Authority and all Authorized Representatives of the Authority are solely responsible to safeguard the use and confidentiality of applicable user and authorization codes, passwords and/or authentication keys upon receipt by the Authority. The Trustee shall not be liable for any losses, costs or expenses arising directly or indirectly from the Trustee's reliance upon and compliance with such Instructions notwithstanding such directions conflict or are inconsistent with a subsequent written instruction. The Authority agrees: (i) to assume all risks arising out of the use of Electronic Means to submit Instructions to the Trustee, including without limitation the risk of the Trustee acting on unauthorized Instructions, and the risk of interception and misuse by third parties; (ii) that it is fully informed of the protections and risks associated with the various methods of transmitting Instructions to the Trustee and that there may be more secure methods of transmitting Instructions than the method(s) selected by the Authority; (iii) that the security procedures (if any) to be followed in connection with its transmission of Instructions provide to it a commercially reasonable degree of protection in light of its particular needs and circumstances; and (iv) to notify the Trustee immediately upon learning of any compromise or unauthorized use of the security procedures.

"Electronic Means" shall mean the following communications methods: S.W.I.F.T., e-mail, facsimile transmission, secure electronic transmission containing applicable authorization codes, passwords and/or authentication keys issued by the Trustee, or another method or system specified by the Trustee as available for use in connection with its services hereunder.

Section 13.09 Binding Effect of Covenants. All the covenants, promises and agreements in this Indenture contained by or on behalf of the Authority, or by or on behalf of the

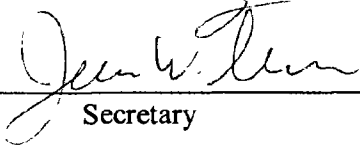
Trustee shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

Section 13.10 Provisions Related to Bond Insurance and Reserve Policies. The provisions related to bond insurance set forth in Exhibit A hereto are incorporated herein by reference as if fully set forth herein. The provisions related to reserve policies set forth in Exhibit B hereto are incorporated herein by reference as if fully set forth herein.

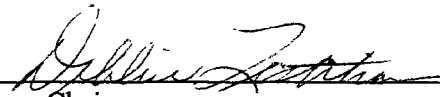
IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairperson or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Indenture to be executed by one of its authorized officers.

ATTEST:

THE PITTSBURGH WATER AND SEWER AUTHORITY



Secretary

By 

Chairperson

[SEAL]

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By _____
Authorized Officer
Title: _____

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairperson or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Indenture to be executed by one of its authorized officers.

ATTEST:

THE PITTSBURGH WATER AND
SEWER AUTHORITY

Secretary

By _____
Chairperson

[SEAL]

THE BANK OF NEW YORK MELLON
TRUST COMPANY, N.A., as Trustee

By Rhonda J. Branna
Authorized Officer
Title: Vice President

EXHIBIT A**PROVISIONS RELATED TO BOND INSURANCE**

The provisions set forth in this Exhibit A shall, with respect to Bonds insured by Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof, apply to such Bonds notwithstanding any other provision of this Indenture to the contrary. The provisions set forth in this Exhibit A shall, with respect to Bonds insured by National Public Finance Guarantee Corporation ("National"), or any successor thereto or assignee thereof, apply to such Bonds notwithstanding any other provision of this Indenture to the contrary.

- (a) "Bond Insurance Policy" shall mean the insurance policy issued by the Insurer guaranteeing the scheduled payment of principal of and interest on the Insured Bonds when due. "Insured Bonds" shall mean the Bonds insured by the Insurer". "Insurer" shall mean, with respect to Bonds insured by Assured Guaranty Municipal Corp.: Assured Guaranty Municipal Corp., a New York stock insurance company, or any successor thereto or assignee thereof; "Insurer" shall mean, with respect to Bonds insured by National: National Public Finance Guarantee Corporation, or any successor thereto or assignee thereof. "Related Document" shall have the meaning set forth in paragraph (h) below.
- (b) The prior written consent of the Insurer shall be a condition precedent to the deposit of any credit instrument provided in lieu of a cash deposit into the Debt Service Reserve Fund, if any, except for a credit instrument provided by the Insurer. Amounts on deposit in the Debt Service Reserve Fund shall be applied solely to the payment of debt service due on the Bonds secured by the Debt Service Reserve Fund.
- (c) The Insurer shall be deemed to be the sole holder of the Insured Bonds for the purpose of exercising any voting right or privilege or giving any consent or direction or taking any other action that the holders of the Insured Bonds are entitled to take pursuant to the Indenture pertaining to (i) defaults and remedies and (ii) the duties and obligations of the Trustee. In furtherance thereof and as a term of the Indenture and each Insured Bond, the Trustee (solely with respect to the Insured Bonds) and each Insured Bondholder appoint the Insurer as their agent and attorney-in-fact and agree that the Insurer may at any time during the continuation of any proceeding by or against the Authority under the United States Bankruptcy Code or any other applicable bankruptcy, insolvency, receivership, rehabilitation or similar law (an "Insolvency Proceeding") direct all matters relating to such Insolvency Proceeding (to the extent of their voting rights with respect to the Insured Bonds), including without limitation, (A) all matters relating to any claim or enforcement proceeding in connection with an Insolvency Proceeding (a "Claim"), (B) the direction of any appeal of any order relating to any Claim, (C) the posting of any surety, supersedeas or performance bond pending any such appeal, and (D) the right to vote to accept or reject any plan of adjustment. In addition, the Trustee (solely with respect to the Insured Bonds) and each Insured Bondholder delegate and assign to the Insurer, to the fullest extent permitted by law, the rights of the Trustee and each Insured Bondholder in the conduct of any Insolvency Proceeding, including, without limitation, all rights of any party to an adversary proceeding or action with respect to any court order issued in connection with

any such Insolvency Proceeding. Remedies granted in Section 8.04 of the Indenture include mandamus.

- (d) Acceleration of the Bonds is permitted under the Indenture. As set forth in paragraph (c) above, the Insurer is deemed to be the sole holder of the Insured Bonds for purposes of voting on acceleration. In the event the maturity of the Insured Bonds is accelerated, the Insurer shall not be obligated to pay any accelerated amount but may elect, in its sole discretion, to pay accelerated principal and interest accrued, on such principal to the date of acceleration (to the extent unpaid by the Authority) and the Trustee shall be required to accept such amounts. Upon payment of such accelerated principal and interest accrued to the acceleration date as provided above, the Insurer's obligations under the Bond Insurance Policy with respect to such Insured Bonds shall be fully discharged.
- (e) No grace period for a covenant default shall exceed sixty (60) days or be extended for more than sixty (60) days, without the prior written consent of the Insurer. No grace period shall be permitted for payment defaults.
- (f) The Insurer is a third party beneficiary to the Indenture.
- (g) Upon the occurrence of an extraordinary optional, special or extraordinary mandatory redemption in part, the selection of Insured Bonds to be redeemed shall be subject to the approval of the Insurer. The exercise of any provision of the Indenture which permits the purchase of Insured Bonds in lieu of redemption shall require the prior written approval of the Insurer if any Insured Bond so purchased is not cancelled upon purchase.
- (h) Any amendment, supplement, modification to, or waiver of, the Indenture or any other transaction document, including any underlying security agreement (each a "Related Document"), that requires the consent of Bondowners or adversely affects the rights and interests of the Insurer shall be subject to the prior written consent of the Insurer.
- (i) The rights granted to the Insurer under the Indenture or any other Related Document to request, consent to or direct any action are rights granted to the Insurer in consideration of its issuance of the Bond Insurance Policy. Any exercise by the Insurer of such rights is merely an exercise of the Insurer's contractual rights and shall not be construed or deemed to be taken for the benefit, or on behalf, of the holders of the Insured Bonds, and such action does not evidence any position of the Insurer, affirmative or negative, as to whether the consent of the owners of the Insured Bonds or any other person is required in addition to the consent of the Insurer.
- (j) Only (1) cash, (2) non-callable direct obligations of the United States of America ("Treasuries"), (3) evidences of ownership of proportionate interests in future interest and principal payments on Treasuries held by a bank or trust company as custodian, under which the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor and the underlying Treasuries are not available to any person claiming through the custodian or to whom the custodian may be obligated, (4) subject to the prior written consent of the Insurer, pre-refunded municipal

obligations rated "AAA" and "Aaa" by S&P and Moody's, respectively, or (5) subject to the prior written consent of the Insurer, securities eligible for "AAA" defeasance under then existing criteria of S&P or any combination thereof, shall be used to effect defeasance of the Insured Bonds unless the Insurer otherwise approves.

To accomplish defeasance, the Authority shall cause to be delivered to the Insurer (i) a report of an independent firm of nationally recognized certified public accountants or such other accountant or financial firm as shall be acceptable to the Insurer ("Accountant") verifying the sufficiency of the escrow established to pay the Insured Bonds in full on the maturity or redemption date ("Verification"), (ii) an Escrow Deposit Agreement (which shall be acceptable in form and substance to the Insurer), (iii) an opinion of nationally recognized bond counsel to the effect that the Insured Bonds are no longer "Outstanding" under the Indenture and (iv) a certificate of discharge of the Trustee with respect to the Insured Bonds; each Verification and defeasance opinion shall be acceptable in form and substance, and addressed, to the Authority, Trustee and Insurer. The Insurer shall be provided with final drafts of the above-referenced documentation not less than five business days prior to the funding of the escrow.

Insured Bonds shall be deemed "Outstanding" under the Indenture unless and until they are in fact paid and retired or the above criteria are met.

- (k) Amounts paid by the Insurer under the Bond Insurance Policy shall not be deemed paid for purposes of the Indenture and the Insured Bonds relating to such payments shall remain Outstanding and continue to be due and owing until paid by the Authority in accordance with the Indenture. The Indenture shall not be discharged unless all amounts due or to become due to the Insurer have been paid in full or duly provided for.
- (l) Each of the Authority and Trustee covenant and agree to take such action (including, as applicable, filing of UCC financing statements and continuations thereof) as is necessary from time to time to preserve the priority of the pledge of the Trust Estate under applicable law.
- (m) Claims Upon the Bond Insurance Policy and Payments by and to the Insurer.

If, on the third Business Day prior to the related scheduled interest payment date or principal payment date ("Payment Date") there is not on deposit with the Trustee, after making all transfers and deposits required under the Indenture, moneys sufficient to pay the principal of and interest on the Insured Bonds due on such Payment Date, the Trustee shall give notice to the Insurer and to its designated agent (if any) (the "Insurer's Fiscal Agent") by telephone or telecopy of the amount of such deficiency by 12:00 noon, New York City time, on such Business Day. If, on the second Business Day prior to the related Payment Date, there continues to be a deficiency in the amount available to pay the principal of and interest on the Insured Bonds due on such Payment Date, the Trustee shall make a claim under the Bond Insurance Policy and give notice to the Insurer and the Insurer's Fiscal Agent (if any) by telephone of the amount of such deficiency, and the allocation of such deficiency between the amount required to pay interest on the Bonds

and the amount required to pay principal of the Insured Bonds, confirmed in writing to the Insurer and the Insurer's Fiscal Agent by 12:00 noon, New York City time, on such second Business Day by filling in the form of Notice of Claim and Certificate delivered with the Bond Insurance Policy.

The Trustee shall designate any portion of payment of principal on Insured Bonds paid by the Insurer, whether by virtue of mandatory sinking fund redemption, maturity or other advancement of maturity, on its books as a reduction in the principal amount of Insured Bonds registered to the then current Insured Bondholder, whether DTC or its nominee or otherwise, and shall issue a replacement Insured Bond to the Insurer, registered in the name of Assured Guaranty Municipal Corp. or National, as the case may be, in a principal amount equal to the amount of principal so paid (without regard to authorized denominations); provided that the Trustee's failure to so designate any payment or issue any replacement Insured Bond shall have no effect on the amount of principal or interest payable by the Authority on any Insured Bond or the subrogation rights of the Insurer.

The Trustee shall keep a complete and accurate record of all funds deposited by the Insurer into the Policy Payments Account (defined below) and the allocation of such funds to payment of interest on and principal of any Insured Bond. The Insurer shall have the right to inspect such records at reasonable times upon reasonable notice to the Trustee.

Upon payment of a claim under the Bond Insurance Policy, the Trustee shall establish a separate special purpose trust account for the benefit of Insured Bondholders referred to herein as the "Policy Payments Account" and over which the Trustee shall have exclusive control and sole right of withdrawal. The Trustee shall receive any amount paid under the Bond Insurance Policy in trust on behalf of Insured Bondholders and shall deposit any such amount in the Policy Payments Account and distribute such amount only for purposes of making the payments for which a claim was made. Such amounts shall be disbursed by the Trustee to Insured Bondholders in the same manner as principal and interest payments are to be made with respect to the Insured Bonds under the sections hereof regarding payment of Insured Bonds. It shall not be necessary for such payments to be made by checks or wire transfers separate from the check or wire transfer used to pay debt service with other funds available to make such payments. Notwithstanding anything herein to the contrary, the Authority agrees to pay to the Insurer (i) a sum equal to the total of all amounts paid by the Insurer under the Bond Insurance Policy (the "Insurer Advances"); and (ii) interest on such Insurer Advances from the date paid by the Insurer until payment thereof in full, payable to the Insurer at the Late Payment Rate per annum (collectively, the "Insurer Reimbursement Amounts"). "Late Payment Rate" means the lesser of (a) the greater of (i) the per annum rate of interest, publicly announced from time to time by JPMorgan Chase Bank at its principal office in The City of New York, as its prime or base lending rate (any change in such rate of interest to be effective on the date such change is announced by JPMorgan Chase Bank) plus 3%, and (ii) the then applicable highest rate of interest on the Insured Bonds and (b) the maximum rate permissible under applicable usury or similar laws limiting interest rates. The Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a

year of 360 days. The Authority hereby covenants and agrees that the Insurer Reimbursement Amounts are secured by a lien on and pledge of the Trust Estate and payable from such Trust Estate on a parity with debt service due on the Insured Bonds.

Funds held in the Policy Payments Account shall not be invested by the Trustee and may not be applied to satisfy any costs, expenses or liabilities of the Trustee. Any funds remaining in the Policy Payments Account following an Insured Bond payment date shall promptly be remitted to the Insurer.

- (n) The Insurer shall, to the extent it makes any payment of principal of or interest on the Insured Bonds, become subrogated to the rights of the recipients of such payments in accordance with the terms of the Bond Insurance Policy (which subrogation rights shall also include the rights of any such recipients in connection with any Insolvency Proceeding). Each obligation of the Authority to the Insurer under the Related Documents shall survive discharge or termination of such Related Documents.
- (o) The Authority shall pay or reimburse the Insurer any and all charges, fees, costs and expenses that the Insurer may reasonably pay or incur in connection with (i) the administration, enforcement, defense or preservation of any rights or security in any Related Document; (ii) the pursuit of any remedies under the Indenture or any other Related Document or otherwise afforded by law or equity, (iii) any amendment, waiver or other action with respect to, or related to, the Indenture or any other Related Document whether or not executed or completed, or (iv) any litigation or other dispute in connection with the Indenture or any other Related Document or the transactions contemplated thereby, other than costs resulting from the failure of the Insurer to honor its obligations under the Bond Insurance Policy. The Insurer reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Indenture or any other Related Document.
- (p) After payment of reasonable expenses of the Trustee, the application of funds realized upon default shall be applied to the payment of expenses of the Authority only after the payment of past due and current debt service on the Insured Bonds and amounts required to restore the Debt Service Reserve Fund to the Reserve Requirement.
- (q) The Insurer shall be entitled to pay principal or interest on the Insured Bonds that shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Authority (as such terms are defined in the Bond Insurance Policy) and any amounts due on the Insured Bonds as a result of acceleration of the maturity thereof in accordance with the Indenture, whether or not the Insurer has received a Notice of Nonpayment (as such terms are defined in the Bond Insurance Policy) or a claim upon the Bond Insurance Policy.
- (r) The notice address of the Insurer Assured Guaranty Municipal Corp. is: Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director – Surveillance, Re: Policy No. __, Telephone: (212) 974-0100; Telecopier: (212) 339-3556. In each case in which notice or other communication refers

to an Event of Default, then a copy of such notice or other communication shall also be sent to the attention of the Deputy General Counsel – Public Finance and shall be marked to indicate "URGENT MATERIAL ENCLOSED." The notice address of the Insurer National: National Public Finance Guarantee Corporation, 1 Manhattanville Road, Suite 301, Purchase, NY 10577, Attention: Insured Portfolio Management, Telephone: 914-273-4545, Facsimile: 914-765-3164.

- (s) The Insurer shall be provided with the following information by the Authority or Trustee, as the case may be:
- (i) Annual audited financial statements within 180 days after the end of the Authority's fiscal year (together with a certification of the Authority that it is not aware of any default or Event of Default under the Indenture), and the Authority's annual budget within 30 days after the approval thereof together with such other information, data or reports as the Insurer shall reasonably request from time to time;
 - (ii) Notice of any draw upon the Debt Service Reserve Fund within two Business Days after knowledge thereof other than (i) withdrawals of amounts in excess of the Debt Service Reserve Requirement and (ii) withdrawals in connection with a refunding of Insured Bonds;
 - (iii) Notice of any default under the Indenture known to the Trustee or Authority within five Business Days after knowledge thereof;
 - (iv) Prior notice of the advance refunding or redemption of any of the Insured Bonds, including the principal amount, maturities and CUSIP numbers thereof;
 - (v) Notice of the resignation or removal of the Trustee and bond registrar and the appointment of, and acceptance of duties by, any successor thereto;
 - (vi) Notice of the commencement of any proceeding by or against the Authority commenced under the United States Bankruptcy Code or any other applicable bankruptcy, insolvency, receivership, rehabilitation or similar law (an "Insolvency Proceeding");
 - (vii) Notice of the making of any claim in connection with any Insolvency Proceeding seeking the avoidance as a preferential transfer of any payment of principal of, or interest on, the Insured Bonds;
 - (viii) A full original transcript of all proceedings relating to the execution of any amendment, supplement, or waiver to the Related Documents;

- (ix) All reports, notices and correspondence to be delivered to holders of Insured Bonds under the terms of the Related Documents; and
- (x) To the extent that the Authority has entered into a continuing disclosure agreement, covenant or undertaking with respect to the Bonds, all information furnished pursuant to such agreements shall also be provided to the Insurer, simultaneously with the furnishing of such information. The Authority shall also provide the Insurer with copies of all amendments, modifications, supplements and restatements relating to such documents.
- (xi) So long as the 1998B Bonds remain Outstanding, the Authority shall provide National with written notice of its intent to issue any type of variable rate security (including, without limitation, variable rate obligations, floating rate notes and auction rate securities) no later than 15 days prior to execution of the documentation relating to the proposed variable rate securities (the "Proposed Securities"). The Authority shall also provide National with drafts of the documentation relating to the Proposed Securities promptly upon the written request of National.
- (t) The Insurer shall have the right to receive such additional information as it may reasonably request.
- (u) The Authority will permit the Insurer to discuss the affairs, finances and accounts of the Authority or any information the Insurer may reasonably request regarding the security for the Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable the Insurer to have access to the facilities, books and records of the Authority on any business day upon reasonable prior notice.
- (v) The Trustee shall notify the Insurer of any failure of the Authority to provide notices, certificates and other information under the transaction documents.
- (w) Notwithstanding satisfaction of the other conditions to the issuance of Additional Bonds set forth in the Indenture, no such issuance may occur (1) if an Event of Default (or any event which, once all notice or grace periods have passed, would constitute an Event of Default) exists unless such default shall be cured upon such issuance and (2) unless the Debt Service Reserve Fund is fully funded at the Debt Service Reserve Requirement (including the proposed issue) upon the issuance of such Additional Bonds, in either case unless otherwise permitted by the Insurer. In addition, so long as the 1998B Bonds are Outstanding, without the prior written consent of the National, no issuance of Balloon Indebtedness or Tender Indebtedness may occur unless the maturity date of such indebtedness is 2031 or later. In addition, so long as the 1998B Bonds are Outstanding, without the prior written consent of National, no issuance of Interim Indebtedness may occur unless (1) the principal amount of the Interim Indebtedness does not exceed \$100,000,000; or (2) the Interim Indebtedness is Subordinate Debt.

- (x) In determining whether any amendment, consent, waiver or other action to be taken, or any failure to take action, under the Indenture would adversely affect the security for the Insured Bonds or the rights of the holders of Insured Bonds, the Trustee shall consider the effect of any such amendment, consent, waiver, action or inaction as if there were no Bond Insurance Policy.
- (y) No contract shall be entered into or any action taken by which the rights of the Insurer or security for or sources of payment of the Bonds may be impaired or prejudiced in any material respect except upon obtaining the prior written consent of the Insurer.
- (z) If the Bonds are issued for refunding purposes, there shall be delivered an opinion of Bond Counsel addressed to the Insurer (or a reliance letter relating thereto), or a certificate of discharge of the trustee for the Refunded Bonds, to the effect that, upon the making of the required deposit to the escrow, the legal defeasance of the Refunded Bonds shall have occurred. If the Refunded Bonds are insured by Assured Guaranty Municipal Corp., at least three business days prior to the proposed date for delivery of the Policy with respect to the Refunding Bonds, the Insurer shall also receive (i) the verification letter, of which the Insurer shall be an addressee, by an independent firm of certified public accountants or other financial firm which is either nationally recognized or otherwise acceptable to the Insurer, of the adequacy of the escrow established to provide for the payment of the Refunded Bonds in accordance with the terms and provisions of the Escrow Deposit Agreement, and (ii) the form of an opinion of Bond Counsel addressed to the Insurer (or a reliance letter relating thereto) to the effect that the Escrow Deposit Agreement is a valid and binding obligation of the parties thereto, enforceable in accordance with its terms (such Escrow Deposit Agreement shall provide that no amendments are permitted without the prior written consent of the Insurer). An executed copy of each of such opinion and reliance letter, if applicable, or Trustee's discharge certificate, as the case may be, shall be forwarded to the Insurer prior to delivery of the Bonds.
- (aa) Any interest rate exchange agreement ("Swap Agreement") entered into by the Authority shall meet the following conditions: (i) the Swap Agreement must be entered into to manage interest costs related to, or a hedge against (a) assets then held, or (b) debt then outstanding, or (iii) debt reasonably expected to be issued within the next twelve (12) months, and (ii) the Swap Agreement shall not contain any leverage element or multiplier component greater than 1.0x unless there is a matching hedge arrangement which effectively off-sets the exposure from any such element or component. Unless otherwise consented to in writing by the Insurer, any uninsured net settlement, breakage or other termination amount then in effect shall be subordinate to debt service on the Bonds and on any debt on parity with the Bonds. The Authority shall not terminate a Swap Agreement unless it demonstrates to the satisfaction of the Insurer prior to the payment of any such termination amount that such payment will not cause the Authority to be in default under the Related Documents, including but not limited to, any monetary obligations thereunder.

EXHIBIT B**PROVISIONS RELATED TO RESERVE POLICIES**

The provisions set forth in this Exhibit B shall, with respect to Reserve Policies issued by Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof ("AGM") related to Bonds issued under this Indenture, apply to such Reserve Policies notwithstanding any other provision of this Indenture to the contrary.

(a) The prior written consent of AGM shall be a condition precedent to the deposit of any credit facility (other than a credit facility provided by AGM) (a "Credit Facility") credited to the Debt Service Reserve Fund established for the Bonds (the "Reserve Fund") in lieu of a cash deposit into the Reserve Fund. Amounts drawn under the Reserve Policy shall be available only for the payment of scheduled principal and interest on the Bonds when due.

(b) The Authority shall repay any draws under the Reserve Policy and pay all related reasonable expenses incurred by AGM and shall pay interest thereon from the date of payment by AGM at the Late Payment Rate. "Late Payment Rate" means the lesser of (x) the greater of (i) the per annum rate of interest, publicly announced from time to time by JPMorgan Chase Bank at its principal office in the City of New York, as its prime or base lending rate ("Prime Rate") (any change in such Prime Rate to be effective on the date such change is announced by JPMorgan Chase Bank) plus 5% (3% to the extent AGM is the bond insurer of the related Bonds), and (ii) the then applicable highest rate of interest on the Bonds and (y) the maximum rate permissible under applicable usury or similar laws limiting interest rates. The Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a year of 360 days. In the event JPMorgan Chase Bank ceases to announce its Prime Rate publicly, Prime Rate shall be the publicly announced prime or base lending rate of such national bank as AGM shall specify. If the interest provisions of this subparagraph (b) shall result in an effective rate of interest which, for any period, exceeds the limit of the usury or any other laws applicable to the indebtedness created herein, then all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice between or by any party hereto, be applied as additional interest for any later periods of time when amounts are outstanding hereunder to the extent that interest otherwise due hereunder for such periods plus such additional interest would not exceed the limit of the usury or such other laws, and any excess shall be applied upon principal immediately upon receipt of such moneys by AGM, with the same force and effect as if the Authority had specifically designated such extra sums to be so applied and AGM had agreed to accept such extra payment(s) as additional interest for such later periods. In no event shall any agreed-to or actual exaction as consideration for the indebtedness created herein exceed the limits imposed or provided by the law applicable to this transaction for the use or detention of money or for forbearance in seeking its collection.

Repayment of draws and payment of expenses and accrued interest thereon at the Late Payment Rate (collectively, "Policy Costs") shall be made from all available funds and shall commence in the first month following each draw, and each such monthly payment shall be in an amount at least equal to 1/12 of the aggregate of Policy Costs related to such draw.

Amounts in respect of Policy Costs paid to AGM shall be credited first to interest due, then to the expenses due and then to principal due. As and to the extent that payments are made to AGM on account of principal due, the coverage under the Reserve Policy will be increased by a like amount, subject to the terms of the Reserve Policy. The obligation to pay Policy Costs shall be secured by a valid lien on all revenues and other collateral pledged as security for the Bonds (subject only to the priority of payment provisions set forth under the Indenture).

All cash and investments in the Reserve Fund shall be transferred to the Debt Service Fund for payment of debt service on Bonds before any drawing may be made on the Reserve Policy or any other Credit Facility credited to the Reserve Fund in lieu of cash. Payment of any Policy Costs shall be made prior to replenishment of any such cash amounts. Draws on all Credit Facilities (including the Reserve Policy) on which there is available coverage shall be made on a pro-rata basis (calculated by reference to the coverage then available thereunder) after applying all available cash and investments in the Reserve Fund. Payment of Policy Costs and reimbursement of amounts with respect to other Credit Facilities shall be made on a pro-rata basis prior to replenishment of any cash drawn from the Reserve Fund. For the avoidance of doubt, "available coverage" means the coverage then available for disbursement pursuant to the terms of the applicable alternative credit instrument without regard to the legal or financial ability or willingness of the provider of such instrument to honor a claim or draw thereon or the failure of such provider to honor any such claim or draw.

(c) Upon a failure to pay Policy Costs when due or any other breach of the terms of this Exhibit B, AGM shall be entitled to exercise any and all legal and equitable remedies available to it, including those provided under the Indenture, other than (i) acceleration of the maturity of the Bonds or (ii) remedies which would adversely affect owners of the Bonds.

(d) The Indenture shall not be discharged until all Policy Costs owing to AGM shall have been paid in full. The Authority's obligation to pay such amounts shall expressly survive payment in full of the Bonds.

(e) The Authority shall include any Policy Costs then due and owing AGM in the calculation of the additional bonds test and the rate covenant in the Indenture.

(f) The Indenture shall require the Trustee to ascertain the necessity for a claim upon the Reserve Policy in accordance with the provisions of subparagraph (b) hereof and to provide notice to AGM in accordance with the terms of the Reserve Policy at least two business days prior to each date upon which interest or principal is due on the Bonds. Where deposits are required to be made by the Authority with the Trustee to the debt service fund for the Bonds more often than semi-annually, the Trustee shall be instructed to give notice to AGM of any failure of the Authority to make timely payment in full of such deposits within two business days of the date due.

(g) The Authority will pay or reimburse AGM any and all reasonable charges, fees, costs, losses, liabilities and expenses which AGM may pay or incur, including, but not limited to, reasonable fees and expenses of attorneys, accountants, consultants and auditors and reasonable costs of investigations, in connection with (i) any accounts established to facilitate payments

under the Reserve Policy, (ii) the administration, enforcement, defense or preservation of any rights in respect of the Indenture or any document executed in connection with the Bonds (the "Related Documents"), including defending, monitoring or participating in any litigation or proceeding (including any bankruptcy proceeding in respect of the Authority) relating to the Indenture or any other Related Document, any party to the Indenture or any other Related Document or the transactions contemplated by the Related Documents, (iii) the foreclosure against, sale or other disposition of any collateral securing any obligations under the Indenture or any other Related Document, if any, or the pursuit of any remedies under the Indenture or any other Related Document, to the extent such costs and expenses are not recovered from such foreclosure, sale or other disposition, (iv) any amendment, waiver or other action with respect to, or related to the Indenture, the Reserve Policy or any other Related Document whether or not executed or completed, or (v) any action taken by AGM to cure a default or termination or similar event (or to mitigate the effect thereof) under the Indenture or any other Related Document; costs and expenses shall include a reasonable allocation of compensation and overhead attributable to time of employees of AGM spent in connection with the actions described in clauses (ii) through (v) above. AGM reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Indenture or any other Related Document. Amounts payable by the Authority hereunder shall bear interest at the Late Payment Rate from the date such amount is paid or incurred by AGM until the date AGM is paid in full.

(h) The obligation of the Authority to pay all amounts due to AGM shall be an absolute and unconditional obligation of the Authority and will be paid or performed strictly in accordance with the provisions of this Exhibit B, irrespective of (i) any lack of validity or enforceability of or any amendment or other modifications of, or waiver with respect to the Bonds, the Indenture or any other Related Document, or (ii) any amendment or other modification of, or waiver with respect to the Reserve Policy; (iii) any exchange, release or non-perfection of any security interest in property securing the Bonds, the Indenture or any other Related Documents; (iv) whether or not such Bonds are contingent or matured, disputed or undisputed, liquidated or unliquidated; (v) any amendment, modification or waiver of or any consent to departure from the Reserve Policy, the Indenture or all or any of the other Related Documents; (vi) the existence of any claim, setoff, defense (other than the defense of payment in full), reduction, abatement or other right which the Authority may have at any time against the Trustee or any other person or entity other than the Insurer, whether in connection with the transactions contemplated herein or in any other Related Documents or any unrelated transactions; (vii) any statement or any other document presented under or in connection with the Reserve Policy proving in any and all respects invalid, inaccurate, insufficient, fraudulent or forged or any statement therein being untrue or inaccurate in any respect; or (viii) any payment by the Insurer under the Reserve Policy against presentation of a certificate or other document which does not strictly comply with the terms of the Reserve Policy.

(i) The Authority shall fully observe, perform, and fulfill each of the provisions (as each of those provisions may be amended, supplemented, modified or waived with the prior written consent of the Insurer) of the Indenture applicable to it, each of the provisions thereof being expressly incorporated into this Exhibit B by reference solely for the benefit of AGM as if set forth directly herein. No provision of the Indenture or any other Related Document shall be

amended, supplemented, modified or waived, without the prior written consent of AGM, in any material respect or otherwise in a manner that could adversely affect the payment obligations of the Authority hereunder or the priority accorded to the reimbursement of Policy Costs under the Indenture. The Insurer is hereby expressly made a third party beneficiary of the Indenture and each other Related Document

(j) The Authority covenants to provide to AGM, promptly upon written request, any information regarding the Bonds or the financial condition and operations of the Authority as reasonably requested by AGM. The Authority will permit AGM to discuss the affairs, finances and accounts of the Authority or any information AGM may reasonably request regarding the security for the Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable AGM to have access to the facilities, books and records of the Authority on any business day upon reasonable prior notice.

Notices and other information to AGM shall be sent to the following address (or such other address as AGM may designate in writing): Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director – Surveillance, Re: Policy No. _____

THE PITTSBURGH WATER AND SEWER AUTHORITY

To

**THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.,
As Trustee**

**2019-1 SUPPLEMENTAL TRUST INDENTURE
DATED AS OF JULY 1, 2019**

Relating to the Issuance of

\$109,855,000

**The Pittsburgh Water and Sewer Authority
Water and Sewer System First Lien Revenue Bonds, Series A of 2019**

This 2019-1 SUPPLEMENTAL TRUST INDENTURE (the "2019-1 Supplemental Indenture") is dated as of July 1, 2019 by and between THE PITTSBURGH WATER AND SEWER AUTHORITY (the "Authority") and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as trustee (the "Trustee").

WITNESSETH:

WHEREAS, the Authority is a public body, politic and corporate, exercising public powers of the Commonwealth of Pennsylvania (the "Commonwealth") as an agency thereof, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth, Title 53 of the Pennsylvania Consolidated Statutes Annotated, Section 5601, et seq., as amended (the "Act"); and

WHEREAS, the Authority's senior lien debt has been issued under a Trust Indenture dated as of October 15, 1993, Amended and Restated as of November 1, 2017 and Effective on December 28, 2017 (the "Original Indenture") with a bond trustee, being The Bank of New York Mellon Trust Company, N.A. (the "Trustee"), as amended and supplemented by a 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture") and a 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") (the Original Indenture, as amended and supplemented by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, collectively, the "Existing Senior Indenture"); and

WHEREAS, Sections 3.01 and 3.02 of the Original Indenture empower the Trustee and the Authority to enter into a Supplemental Indenture in connection with the issuance of additional bonds to refund any indebtedness including subordinate indebtedness, to pay costs of issuance, to fund costs associated with Capitalized Interest, and to fund reserves; and

WHEREAS, in order to promote the health, safety and welfare of those it serves, the Authority adopted Resolution No. 36 of 2016 under which it (a) approved the undertaking of capital projects with respect to the Water and Sewer System (the "Capital Project") consisting of projects related to lead service line replacements, water treatment plant improvements, wastewater/sewer rehabilitation, water distribution, and green infrastructure, and (b) authorized the issuance of its \$80,000,000 maximum principal amount Revenue Note, Series of 2016 (the "2016 Note") representing a drawdown, revolving, interim construction loan from JPMorgan Chase Bank, National Association ("JPMorgan Bank"); and

WHEREAS, in order to increase the drawdown, revolving, interim construction loan, the Authority adopted Resolution No. 64 of 2018 in which it authorized (a) the issuance of its \$150,000,000 maximum principal amount Revenue Note, Series of 2018 (the "2018 Note"), and (b) the refunding and retirement of the 2016 Note with proceeds of the 2018 Note; and

WHEREAS, both the 2016 Note and the 2018 Note have constituted Subordinate Debt; and

WHEREAS, the Authority has drawn on the 2016 Note and the 2018 Note to fund Costs of the Capital Project, and the Authority now desires to refund all or a portion of the interim debt evidenced by the 2018 Note with long-term Senior Debt under the Indenture (defined below);

and

WHEREAS, in order to provide funds (a) to refund, on a long-term basis, all or a portion of the interim debt evidenced by the 2018 Note, the proceeds of which were used to fund the Capital Project, (b) to pay the premium related to a Debt Service Reserve Fund Policy, and (c) to pay the costs of issuing the 2019A Bonds (defined below) and insuring the 2019A Insured Bonds (defined below) (collectively, the “Refunding Project”), the Authority desires to issue its \$109,855,000 Water and Sewer System First Lien Revenue Bonds, Series A of 2019 (the “2019A Bonds”); and

WHEREAS, the 2019A Bonds are being issued under and secured by the terms of the Existing Senior Indenture as supplemented by this 2019-1 Supplemental Indenture (the Existing Senior Indenture, as amended and supplemented by this 2019-1 Supplemental Indenture, and as amended and supplemented from time to time in the future, is referred to herein as the “Indenture”); and

WHEREAS, the definitive form of the 2019A Bonds, including the certificate of authentication thereon, will be substantially in the form attached hereto and incorporated herein as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture; and

WHEREAS, the execution and delivery of this 2019-1 Supplemental Indenture has been duly authorized by a resolution of the Authority adopted on April 5, 2019 (the “Resolution”), and all things necessary to make the 2019A Bonds, when executed by the Authority, authenticated by the Trustee and issued by the Authority, the valid, binding and legal obligations of the Authority, and to constitute this 2019-1 Supplemental Indenture a valid, binding and legal pledge of the security therefor, as hereinafter provided, have been duly done and performed; and

WHEREAS, the scheduled payment of principal of and interest on the 2019A Insured Bonds (hereinafter defined) when due will be guaranteed under an insurance policy to be issued by Assured Guaranty Municipal Corp. concurrently with the delivery of the 2019A Bonds;

NOW, THEREFORE, the parties hereto, intending to be legally bound, hereby agree as follows:

ARTICLE I DEFINITIONS

SECTION 1.01 Definitions. The terms previously defined in the recitals hereto and in the Existing Senior Indenture shall, for all purposes of the Indenture, have the meanings therein specified, unless the context clearly otherwise requires. In addition, the following terms shall have the following meanings herein, unless the context clearly otherwise requires:

Bond Insurer

The term "Bond Insurer" or "Insurer" shall mean, with respect to the 2019A Insured Bonds, Assured Guaranty Municipal Corp., a stock insurance company incorporated under the laws of the State of New York, or any successor thereto.

Interest Payment Date

The term "Interest Payment Date" for the 2019A Bonds shall mean each March 1 and September 1, commencing September 1, 2019.

Official Statement

The term "Official Statement" means the Official Statement for the 2019A Bonds dated June 18, 2019.

Rating Agency

The term "Rating Agency" shall mean S&P when the 2019A Bonds are rated by S&P and Moody's when the 2019A Bonds are rated by Moody's.

Tax Regulatory Certificate

The term "Tax Regulatory Certificate" shall mean the Tax Certificate of the Authority dated July 2, 2019 related to the 2019A Bonds.

2019A Bond Insurance Policy

The term "2019A Bond Insurance Policy" shall mean the financial guaranty insurance policy issued by the Bond Insurer insuring the scheduled payment when due of the principal of and interest on the 2019A Insured Bonds as provided therein.

2019A Insured Bonds

The term "2019A Insured Bonds" shall mean the 2019A Bonds stated to mature on September 1, 2024 through 2039 and on September 1, 2044. These are the 2019A Bonds that are insured by the Bond Insurer; the 2019A Bonds stated to mature on September 1, 2020 through 2023 are not insured by the Bond Insurer.

**ARTICLE II
CONCERNING 2019A BONDS**

SECTION 2.01 The 2019A Bonds. There is hereby created one new series of Bonds to be issued under and secured by the Indenture, on a parity with the other first lien Bonds of the Authority, issued or to be issued pursuant to Sections 3.01 and 3.02 of the Existing Senior Indenture, to be designated "The Pittsburgh Water and Sewer Authority, Water and Sewer System First Lien Revenue Bonds, Series A of 2019," in the aggregate principal amount of \$109,855,000. The 2019A Bonds shall be issued for the purpose of providing funds for the payment of the costs of the Refunding Project. The 2019A Bonds shall be substantially in the form attached hereto as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture. The 2019A Bonds shall be executed in the form and manner herein specified and delivered to the Trustee for authentication and the Trustee shall authenticate and deliver the principal amount of 2019A Bonds, but only upon receipt by the Trustee of the Resolution, this 2019-1 Supplemental Indenture and certificates, opinions and all other materials and documents as provided in Section 3.01 and 3.02 of the Existing Senior Indenture. The 2019A Bonds as issued hereunder will be subject to the provisions of the Existing Senior Indenture and this 2019-1 Supplemental Indenture.

SECTION 2.02 Maturities and Interest Rates. The 2019A Bonds shall be issuable only as fully registered bonds in denominations of \$5,000 or any integral multiple thereof. The 2019A Bonds shall be numbered and shall bear such prefixes as may be satisfactory to the Authority and the Trustee. The 2019A Bonds shall bear interest on the unpaid principal thereof at the annual fixed rates set forth below, computed on the basis of a 360-day year consisting of twelve 30-day months, payable semiannually on March 1 and September 1 of each year, commencing September 1, 2019 until the principal thereof shall have been paid or provided for. The 2019A Bonds shall mature on the following dates and in the following principal amounts and bear interest at the following rates:

<u>2019A Bonds</u>		
<u>Maturity Date (September 1)</u>	<u>Principal</u>	<u>Interest Rate</u>
2020	\$2,295,000	5.000%
2021	\$2,415,000	5.000%
2022	\$2,540,000	5.000%
2023	\$2,665,000	5.000%
2024	\$2,800,000	5.000%
2025	\$2,940,000	5.000%
2026	\$3,085,000	5.000%
2027	\$3,240,000	5.000%
2028	\$3,400,000	5.000%
2029	\$3,570,000	5.000%
2030	\$3,750,000	5.000%
2031	\$3,935,000	5.000%
2032	\$4,135,000	5.000%
2033	\$4,340,000	5.000%

2034	\$4,560,000	5.000%
2035	\$4,785,000	5.000%
2036	\$5,025,000	5.000%
2037	\$5,275,000	5.000%
2038	\$5,540,000	5.000%
2039	\$5,815,000	5.000%
2044	\$33,745,000	5.000%

Each 2019A Bond shall bear interest from the immediately preceding Interest Payment Date to which interest has been paid, (a) unless the date of authentication is after the Record Date and on or before the succeeding Interest Payment Date in which case such 2019A Bond shall bear interest from such succeeding Interest Payment Date or (b) unless the date of authentication is on or prior to September 1, 2019 and if no interest has been paid on such 2019A Bond, such 2019A Bond shall bear interest from July 2, 2019.

The debt service schedule for the 2019A Bonds is set forth in Exhibit B hereto.

SECTION 2.03 Redemption Provisions.

Optional Redemption.

The 2019A Bonds maturing on or after September 1, 2030 are subject to redemption prior to maturity, at the option of the Authority, as a whole or in part, at any time, in the order of maturity selected by the Authority and by lot within a maturity on or after September 1, 2029. Any such redemption will be made at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

Mandatory Sinking Fund Redemption.

The 2019A Bonds stated to mature on September 1, 2044 are subject to mandatory sinking fund redemption in part, by lot, on the dates and in the principal amounts set out below at par plus accrued interest to the date fixed for redemption:

2019A Bonds Maturing on September 1, 2044

<u>Redemption Date (September 1)</u>	<u>Principal Amount To Be Redeemed</u>
2040	\$6,105,000
2041	\$6,410,000
2042	\$6,735,000
2043	\$7,070,000
2044 (maturity)	\$7,425,000

Extraordinary Optional Redemption. The 2019A Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority, in whole or in part, at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, from

moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, plus interest accrued to the date fixed for redemption for the 2019A Bonds.

SECTION 2.04 Notice of Redemption. When required to redeem 2019A Bonds under any provision of this 2019-1 Supplemental Indenture, other than Mandatory Sinking Fund Redemption under Section 2.03, or when directed to do so by the Authority pursuant to the provisions of this 2019-1 Supplemental Indenture, the Trustee shall cause notice of the redemption to be given not less than 20 days prior to the redemption date, by mailing copies of such notice of redemption by first class mail, postage prepaid, to all Holders of 2019A Bonds to be redeemed at their registered addresses, but failure to mail any such notice or defect in the mailing thereof in respect of any 2019A Bond shall not affect the validity of the redemption of any other 2019A Bond with respect to which notice was properly given. Each such notice shall be dated and shall be given in the name of the Authority and shall state the following information:

(a) the identification numbers, as established under this 2019-1 Supplemental Indenture, and the CUSIP numbers, if any, of the 2019A Bonds being redeemed, provided that any such notice shall state that no representation is made as to the correctness of CUSIP numbers either as printed on such 2019A Bonds or as contained in the notice of redemption and that reliance may be placed only on the identification numbers contained in the notice or printed on such 2019A Bonds;

(b) any descriptive information needed to identify accurately the 2019A Bonds being redeemed;

(c) in the case of partial redemption of any 2019A Bonds, the respective principal amounts thereof to be redeemed;

(d) the redemption date;

(e) the redemption price;

(f) that on the redemption date the redemption price will become due and payable upon each such 2019A Bond or portion thereof called for redemption, and that interest thereon shall cease to accrue from and after said date; and

(g) the place where such 2019A Bonds are to be surrendered for payment of the redemption price.

In addition, the Trustee shall at all reasonable times upon prior written request and at the expense of the requesting party make available to the Authority and the Bond Insurer complete information as to 2019A Bonds which have been redeemed or called for redemption.

If at the time of mailing of notice of any optional redemption there shall not have been deposited monies in the Redemption Fund available for payment pursuant to Section 6.09 of the Existing Senior Indenture sufficient to redeem all the 2019A Bonds called for redemption, such notice shall state that it is conditional in that it is subject to the deposit of the redemption

monies in the Redemption Fund available for payment on the redemption date, in which case such notice shall be of no effect unless monies are so deposited.

SECTION 2.05 Book-Entry Only Bonds. The 2019A Bonds shall be initially issued in book-entry only form. In the event that any provision of this Section 2.05 is inconsistent with other provisions of this 2019-1 Supplemental Indenture, so long as the 2019A Bonds shall be in book-entry only form, the provisions of this Section 2.05 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the 2019A Bonds. The ownership of one fully registered 2019A Bond for each maturity set forth in this 2019-1 Supplemental Indenture, each in the aggregate principal amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the 2019A Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the 2019A Bonds for an equal aggregate principal amount of 2019A Bonds of the applicable Series registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a 2019A Bond or any other evidence of ownership of the 2019A Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the 2019A Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the 2019A Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such 2019A Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under the Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the 2019A Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the 2019A Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the 2019A Bonds so redeemed, but DTC or its nominee may retain such 2019A Bonds and make an appropriate notation on the 2019A Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the 2019A Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the 2019A Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the 2019A Bonds, selecting the 2019A Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under the Indenture, registering the transfer of 2019A Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the 2019A Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the 2019A Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such

participant of any amount in respect of the principal or redemption price of or interest on the 2019A Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under the Indenture; or (v) the selection by DTC or any such participant of any person to receive payment in the event of a partial redemption of any Series of the 2019A Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the 2019A Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under the Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to the Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the 2019A Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under the Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the 2019A Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the 2019A Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the 2019A Bonds in registered certificate form in denominations of \$5,000 and integral multiples thereof, at the expense of the Authority, to such persons, and in such maturities and principal amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the 2019A Bonds.

SECTION 2.06 Consent to Amendment and Restatement of Original Indenture. In 2017, the Authority and the Trustee entered into the Original Indenture as then so amended and restated. See Sections 1.03, 1.04 and 1.05, on pages 31-32, of the Original Indenture. **THE PURCHASERS OF THE 2019A BONDS ARE HEREBY DEEMED, BY VIRTUE OF THEIR**

PURCHASE OF THE 2019A BONDS, TO HAVE CONSENTED TO THE ORIGINAL INDENTURE AS SO AMENDED AND RESTATED IN 2017 ON BEHALF OF THEMSELVES AND ALL FUTURE OWNERS OF THE 2019A BONDS.

**ARTICLE III
DEPOSITS TO FUNDS AND DISBURSEMENT OF MONEYS**

SECTION 3.01 Deposit of 2019A Bond Proceeds into Clearing Fund; Prepayment of Revenue Note, Series of 2018. Upon receipt, the proceeds of the 2019A Bonds shall be deposited to a Clearing Fund for the 2019A Bonds, which is hereby created, and shall be disbursed for the purposes and in the amounts set forth in a closing certificate of the Authority executed on the date of issuance of the 2019A Bonds. The closing certificate shall also state the amount of the proceeds of the 2019A Bonds that is to be delivered to the Trustee for application as hereinafter described.

A portion of the proceeds of the 2019A Bonds in the amount of \$131,200,000 in the Clearing Fund shall be applied to optionally prepay \$131,200,000 principal amount on the Authority's Revenue Note, Series of 2018, the registered owner of which is JPMorgan Chase Bank, National Association. The remaining proceeds of the 2019A Bonds shall be applied as set forth in the closing certificate of the Authority.

Amounts remaining on deposit in the Clearing Fund on August 1, 2019 shall, without further direction from the Authority, be applied by the Trustee to pay interest on the 2019A Bonds on the next applicable Interest Payment Date.

SECTION 3.02 Revenue Fund.

A. The Authority, in accordance with Section 6.02 of the Existing Senior Indenture, will transfer from the Revenue Fund to the Debt Service Fund from time to time, the amounts required to pay the principal of and interest on the 2019A Bonds.

The foregoing provisions relating to the Debt Service Fund are subject to the provision that there shall be credited to the transfer from the Revenue Fund available moneys deposited to the Debt Service Fund or earned as interest on moneys on deposit to the credit of the Debt Service Fund, and in determining the amount required to be transferred from the Revenue Fund to the Debt Service Fund pursuant to this Section, effect shall be given to the anticipated receipt on or before the appropriate payment date of the available moneys in the Debt Service Fund.

B. On or before each Interest Payment Date and on or before each date on which 2019A Bonds are to be redeemed, the Trustee shall pay from moneys held in the Debt Service Fund (or, the Debt Service Reserve Fund in the event that there are insufficient funds in the Debt Service Fund available for that purpose), the amount of principal, interest or redemption price payable with respect to the 2019A Bonds on such Interest Payment Date or redemption date; provided, however, that the principal or redemption price shall be paid only on presentation of the 2019A Bonds which are being paid, subject, however, to Section 2.05 hereof.

The Authority may deposit into the Debt Service Fund such additional funds as the

Authority shall determine which shall be applied by the Trustee at the written request of the Authority to the purchase of 2019A Bonds and such moneys shall be withdrawn by the Trustee and deposited in the Redemption Fund and applied to the payment of the purchase price of such 2019A Bonds which the Authority or the Trustee may agree to purchase; provided, however, that the Authority shall not purchase and the Trustee shall not apply moneys in the Debt Service Fund to the purchase of such 2019A Bonds at a price in excess of 100% of the principal amount thereof, plus accrued interest thereon to the date of purchase. At any time that the Trustee shall be requested to apply such moneys in the Debt Service Fund to purchase such 2019A Bonds, the Authority shall furnish to the Trustee not later than sixty (60) days prior to the next maturity date of any applicable year an Officers' Certificate specifying the 2019A Bonds which it has agreed to purchase, the purchase price thereof, the names of the sellers and the expenses involved in connection with such purchase.

SECTION 3.03 Deposit to Debt Service Reserve Fund. On the date of issuance of the 2019A Bonds there shall be on deposit to the Debt Service Reserve Fund, the existing Debt Service Reserve Insurance Policy No. 210578-R (the "Existing Reserve Policy") and a Debt Service Reserve Insurance Policy No. 219439-R (the "2019A Reserve Policy") both of Assured Guaranty Municipal Corp., which shall enable the amount on deposit in the Common Debt Service Reserve Fund to equal the Maximum Annual Debt Service Requirements on all Bonds Outstanding under the Indenture including the 2019A Bonds. The Authority confirms that the provisions in the Existing Senior Indenture and any insurance or reimbursement agreement entered into with the Bond Insurer shall remain in effect with respect to the Reserve Policy. The 2019A Bonds and all other Outstanding Bonds under the Indenture are Common Debt Service Reserve Secured Bonds (as defined in the Indenture).

ARTICLE IV
INTERNAL REVENUE CODE AND OTHER COVENANTS

SECTION 4.01 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered owners, from time to time, of the 2019A Bonds that no part of the proceeds of the 2019A Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the 2019A Bonds, would have caused the 2019A Bonds to be arbitrage bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and the regulations thereunder proposed or in effect at the time of such use and applicable to the 2019A Bonds, and that it will comply with the requirements of that section and the regulations throughout the term of the 2019A Bonds. In the event the Authority is of the opinion that it is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in the Tax Regulatory Certificate are hereby incorporated herein and made applicable to the 2019A Bonds.

ARTICLE V
AMENDMENTS

SECTION 5.01 Amendments to Existing Senior Indenture. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, the Existing Senior Indenture may be amended without the consent of the Bondholders “to cure any ambiguity, formal defect or omission in this Indenture or any Supplemental Indenture” and “to make any such provision in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture”.

SECTION 5.02 Transfers and Exchanges of Bonds. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 2.04 of the Existing Senior Indenture is amended to add the following paragraph to the end of such section:

In the event the Bond are no longer Book-Entry Bonds, to the extent that the Holder of the Bonds under this Subordinate Indenture is not an exempt recipient under Treas. Reg. § 1.6045-(c)(3), such Holder shall provide or cause to be provided to the Trustee information regarding the amount paid for the Bonds, any brokers’ fees or commissions, and any other capitalized costs relating to the Bonds, in each case to the extent necessary for the Trustee to comply with any applicable tax reporting obligations, including without limitation any cost basis reporting obligations under Internal Revenue Code Section 6045. The Trustee may rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

SECTION 5.03 Book-Entry Only Bonds. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 2.10 of the Existing Senior Indenture is amended to add the following two paragraphs to the end of such section:

In connection with any proposed transfer outside the Book-Entry Only system, prior to or in conjunction with the issuance of certificated Bonds, the Bondholder shall provide or cause to be provided to the Trustee all information necessary to allow the Trustee to comply with any applicable tax reporting obligations, including, without limitation, any cost basis reporting obligations under the Internal Revenue Code Section 6045.

The Authority acknowledges such tax reporting obligations and, if necessary, agrees to use commercially reasonable efforts to assist the Trustee in obtaining such information. The Trustee shall conclusively

rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

Section 5.04 Authorized Investments. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 6.12 of the Existing Senior Indenture is amended to revise the last sentence of such section to read as follows:

Although the Authority recognizes that it may obtain brokerage confirmations or written instructions containing comparable information at no additional cost, the Authority agrees that confirmations are not required to be issued by the Trustee for each month in which a monthly statement of investments is provided it; provided that no statement is required for any Fund and/or Account held by the Trustee for any month in which no investment activity occurred during such month in such Fund or Account.

SECTION 5.05 Rate Covenant Net Revenues and Rate Covenant Tests. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, the last paragraph of Section 7.01(c) of the Existing Senior Indenture is amended to read as follows (new language underlined):

The Authority shall test for compliance with this Section 7.01(c) within 120 days after the end of each Fiscal Year. For purposes of such testing under Section 7.01(c)(i) and (ii), Rate Covenant Net Revenues may take into account for a Fiscal Year, transfers from or to the Rate Stabilization Fund made within 60 days after the end of such Fiscal Year.

SECTION 5.06 Bondholders Consent to Original Indenture as Amended and Supplemented. In 2017, the Holders of in excess of 66 2/3% in principal amount of the Bonds Outstanding consented to the Original Indenture (being an amended and restated indenture). By their purchase of the 2019A Bonds, the Holders of the 2019A Bonds, on behalf of themselves and all future holders of the 2019A Bonds, consent to the provisions of the Original Indenture, as amended and supplemented.

ARTICLE VI

MISCELLANEOUS PROVISIONS

SECTION 6.01 Provisions Related to Bond Insurance. The provisions related to the 2019A Bond Insurance Policy are set forth in Exhibit C hereto, and such provisions are incorporated herein by reference as if fully set forth herein.

SECTION 6.02 Benefitted Parties. Nothing in this 2019-1 Supplemental Indenture, expressed or implied, is intended or shall be construed to confer upon or give any Person, other than the parties hereto, the Bond Insurer (to the extent rights are granted to the Bond Insurer in this 2019-1 Supplemental Indenture) and the registered Owners of the 2019A Bonds, any right, remedy or claim under or by reason of this 2019-1 Supplemental Indenture or any covenant, condition or stipulation hereof; and the covenants, stipulations and agreements contained in this 2019-1 Supplemental Indenture are and shall be for the sole and exclusive benefit of the parties hereto, the Bond Insurer and the registered Owners of the 2019A Bonds.

SECTION 6.03 Successors and Assigns. All the covenants and agreements by or on behalf of the Authority, or by or on behalf of the Trustee, contained in this 2019-1 Supplemental Indenture for all purposes shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

SECTION 6.04 Meanings of Terms and Phrases. All terms and phrases used in this 2019-1 Supplemental Indenture for all purposes hereof, shall have the meanings given to such terms and phrases in the Existing Senior Indenture, as supplemented hereby, unless otherwise specifically defined herein or unless the context plainly otherwise requires.

SECTION 6.05 Governing Law. The laws of the Commonwealth of Pennsylvania shall govern the construction of this 2019-1 Supplemental Indenture.

SECTION 6.06 Counterparts. This 2019-1 Supplemental Indenture may be executed in any number of counterparts, each of which when so executed and delivered shall be an original, but such counterparts shall together constitute but one and the same instrument.

SECTION 6.07 In Full Force and Effect. The Indenture, as supplemented hereby, shall be and remain in full force and effect.

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2019-1 Supplemental Indenture to be executed in its name by its Chairman or Vice-Chairman and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2019-1 Supplemental Indenture to be executed in its name by one of its authorized officers, and corporate seal to be hereunder affixed, attested by one of its authorized officers, all as of the day and year first above written.

THE PITTSBURGH WATER AND SEWER AUTHORITY

By: Paul Lopez
Chairman

Attest: Edward Basca
Jon W. Turner
(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By: _____
Authorized Officer

Attest:

Authorized Officer

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2019-1 Supplemental Indenture to be executed in its name by its Chairman or Vice-Chairman and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2019-1 Supplemental Indenture to be executed in its name by one of its authorized officers, and corporate seal to be hereunder affixed, attested by one of its authorized officers, all as of the day and year first above written.

THE PITTSBURGH WATER AND SEWER
AUTHORITY

By: _____
Chairman

Attest:

(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST
COMPANY, N.A., as Trustee

By: *Bruna J. Bramon*
Authorized Officer

Attest:

Mariana Mangano
Authorized Officer

THE PITTSBURGH WATER AND SEWER AUTHORITY

To

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.,
As Trustee

2020-1 SUPPLEMENTAL TRUST INDENTURE
DATED AS OF DECEMBER 1, 2020

Relating to the Issuance of

\$890,000

The Pittsburgh Water and Sewer Authority
Water and Sewer System First Lien Revenue Bonds, Series A of 2020
(Federally Taxable)

And to the Issuance of

\$91,520,000

The Pittsburgh Water and Sewer Authority
Water and Sewer System First Lien Revenue Bonds, Series B of 2020

And to the Remarketing of

\$218,805,000 The Pittsburgh Water and Sewer Authority
Water and Sewer System First Lien Revenue Refunding Bonds, Series C of 2017

This 2020-1 SUPPLEMENTAL TRUST INDENTURE (the "2020-1 Supplemental Indenture") is dated as of December 1, 2020 by and between THE PITTSBURGH WATER AND SEWER AUTHORITY (the "Authority") and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as trustee (the "Trustee").

WITNESSETH:

WHEREAS, the Authority is a public body, politic and corporate, exercising public powers of the Commonwealth of Pennsylvania (the "Commonwealth") as an agency thereof, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth, Title 53 of the Pennsylvania Consolidated Statutes Annotated, Section 5601, et seq., as amended (the "Act"); and

WHEREAS, the Authority's senior lien debt has been issued under an Amended and Restated Trust Indenture originally dated as of October 15, 1993, amended and restated as of November 1, 2017 and effective as of December 28, 2017 (the "Original Senior Indenture"), as amended and supplemented by the 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture"), the 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") and the 2019-1 Supplemental Trust Indenture dated as of July 1, 2019 (the "2019-1 Supplemental Indenture") (the Original Senior Indenture as amended and supplemented by the 2017-1 Supplemental Indenture, the 2017-2 Supplemental Indenture and the 2019-1 Supplemental Indenture is referred to herein as the "Existing Senior Indenture"), as such Existing Senior Indenture is further amended and supplemented by this 2020-1 Supplemental Indenture (the Existing Senior Indenture as amended and supplemented by this 2020-1 Supplemental Indenture, and as amended and supplemented from time to time, is referred to herein as the "Indenture"); and

WHEREAS, Section 3.02 of the Original Senior Indenture empowers the Trustee and the Authority to enter into a Supplemental Indenture in connection with the issuance of additional bonds under the Indenture; and

WHEREAS, the Authority currently has the following senior debt outstanding under the Indenture: Series B of 1998 (capital appreciation bonds – current outstanding accreted value of approximately \$61,996,886), Series A of 2013 (\$67,420,000 outstanding principal amount) (the "2013A Bonds"), Series B of 2013 (\$38,760,000 outstanding principal amount) (the "2013B Bonds") (the 2013A Bonds and the 2013B Bonds are referred to herein collectively as the "2013AB Bonds"), Series A of 2017 (\$129,610,000 outstanding principal amount), Series C of 2017 (\$218,805,000 outstanding principal amount) (the "2017C Bonds") and Series A of 2019 (\$107,560,000 outstanding principal amount); and

WHEREAS, , the Authority desires to undertake two financings:

- (a) The 2017C Bonds are in a variable rate mode with an upcoming mandatory tender date of December 1, 2020. The Authority desires to remarket the 2017C Bonds (the "2017C Refinancing") (such project is the "2017C Refinancing Project" – see Article VI hereof); and in order to pay the costs of remarketing related to the 2017C Refinancing Project, the Authority desires to issue its Water and Sewer System First Lien Revenue Bonds, Series A of 2020 (Federally Taxable) (the "2020A Bonds"); and

- (b) The Authority desires to issue new, fixed rate Water and Sewer System First Lien Revenue Bonds, Series B of 2020 (the "2020B Bonds" and together with the 2020A Bonds, the "2020AB Bonds"), the proceeds of which will pay down all or a portion of the outstanding principal amount under a capital line of credit revenue note Series of 2020 in favor of PNC Bank, N.A. in the maximum principal amount of \$150,000,000 (the "2020 PNC Note") thereby providing long-term financing for the Authority's capital projects, and pay the costs of issuance and insuring of the 2020B Bonds (such project is the "PNC Paydown Project"); and

WHEREAS, the 2020AB Bonds are being issued under and secured by the terms of the Existing Senior Indenture as supplemented by this 2020-1 Supplemental Indenture; and

WHEREAS, the definitive form of the 2020A Bonds, including the certificate of authentication thereon, will be substantially in the form attached hereto and incorporated herein as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture; and

WHEREAS, the definitive form of the 2020B Bonds, including the certificate of authentication thereon, will be substantially in the form attached hereto and incorporated herein as Exhibit B, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture; and

WHEREAS, the definitive form of the 2017C Bonds, including the certificate of authentication thereon, as of December 1, 2020 for the new Interest Period, will be substantially in the form attached hereto and incorporated herein as Exhibit E, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture; and

WHEREAS, the execution and delivery of this 2020-1 Supplemental Indenture has been duly authorized by a resolution adopted on September 25, 2020 (the "Resolution") by the Board the Authority, and all things necessary to make the 2020AB Bonds, when executed by the Authority, authenticated by the Trustee and issued by the Authority, the valid, binding and legal obligations of the Authority, and to constitute the Indenture a valid, binding and legal pledge of the security, as therein provided, have been duly done and performed; and

WHEREAS, the scheduled payment of principal of and interest on the 2020B Bonds when due will be guaranteed under insurance policies to be issued concurrently with the delivery of the 2020B Bonds by Assured Guaranty Municipal Corp.; and

WHEREAS, the Authority desires to effectuate certain technical amendments to the Indenture as set forth in Article V hereof in order to cure any ambiguity, formal defect or omission in the Indenture and to make such provisions in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture; and

NOW, THEREFORE, the parties hereto, intending to be legally bound, hereby agree as follows:

ARTICLE I DEFINITIONS

SECTION 1.01 Definitions. The terms previously defined in the recitals hereto and in the Existing Senior Indenture shall, for all purposes of the Indenture, have the meanings therein specified, unless the context clearly otherwise requires. In addition, the following terms shall have the following meanings herein, unless the context clearly otherwise requires:

Bond Insurer

The term "Bond Insurer" or "Insurer" shall mean, with respect to the 2020B Bonds, Assured Guaranty Municipal Corp., a stock insurance company incorporated under the laws of the State of New York, or any successor thereto.

Interest Payment Date

The term "Interest Payment Date" for the 2020AB Bonds shall mean each March 1 and September 1, commencing March 1, 2021.

Official Statement

The term "Official Statement" means the Official Statement for the 2020AB Bonds dated December 1, 2020.

Rating Agency

The term "Rating Agency" shall mean Standard & Poor's when the 2020AB Bonds are rated by Standard and Poor's and Moody's when the 2020AB Bonds are rated by Moody's.

Tax Regulatory Certificate

The term "Tax Regulatory Certificate" shall mean the Tax Certificate of the Authority dated December 1, 2020 related to the 2020B Bonds.

2020B Bond Insurance Policy

The term "2020B Bond Insurance Policy" shall mean the financial guaranty insurance policy or policies issued by the Bond Insurer insuring the scheduled payment when due of the principal of and interest on the 2020B Bonds as provided therein.

**ARTICLE II
CONCERNING 2020AB BONDS**

SECTION 2.01 The 2020A Bonds and the 2020B Bonds. There are hereby created two new series of Bonds to be issued under and secured by the Indenture, on a parity with the other first lien Bonds of the Authority, issued or to be issued pursuant to Section 3.02 of the Existing Senior Indenture, and Other Senior Parity Indebtedness, to be designated "The Pittsburgh Water and Sewer Authority, Water and Sewer System First Lien Revenue Bonds, Series A of 2020 (Federally Taxable)," in the aggregate principal amount of \$890,000 and the "The Pittsburgh Water and Sewer Authority, Water and Sewer System First Lien Revenue Bonds, Series B of 2020," in the aggregate principal amount of \$91,520,000. The 2020A Bonds shall be issued for the purpose of paying the costs of remarketing related to the 2017C Refinancing Project. The 2020B Bonds shall be issued for the purpose of providing funds for the payment of the costs of the PNC Paydown Project. The 2020A Bonds shall be substantially in the form attached hereto as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture. The 2020B Bonds shall be substantially in the form attached hereto as Exhibit B, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture. The 2020AB Bonds shall be executed in the form and manner herein specified and delivered to the Trustee for authentication and the Trustee shall authenticate and deliver the principal amount of 2020A Bonds and the principal amount of the 2020B Bonds, but only upon receipt by the Trustee of the Resolution, this 2020-1 Supplemental Indenture and certificates, opinions and all other materials and documents as provided in Section 3.02 of the Existing Senior Indenture. The 2020AB Bonds as issued hereunder will be subject to the provisions of the Existing Senior Indenture and this 2020-1 Supplemental Indenture.

SECTION 2.02 Maturities and Interest Rates. The 2020AB Bonds shall be issuable only as fully registered bonds in denominations of \$5,000 or any integral multiple thereof. The 2020AB Bonds shall be numbered and shall bear such prefixes as may be satisfactory to the Authority and the Trustee. The 2020AB Bonds shall bear interest on the unpaid principal thereof at the annual rates set forth below, computed on the basis of a 360-day year consisting of twelve 30-day months, payable semiannually on March 1 and September 1 of each year, commencing March 1, 2021 until the principal thereof shall have been paid or provided for. The 2020AB Bonds shall mature on the following dates and in the following principal amounts and bear interest at the following rates:

	<u>2020A Bonds</u>	
<u>Maturity Date</u> <u>(September 1)</u>	<u>Principal</u>	<u>Interest Rate</u>
2022	\$890,000	0.70%

<u>Maturity Date (September 1)</u>	<u>2020B Bonds</u>	
	<u>Principal</u>	<u>Interest Rate</u>
2022	\$795,000	3.00%
2023	\$1,710,000	4.00%
2024	\$1,780,000	4.00%
2025	\$1,850,000	4.00%
2026	\$1,920,000	5.00%
2027	\$2,020,000	5.00%
2028	\$2,120,000	5.00%
2029	\$2,225,000	5.00%
2030	\$2,335,000	5.00%
2031	\$2,455,000	5.00%
2032	\$2,575,000	5.00%
2033	\$2,705,000	5.00%
2034	\$2,840,000	5.00%
2035	\$2,980,000	4.00%
2036	\$3,100,000	4.00%
2037	\$3,225,000	4.00%
2038	\$3,355,000	4.00%
2039	\$3,490,000	3.00%
2040	\$3,595,000	3.00%
2045	\$20,050,000	4.00%
2050	\$24,395,000	4.00%

Each 2020AB Bond shall bear interest from the immediately preceding Interest Payment Date to which interest has been paid, (a) unless the date of authentication is after the Record Date and on or before the succeeding Interest Payment Date in which case such 2020AB Bond shall bear interest from such succeeding Interest Payment Date or (b) unless the date of authentication is on or prior to March 1, 2021 and if no interest has been paid on such 2020AB Bond, such 2020AB Bond shall bear interest from December 1, 2020.

The debt service schedule for the 2020A Bonds is set forth in Exhibit C hereto.

The debt service schedule for the 2020B Bonds is set forth in Exhibit D hereto.

SECTION 2.03 Redemption Provisions.

Optional Redemption.

The 2020A Bonds are not subject to optional redemption prior to maturity.

The 2020B Bonds maturing on or after September 1, 2031 are subject to redemption prior to maturity, at the option of the Authority, as a whole or in part, at any time, in the order of maturity selected by the Authority and by lot within a maturity on or after September 1, 2030. Any such redemption will be made at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

Mandatory Sinking Fund Redemption.

The 2020A Bonds are not subject to mandatory sinking fund redemption prior to maturity.

The 2020B Bonds are subject to mandatory sinking fund redemption prior to maturity as follows:

Bonds Stated to Mature on September 1, 2045:

<u>Redemption Date</u>	<u>Amounts</u>
September 1, 2041	\$3,700,000
September 1, 2042	\$3,850,000
September 1, 2043	\$4,005,000
September 1, 2044	\$4,165,000
September 1, 2045*	\$4,330,000

* Final maturity

Bonds Stated to Mature on September 1, 2050:

<u>Redemption Date</u>	<u>Amounts</u>
September 1, 2046	\$4,505,000
September 1, 2047	\$4,685,000
September 1, 2048	\$4,870,000
September 1, 2049	\$5,065,000
September 1, 2050*	\$5,270,000

* Final maturity

Extraordinary Optional Redemption. The 2020AB Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority, in whole or in part, at any time, in

the event of condemnation, damage or destruction of the Water and Sewer System, from moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, plus interest accrued to the date fixed for redemption for the 2020AB Bonds.

SECTION 2.04 Notice of Redemption. When required to redeem 2020AB Bonds under any provision of this 2020-1 Supplemental Indenture, other than Mandatory Sinking Fund Redemption under Section 2.03, or when directed to do so by the Authority pursuant to the provisions of this 2020-1 Supplemental Indenture, the Trustee shall cause notice of the redemption to be given not less than 30 days prior to the redemption date, by mailing copies of such notice of redemption by first class mail, postage prepaid, to all Holders of 2020AB Bonds to be redeemed at their registered addresses, but failure to mail any such notice or defect in the mailing thereof in respect of any 2020AB Bond shall not affect the validity of the redemption of any other 2020AB Bond with respect to which notice was properly given. Each such notice shall be dated and shall be given in the name of the Authority and shall state the following information:

(a) the identification numbers, as established under this 2020-1 Supplemental Indenture, and the CUSIP numbers, if any, of the 2020AB Bonds being redeemed, provided that any such notice shall state that no representation is made as to the correctness of CUSIP numbers either as printed on such 2020AB Bonds or as contained in the notice of redemption and that reliance may be placed only on the identification numbers contained in the notice or printed on such 2020AB Bonds;

(b) any descriptive information needed to identify accurately the 2020AB Bonds being redeemed;

(c) in the case of partial redemption of any series of 2020AB Bonds, the respective principal amounts thereof to be redeemed;

(d) the redemption date;

(e) the redemption price;

(f) that on the redemption date the redemption price will become due and payable upon each such 2020AB Bond or portion thereof called for redemption, and that interest thereon shall cease to accrue from and after said date; and

(g) the place where such 2020AB Bonds are to be surrendered for payment of the redemption price.

In addition, the Trustee shall at all reasonable times upon prior written request and at the expense of the requesting party make available to the Authority complete information as to 2020AB Bonds and the Bond Insurer complete information as to 2020B Bonds which have been redeemed or called for redemption.

If at the time of mailing of notice of any optional redemption there shall not have been deposited monies in the Redemption Fund available for payment pursuant to Section 6.09 of

the Original Senior Indenture sufficient to redeem all the 2020AB Bonds called for redemption, such notice shall state that it is conditional in that it is subject to the deposit of the redemption monies in the Redemption Fund available for payment on the redemption date, in which case such notice shall be of no effect unless monies are so deposited.

SECTION 2.05 Book-Entry Only Bonds. The 2020AB Bonds shall be initially issued in book-entry only form. In the event that any provision of this Section 2.05 is inconsistent with other provisions of this 2020-1 Supplemental Indenture, so long as the 2020AB Bonds shall be in book-entry only form, the provisions of this Section 2.05 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the 2020AB Bonds. The ownership of one fully registered Bond for each maturity of each Series set forth in this 2020-1 Supplemental Indenture, each in the aggregate Principal Amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the 2020AB Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the 2020AB Bonds for an equal aggregate Principal Amount of 2020AB Bonds of the applicable Series registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a 2020AB Bond or any other evidence of ownership of the 2020AB Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the 2020AB Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the 2020AB Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such 2020AB Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under the Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the 2020AB Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the 2020AB Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the 2020AB Bonds so redeemed, but DTC or its nominee may retain such 2020AB Bonds and make an appropriate notation on the 2020AB Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the 2020AB Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the 2020AB Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the 2020AB Bonds, selecting the 2020AB Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under the Indenture, registering the transfer of 2020AB Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the 2020AB Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the

Trustee as being a Bondholder, with respect to either: (i) the 2020AB Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such participant of any amount in respect of the principal or redemption price of or interest on the 2020AB Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under the Indenture; or (v) the selection by DTC or any such participant of any person to receive payment in the event of a partial redemption of any Series of the 2020AB Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the 2020AB Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under the Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to the Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the 2020AB Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under the Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the 2020AB Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the 2020AB Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the 2020AB Bonds of each Series in registered certificate form in denominations of \$5,000 and integral multiples thereof, at the expense of the Authority, to such persons, and in such maturities and Principal Amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the 2020AB Bonds. Prior to any transfer of the Bonds outside the Book-Entry Only system (including, but not limited to, the initial transfer outside the Book-Entry Only system), the transferor shall provide or cause to be provided to the Trustee all information necessary to allow the Trustee to comply

with any applicable tax reporting obligations, including without limitation any cost basis reporting obligations under Internal Revenue Code Section 6045, as amended. The Trustee shall conclusively rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

SECTION 2.06 Consent to Current Senior Indenture. The Current Senior Indenture contained certain amendments and restatements in 2017. THE PURCHASERS OF THE 2020AB BONDS ARE HEREBY DEEMED, BY VIRTUE OF THEIR PURCHASE OF THE 2020AB BONDS, TO HAVE CONSENTED TO THE INDENTURE (INCLUDING ALL AMENDMENTS AND RESTATEMENTS INCLUDED IN THE ORIGINAL SENIOR INDENTURE AND THE SUPPLEMENTS THERETO) ON BEHALF OF THEMSELVES AND ALL FUTURE OWNERS OF THE 2020AB BONDS.

ARTICLE III DEPOSITS TO FUNDS AND DISBURSEMENT OF MONEYS

SECTION 3.01 Deposit of 2020AB Bond Proceeds. Upon receipt of the proceeds of the 2020AB Bonds, such moneys shall be deposited to a Clearing Fund for the 2020AB Bonds, which is hereby created, and shall be disbursed for the purposes and in the amounts set forth in the closing certificate or closing certificates of the Authority executed on the date of issuance of the 2020AB Bonds. Each closing certificate shall also state the amount of the proceeds of the 2020AB Bonds that is to be delivered to the Trustee for application as hereinafter described.

A portion of the proceeds of the 2020A Bonds shall be applied to pay costs of remarketing the 2017C Bonds.

A portion of the proceeds of the 2020B Bonds shall be applied to pay down a portion of the 2020 PNC Note.

A portion of the proceeds of the 2020AB Bonds shall be applied to pay the costs of issuance of the 2020AB Bonds and the costs of insuring the 2020B Bonds.

Amounts remaining on deposit in the Clearing Fund on February 1, 2021 shall, without further direction from the Authority, be applied by the Trustee to pay interest on the 2020A Bonds on the next applicable Interest Payment Date.

SECTION 3.02 Revenue Fund.

A. The Authority will transfer from the Revenue Fund to the Debt Service Fund from time to time, the amounts required to pay the principal of and interest on the 2020AB Bonds.

The foregoing provisions relating to the Debt Service Fund are subject to the provision that there shall be credited to the Revenue Fund available moneys deposited to the Debt Service Fund or earned as interest on moneys on deposit to the credit of the Debt Service Fund, and in determining the amount required to be transferred from the Revenue Fund to the Debt Service Fund pursuant to this Section, effect shall be given to the anticipated receipt on or before the appropriate payment date of the available moneys in the Debt Service Fund.

B. On or before each Interest Payment Date and on or before each date on which 2020AB Bonds are to be redeemed, the Trustee shall pay from moneys held in the Debt Service Fund (or, the Debt Service Reserve Fund in the event that there are insufficient funds in the Debt Service Fund available for that purpose), the amount of principal, interest or redemption price payable with respect to the 2020AB Bonds on such Interest Payment Date or redemption date; provided, however, that the principal or redemption price shall be paid only on presentment of the 2020AB Bond which is being paid, subject, however, to Section 2.05 hereof.

The Authority may deposit into the Debt Service Fund such additional funds as the Authority shall determine which shall be applied by the Trustee at the written request of the Authority to the purchase of 2020AB Bonds and such moneys shall be withdrawn by the Trustee and deposited in the Redemption Fund and applied to the payment of the purchase price of such 2020AB Bonds which the Authority or the Trustee may agree to purchase; provided, however,

that the Authority shall not purchase and the Trustee shall not apply moneys in the Debt Service Fund to the purchase of such 2020AB Bonds at a price in excess of 100% of the principal amount thereof, plus accrued interest thereon to the date of purchase. At any time that the Trustee shall be requested to apply such moneys in the Debt Service Fund to purchase such 2020AB Bonds, the Authority shall furnish to the Trustee not later than sixty (60) days prior to the next maturity date of any applicable year an Officers' Certificate specifying the 2020AB Bonds which it has agreed to purchase, the purchase price thereof, the names of the sellers and the expenses involved in connection with such purchase.

SECTION 3.03 Deposit to Debt Service Reserve Fund. On the date of issuance of the 2020AB Bonds there shall be on deposit to the Debt Service Reserve Fund, the existing Debt Service Reserve Insurance Policy No. 210578-R and Policy No. 219493-R (the "Reserve Policies") of Assured Guaranty Municipal Corp., which together with other funds on deposit shall enable the amount on deposit in the Common Debt Service Reserve Fund to be sufficient to meet the Common Debt Service Reserve Requirement on all Bonds Outstanding under the Indenture including the 2020AB Bonds. The Authority confirms that the provisions in the Indenture and any insurance or reimbursement agreement entered into with the Bond Insurer shall remain in effect with respect to the Reserve Policies. The 2020AB Bonds and all other Outstanding Bonds under the Indenture are Common Debt Service Reserve Secured Bonds (as defined in the Indenture).

ARTICLE IV
INTERNAL REVENUE CODE AND OTHER COVENANTS

SECTION 4.01 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered owners, from time to time, of the 2020B Bonds that no part of the proceeds of the 2020B Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the 2020B Bonds, would have caused the 2020B Bonds to be arbitrage bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and the regulations thereunder proposed or in effect at the time of such use and applicable to the 2020B Bonds, and that it will comply with the requirements of that section and the regulations throughout the term of the 2020B Bonds. In the event the Authority is of the opinion that it is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in the Tax Regulatory Certificate are hereby incorporated herein.

ARTICLE V

AMENDMENTS

SECTION 5.01 Amendments Regarding Requisitions. The Construction Fund requisition provisions of the Current Senior Indenture are amended as follows (underlined text is new language; bracketed text is removed language):

(a) The definition of Consulting Engineer in Section 1.01 of the Original Senior Indenture is amended to read as follows:

Consulting Engineer

The term "Consulting Engineer" shall mean a person who is a registered professional engineer under the laws of the Commonwealth qualified to pass on engineering questions relating to the operation and maintenance of water, stormwater and sewer systems, who is appointed by the Board, who is in fact independent (although such person may be regularly retained by the Authority) and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board or an officer or employee of the Authority or the City. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority or the City. The Consulting Engineer may perform similar services for the City. Notwithstanding the foregoing, with respect to the Consulting Engineer approval of requisitions under Section 5.01(b) hereof, the term Consulting Engineer may include a licensed professional engineer who is not independent and is an employee of the Authority and who is not signing the requisition under Section 5.01(a) hereof.

(b) Section 5.01 of the Original Senior Indenture is amended to read as follows:

Construction Fund. There is hereby created a special fund known as the "Construction Fund", which shall be held in trust by the Trustee. Money shall be deposited to the Construction Fund pursuant to the provisions of Article II and from any other sources identified by the Authority. To the extent Costs of a Construction Project are paid for from Bonds, the Authority must deposit the construction proceeds of the Bonds in the Construction Fund and must follow the provisions of this Article V. To the extent the Authority is self-funding Costs from other than proceeds of Bonds, the Authority may use moneys in the Revenue Fund and the Operating Fund to pay such Costs, and the Authority need not use the Construction Fund or follow the provisions of this Article V.

Payment of the Costs of a Construction Project shall be made from the Construction Fund as described below. A special account shall be created and identified for each such Construction Project, although funds, at the written direction of the Authority, may be transferred from one such account in the Construction Fund to another account in such Fund. On the date of issuance of Bonds to finance in whole or in part a Construction Project, the moneys directed, in writing, by the Authority to be transferred from the Clearing Fund shall be deposited into the Construction Fund or an account therein. All moneys on deposit in the Construction Fund shall be held in Trust by the Trustee as security under this Indenture and disbursed by the Trustee pursuant to this Section 5.01 in payment of the Costs of the Construction Project. Before each such withdrawal and payment of the Costs of the Construction Project from the Construction Fund by the Trustee, the Authority shall deliver to the Trustee the following:

A requisition, signed by any [two] one of the Chairperson or Vice Chairperson or Secretary or Assistant Secretary or the Executive Director or the Chief Financial Officer or the Director of Finance of the Authority, or signed by such other person [or persons] who is [or are] authorized to do so pursuant to a Resolution of the Board, stating in respect of each payment to be made:

- (1) the item number of the payment;
- (2) the name and address of the person to whom payment is due;
- (3) the amount to be paid and the Construction Fund from which payment is to be made;
- (4) the purpose for which the obligation was incurred;
- (5) that obligations in the stated amount have been incurred by the Authority and that each item thereof is a proper part of the Cost of the Construction Project and has not been paid;
- (6) that there has not been filed with or served upon the Authority notice of any lien, right to lien or attachment upon, or claim affecting the right to receive payment of any of the moneys payable to any persons named in such requisition;

(7) that such requisition contains no items representing payment on account of any retained percentage which the Authority is on the date of such certificate entitled to retain;

(8) that neither the Authority nor any of its officers or members has received any discount, rebate, commission, fee, proceeds from insurance or other abatement which is not reflected on the requisition in connection with any such expenditures or indebtedness; and

(9) that no part of any such item has been included in any previous requisition for the withdrawal of moneys from the Construction Fund; and

Except to the extent to which a requisition relates to financing costs, a certificate signed by the Consulting Engineer approving such requisition and certifying that each item to be paid as set forth in such requisition constitutes an obligation which has been properly incurred as part of the Cost of the Construction Project and is then due and unpaid.

Upon the receipt of each such requisition and the accompanying certificate, the Trustee shall (a) unless otherwise requested by the Authority under clause (b) of this sentence, pay to the persons named in such requisition, the respective amounts stated therein to be due to such persons; or (b) if requested to do so by the Authority, forward the aggregate amount payable pursuant to the requisition to an account designated by the Authority for payment by the Authority to the persons named in the requisition, the respective amounts stated in the requisition to be due to such persons (if such amounts are paid by the Authority, the Authority will then give the Trustee evidence that the Authority has paid such amounts).

Investment earnings on the amounts on deposit in the Construction Fund shall be retained in the Construction Fund unless the Authority directs the Trustee, in writing, to transfer such earnings to the Debt Service Fund.

Any moneys remaining in the Construction Fund after all amounts due in respect of the Construction Project shall have been paid (including any Costs of any amendment or revision of the Construction Project pursuant to Section 5.02 below), which fact shall be evidenced to the Trustee by delivery of a certificate of an Authorized Representative of the Authority to that effect, shall be transferred by the Trustee to the Revenue Fund and applied as directed in writing by the Authority; with respect to such

application, the Authority will obtain an opinion of Bond Counsel that such application in and of itself will not adversely affect the exclusion for federal income tax purposes from gross income of interest on the Series of Bonds issued to fund such Construction Project if interest on such Series of Bonds is excludable from gross income for federal income tax purposes. If an Event of Default pursuant to Section 8.01(a) or (b) occurs, and only to the extent that no other available moneys are held under this Indenture, the Trustee shall transfer moneys from the Construction Fund to the Debt Service Fund to pay principal and interest on the Bonds.

All requisitions received by the Trustee pursuant to Section 5.01(a) may be relied upon without investigation or inquiry by and shall be retained in the possession of the Trustee for a period of five (5) years, subject at all times to the inspection of the Authority, its agents and representatives, and any other person authorized by a certificate of an Authorized Representative of the Authority.

ARTICLE VI

REMARKETING OF 2017C BONDS

SECTION 6.01 Remarketing of 2017C Bonds.

(a) The 2017C Bonds are outstanding under the Indenture and, pursuant to the terms of the 2017-2 Supplemental Indenture, are currently in an Initial Period described as follows: the 2017C Bonds (1) are issued in one Series with no Sub-Series, (2) bear interest at an Index Rate, being the lesser of (i) the LIBOR Index Rate, and (ii) the Maximum Rate, (3) are Soft Tender Index Rate Bonds, (4) have an Initial Index Rate Bonds Purchase Date of December 1, 2020, (5) are subject to optional redemption on any Business Day on or after June 1, 2020 in whole or in part at a redemption price equal to 100% of principal amount to be redeemed plus interest accrued to the redemption date, upon giving notice in accordance with Section 3.02, (6) are subject to mandatory sinking fund redemption in accordance with Section 3.01(b) of the Original Senior Indenture, (7) are subject to extraordinary optional indenture in accordance with Section 3.01(d) of the Original Senior Indenture, and (8) are in Authorized Denominations of \$5,000 and integral multiples thereof.

(b) The 2017C Bonds are being remarketed as of December 1, 2020 in a new Interest Period, pursuant to Section 2.03(f) of the 2017-2 Supplemental Indenture, described as follows: the 2017C Bonds as of December 1, 2020 (1) will be in one Series with no Sub-Series, (2) will bear interest at an Index Rate, being the lesser of (i) the SIFMA Index Rate, and (ii) the Maximum Rate, (3) are Soft Tender Index Rate Bonds, (4) have a Purchase Date of December 1, 2023, (5) are subject to optional redemption on any Business Day on or after June 1, 2023 in whole or in part at a redemption price equal to 100% of principal amount to be redeemed plus interest accrued to the redemption date, upon giving notice in accordance with Section 3.02, (6) are subject to mandatory sinking fund redemption in accordance with Section 3.01(b) of the Original Senior Indenture, (7) are subject to extraordinary optional indenture in accordance with Section 3.01(d) of the Original Senior Indenture, and (8) are in Authorized Denominations of \$5,000 and integral multiples thereof. The 2017C Bonds shall bear interest at SIFMA Index plus 0.65%, not to exceed Maximum Rate during the period December 1, 2020 to December 1, 2023.

(c) The 2017C Bonds, as of December 1, 2020 for the new Interest Period, shall be substantially in the form attached hereto as Exhibit E, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture.

(d) Also on December 1, 2020, the Authority will enter into a new interest rate swap agreement for a three year term with Merrill Lynch Capital Services, Inc. related to certain of the 2017C Bonds under which the Authority will pay a LIBOR-based rate and receive a SIFMA-based rate thereby matching the LIBOR-based rate for three years under the Authority's existing interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. related to certain of the 2017C Bonds.

(e) BofA Securities Inc. ("BofA") has been appointed by the Authority as Remarketing Agent hereunder for the remarketing of the 2017C Bonds in connection with the December 1, 2020 Conversion Date. The Authority and BofA have entered into a Remarketing Agreement dated as of November 1, 2020 with respect to such remarketing.

ARTICLE VII

MISCELLANEOUS PROVISIONS

SECTION 7.01 Provisions Related to Bond Insurance. The provisions related to the 2020B Bond Insurance Policy are set forth in Exhibit F hereto, and such provisions are incorporated herein by reference as if fully set forth herein.

SECTION 7.02 Benefitted Parties. Nothing in this 2020-1 Supplemental Indenture, expressed or implied, is intended or shall be construed to confer upon or give any Person, other than the parties hereto, the Bond Insurer (to the extent rights are granted to the Bond Insurer in this 2020-1 Supplemental Indenture) and the registered Owners of the 2020AB Bonds, any right, remedy or claim under or by reason of this 2020-1 Supplemental Indenture or any covenant, condition or stipulation hereof; and the covenants, stipulations and agreements contained in this 2020-1 Supplemental Indenture are and shall be for the sole and exclusive benefit of the parties hereto, the Bond Insurer and the registered Owners of the 2020AB Bonds and 2017C Bonds.

SECTION 7.03 Successors and Assigns. All the covenants and agreements by or on behalf of the Authority, or by or on behalf of the Trustee, contained in this 2020-1 Supplemental Indenture for all purposes shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

SECTION 7.04 Meanings of Terms and Phrases. All terms and phrases used in this 2020-1 Supplemental Indenture for all purposes hereof, shall have the meanings given to such terms and phrases in the Indenture, as supplemented hereby, unless otherwise specifically defined herein or unless the context plainly otherwise requires.

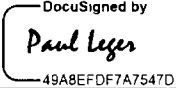
SECTION 7.05 Governing Law. The laws of the Commonwealth of Pennsylvania shall govern the construction of this 2020-1 Supplemental Indenture.

SECTION 7.06 Counterparts. This 2020-1 Supplemental Indenture may be executed in any number of counterparts, each of which when so executed and delivered shall be an original, but such counterparts shall together constitute but one and the same instrument.

SECTION 7.07 In Full Force and Effect. The Indenture, as amended and supplemented hereby, shall be and remain in full force and effect, and is hereby ratified, approved and confirmed.

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2020-1 Supplemental Indenture to be executed in its name by its Chair or Vice-Chair and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2020-1 Supplemental Indenture to be executed in its name by one of its authorized officers, all as of the day and year first above written.

THE PITTSBURGH WATER AND SEWER AUTHORITY

By:  _____
Chair

Attest:  _____
(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By: _____
Authorized Officer

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2020-1 Supplemental Indenture to be executed in its name by its Chair or Vice-Chair and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2020-1 Supplemental Indenture to be executed in its name by one of its authorized officers, all as of the day and year first above written.

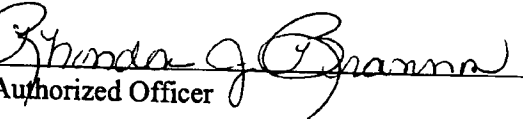
THE PITTSBURGH WATER AND SEWER
AUTHORITY

By: _____
Chair

Attest:

(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST
COMPANY, N.A., as Trustee

By: 
Authorized Officer

2019-1 SUPPLEMENTAL SUBORDINATE TRUST INDENTURE

**Constituting the
AMENDED AND RESTATED SUBORDINATE TRUST INDENTURE
dated as of July 1, 2019**

BETWEEN

THE PITTSBURGH WATER AND SEWER AUTHORITY

and

**THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.
as Trustee**

**Relating to the Issuance of
\$104,290,000
The Pittsburgh Water and Sewer Authority
Water and Sewer System Subordinate Revenue Refunding Bonds, Series B of 2019**

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**2019-1 SUPPLEMENTAL SUBORDINATE TRUST INDENTURE CONSTITUTING THE
AMENDED AND RESTATED SUBORDINATE TRUST INDENTURE**

THIS 2019-1 SUPPLEMENTAL SUBORDINATE TRUST INDENTURE¹ constituting the AMENDED AND RESTATED SUBORDINATE TRUST INDENTURE dated as of the 1st day of July, 2019 (as amended and supplemented from time to time, the "Subordinate Indenture"), is by and between THE PITTSBURGH WATER AND SEWER AUTHORITY, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania, having its principal office in the City of Pittsburgh, Allegheny County, Pennsylvania (the "Authority"), and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., a national banking corporation organized and existing under and by virtue of the laws of the United States of America, having power and authority to accept and execute trusts and having a corporate trust office in the City of Pittsburgh, Allegheny County, Pennsylvania, as trustee (the "Trustee").

WHEREAS, the Authority makes the following findings and statements:

1. The Act. The Authority is a public body, corporate and politic, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth of Pennsylvania (the "Commonwealth"), Title 53 of the Pennsylvania Consolidated Statutes, Section 5601, et seq., as amended (the "Act").

2. Relationship with the City. The Authority was organized in February 1984 by the City of Pittsburgh, Allegheny County, Pennsylvania (the "City") for the purpose of assuming the responsibility for the operation of the City's water supply and distribution and wastewater collection systems (as further modified as defined herein, the "System"). Pursuant to a Lease and Management Agreement dated as of March 29, 1984 between the City and the Authority (the "Lease and Management Agreement"), the System was leased by the City to the Authority. The Authority then designated the City as its agent to operate and maintain the System. The City and the Authority entered into a Capital Lease Agreement dated as of July 15, 1995 (the "Capital Lease Agreement") under which the Lease and Management Agreement was terminated and the Authority was granted the option to acquire the portion of the System owned by the City. Pursuant to the Capital Lease Agreement, which has a term of 30 years, the Authority made three payments totaling \$101,416,974.60 during the first three years, and on September 1, 2025, upon the payment of \$1.00, the Authority will acquire title to the System. At the same time the City and the Authority entered into the Capital Lease Agreement, they also entered into a Cooperation Agreement dated as of June 15, 1995, effective January 1, 1995, as amended by a First Amendment to Cooperation Agreement dated March 21, 2011 (as amended and supplemented from time to time, the "Cooperation Agreement"). The Cooperation Agreement provides for the following matters: the Authority agreed to assume responsibility for management and operation of the System, with some sewer functions remaining with the City. The City provides certain specified services to the Authority on a fee for services basis and the Authority makes certain payments to the City to reimburse it for costs incurred by the City in regard to the operation and maintenance of the System. The Authority agrees to provide the City with water without charge to be used by the City, its departments, agencies and instrumentalities,

¹ Amending and supplementing the Existing Subordinate Indenture defined in paragraph 4 below.

and the Authority agrees to reimburse the City for equalization payments made by the City to a private utility which serves customers in a portion of the City. In the 2011 amendment to the Cooperation Agreement, the City agreed to subordinate the payments it is entitled to under the Cooperation Agreement to the Authority's debt obligations.

3. Existing Senior Indenture. The Authority's existing senior lien debt in the approximate principal amount of \$551,392,00 is outstanding under an Amended and Restated Trust Indenture dated as of October 15, 1993, amended and restated as of November 1, 2017, and effective on December 28, 2017 (the "Original Indenture") with The Bank of New York Mellon Trust Company, N.A., as trustee (the "Trustee"), as amended and supplemented by a 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture"), and a 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") (the Original Indenture, as amended and supplemented by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, collectively, the "Existing Senior Indenture").

4. Existing Subordinate Indenture. The Authority's subordinate lien bond debt has been issued to date under a Subordinate Trust Indenture dated as of July 15, 1995 (the "Original Subordinate Indenture") between the Authority and a bond trustee, now being The Bank of New York Mellon Trust Company, N.A. (the "Subordinate Trustee"), as amended and supplemented by a First Supplemental Subordinate Indenture dated as of March 1, 1998 (the "First Supplemental Subordinate Indenture"), a Second Supplemental Subordinate Indenture dated as of June 1, 2008 (the "Second Supplemental Subordinate Indenture"), an Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 1, 2009 (the "2009-1 Supplemental Subordinate Indenture"), an Amendment to the Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 15, 2009 (the "2009-2 Supplemental Subordinate Indenture"), a Second Amending Supplement to the Second Supplemental Indenture dated as of September 1, 2012 (the "2012 Supplemental Subordinate Indenture"), a Third Amending Supplement to the Second Supplemental Subordinate Indenture dated as of September 1, 2013 (the "Third Supplemental Subordinate Indenture"), a Fourth Amending Supplement to the Second Supplemental Indenture dated as of November 3, 2014 (the "2014 Supplemental Subordinate Indenture"), a Fifth Amending Supplement to the Second Supplemental Indenture dated as of September 1, 2015 (the "2015 Supplemental Subordinate Indenture"), a 2018-1 Supplemental Subordinate Trust Indenture dated as of August 31, 2018 (the "2018-1 Supplemental Subordinate Indenture") and a 2018-2 Supplemental Subordinate Trust Indenture dated as of August 31, 2018 (the "2018-2 Supplemental Subordinate Indenture") (the Original Subordinate Indenture, as amended and supplemented by the First Supplemental Subordinate Indenture, the Second Supplemental Subordinate Indenture, the 2009-1 Supplemental Subordinate Indenture, the 2009-2 Supplemental Subordinate Indenture, the 2012 Supplemental Subordinate Indenture, the 2013 Supplemental Subordinate Indenture, the 2014 Supplemental Subordinate Indenture, the 2015 Supplemental Subordinate Indenture, the 2018-1 Supplemental Subordinate Indenture and the 2018-2 Supplemental Subordinate Indenture (the "Existing Subordinate Indenture").

5. 2008C-1 Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2008, the Authority issued its \$51,910,000 (Variable Rate Demand) Water and Sewer System

Subordinate Revenue Refunding Bonds, Series C-1 of 2008 (the “2008C-1 Subordinate Bonds”) and its \$51,885,000 (Variable Rate Demand) Water and Sewer System Subordinate Revenue Refunding Bonds, Series C of 2008 (the “2008C-2 Subordinate Bonds”) pursuant to the Second Supplemental Subordinate Indenture. The 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds are variable rate bonds issued to refund certain prior debt. With respect to such bonds, the Authority entered into long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. These swaps are insured by Assured Guaranty Municipal Corp. (“AGM”). AGM provides the debt service reserve fund policy for the 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds.

6. Subseries of 2008C-1 Subordinate Bonds. The 2008C-1 Subordinate Bonds were initially insured by AGM with a liquidity facility provided by Dexia Credit Local. In 2009, the Authority, pursuant to the 2009-1 Supplemental Subordinate Indenture and an Amendment to the Amending Supplement to the Initial Subordinate Indenture and the 2009-2 Supplemental Subordinate Indenture, divided the 2008C-1 Subordinate Bonds into four subseries: the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1A of 2008 (the “2008C-1A Subordinate Bonds”); the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1B of 2008 (the “2008C-1B Subordinate Bonds”); the \$5,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1C of 2008 (the “2008C-1C Subordinate Bonds”); and the \$26,910,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1D of 2008 (the “2008C-1D Subordinate Bonds”). All of these bonds were converted into a term mode. Dexia Credit Local was removed as the liquidity facility for all of these bonds. New banks were designated as liquidity facility providers for the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds. The 2008C-1D Subordinate Bonds were remarketed in 2009 without a liquidity facility. In 2012, the 2008C-1D Subordinate Bonds were remarketed again without a liquidity facility and the Authority entered into the 2012 Supplemental Subordinate Indenture.

7. 2008C-2 Subordinate Bonds. The 2008C-2 Subordinate Bonds are insured by AGM.

8. Direct Placement of 2008C-1ABC Subordinate Bonds. In 2013, the Authority began a process in which all of the subordinate bonds would eventually be put into direct placements by 2016. Pursuant to the Third Supplemental Subordinate Indenture, the AGM insurance on the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds (collectively, the “2008C-1ABC Subordinate Bonds”) was terminated, and the 2008C-1ABC Subordinate Bonds were directly placed with Banc of America Preferred Funding Corporation. In connection with the direct placement, the Authority and Banc of America Preferred Funding Corporation entered into a Continuing Covenant Agreement dated as of September 1, 2013 (the “2008C-1ABC Continuing Covenant Agreement”).

9. Direct Placement of 2008C-2 Subordinate Bonds; LIBOR Rates for 2008C-1ABC Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2014 and 2015, the rest of the subordinate bonds were put into direct placements. Pursuant to the 2014 Supplemental Indenture, the 2008C-1ABC Subordinate Bonds, which were directly placed with the Banc of America Preferred Funding Corporation in 2013, were converted to a LIBOR-based

interest rate mode; and the 2008C-2 Subordinate Bonds were directly placed with DNT Asset Trust (an affiliate of J.P. Morgan Chase Bank, N.A.) in a LIBOR-based interest rate mode. The Authority and Banc of America Preferred Funding Corporation entered into a First Amendment to Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-1ABC First Amendment to Continuing Covenant Agreement”). The Authority and DNT Asset Trust entered into a Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-2 Continuing Covenant Agreement”). In connection with these actions, the Authority entered into amendments to the long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. to provide for LIBOR-based payments by the counterparties under the swap agreements (with respect to all of the 2008C Subordinate Bonds). In November 2018, DNT Asset Trust tendered the 2008C-2 Bonds, and such bonds were purchased by JPMorgan Chase Bank, National Association² pursuant to a Bond Purchase Agreement dated as of October 19, 2018 (the “JPMorgan 2008C-2 BPA”). Pursuant to the JPMorgan BPA and the 2018-2 Supplemental Subordinate Indenture, the 2008C-2 Bonds were converted into a new, two-year interest period ending on November 2, 2020 with a LIBOR-based interest rate.

10. Direct Placement of 2008C-1D Subordinate Bonds. In 2015, pursuant to the 2015 Supplemental Indenture, the 2008C-1D Subordinate Bonds were directly placed with Bank of America, N.A. in a LIBOR-based interest rate mode. The Authority and Bank of America, N.A. entered into a Continuing Covenant Agreement dated as of September 1, 2015 (the “2008C-1D Continuing Covenant Agreement”). In August 2018, the Authority and Bank of America, N.A. entered into a First Amendment to Continuing Covenant Agreement (the “First Amendment to 2008C-1D Continuing Covenant Agreement”), and, pursuant to that amended agreement and the 2008-1 Supplemental Subordinate Indenture, the 2008C-1D Bonds were converted into a new, three-year interest period ending on August 31, 2021 with a LIBOR-based interest rate.

11. Agreements with AGM Regarding Swap Insurance. The Authority has two agreements with AGM regarding the interest rate swap agreements that AGM insures related to the 2008C Subordinate Bonds: an Agreement Regarding Insured Swap Transaction dated as of September 1, 2013, as amended by an Amendment dated as of July 11, 2017 (collectively, the “AGM 2008C-1ABC and 2008C-1D Agreement”), and an Agreement Regarding Insured Swap Transaction dated as of November 1, 2014 (the “AGM 2008C-2 Agreement”). These agreements require the swaps or the insurance thereof to be terminated in certain circumstances.

12. Non-Bond Subordinate Debt: PENNVEST Loans, 2018 Revolving Credit Agreement, and 2018 Operating Line of Credit. In addition to the senior and subordinate bonds, the Authority has three other types of debt which are subordinate to both the senior and the subordinate bonds, but are on parity with each other with respect to the Authority’s Revenues (as hereinafter defined). The first type of debt consists of multiple loans (the “PENNVEST Loans”) from the Pennsylvania Infrastructure Investment Authority (“PENNVEST”). The PENNVEST Loans were entered into by the Authority between 2001 and 2019 and have an outstanding principal amount of approximately \$62 million. The second type of debt is a \$150 million maximum principal amount revolving construction loan evidenced by a Revenue Note, Series of

² An affiliate of DNT Asset Trust.

2018 (the “2018 Note”). The 2018 Note was issued pursuant to a Revolving Credit and Security Agreement dated as of August 31, 2018 (the “2018 Revolving Credit Agreement”) between the Authority and the lender, JPMorgan Chase Bank, National Association. The third type of debt is \$20 million maximum principal amount revolving line of credit with PNC Bank, National Association for operating expenses (the “2018 Operating Line of Credit”). In connection with the execution of the 2018 Revolving Credit Agreement and the 2018 Operating Line of Credit, the Authority, PENNVEST, JPMorgan Chase Bank, National Association, PNC Bank, National Association and The Bank of New York Mellon Trust Company, N.A., as collateral trustee, entered into an Amended and Restated Intercreditor Agreement dated as of July 1, 2016 and amended and restated as of August 31, 2018 (the “2018 Intercreditor Agreement”) setting forth their respective rights with respect to the Revenues.

13. This Amended and Restated Subordinate Indenture. The Authority intends to issue its \$104,290,000 aggregate principal amount Water and Sewer System Subordinate Revenue Refunding Bonds, Series B of 2019 (the “2019B Subordinate Bonds”), the proceeds of which will be applied (a) to currently redeem all of the 2008C-1ABC Bonds, 2008C-1D Bonds and 2008C-2 Bonds (the “Refunded Subordinate Bonds”), (b) to pay a portion of the swap termination payments relating to the termination of the interest rate swap agreements related to the Refunded Subordinate Bonds, (c) to pay the premium relating to a Debt Service Reserve Fund Policy, and (d) to pay the costs of issuing and insuring the 2019B Subordinate Bonds (the “2019 Project”). Since all of the subordinate bonds under the Existing Subordinate Indenture are being redeemed, this 2019-1 Supplemental Subordinate Indenture is totally amending and restating the Existing Subordinate Indenture by constituting the new Amended and Restated Subordinate Trust Indenture hereunder (referred to herein as the “Subordinate Indenture”), and by their purchase of the 2019B Subordinate Bonds, the 2019B Bondholders are consenting to this new Subordinate Indenture.

WHEREAS, the execution and delivery of this Subordinate Indenture have been duly authorized by a resolution of the Authority; and

WHEREAS, all acts, conditions and things required by the Constitution and laws of the Commonwealth, including the Act, to happen, exist and be performed precedent to and in the execution and delivery of this Subordinate Indenture have happened, exist and have been performed as so required, in order to make this Subordinate Indenture a valid and binding trust indenture for the security of the Subordinate Bonds, subject to the lien on Revenues created under this Subordinate Indenture, in accordance with its terms;

NOW, THEREFORE, THIS AMENDED AND RESTATED TRUST INDENTURE WITNESSETH: that in consideration of the premises and of the acceptance by the Trustee of the trusts hereby created, and of the purchase and acceptance of the Subordinate Bonds by the registered Owners thereof, and for the purpose of fixing and declaring the terms and conditions upon which the Subordinate Bonds are or may be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become Owners thereof, and to declare the terms and conditions upon which the Subordinate Bonds are secured, and to secure equally and on parity the payment of (i) the principal of, and interest and premium (if any) on all Subordinate Bonds at any time issued and outstanding hereunder, according to their tenor, purport and effect, and (ii) Other Subordinate Parity Indebtedness and to secure the performance

and observance of all of the covenants, agreements and conditions therein and herein contained, the Authority, intending to be legally bound, has executed and delivered this Subordinate Indenture and by these presents does hereby sell, assign, transfer, set over, grant a security interest in and pledge unto The Bank of New York Mellon Trust Company, N.A., as Trustee, its successors in the trust and its assigns forever, to the extent provided in this Subordinate Indenture, subject to the lien of the Senior Indenture, as the same may be amended or supplemented from time to time, the Revenues (as defined in this Subordinate Indenture), after payment of the Current Expenses (as defined in this Subordinate Indenture), together with all cash and investments from time to time held in any fund (other than the Subordinate Rebate Fund) by the Trustee hereunder or held by the Authority in the Revenue Fund, the Operating Reserve Fund or the Rate Stabilization Fund (such funds created pursuant to the Senior Indenture) (collectively, the "Trust Estate").

TO HAVE AND TO HOLD the same unto the Trustee, its successors and assigns in trust forever, IN TRUST, NEVERTHELESS, upon the terms and trusts herein set forth, to secure the payment of all Subordinate Bonds issued hereunder and the interest thereon and the observance and performance of all the terms, provisions and conditions of this Subordinate Indenture, and for the equal and ratable benefit and security of all and singular the present and future holders of the Subordinate Bonds and Other Subordinate Parity Indebtedness Parties, without preference, priority or distinction as to lien or otherwise, except as otherwise hereinafter provided, of any one Subordinate Bond or Other Subordinate Parity Indebtedness over any other Subordinate Bond or Other Subordinate Parity Indebtedness by the reason of priority in the issue, sale or authentication thereof or otherwise and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, including the payment of Other Subordinate Parity Indebtedness, and it is hereby covenanted and agreed by and between the parties hereto that the terms and conditions upon which the Subordinate Bonds are to be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become registered Owners thereof, and the trusts and conditions upon which the pledged Revenues are to be held and disposed of, are as follows:

ARTICLE I

DEFINITIONS AND GENERAL INDENTURE MATTERS

Section 1.01 Definitions.

(a) The following terms defined in the Recitals of this Subordinate Indenture shall have the meanings as defined therein for all purposes of this Subordinate Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Act
 AGM
 Capital Lease Agreement
 City
 Commonwealth
 Cooperation Agreement
 Existing Senior Indenture

Existing Subordinate Indenture
Intercreditor Agreement
PENNVEST
Refunded Subordinate Bonds

(b) Terms used but not defined herein, which relate to the Senior Indenture or the Senior Bonds, shall have the meanings set forth in the Senior Indenture. Terms defined below in this Article I shall have the meanings set forth below for all purposes of this Subordinate Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Account

The term "Account" shall mean any of the various accounts, sometimes created within a Fund, under this Subordinate Indenture including in a Supplemental Indenture.

Accreted Values

The term "Accreted Values" with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall mean an amount equal to the Principal Amount of such Subordinate Bonds (determined on the basis of the Principal Amount per \$5,000 at maturity thereof) plus the amount assuming semiannual compounding of earnings which would be produced on the investment of such Principal Amount, beginning on the dated date of such Subordinate Bonds and ending at the maturity date thereof, at a yield which if produced until maturity will produce \$5,000 at maturity. As of any Valuation Date, the Accreted Value of any such Subordinate Bonds shall mean the amount set forth for such date in the Supplemental Indenture and as of any date other than a Valuation Date, the sum of (a) the Accreted Value on the preceding Valuation Date and (b) the product of (i) a fraction, the numerator of which is the number of days having elapsed from the preceding Valuation Date and denominator of which is the number of days from such preceding Valuation Date to the next succeeding Valuation Date, and (ii) the difference between the Accreted Values for such Valuation Dates. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Subordinate Bonds Outstanding, Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Additional Bonds

The term "Additional Bonds" shall mean Subordinate Bonds authenticated and delivered hereunder of any Series other than the 2019B Subordinate Bonds.

Additional Indebtedness Test

The term "Additional Indebtedness Test" shall mean the certification requirement set forth in Section 3.02(g)(ii) or 3.02(h)(ii) hereof for the issuance of Additional Bonds, and in Section 3.03(a) hereof for the issuance of Other Subordinate Parity Indebtedness.

Additional Indebtedness Test Net Revenues

The term "Additional Indebtedness Test Net Revenues" shall mean Net Revenues adjusted for the purpose of determining fulfillment of the Additional Indebtedness Test to exclude for the relevant Test Period any Revenues consisting of Grants, proceeds of any business interruption insurance, and investment income earned on the Construction Fund and Rate Stabilization Fund.

Annual Budget

The term "Annual Budget" shall mean the budget required by Section 7.11 herein.

Annual Debt Service

The term "Annual Debt Service" shall mean the amount of payments scheduled to come due within a specified Fiscal Year for principal of and interest on any specified Indebtedness. For purposes of calculating Annual Debt Service, the following assumptions are to be used to calculate the principal and interest due in such specified Fiscal Year:

(a) In determining the Principal Amount due in the Fiscal Year, except to the extent that another subparagraph of this definition applies, payment shall be assumed to be made in accordance with any amortization schedule established for such Indebtedness, including any scheduled redemption of such specified Indebtedness and, for such purpose, the redemption payment shall be deemed a principal payment. In determining the amount of interest due in each Fiscal Year, except to the extent subparagraphs (b) through (h) of this definition apply, (i) interest payable at a fixed rate shall be assumed to be made at such fixed rate and on the required payment dates and (ii) the interest rate to be used for Variable Rate Indebtedness that has been Outstanding for at least twelve (12) months shall be the average rate over the twelve (12) months immediately preceding the date of calculation, or for Variable Rate Indebtedness that has been Outstanding less than twelve (12) months the interest rate to be used shall be the actual rate on the date of calculation, or, for Variable Rate Indebtedness proposed to be issued the interest rate to be used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Subordinate Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

For the purpose of verifying compliance with the rate covenant contained in Section 7.01 hereof, Variable Rate Indebtedness shall be deemed to bear interest at the actual rate or rates borne during any applicable Fiscal Year.

The amount of Capitalized Interest on deposit in the Subordinate Debt Service Fund shall be subtracted from the amount of interest due for any related Fiscal Year, but

only to the extent that such Capitalized Interest is dedicated to a particular interest payment coming due during such Fiscal Year.

(b) Each maturity of Indebtedness that constitutes Balloon Indebtedness shall be treated as if it were to be amortized over a term of not more than forty (40) years and with substantially level annual debt service payments commencing not later than the year following the year in which such Balloon Indebtedness was issued, and extending not later than forty (40) years from the date such Balloon Indebtedness was originally issued. For fixed rate obligations, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Subordinate Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above in this sentence. For Balloon Indebtedness that also constitutes Variable Rate Indebtedness, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Subordinate Bonds of a corresponding term issued under this Subordinate Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Subordinate Bonds bear interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

(c) Notwithstanding subparagraph (b) above, if any stated maturity date of Indebtedness that constitutes Balloon Indebtedness occurs within twelve (12) months from the date of the calculation of Annual Debt Service, the principal amount maturing shall be assumed to become due and payable on the stated maturity date unless there is delivered a certificate of an Authorized Representative of the Authority stating that (i) the Authority intends to refinance such maturity and (ii) the probable terms of such refinancing. Upon delivery of such certificate, such Balloon Indebtedness shall be assumed to be refinanced, and Annual Debt Service shall be calculated, in accordance with the probable terms set out in such certificate, except that such assumption shall not result in an interest rate lower than that which would be assumed under subparagraph (b) above and such Balloon Indebtedness shall be amortized over a term of not more than forty (40) years from the date of refinancing.

(d) If any Indebtedness that is then proposed to be issued constitutes Tender Indebtedness, then Tender Indebtedness shall be treated as if the principal amount of such Subordinate Bonds were to be amortized over a term of not more than 40 years from the date such Tender Indebtedness was originally issued, except that if any principal maturity or amortization schedule is set forth in a Supplemental Indenture or other applicable agreement, such schedule shall be used to determine the principal maturity or

amortization of such Indebtedness. The interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Subordinate Bonds of a corresponding term issued under this Subordinate Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. For all principal and interest payments becoming due prior to the year in which such Tender Indebtedness is first subject to tender, such payments shall be treated as described in the other applicable subparagraphs of this definition.

(e) With respect to any Interim Indebtedness, it shall be assumed that the principal amount of the Interim Indebtedness will be continuously refinanced and will remain Outstanding until the first Fiscal Year for which interest on the Interim Indebtedness has not been capitalized or otherwise funded or provided for. For such first Fiscal Year, it shall be assumed that (i) the Outstanding principal amount of the Interim Indebtedness will be refinanced with a Series of Additional Bonds that will be amortized over a period not to exceed forty (40) years in such manner as will cause the maximum annual debt service payments applicable to such Series in any twelve (12) month period not to exceed 110% of the minimum annual debt service payments applicable to such Series for any other twelve (12) month period, and (ii) the Series of Additional Bonds will bear interest at a fixed interest rate estimated by (1) a Qualified Independent Consultant to be the interest rate such Series of Additional Bonds would bear if issued on such terms on the date of such estimate to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Subordinate Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. Indebtedness which is Interim Indebtedness shall not be treated as Balloon Indebtedness.

(f) Except for Hedge Agreements, Qualified Interest Rate Swap Agreements are to be disregarded in calculating the Debt Service Reserve Requirement. Upon incurrence of a Hedge Agreement, all calculations, including for the annual amount on account of principal and interest on Indebtedness subject to the Hedge Agreement, shall be made using the Hedge Fixed Rate for the applicable period and such Indebtedness shall not be considered as Variable Rate Indebtedness for such period.

(g) If money that is not included in the definition of "Revenues" has been used to pay or has been irrevocably deposited with and is held by the Authority to pay principal and/or interest on Indebtedness, then the principal and/or interest paid from such money shall be excluded from the computation of Annual Debt Service.

(h) For any Indebtedness for which a binding commitment, letter of credit or other credit arrangement providing for the extension of such Indebtedness beyond its original maturity date exists, the computation of the annual amount payable on account of principal and interest on such Indebtedness shall, at the option of the Authority, be made on the assumption that such Indebtedness will be amortized in accordance with such credit arrangement.

Approval Amount

The term "Approval Amount" shall mean a majority in aggregate Principal Amount of the applicable Subordinate Bonds then Outstanding.

Authority

The term "Authority" shall mean The Pittsburgh Water and Sewer Authority, a body corporate and politic existing and operating under the Act.

Authority Bonds

The term "Authority Bonds" shall mean all Senior Bonds Outstanding under the Senior Indenture and all Subordinate Bonds Outstanding under this Subordinate Indenture.

Authorized Representative of the Authority

The term "Authorized Representative of the Authority" shall mean the Chairman, the Vice Chairperson, the Secretary, the Assistant Secretary, the Executive Director, the Chief Financial Officer, the Director of Finance, the Chief Corporate Counsel/Chief of Administration, the Treasurer, the Budget Director or any such other person or persons as may be designated to act on behalf of the Authority by a certificate executed by the Chairman of the Authority and on file with the Trustee.

Balloon Indebtedness

The term "Balloon Indebtedness" shall mean all or any portion of any Indebtedness 25% or more of the initial principal of which matures on the same date or within such Fiscal Year. For purposes of this definition, the principal amount maturing on any date shall be reduced by the amount of such Indebtedness scheduled to be amortized by prepayment or redemption prior to its stated maturity date. If any indebtedness consists partially of Variable Rate Indebtedness and partially of indebtedness bearing interest at a fixed rate, the portion constituting Variable Rate Indebtedness and the portion bearing interest at a fixed rate shall be treated as separate issues for purposes of determining whether any such indebtedness constitutes Balloon Indebtedness.

Board

The term "Board" shall mean the governing body of the Authority.

Bond Counsel

The term “Bond Counsel” shall mean an attorney or firm of attorneys selected by the Authority which is a nationally recognized and experienced bond counsel relating to the financing of facilities through the issuance of tax-exempt or taxable bonds.

Bond Insurance Policy

The term “Bond Insurance Policy” shall mean a municipal bond insurance policy or policies, including any endorsements thereto, issued by a Bond Insurer guaranteeing the scheduled payment of the principal of and interest on Subordinate Bonds.

Bond Insurer or Insurer

The term “Bond Insurer” or “Insurer” shall mean an insurance company guaranteeing the payment of principal and interest on Subordinate Bonds when due.

Bond Year

The term “Bond Year” shall mean, each year, the twelve (12) month period commencing on the date of issuance of a Series of Subordinate Bonds or the anniversary date thereof, or as otherwise provided in the Supplemental Indenture or the Tax Regulatory Certificate for a Series of Subordinate Bonds.

Business Day

Except as otherwise defined in a Supplemental Indenture related to a Series of Subordinate Bonds, the term “Business Day” shall mean a day on which banking business is transacted, but not including a Saturday, Sunday or legal holiday, or any day on which banks located in each of the cities in which the offices of the Trustee and the Paying Agent responsible for the administration of this Subordinate Indenture are located are authorized by law to close, or any day on which the New York Stock Exchange is closed.

Capital Additions

The term "Capital Additions" shall mean all new or additional property, which the Authority has authority to, or is required to, construct or acquire with respect to the System, and any and all permanent improvements, replacements, additions, extensions and betterments to real or fixed property of the Authority with respect to the System.

Capital Appreciation Bonds

The term “Capital Appreciation Bonds” shall mean Subordinate Bonds as to which the Accreted Value is payable only at the maturity or prior redemption of the Subordinate Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Subordinate Bonds Outstanding, Capital Appreciation Bonds shall be valued at their Accreted Values.

Capital Appreciation and Income Bonds

The term “Capital Appreciation and Income Bonds” shall mean Subordinate Bonds as to which interest is deferred and compounded prior to the date after which interest ceases to be deferred and compounded and the interest becomes currently payable. For purposes of consents, voting rights, Bondowner rights, or any other matter in herein determined by a percentage of the aggregate Principal Amount of Subordinate Bonds Outstanding, Capital Appreciation and Income Bonds shall be valued at their Accreted Values.

Capitalized Interest

The term “Capitalized Interest” shall mean the amount of interest on Subordinate Bonds, if any, funded from the proceeds of the Subordinate Bonds or other money that are deposited with the Trustee in the Debt Service Fund as shall be described in a Supplemental Indenture upon issuance of Subordinate Bonds to be used to pay interest on the Subordinate Bonds.

Code

The term “Code” shall mean the Internal Revenue Code of 1986, as amended, including applicable regulations, rulings and revenue procedures promulgated or applicable thereunder.

Common Debt Service Reserve Requirement

The term “Common Debt Service Reserve Requirement” shall mean, for all Common Debt Service Reserve Secured Bonds, the least of (i) 10% of the aggregate original stated Principal Amount of all Common Debt Service Reserve Secured Bonds (provided that if any Common Debt Service Reserve Secured Bonds have more than a *de minimis* (2%) amount of original issue discount or premium, the issue price of such Common Debt Service Reserve Secured Bonds (net of pre-issuance accrued interest) is used to measure the 10% limitation in lieu of its stated Principal Amount), (ii) the maximum amount of aggregate Annual Debt Service on all Common Debt Service Reserve Secured Bonds in any Fiscal Year, or (iii) 125% of average aggregate Annual Debt Service on all Common Debt Service Reserve Secured Bonds.

Common Debt Service Reserve Secured Bonds

The term “Common Debt Service Reserve Secured Bonds” shall mean any Series of Subordinate Bonds for which this Subordinate Indenture or the Supplemental Indenture authorizes said Bonds to be secured by the Common Debt Service Reserve Requirement. The 2019B Subordinate Bonds shall be Common Debt Service Reserve Secured Bonds.

Construction Fund

The term “Construction Fund” shall mean the Construction Fund designated and established pursuant to Section 5.01 hereof.

Construction Project

The term "Construction Project" shall mean the acquisition or construction of Capital Additions or other improvements to the System, as the same may be amended from time to time.

Consulting Engineer

The term "Consulting Engineer" shall mean a person who is a registered professional engineer under the laws of the Commonwealth qualified to pass on engineering questions relating to the operation and maintenance of water, stormwater and sewer systems, who is appointed by the Board, who is in fact independent (although such person may be regularly retained by the Authority) and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board or an officer or employee of the Authority or the City. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority or the City. The Consulting Engineer may perform similar services for the City.

Continuing Disclosure Undertaking

The term "Continuing Disclosure Undertaking" shall mean the continuing disclosure undertaking or continuing disclosure agreement, if any, relating to a Series of Subordinate Bonds.

Cost

The term "Cost", when used with reference to a Construction Project or with reference to Capital Additions, shall mean the amounts required to be paid to construct and complete the Construction Project or to construct or otherwise acquire such Capital Additions, and shall include, in addition to such other items as are included within any proper definition of cost, allowances or charges for interest during construction and for a reasonable period thereafter, which is not otherwise provided for, taxes, engineering, legal, fiscal and superintendence expenses and premiums for casualty and other insurance and all expenses incurred by the Authority in connection with the preparation, issue and sale of the Subordinate Bonds or other Indebtedness including discounts (if any) incurred on the sale of the Subordinate Bonds or other Indebtedness.

Counsel

The term "Counsel" shall mean legal counsel admitted to practice before the Supreme Court of the Commonwealth, who may but need not be counsel regularly retained by the Authority, and not unsatisfactory to the Trustee.

Counsel's Opinion

The term “Counsel’s Opinion” shall mean an opinion signed by an attorney or firm of attorneys selected by the Authority or the Trustee, respectively.

Counterparty

The term “Counterparty” shall mean any counterparty (the party other than the Authority) on a Qualified Interest Rate Swap Agreement.

Credit Facility

The term “Credit Facility” shall mean a letter of credit, liquidity facility, a bond insurance policy, surety bond or similar arrangement securing any obligation of the Authority with respect to any Indebtedness.

Current Expenses

The term "Current Expenses" shall mean all current expenses directly or indirectly attributable to the ownership or operation of the System, including reasonable and necessary usual expenses of administration, operation, maintenance and repair; costs for billing and collecting the rates; insurance premiums; costs and expenses of any Credit Facility; and legal, engineering, auditing and financial advisory expenses; all as determined (except as otherwise specified in this Subordinate Indenture) in accordance with GAAP for entities such as the Authority consistently applied, excluding (a) any payments payable by the Authority to the City under the Cooperation Agreement, (b) any payments in lieu of taxes or allowance for depreciation or amortization, and (c) expenses which constitute extraordinary, nonrecurring and non-continuing expenses of the System in the written opinion of the Qualified Independent Consultant.

Current Interest Capital Appreciation Bonds

The term “Current Interest Capital Appreciation Bonds” shall mean Subordinate Bonds as to which a portion of interest is currently payable and a portion of the interest is deferred and compounded until the Accreted Value is payable only at the maturity or prior redemption of the Subordinate Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Subordinate Bonds Outstanding, Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Debt Service Reserve Fund Policy

The term “Debt Service Reserve Fund Policy” shall mean a Municipal Bond Debt Service Reserve Fund Policy or Policies issued by a Bond Insurer and deposited into the Subordinate Debt Service Reserve Fund.

Debt Service Reserve Requirement

The term “Debt Service Reserve Requirement” shall mean the applicable Common Debt Service Reserve Requirement or the Series Debt Service Reserve Requirement.

DTC

The term “DTC” shall have the meaning set forth in Section 2.10 hereof.

DTC Representation Letter

The term “DTC Representation Letter” shall have the meaning set forth in Section 2.10 hereof.

EMMA

The term “EMMA” shall mean the Electronic Municipal Market Access system operated by the MSRB, or any successor system.

Fiscal Year

The term “Fiscal Year” shall mean the period of twelve months beginning on January 1 of each year or such other twelve month period as may be designated by the Authority.

Fund

The term “Fund” shall mean any of the various funds created under this Subordinate Indenture including in a Supplemental Indenture.

GAAP

The term “GAAP” shall mean generally accepted accounting principles.

Grant

The term “Grant” shall mean a grant provided by any entity to or for the Authority for the payment of Current Expenses.

Hedge Agreement

The term “Hedge Agreement” shall mean an Interest Rate Swap, cap, collar, floor, forward or other hedging agreement, arrangement or security however denominated, expressly identified pursuant to its terms as being entered into in connection with and in order to hedge interest rate fluctuations on all or a portion of any Indebtedness where (a) interest on such Indebtedness or such portion of such Indebtedness is payable at a variable rate of interest for any future period of time or is calculated at a varying rate per annum, and (b) a fixed rate is specified by the Authority in such agreement, or such Indebtedness, taken together with such agreement

results in a net fixed rate payable by the Authority for such period of time (the “Hedge Fixed Rate”), assuming the Authority and the party(ies) with whom the Authority has entered into the agreement make all payments required to be made by the terms of the agreement, provided that no such agreement may be entered into by the Authority unless any termination or similar payment which may be payable by the Authority thereunder is expressly subordinate to the obligation of the Authority on the Indebtedness.

Hedge Fixed Rate

The term “Hedge Fixed Rate” shall have the meaning set forth in the definition of Hedge Agreement above.

Holder of Subordinate Bonds

The term “Holder of Subordinate Bonds” or “Bondholder” or “Holder” or “Owner of Subordinate Bonds” or “Owner” or “Bondowner” or any similar term shall mean any registered owner of any Subordinate Bond.

Indebtedness

The term “Indebtedness” shall mean (a) Senior Debt, including the Senior Bonds and Other Senior Parity Indebtedness, (b) Subordinate Debt, including Subordinate Bonds, Other Subordinate Parity Indebtedness and Secondary Subordinate Debt, and (c) other debt of the Authority not secured by the Revenues.

Independent Auditor

The term “Independent Auditor” shall mean a person who is engaged in the accounting profession, who is a nationally recognized certified public accountant under the laws of the Commonwealth, who is in fact independent (although such person may be regularly retained by the Authority) who is appointed by the Board and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board, or an officer or employee of the Authority. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority.

Interest Account

The term “Interest Account” shall mean the Interest Account in the Subordinate Debt Service Fund so designated and created by Section 6.01(b)(1) hereof.

Interest Payment Date

The term “Interest Payment Date” shall mean the interest payment dates specified herein or in any Supplemental Indenture with respect to Subordinate Bonds issued thereunder, or the applicable interest payment dates for any other Indebtedness.

Interim Indebtedness

The term “Interim Indebtedness” shall mean any Indebtedness (i) for or with respect to which no principal payments are required to be made other than on the maturity date thereof, which date shall be no later than five (5) years from the date of its delivery to the initial purchasers, and (ii) which are authorized by an agreement that declares the Authority’s intent, at the time of issuance, to refund or refinance all or a part of the same prior to or on such maturity date, including commercial paper, notes, and similar obligations.

Letter of Credit

The term “Letter of Credit” shall mean an irrevocable transferable direct-pay letter of credit or standby letter of credit issued for a Series of Subordinate Bonds by a Letter of Credit Bank for the account of the Authority in favor of the Trustee supporting a Series of Subordinate Bonds as set forth in a Reimbursement Agreement.

Letter of Credit Bank

The term “Letter of Credit Bank” shall mean the issuer of a Letter of Credit pursuant to a Reimbursement Agreement.

Liquidity Facility

The term “Liquidity Facility” shall mean a standby bond purchase agreement or other liquidity facility pursuant to which the provider or providers agree to purchase Subordinate Bonds issued pursuant to this Subordinate Indenture tendered for purchase in accordance with a Supplemental Indenture, (ii) the provider of which has short-term ratings of at least “A-1” from S&P and “P-1” from Moody’s (unless such requirement is waived by the applicable Bond Insurer or Letter of Credit Bank) and (iii) which is acceptable to the applicable Bond Insurer or Letter of Credit Bank and each Rating Service and otherwise satisfying the requirements of a Supplemental Indenture pursuant to which Subordinate Bonds supported by such Liquidity Facility were issued.

Liquidity Facility Issuer

The term “Liquidity Facility Issuer” shall mean the issuer of a Liquidity Facility pursuant to a Reimbursement Agreement.

Moody's

The term "Moody's" shall mean Moody's Investors Service, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

MSRB

The term “MSRB” shall mean the Municipal Securities Rulemaking Board, or any successor agency.

Net Revenues

The term “Net Revenues”, when used with reference to any period, shall mean the Revenues of the Authority for such period, less all Current Expenses for such period.

Other Senior Parity Indebtedness

The term “Other Senior Parity Indebtedness” shall have the meaning set forth in the Senior Indenture.

Other Subordinate Parity Indebtedness

The term “Other Subordinate Parity Indebtedness” shall mean any other Indebtedness incurred by the Authority under this Subordinate Indenture or secured by this Subordinate Indenture that the Authority is required, or has elected, to treat as payable on a parity with the Subordinate Bonds with respect to the pledge of Revenues, including Reimbursement Obligations under Reimbursement Agreements and Periodic Payments under Qualified Interest Rate Swap Agreements.

Other Subordinate Parity Indebtedness Party

The term “Other Subordinate Parity Indebtedness Party” shall mean the other party (not the Authority) on Other Subordinate Parity Indebtedness, including, without limitation, any Letter of Credit Bank, Liquidity Facility Issuer, or Counterparty (but only with respect to Periodic Payments).

Outstanding

The term “Outstanding under this Subordinate Indenture” or “Outstanding hereunder” or “Outstanding”, when used with reference to Subordinate Bonds, shall mean, at any date as of which the amount of Outstanding Subordinate Bonds is to be determined, the aggregate of all Subordinate Bonds authenticated and delivered under this Subordinate Indenture, except

- (i) Subordinate Bonds cancelled at or prior to such date;
- (ii) Subordinate Bonds for the payment of which funds shall have been theretofore deposited in trust with the Trustee and which shall have matured by their terms but shall not have been surrendered for payment;
- (iii) Subordinate Bonds for the redemption or payment of which funds in the full amount required, either alone or together with the interest to be earned thereon, but without the need to reinvest interest or principal, shall then be irrevocably held in trust by the Trustee, provided that notice of such

redemption shall have been provided as set forth in Article IV or provisions satisfactory to the Trustee shall have been made for providing such notice;

- (iv) Subordinate Bonds deemed to be paid pursuant to the provisions of Article XII hereof.

With respect to Indebtedness other than Subordinate Bonds, "Outstanding" shall mean Indebtedness which has not been paid and with respect to which payment has not been provided for.

Paying Agent

The term "Paying Agent" shall initially mean The Bank of New York Mellon Trust Company, N.A., its successors and assigns, and any successor paying agent or co-paying agent appointed by the Authority.

Periodic Payments

The term "Periodic Payments" shall mean any regularly scheduled fixed payment payable by the Authority to the Counterparty pursuant to the terms of any Qualified Interest Rate Swap Agreement(s); however, Periodic Payments shall not include any termination payments or any other sums payable under the Qualified Interest Rate Swap Agreement that are not regularly scheduled payments payable by the Authority.

Policy Costs

The term "Policy Costs" shall mean, collectively, the repayment of any draws under a Debt Service Reserve Fund Policy and related reasonable expenses incurred by a Bond Insurer (together with interest thereon).

Prime Rate

The term "Prime Rate" means the rate of interest announced, from time to time, by the Trustee as its prime rate.

Principal Account

The term "Principal Account" shall mean the Principal Account in the Subordinate Debt Service Fund so designated and created by Section 6.01(b)(1) hereof.

Principal Amount

The term "Principal Amount" with respect to any Indebtedness, shall mean the stated principal thereon, the Accreted Value thereof, as applicable, or such other amount payable on any Indebtedness that is designated as principal pursuant to a Supplemental Indenture.

Principal Office of the Trustee

The term “Principal Office” shall mean the designated corporate trust office of the Trustee responsible for the administration of this Subordinate Indenture or at the office of any successor trustee or paying agent appointed under this Subordinate Indenture.

Qualified Independent Consultant

The term “Qualified Independent Consultant” shall mean an independent professional consultant having the skill and experience necessary to provide the particular certificate, report or approval required by the provision of this Subordinate Indenture or any Supplemental Indenture in which such requirement appears, including without limitation a Consulting Engineer and an Independent Auditor.

Qualified Interest Rate Swap Agreement

The term “Qualified Interest Rate Swap Agreement” shall mean any agreement relating to any Subordinate Bonds issued or to be issued under this Subordinate Indenture with a Counterparty whereby the Authority will pay to the Counterparty periodic fixed amounts based upon a fixed percentage of a notional amount specified in such agreement and such Counterparty will pay to the Authority certain periodic floating amounts based upon a variable percent of the same notional amount; provided, that the underwriter for the applicable Subordinate Bonds or the Authority's financial advisor has certified to the Authority and the Trustee that (based upon then current market conditions) such Qualified Interest Rate Swap Agreement creates an overall lower Debt Service Requirement than would be attained through the issuance of Additional Bonds in an amount equal to such notional amounts at a fixed rate without such Qualified Interest Rate Swap Agreement. Periodic Payments under a Qualified Interest Rate Swap Agreement may be on parity with the Subordinate Bonds to which the Qualified Interest Rate Swap Agreement relates.

Rate Covenant

The term “Rate Covenant” shall mean the obligation of the Authority to fix, charge, collect and revise rates, fees and other charges for the use of, and the services furnished by, the System sufficient to meet the requirements of this Subordinate Indenture, including without limitation Section 7.01.

Rate Covenant Net Revenues

The term “Rate Covenant Net Revenues” shall mean Net Revenues, provided that Net Revenues shall be adjusted for the purpose of determining compliance with the Rate Covenant as follows: (i) to include transfers from the Rate Stabilization Fund to the Revenue Fund (as provided in Section 6.08 of the Senior Indenture), and (ii) to exclude transfers to the Rate Stabilization Fund from the Revenue Fund (as provided in Section 6.08 of the Senior Indenture).

Rating Agency

The term "Rating Agency" shall mean Moody's or S&P, or either of them, and their successors, or any other nationally recognized statistical rating organization selected by the Authority.

Record Date

The term "Record Date" shall mean the fifteenth day (whether or not such day is a Business Day) immediately preceding any Interest Payment Date or such other date set forth in a Supplemental Indenture.

Reimbursement Agreement

The term "Reimbursement Agreement" shall mean an agreement between the Authority and a Letter of Credit Bank or between the Authority and a Liquidity Facility Issuer, which agreements may be amended from time to time in accordance with the terms hereof and thereof.

Reimbursement Obligations

The term "Reimbursement Obligations" shall mean the obligations to reimburse the Letter of Credit Bank for draws on such Letter of Credit Bank's Letter of Credit, or to reimburse a Liquidity Facility Issuer making liquidity payments pursuant to a Liquidity Facility and to pay all other amounts due or to become due under the applicable Reimbursement Agreement.

Reserve Determination Date

The term "Reserve Determination Date" shall mean any date established in writing by an Authorized Representative of the Authority for the valuation of investments, including any Debt Service Reserve Fund Policy and other applicable credit facilities, in the Subordinate Debt Service Reserve Fund, which valuation shall be at least annually.

Resolution of the Board or Resolution of the Authority

The term "Resolution of the Board" or "Resolution of the Authority" shall mean a resolution certified by the Secretary or Assistant Secretary of the Authority to have been duly adopted by the Board and to be in full force and effect on the date of such certification.

Revenue Fund

The term "Revenue Fund" shall mean the fund so designated and created by Section 6.01(1) of the Senior Indenture.

Revenues

The term "Revenues" shall mean any and all rates, fees, rents and charges established or to be established, levied and collected in connection with, and all other payments, revenues of whatever kind or character arising from, the operation or ownership of any property of the Authority or any part thereof (except tap or connection fees and charges to the extent such fees or charges are pledged in accordance with the Act as a refund to such person who has paid for the construction of any extension of the System), any income earned on the moneys or investments on deposit in the Debt Service Fund, Debt Service Reserve Fund, Construction Fund, Revenue Fund, Operating Fund, Operating Reserve Fund, Rate Stabilization Fund and any sinking, purchase or analogous fund created under the Senior Indenture and hereunder and any Periodic Payments received by the Authority from the Counterparty pursuant to any Qualified Interest Rate Swap Agreement which, upon receipt, shall be transferred to and deposited in the Revenue Fund, all as determined (except as otherwise specified in this Subordinate Indenture or the Senior Indenture) in accordance with GAAP for entities such as the Authority consistently applied. Revenues shall not include refundable customer deposits or other payments solely in aid of construction, any Grants, payments from PENNVEST or similar payments, or the proceeds resulting from the sale of all or a portion of the System.

Secondary Subordinate Debt

The term "Secondary Subordinate Debt" shall mean Subordinate Debt which has pledged to its payment Net Revenues, alone or in conjunction with other sources, as a subordinate lien pledge after the pledge of Net Revenues to secure the Senior Debt and to secure Subordinate Bonds and Other Subordinate Parity Indebtedness. Such debt as of the date hereof includes the PENNVEST Loans, the 2018 Revolving Credit Agreement with JPMorgan Chase Bank, N.A. and the 2018 Operating Line of Credit with PNC Bank, National Association.

Senior Bond or Senior Bonds

The term "Senior Bond" or "Senior Bonds" shall mean any bond or all the bonds, as the case may be, authenticated and delivered under the Senior Indenture, and not including Subordinate Bonds.

Senior Debt

The term "Senior Debt" shall mean the Senior Bonds and Other Senior Parity Indebtedness.

Senior Indenture

The term "Senior Indenture" shall mean the Amended and Restated Trust Indenture dated as of October 15, 1993, amended and restated as of November 1, 2017, and effective on December 28, 2017, with The Bank of New York Mellon Trust Company, N.A., as trustee, as amended and supplemented from time to time, together with any replacement indenture pursuant to which a first lien on Revenues is pledged.

Separate Series Debt Service Reserve Requirement

The term “Separate Series Debt Service Reserve Requirement” shall mean, for any Series of Additional Bonds hereunder for which the Supplemental Indenture authorizes a Separate Series Debt Service Reserve Requirement, the amount, if any, specified in such Supplemental Indenture as the Separate Series Debt Service Reserve Requirement; provided, however, that such amount shall not exceed the maximum amount permitted by the Code. Such amount may be zero.

Separate Series Debt Service Reserve Secured Bonds

The term “Separate Series Debt Service Reserve Secured Bonds” shall mean any Series of Subordinate Bonds for which the Supplemental Indenture authorizes said Bonds to be secured by funds constituting a Separate Series Debt Service Reserve Requirement.

Series or Series of Subordinate Bonds

The term “Series” or “Series of Subordinate Bonds” shall mean a separate series or subseries of Subordinate Bonds issued hereunder or under a Supplemental Indenture.

Series Debt Service Reserve Account

The term “Series Debt Service Reserve Account” shall mean each account in the Debt Service Reserve Fund related to a particular Series of Bonds that is required to be funded as required in a Supplemental Indenture.

Series Debt Service Reserve Requirement

The term “Series Debt Service Reserve Requirement” shall mean for any Series of the Subordinate Bonds, the Common Debt Service Reserve Requirement or the Separate Series Debt Service Reserve Requirement set forth in the Supplemental Indenture authorizing such Series of Subordinate Bonds.

Sinking Fund Account

The term “Sinking Fund Account” shall mean the Sinking Fund Account in the Subordinate Debt Service Fund created in Section 6.01(b)(1) hereof.

S&P

The term “S&P” shall mean Standard & Poor's Corporation, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, “S&P” shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

Subordinate Bond or Subordinate Bonds

The term "Subordinate Bond" or "Subordinate Bonds" shall mean any bond or all the bonds, as the case may be, authenticated and delivered under this Subordinate Indenture, and not including Senior Bonds.

Subordinate Debt

The term "Subordinate Debt" shall mean any bonds, notes or other obligations issued in connection with the System (a) which are designated by the Authority as Subordinate Debt, and (b) which may have pledged to their payment Net Revenues, alone or in conjunction with other sources, as a subordinate lien pledge after the pledge of Net Revenues to Senior Debt. Subordinate Debt shall include amounts owed to letter of credit banks or liquidity facility providers securing Subordinate Debt or periodic payments due on interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(3) of the Senior Indenture, or termination or other payments (other than periodic payments) due under interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(5) of the Senior Indenture.

Subordinate Debt Service Fund

The term "Subordinate Debt Service Fund" is the fund so designated and created by Section 6.01(b)(1) hereof.

Subordinate Debt Service Reserve Fund

The term "Subordinate Debt Service Reserve Fund" is the fund so designated and created by Section 6.01(b)(2) hereof.

Subordinate Indenture

The term "Subordinate Indenture" or "this Subordinate Indenture" shall mean this amended and restated subordinate trust indenture and all indentures supplemental hereto.

Subordinate Rebate Fund

The term "Subordinate Rebate Fund" shall mean the fund so designated and created pursuant to Section 6.01(b)(4) hereof.

Subordinate Redemption Fund

The term "Subordinate Redemption Fund" shall mean the fund so designated and created pursuant to Section 6.01(b)(3) hereof.

Supplemental Indenture

The term "Supplemental Indenture" or "Indenture supplemental hereto" shall mean any indenture now or hereafter duly authorized and entered into in accordance with the provisions of this Subordinate Indenture.

System

The term "System" shall mean and include, as of any particular time, (i) all tangible property, fixed or moveable, then owned or operated by the Authority and used in the rendering of water service, stormwater service, and sewer service by the Authority, (ii) all Capital Additions then constructed or otherwise acquired relating to water service, stormwater service, and sewer service, and (iii) all franchises used or useful to the Authority at such particular time in the rendering of water service, stormwater service, and sewer service by the Authority.

Tax Regulatory Certificate

The term "Tax Regulatory Certificate" shall mean a Tax Regulatory Certificate, Tax Regulatory Agreement, Non-Arbitrage Certificate or similar tax certificate of the Authority executed and delivered by the Authority in respect of a Series of Subordinate Bonds issued under this Subordinate Indenture.

Tender Indebtedness

The term "Tender Indebtedness" shall mean any Indebtedness a feature of which is an option or obligation on the part of the holders of such Indebtedness to tender all or a portion of such Indebtedness to a fiduciary for payment or purchase and requiring that such Indebtedness or a portion of such Indebtedness be purchased if properly tendered.

Term Bonds

The term "Term Bonds" shall mean any Subordinate Bonds stated to mature on a specified date and required to be redeemed in part prior to maturity according to a sinking fund schedule.

Test Period

The term "Test Period" shall mean any 12 consecutive months of the last 24 months prior to the testing date.

Trust Estate

The term "Trust Estate" shall have the meaning set forth in the Granting Clause hereto.

Trustee

The term "Trustee" shall mean The Bank of New York Mellon Trust Company, N.A., its successors in the trust hereunder.

Valuation Date

The term "Valuation Date" with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds, shall mean the date or dates set forth in the Supplemental Indenture on which specific Accreted Values are assigned to such Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds.

Variable Rate Indebtedness

The term "Variable Rate Indebtedness" shall mean any Indebtedness the interest rate on which is not fixed to maturity at the time of calculation, or other relevant time.

Section 1.02 Rules of Interpretation. Except where the context otherwise requires, (i) words importing one gender shall include all genders and words importing the singular number shall include the plural and vice versa, (ii) references to any entities shall include their successors and assigns, and (iii) references to any documents shall include any subsequent amendments and supplements thereto.

Section 1.03 Effect on Existing Subordinate Indenture. This 2019-1 Supplemental Subordinate Trust Indenture constitutes the Amended and Restated Subordinate Trust Indenture and it replaces in its entirety the Existing Subordinate Indenture without impairment to the liens created by the Existing Subordinate Indenture. By their purchase of the 2019B Subordinate Bonds, the Holders of the 2019B Subordinate Bonds, on behalf of themselves and all future holders of the 2019B Subordinate Bonds, consent to the provisions of this Amended and Restated Subordinate Indenture and to the replacement in its entirety of the Existing Subordinate Indenture.

ARTICLE II

DESCRIPTION, EXECUTION AND REGISTRATION OF BONDS

Section 2.01 Issuance of Subordinate Bonds; 2019B Subordinate Bonds; Form and Terms thereof. The Subordinate Bonds may, at the election of the Authority, be issued in one or more Series and shall be designated generally as the "Water and Sewer System Subordinate Revenue Bonds" of the Authority or similar designation.

There is hereby created one new series of Subordinate Bonds to be issued under and secured by this Subordinate Indenture, on a parity with the other Subordinate Bonds of the Authority which may be issued in the future pursuant to Section 3.02 of this Subordinate Indenture, to be designated "The Pittsburgh Water and Sewer Authority, Water and Sewer System Subordinate Revenue Refunding Bonds, Series B of 2019," in the aggregate principal amount of \$104,290,000. The 2019B Subordinate Bonds shall be issued for the purpose of providing funds for the payment of the cost of the 2019 Project. The 2019B Subordinate Bonds shall be substantially in the form attached hereto as Exhibit C, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by this Subordinate Indenture. The 2019B Subordinate Bonds shall be executed in the form and manner herein specified and delivered to the Trustee for authentication and the Trustee shall authenticate and deliver the principal amount of 2019B Subordinate Bonds, but only upon receipt by the Trustee of the Resolution, this 2019-1 Supplemental Indenture and certificates, opinions and all other materials and documents as provided in Section 3.02 of this Subordinate Indenture. The 2019B Subordinate Bonds as issued hereunder will be subject to the provisions of this Subordinate Indenture. The 2019B Subordinate Bonds are Common Debt Service Reserve Secured Bonds hereunder.

The 2019B Subordinate Bonds shall be issuable only as fully registered bonds in denominations of \$5,000 or any integral multiple thereof. The 2019B Subordinate Bonds shall be numbered and shall bear such prefixes as may be satisfactory to the Authority and the Trustee. The 2019B Subordinate Bonds shall bear interest on the unpaid principal thereof at the annual fixed rates set forth below, computed on the basis of a 360-day year consisting of twelve 30-day months, payable semiannually on March 1 and September 1 of each year, commencing September 1, 2019 until the principal thereof shall have been paid or provided for. The 2019B Subordinate Bonds shall mature on the following dates and in the following principal amounts and bear interest at the following rates:

2019B Subordinate Bonds

<u>Maturity Date</u> <u>(September 1)</u>	<u>Principal</u>	<u>Interest Rate</u>
2030	\$2,990,000	5.000%
2031	\$15,405,000	5.000%
2032	\$25,600,000	5.000%
2033	\$26,635,000	5.000%
2034	\$27,880,000	4.000%
2035	\$5,780,000	4.000%

Each 2019B Subordinate Bond shall bear interest from the immediately preceding Interest Payment Date to which interest has been paid, (a) unless the date of authentication is after the Record Date and on or before the succeeding Interest Payment Date in which case such 2019B Subordinate Bond shall bear interest from such succeeding Interest Payment Date or (b) unless the date of authentication is on or prior to September 1, 2019 and if no interest has been paid on such 2019B Subordinate Bond, such 2019B Subordinate Bond shall bear interest from July 2, 2019.

The debt service schedule for the 2019B Subordinate Bonds is set forth in Exhibit D hereto.

The 2019B Subordinate Bonds shall be redeemable as provided therein and in Article IV hereof.

Subject to applicable provisions hereof, all Additional Bonds shall be issued and shall contain such maturities, payment terms, interest rate provisions, redemption or prepayment features and other provisions as shall be set forth in the Supplemental Indenture providing for the issuance of such Additional Bonds.

The Subordinate Bonds shall be limited obligations of the Authority, payable solely from the Trust Estate. The Subordinate Bonds shall constitute a valid claim of the respective Owners thereof against the Trust Estate, which is pledged, subject to the pledge to secure Senior Debt under the Senior Indenture, to secure the payment of the principal of, redemption premium, if any, and interest on the Subordinate Bonds, and which shall be utilized for no other purpose, except as expressly authorized in this Subordinate Indenture and the Senior Indenture. The Subordinate Bonds shall not constitute general obligations of the Authority and under no circumstances shall the Subordinate Bonds be payable from, nor shall the registered Owners thereof have any rightful claim to, any income, revenues, funds or assets of the Authority other than those pledged hereunder as security for the payment of the Subordinate Bonds.

Section 2.02 Registration of Subordinate Bonds. The Authority shall keep or cause to be kept at the Principal Office of the Trustee books for the registration and transfer of Subordinate Bonds; and the Authority will register or transfer or cause to be registered or transferred therein, as hereinafter provided and under such reasonable regulations as it may prescribe, any Subordinate Bond entitled to be so registered or transferred, upon presentation for such purpose. The Trustee is hereby appointed as registrar of the Authority for the purpose of registering, transferring and exchanging the Subordinate Bonds. A Bond Insurer shall, upon the occurrence of an event of default triggering an obligation to make payments under the Insurance Policy, have the right to inspect the registration books maintained pursuant to this Section 2.02.

Section 2.03 Uniform Commercial Code. The Subordinate Bonds shall be securities under the Pennsylvania Uniform Commercial Code Investment Securities and shall be negotiable instruments to the extent provided therein.

Section 2.04 Transfers and Exchanges of Subordinate Bonds. Upon surrender for transfer of any fully registered Subordinate Bond at the Principal Office of the Trustee, the Trustee shall authenticate and deliver in the name of the transferee or transferees one or more new fully registered Subordinate Bonds of authorized denominations for the aggregate Principal Amount which the Bondholder is entitled to receive.

Any Subordinate Bond shall be exchangeable for Subordinate Bonds of any authorized denomination, in an aggregate Principal Amount equal to the Principal Amount of the Subordinate Bond presented for exchange.

All Subordinate Bonds presented for transfer or exchange shall be accompanied by a written instrument or instruments of transfer or authorization for exchange, in form satisfactory to the Trustee, duly executed by the Bondholder or by his duly authorized attorney. No transfer of any Subordinate Bond shall be valid unless made on the registration books by the registered Owner in person, or by his duly authorized attorney. Such registrations, exchanges and transfers shall be without expense to the Holders of the Subordinate Bonds, but any taxes, fees or other governmental charges required to be paid with respect to the same shall be paid by the Holder requesting any such registration, exchange or transfer as a condition precedent to the exercise of such privilege. Subordinate Bonds may be presented for exchange or transfer only at the Principal Office of the Trustee or at the office of any Paying Agent as the Authority may hereafter appoint.

The Trustee shall not be required to register the transfer or exchange of any Subordinate Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Subordinate Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Subordinate Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

In the event the Subordinate Bonds are no longer Book-Entry Bonds, to the extent that the Holder of the Subordinate Bonds under this Subordinate Indenture is not an exempt recipient under Treas. Reg. § 1.6045-(c)(3), such Holder shall provide or cause to be provided to the Trustee information regarding the amount paid for the Subordinate Bonds, any brokers' fees or commissions, and any other capitalized costs relating to the Subordinate Bonds, in each case to the extent necessary for the Trustee to comply with any applicable tax reporting obligations, including without limitation any cost basis reporting obligations under Internal Revenue Code Section 6045. The Trustee may rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

Section 2.05 Form of Subordinate Bonds; Temporary Subordinate Bonds. Subordinate Bonds in definitive form shall be printed or typewritten. Until Subordinate Bonds in definitive form of any Series are ready for delivery, the Authority may execute and upon its request in writing the Trustee shall initially authenticate and deliver in lieu of any thereof, and subject to the same provisions, limitations and conditions, one or more printed, or typewritten Subordinate Bonds in temporary form, substantially of the tenor of the Subordinate Bonds hereinbefore described, and with appropriate omissions, variations and insertions, with regard to the Subordinate Bonds. Such Subordinate Bonds or Subordinate Bonds in temporary form may be for the amount of \$5,000 or any multiple or multiples thereof, as the Authority may determine. Until exchanged for Subordinate Bonds in definitive form such Subordinate Bonds in temporary form shall be entitled to the lien and benefit of this Subordinate Indenture. The Authority shall, without unreasonable delay, prepare, execute and deliver to the Trustee, and thereupon, upon the presentation and surrender of any Subordinate Bond or Subordinate Bonds in temporary form, the Trustee shall authenticate and deliver, in exchange therefor, a Subordinate Bond or Subordinate Bonds in definitive form of the same Series and same maturity for the same aggregate Principal Amount as the Subordinate Bond or Subordinate Bonds in temporary form surrendered. Such exchange shall be made by the Authority at its own expense and without making any charge therefor. Until such Subordinate Bonds in definitive form are ready for

delivery, the Holder of one or more Subordinate Bonds in temporary form may, with the consent of the Authority, exchange the same, upon the surrender thereof to the Trustee for cancellation, for Subordinate Bonds in temporary form of like aggregate Principal Amount, of the same Series and maturity, in authorized denominations.

Section 2.06 Numbering of Subordinate Bonds. Any Subordinate Bond may bear such numbers, letters, or other marks of identification or designation, and may be endorsed with or have incorporated in the text thereof such legends or recitals with respect to transferability or in respect of the Subordinate Bond or Subordinate Bonds for which it is exchangeable and may contain such provisions, specifications and descriptive words, not inconsistent with the provisions of this Subordinate Indenture, as may be determined by the Authority and approved by the Trustee.

Section 2.07 Execution of Subordinate Bonds. All the Subordinate Bonds shall, from time to time, be executed on behalf of the Authority by the manual or facsimile signature of its Chairman or its Vice Chairperson and its corporate seal (which may be in facsimile) shall be thereunto affixed or thereon imprinted and attested by the manual or facsimile signature of its Secretary or its Assistant Secretary. If any of the officers whose signature shall be upon the Subordinate Bonds shall cease to be such officers of the Authority before the Subordinate Bonds so signed and sealed shall have been actually authenticated by the Trustee or delivered by the Authority, such Subordinate Bonds nevertheless may be authenticated, issued, and delivered with the same force and effect as though the person or persons whose signature shall be upon such Subordinate Bonds had not ceased to be such officer or officers of the Authority; and also any such Subordinate Bond may be signed and sealed on behalf of the Authority by the signature of such persons as at the actual date of the execution of such Subordinate Bond shall be the proper officers of the Authority, although at the nominal date of such Subordinate Bond any such person shall not have been such officer of the Authority.

Section 2.08 Mutilated, Lost, Stolen or Destroyed Subordinate Bonds. Upon receipt by the Authority and the Trustee of evidence satisfactory to both of them that any Outstanding Subordinate Bond has been mutilated, destroyed, lost or stolen, and of indemnity satisfactory to both of them, the Authority, in its discretion, may execute and thereupon the Trustee shall authenticate and deliver, a new Subordinate Bond of the same Series and same maturity and of like tenor in exchange and substitution for, and upon surrender and cancellation of, the mutilated Subordinate Bond or in lieu of and in substitution for the Subordinate Bond so destroyed, lost or stolen. The Authority may, for each new Subordinate Bond authenticated and delivered under the provisions of this Section, require the payment of the expenses, including counsel fees, which may be incurred by the Trustee in taking action pursuant to this Section 2.04. Any Subordinate Bond issued under the provisions of this Section in lieu of any Subordinate Bond alleged to be destroyed, lost or stolen, shall constitute an original additional contractual obligation on the part of the Authority whether or not the Subordinate Bond so alleged to be destroyed, lost or stolen be at any time enforceable by anyone; and shall be equally and proportionately entitled to the benefits of this Subordinate Indenture with all other Subordinate Bonds issued under this Subordinate Indenture.

Section 2.09 Certificate of Authentication. Subject to the qualifications hereinbefore set forth, the Subordinate Bonds to be secured hereby shall be substantially of the

tenor and effect hereinbefore recited, and no Bonds shall be secured hereby or entitled to the benefit hereof, or shall be or become valid or obligatory for any purpose, unless there shall be endorsed thereon a certificate of authentication, substantially set forth in the form of the Subordinate Bond as shall be set forth in this Subordinate Indenture or in the Supplemental Indenture providing for the issuance of such Bonds, executed by the Trustee; and such certificate on any Subordinate Bond issued by the Authority shall be conclusive evidence and the only competent evidence that it has been duly authenticated and delivered hereunder. The Subordinate Bonds shall be authenticated by the Trustee.

Section 2.10 Book-Entry Only Subordinate Bonds. Unless a Supplemental Indenture shall provide otherwise with respect to a Series of Bonds, the Subordinate Bonds of a Series shall be initially issued in book-entry only form. Unless a Supplemental Indenture shall provide otherwise with respect to a Series, in the event that any provision of this Section 2.10 is inconsistent with other provisions of this Subordinate Indenture, so long as the Subordinate Bonds shall be in book-entry only form, the provisions of this Section 2.10 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the Subordinate Bonds. The ownership of one fully registered Subordinate Bond for each maturity set forth in this Subordinate Indenture, each in the aggregate Principal Amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the Subordinate Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the Subordinate Bonds for an equal aggregate Principal Amount of Subordinate Bonds registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a Subordinate Bond or any other evidence of ownership of the Subordinate Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the Subordinate Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the Subordinate Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such Subordinate Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under this Subordinate Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the Subordinate Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the Subordinate Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the Subordinate Bonds so redeemed, but DTC or its nominee may retain such Subordinate Bonds and make an appropriate notation on the Subordinate Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the Subordinate Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the Subordinate Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the Subordinate Bonds, selecting the Bonds or

portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under this Subordinate Indenture, registering the transfer of Subordinate Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the Subordinate Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the Subordinate Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such participant of any amount in respect of the principal or redemption price of or interest on the Subordinate Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under this Subordinate Indenture; or (v) the selection by DTC or any such participant of any person to receive payment in the event of a partial redemption of the Subordinate Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the Subordinate Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under this Subordinate Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to this Subordinate Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the Subordinate Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under this Subordinate Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the Subordinate Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the Subordinate Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Subordinate Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the Subordinate Bonds in registered certificate form in

denominations of \$5,000 and integral multiples thereof (or such other denominations as are applicable to a Series as set forth in a Supplemental Indenture), at the expense of the Authority, to such persons, and in such maturities and Principal Amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the Subordinate Bonds.

In connection with any proposed transfer outside the Book-Entry Only system, prior to or in conjunction with the issuance of certificated Subordinate Bonds, the Bondholder shall provide or cause to be provided to the Trustee all information necessary to allow the Trustee to comply with any applicable tax reporting obligations, including, without limitation, any cost basis reporting obligations under the Internal Revenue Code Section 6045.

The Authority acknowledges such tax reporting obligations and, if necessary, agrees to use commercially reasonable efforts to assist the Trustee in obtaining such information. The Trustee shall conclusively rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

ARTICLE III

AUTHENTICATION AND DELIVERY OF SUBORDINATE BONDS

Section 3.01 Purposes of Subordinate Bonds. The Authority may issue Additional Bonds from time to time under this Subordinate Indenture. Additional Bonds may be issued (a) to pay Costs, (b) to refund Subordinate Bonds or any other Indebtedness (including Senior Debt or Subordinate Debt or other debt not secured by the Revenues), (c) to pay costs of issuance, (d) to fund reserves and/or pay costs associated with Capitalized Interest or terminating Qualified Interest Rate Swap Agreements, or (e) for a combination of such purposes.

In the event that any Policy Costs are due and owing at the time of issuance of the Additional Bonds, for the purpose of the debt tests required by Section 3.02 hereof, Revenues of the Authority shall be reduced by the amount of any Policy Costs then due and owing.

No Additional Bonds may be issued without the prior written consent of a Bond Insurer if any Policy Costs are past due and owing to the Bond Insurer.

Section 3.02 Conditions for Issuing Subordinate Bonds. Before the issuance and authentication of any Series of Subordinate Bonds by the Trustee, there shall be filed with the Trustee:

- (a) In connection with the initial execution of this Subordinate Indenture:
 - (i) A certified copy of this Subordinate Indenture;
 - (ii) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that this Subordinate Indenture has been duly authorized,

executed and delivered to the Trustee and is a valid, binding and enforceable obligation of the Authority.

(b) A certified copy of a Supplemental Indenture (or this Subordinate Indenture only with respect to the 2019B Subordinate Bonds) which (1) shall include: (A) provisions authorizing the issuance, fixing the Principal Amount and setting forth the details of such Subordinate Bonds, including their date, the interest rate or rates and the manner in which the Subordinate Bonds are to bear and pay interest (including whether such Bonds constitute Capital Appreciation Bonds, Capital Appreciation and Income Bonds or Current Interest Capital Appreciation Bonds), the principal and Interest Payment Dates of the Subordinate Bonds; the purposes for which such Subordinate Bonds are being issued, the manner of numbering of such Subordinate Bonds, the Series designation, the denominations, the maturity dates and principal maturities, the Principal Amounts required to be redeemed pursuant to any mandatory redemption provisions or the manner for determining such Principal Amounts, any provisions for optional or extraordinary redemption before maturity, and any provisions regarding the Common Debt Service Reserve Requirement or Series Debt Service Reserve Requirement; and (B) provisions for the application of the proceeds of such Subordinate Bonds; and (2) may include: (A) provisions for Credit Facilities and for other Funds and Accounts to be established with respect to such Subordinate Bonds; (B) provisions necessary or expedient for the issuance and administration of Subordinate Bonds bearing interest at a variable rate or other manner of bearing interest, including remarketing provisions, liquidity facility provisions and provisions for establishing the variable rate and converting to a fixed rate; (C) provisions for entering into credit enhancement devices permitted by Commonwealth law; and (D) such other provisions as the Authority may deem appropriate.

(c) A certified copy of applicable Resolution of the Board authorizing, as required by law, the issuance, sale, award, execution and delivery of such Subordinate Bonds and, in the case of a Series of Bonds issued to refund Indebtedness, calling for redemption or payment of the Indebtedness to be refunded, fixing any redemption date and authorizing any required notice of redemption in accordance with the provisions of this Subordinate Indenture.

(d) A certificate signed by an Authorized Representative of the Authority and dated the date of such issuance, to the effect that:

(i) Either (A) upon and immediately following such issuance, no Event of Default has occurred which has not been cured or waived, and no event or condition exists which, with the giving of notice or lapse of time or both, would become an Event of Default or (B) if any such event or condition is happening or existing, specifying such event or condition, stating that the Authority will act with due diligence to correct such event or condition after the issuance of such Subordinate Bonds, and describing in reasonable detail the actions to be taken by the Authority toward such correction; and

(ii) All required approvals, limitations, conditions and provisions precedent to the issuance of such Series of Subordinate Bonds have been obtained, observed, met and satisfied.

(e) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that the Supplemental Indenture for such Series of Subordinate Bonds (or this Subordinate Indenture only in connection with the 2019B Subordinate Bonds) has been duly authorized, executed and delivered, is binding on the Authority and complies in all respects with the requirements of this Subordinate Indenture.

(f) An opinion of Bond Counsel, subject to customary exceptions and qualifications, substantially to the effect that the issuance of such Subordinate Bonds has been duly authorized, that such Bonds are valid and binding limited obligations of the Authority, and with respect to Subordinate Bonds to be issued on a tax-exempt basis, that the interest on such Bonds is excludable from gross income for purposes of Federal income taxation.

(g) If a Series of Subordinate Bonds are issued to pay Costs, the following:

(i) (A) if the Subordinate Bonds are Common Debt Service Reserve Secured Bonds, evidence that upon issuance of such Subordinate Bonds, the Common Debt Service Reserve Requirement will be fully funded, or (B) if the Subordinate Bonds are Separate Series Debt Service Reserve Secured Bonds, evidence that, upon issuance of such Subordinate Bonds, the Separate Series Debt Service Reserve Requirement for such Subordinate Bonds will be fully funded or will be funded in accordance with the requirements of the applicable Supplemental Indenture; and

(ii) A certificate of (A) a Qualified Independent Consultant, stating that based on the Authority's financial records for a Test Period, the Authority would have been able to meet the Rate Covenant in Section 7.01 of the Senior Indenture, taking into account (i) the maximum Annual Debt Service on the proposed Series of Additional Bonds in the current or any future Fiscal Year, (ii) the additional Net Revenues from the rates, fees and other charges adjusted to reflect any rate increases that had not been in effect throughout the Test Period but that have been approved by and can be implemented by the Authority at the time of the delivery of the proposed Series of Additional Bonds to go into effect within the following five years; and (iii) additional Net Revenues that the Authority may realize from the addition to the System of the assets it proposes to finance through the issuance of the proposed Series of Additional Bonds or other funding sources within the following five years or (B) the Authorized Representative of the Authority stating that based on the Authority's financial records for a Test Period, the Authority has met the Rate Covenant in Section 7.01 of the Senior Indenture, taking into account the maximum Annual Debt Service on the proposed Series of Additional Bonds. In making the certifications required under this paragraph, the Authorized Representative of the Authority or the Qualified Independent Consultant, as applicable, shall determine and utilize the Additional Indebtedness Test Net Revenues in place of the Rate Covenant Net Revenues in determining whether the Authority would have been able to meet the Rate Covenant in Section 7.01 of the Senior Indenture.

(h) If any Subordinate Bonds are issued to refund any Indebtedness, the following:

(i) Evidence that the Authority has made provision as required by this Subordinate Indenture for the payment or redemption of all Indebtedness to be refunded;

(ii) A certificate of an Authorized Representative of the Authority demonstrating that the proposed refunding will not result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year. If the proposed refunding will result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year, then the issuance of that Series of Additional Bonds shall be subject to the same requirements as the issuance of a Series of Additional Bonds to pay Costs under Section 3.02(g)(ii).

(i) A request and authorization of the Authority, signed by an Authorized Representative of the Authority, to the Trustee to authenticate and deliver such Subordinate Bonds to the purchaser upon payment to the Trustee of a specified sum plus accrued interest to the date of delivery.

Except for the requirements of subsection (d) of this Section (which may be waived by the purchasers of such Bonds by an instrument or concurrent instruments in writing signed by such purchasers), none of the requirements in this Section may be waived without the consent of the holders of not less than a majority in aggregate Principal Amount of the Outstanding Bonds.

Section 3.03 Other Subordinate Parity Indebtedness.

(a) The Authority may incur or refinance Other Subordinate Parity Indebtedness provided that:

(1) the documents relating to the Other Subordinate Parity Indebtedness acknowledge that such debt constitutes Other Subordinate Parity Indebtedness under this Subordinate Indenture and is subject to the applicable terms and conditions hereof as if it were Subordinate Bonds, and specify the amounts and due dates of Annual Debt Service with respect to the Other Subordinate Parity Indebtedness;

(2) the requirements of Sections 3.02(g) or 3.02(h), as appropriate, have been met as if the Other Subordinate Parity Indebtedness was an additional Series of Subordinate Bonds;

(3) the Trustee receives written notice of the issuance of the Other Subordinate Parity Indebtedness and the material terms and conditions thereof and the Trustee shall register the holder as owner thereof as such on its books and records, and

(4) the Trustee receives a Counsel's Opinion that the documents creating the Other Subordinate Parity Indebtedness have been duly authorized, executed and delivered on behalf of the Authority and constitute valid, binding and enforceable obligations.

(b) The Authority shall fulfill its obligations under all contracts or agreements creating Other Subordinate Parity Indebtedness as they may exist from time to time.

Section 3.04 Secondary Subordinate Debt of Authority. In addition to the foregoing and in addition to any subordinate pledge granted by the Authority to a Bond Insurer in connection with a Debt Service Reserve Fund Policy, the Authority may incur or assume Secondary Subordinate Debt provided that:

- (1) the security for such Secondary Subordinate Debt is subordinate to the lien of and security interests granted by this Subordinate Indenture; and
- (2) any agreement for the repayment of such Secondary Subordinate Debt and any instrument evidencing or securing such Secondary Subordinate Debt shall provide: (i) that an event of default thereunder may be an event of default under this Subordinate Indenture, and (ii) that, notwithstanding the occurrence of any event of default in respect of any Secondary Subordinate Debt, the lender shall not be entitled to exercise any rights or remedies with respect to the Revenues until and unless the Trustee shall have instituted proceedings to exercise its rights pursuant to Article VIII hereof.

Section 3.05 Covenant as to Prior Lien Debt. The Authority will not incur or assume any debt which will be secured by a lien on the Revenues which will be prior to the lien granted by the terms of this Subordinate Indenture, except as permitted under the Senior Indenture.

Section 3.06 Deposit of Subordinate Bond Proceeds. Upon receipt of the proceeds of any Series of Subordinate Bonds issued under this Subordinate Indenture, such moneys shall be deposited to a Clearing Fund for such Subordinate Bonds and shall be disbursed for the purposes and in the amounts set forth in the closing certificate of the Authority executed on the date of issuance of such Subordinate Bonds. To the extent it is determined on or before thirty (30) days after the date of issuance of such Subordinate Bonds that any remaining moneys in such fund will not be necessary to pay costs of issuance, such moneys shall be transferred to the Subordinate Debt Service Fund and applied to pay interest on such Subordinate Bonds on the next Interest Payment Date for such Subordinate Bonds.

ARTICLE IV

REDEMPTION OF BONDS

Section 4.01 Redemption of Subordinate Bonds; Redemption of 2019B Subordinate Bonds.

- (a) The 2019B Subordinate Bonds shall be subject to redemption as follows:

Optional Redemption

The 2019B Subordinate Bonds maturing on or after September 1, 2034 are subject to redemption prior to maturity, at the option of the Authority, as a whole or in part, at any time, in the order of maturity selected by the Authority and by lot within a maturity on or after September 1, 2029. Any such redemption will be made at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

(b) The Subordinate Bonds of any Series issued under the provisions of this Subordinate Indenture (other than the 2019B Subordinate Bonds) shall be subject to redemption, in whole or in part, and at such times and prices as may be provided in the Supplemental Indenture pursuant to which such Subordinate Bonds are issued. The Subordinate Bonds of any Series to be called for redemption shall be selected as provided in the applicable Supplemental Indenture. The Trustee shall treat each Subordinate Bond of a denomination greater than the minimum denomination authorized in the applicable Supplement Indenture as can be obtained by dividing the Subordinate Bond's actual Principal Amount by such minimum denomination.

Section 4.02 Notice of Redemption. Whenever the Authority shall redeem all or part of the Subordinate Bonds, it shall cause a written notice of intention to redeem, signed in the name of the Authority by an Authorized Representative of the Authority to be sent, by the Trustee by first class mail to each registered Owner of the Bonds to be redeemed at the last address of said registered Owner appearing upon the registration books not less than twenty (20) days or more than sixty (60) days before the redemption date (unless the applicable Supplemental Indenture provides for other timing for the notice). Failure to mail any such notice shall not affect the validity of the proceeding for redemption. Such notice shall specify the information set forth in the next following paragraph. The notice shall further state that, from and after such redemption date, interest thereon will cease to accrue. Simultaneously with the mailing of notice to Bondholders, the Trustee shall notify a Bond Insurer of any redemption, other than mandatory sinking fund redemption, of Subordinate Bonds being insured by a Bond Insurer. In the case of an optional redemption, the notice may, at the Authority's discretion, state (1) that it is conditioned upon the deposit of moneys, in an amount equal to the amount necessary to effect the redemption, with the Trustee no later than the redemption date or (2) that the Authority retains the right to rescind such notice at any time prior to the scheduled redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice (in either case, a "Conditional Redemption"), and such notice and optional redemption shall be of no effect if such monies are not so deposited or if the notice is rescinded as described below.

In addition to the foregoing, the redemption notice shall contain with respect to each Subordinate Bond being redeemed, (1) the CUSIP number as provided in Section 4.04 hereof, (2) the date of issue; (3) the interest rate, (4) the maturity date, and (5) any other descriptive information determined by the Trustee to be needed to identify the Subordinate Bonds. If a redemption is a Conditional Redemption, the notice shall so state. The Trustee also shall send each notice of redemption to (i) any Rating Service then rating the Subordinate Bonds to be redeemed; (ii) all of the registered clearing agencies known to the Trustee to be in the business of holding substantial amounts of bonds of a type similar to the Subordinate Bonds; and (iii) one or more national information services that disseminate notices of redemption of bonds such as the Subordinate Bonds, such services to be identified by the Trustee.

Any Conditional Redemption may be rescinded in whole or in part at any time prior to the redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice. The Trustee shall give prompt notice of such rescission to the affected Bondholders. Any Subordinate Bonds subject to Conditional Redemption where redemption has been rescinded shall remain Outstanding, and the rescission shall not constitute an Event of Default.

Further, in the case of a Conditional Redemption, the failure of the Authority to make funds available in part or in whole on or before the redemption date shall not constitute an Event of Default.

Section 4.03 Nonpresentment of Subordinate Bonds. Notice having been given in the manner hereinbefore provided in this Article and irrevocable instructions having been given to the Trustee to pay said Subordinate Bonds or portions thereof and cash equal to the redemption price of said Subordinate Bonds and the interest accrued thereon to the date of redemption having been deposited in trust with the Trustee on or prior to the date set for redemption, the Subordinate Bonds so called for redemption shall become due and payable on the redemption date so designated, and interest on such Subordinate Bonds shall cease to accrue from such redemption date, whether such Subordinate Bonds are presented for redemption or not. The Principal Amount of all Subordinate Bonds so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Trustee, upon presentation and surrender thereof.

Section 4.04 CUSIP Numbers. The Trustee shall use the "CUSIP" numbers assigned to the Subordinate Bonds, if then generally in use, in notices of redemption of Subordinate Bonds as a convenience to Bondholders; provided that any such notice shall state that no representation is made as to the correctness of such numbers either as printed on the Subordinate Bonds or as contained in any notice of redemption and that reliance may only be placed on the identification numbers established under this Subordinate Indenture.

ARTICLE V

CONSTRUCTION FUND

Section 5.01 Construction Fund. There is hereby created a special fund known as the "Construction Fund", which shall be held in trust by the Trustee. Money shall be deposited to the Construction Fund pursuant to the provisions of Section 3.06 and from any other sources identified by the Authority. To the extent Costs of a Construction Project are paid for from Subordinate Bonds, the Authority must deposit the construction proceeds of the Subordinate Bonds in the Construction Fund and must follow the provisions of this Article V. To the extent the Authority is self-funding Costs from other than proceeds of Subordinate Bonds, the Authority may use moneys in the Revenue Fund and the Operating Fund under the Senior Indenture to pay such Costs, and the Authority need not use the Construction Fund or follow the provisions of this Article V.

Payment of the Costs of a Construction Project shall be made from the Construction Fund. A special account shall be created and identified for each such Construction Project, although funds, at the written direction of the Authority, may be transferred from one such account in the Construction Fund to another account in such Fund. On the date of issuance of Subordinate Bonds to finance in whole or in part a Construction Project, the moneys directed, in writing, by the Authority to be transferred from the Clearing Fund shall be deposited into the Construction Fund or an account therein. All moneys on deposit in the Construction Fund shall be held in Trust by the Trustee as security under this Subordinate Indenture and disbursed by the Trustee pursuant to this Section 5.01 in payment of the Costs of the Construction Project. Before

each such withdrawal and payment of the Costs of the Construction Project from the Construction Fund by the Trustee, the Authority shall deliver to the Trustee the following:

(a) A requisition, signed by any two of the Authorized Representatives of the Authority, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, stating in respect of each payment to be made:

- (1) the item number of the payment;
- (2) the name and address of the person to whom payment is due;
- (3) the amount to be paid and the Construction Fund from which payment is to be made;
- (4) the purpose for which the obligation was incurred;
- (5) that obligations in the stated amount have been incurred by the Authority and that each item thereof is a proper part of the Cost of the Construction Project and has not been paid;
- (6) that there has not been filed with or served upon the Authority notice of any lien, right to lien or attachment upon, or claim affecting the right to receive payment of any of the moneys payable to any persons named in such requisition;
- (7) that such requisition contains no items representing payment on account of any retained percentage which the Authority is on the date of such certificate entitled to retain;
- (8) that neither the Authority nor any of its officers or members has received any discount, rebate, commission, fee, proceeds from insurance or other abatement which is not reflected on the requisition in connection with any such expenditures or indebtedness; and
- (9) that no part of any such item has been included in any previous requisition for the withdrawal of moneys from the Construction Fund; and

(b) Except to the extent to which a requisition relates to financing costs, a certificate signed by the Consulting Engineer approving such requisition and certifying that each item to be paid as set forth in such requisition constitutes an obligation which has been properly incurred as part of the Cost of the Construction Project and is then due and unpaid. For purposes of this Section 7.09, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Subordinate Indenture.

Upon the receipt of each such requisition and the accompanying certificate, the Trustee shall pay to the persons named in such requisition, the respective amounts stated therein to be due to such persons.

Investment earnings on the amounts on deposit in the Construction Fund shall be retained in the Construction Fund unless the Authority directs the Trustee, in writing, to transfer such earnings to the Subordinate Debt Service Fund.

Any moneys remaining in the Construction Fund after all amounts due in respect of the Construction Project shall have been paid (including any Costs of any amendment or revision of the Construction Project pursuant to Section 5.02 below), which fact shall be evidenced to the Trustee by delivery of a certificate of an Authorized Representative of the Authority to that effect, shall be transferred by the Trustee to the Revenue Fund and applied as directed in writing by the Authority; with respect to such application, the Authority will obtain an opinion of Bond Counsel that such application in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Subordinate Bonds issued to fund such Construction Project. If an Event of Default pursuant to Section 8.01(a) or (b) occurs, and only to the extent that no other available moneys are held under this Subordinate Indenture, the Trustee shall transfer moneys from the Construction Fund to the Subordinate Debt Service Fund to pay principal and interest on the Subordinate Bonds.

All requisitions received by the Trustee pursuant to Section 5.01(a) may be relied upon without investigation or inquiry by and shall be retained in the possession of the Trustee for a period of five (5) years, subject at all times to the inspection of the Authority, its agents and representatives, and any other person authorized by a certificate of an Authorized Representative of the Authority.

Section 5.02 Amendment of Construction Project. The Authority may from time to time amend or revise a Construction Project with the approval of the Consulting Engineer, but only if the Authority shall have first delivered to the Trustee (i) a written statement describing the proposed amendments and revisions, (ii) a Resolution of the Board approving the proposed amendments and revisions, (iii) a certificate signed by the Consulting Engineer setting forth the general effect of such proposed amendments and revisions and certifying in his opinion that such proposed amendments and revisions are in the best interests of the Authority, and (iv) an opinion of Bond Counsel that such amendment or revision in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Subordinate Bonds issued to fund such Construction Project.

Section 5.03 Contract Security. All contracts which provide for the furnishing of material or the doing of work with regard to a Construction Project shall be in compliance with all federal and state statutes, rules and regulations and shall be subject to the approval of the Consulting Engineer. The Authority will require each person with whom it may contract for construction to furnish a performance security and a labor and materialmen's security each for not less than 100% of the full amount of the contract entered into with such person or such greater or lesser amount as may be required by applicable law, and to carry such insurance as may be required by law and as may be recommended by the Consulting Engineer. The proceeds of any such performance security shall forthwith, upon the receipt thereof by the Authority, be deposited to the credit of the applicable Construction Fund or account therein and applied toward the completion of the construction covered by the contract in connection with which such performance security shall have been furnished except that any such proceeds as shall constitute liquidated damages for delay shall be deposited to the credit of the Revenue Fund. For purposes

of this Section 5.03, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Subordinate Indenture.

ARTICLE VI

REVENUES, FUNDS AND INVESTMENTS

Section 6.01 Funds and Accounts.

(a) Reference is made to Article VI of the Senior Indenture which describes the Revenue Fund and various other funds created under or pursuant to the Senior Indenture and this Subordinate Indenture. The periodic transfer of funds from the Revenue Fund is described in Section 6.02 of the Senior Indenture.

(b) In addition to the Construction Fund established in Section 5.01 hereof, there are hereby established the following Funds and Accounts to be held by the Trustee pursuant to this Subordinate Indenture:

(1) Subordinate Debt Service Fund to be held by the Trustee, subject to the lien of this Subordinate Indenture, in which there shall be established an Interest Account, a Principal Account and a Sinking Fund Account, and a separate subaccount in each such Account with respect to (i) all Series of Common Debt Service Reserve Secured Bonds and (ii) each Series of Separately Secured Debt Service Reserve Fund Bonds; and (iii) Other Senior Parity Indebtedness;

(2) Subordinate Debt Service Reserve Fund to be held by the Trustee, subject to the lien of this Subordinate Indenture;

(3) Subordinate Redemption Fund to be held by the Trustee, subject to the lien of this Subordinate Indenture; and

(4) Subordinate Rebate Fund to be held by the Trustee, but is not subject to the lien of this Subordinate Indenture.

Section 6.02 Subordinate Debt Service Fund. The Authority shall deposit and the Trustee shall apply the amounts required to be deposited on the applicable dates pursuant to the provisions of this Subordinate Indenture and any documents related to the Subordinate Debt for the purpose of paying the interest on and principal of Subordinate Debt.

Section 6.03 Subordinate Debt Service Reserve Fund.

The Series Debt Service Reserve Account maintained for all Common Debt Service Reserve Secured Bonds shall be funded at all times to the Common Debt Service Reserve Requirement, and all other Series Debt Service Reserve Accounts shall be funded at all times to the applicable Separate Series Debt Service Reserve Requirement as set forth in a Supplemental Indenture. Amounts in each Series Debt Service Reserve Account shall be used to

pay debt service on the related Series of Subordinate Bonds on the date such debt service is due if insufficient funds for that purpose are available in the related Series subaccount in the Interest Account and the related Series subaccount in the Principal Account (but only to the extent amounts in such subaccounts are less than the amounts required). Amounts in each Series Debt Service Reserve Account shall be pledged to Holders of the Subordinate Bonds secured by such Series Debt Service Reserve Account.

The Authority shall withdraw from the Revenue Fund and deposit into the Subordinate Debt Service Reserve Fund:

(a) on the dates specified in the Senior Indenture or this Subordinate Indenture or any Supplemental Indenture, the amounts required to be deposited on such dates to the credit of the applicable accounts of the Subordinate Debt Service Reserve Fund; and

(b) if a deficiency exists in any account of the Subordinate Debt Service Reserve Fund, on the dates specified in the Senior Indenture or this Subordinate Indenture or a Supplemental Indenture, such amounts as will be sufficient to repair any deficiencies in such account of the Subordinate Debt Service Reserve Fund in not more than twenty-four equal monthly payments.

In lieu of or in addition to cash or investments, at any time the Authority may cause to be deposited to the credit of the Subordinate Debt Service Reserve Fund any form of Credit Facility, including a Debt Service Reserve Fund Policy, in the amount of all or a portion of the Subordinate Debt Service Reserve Fund, irrevocably payable to the Trustee as beneficiary for the Holders of the respective Series of Subordinate Bonds, provided that the Trustee has received evidence satisfactory to it that the provider of the Credit Facility has a credit rating in one of the three highest credit rating categories by one Rating Agency.

If a disbursement is made pursuant to any Credit Facility, the Authority shall either (a) reinstate the maximum limits of such Credit Facility, or (b) deposit to the credit of the Subordinate Debt Service Reserve Fund moneys in the amount of the disbursement made under such Credit Facility from available Net Revenues. To the extent such moneys are still insufficient, then the Authority shall transfer to the Trustee from any legally available moneys the amount of such deficiency as soon as practicable and in any event within 24 months by depositing one-twenty-fourth of the required amount each month.

Amounts, if any, released from any Subordinate Debt Service Reserve Fund upon deposit to the credit of such Subordinate Debt Service Reserve Fund of a Credit Facility shall, upon designation by an Authorized Representative of the Authority, accompanied by an opinion of Bond Counsel that such use in and of itself will not adversely affect the exclusion from gross income of interest on the respective Series of Bonds, be transferred (a) to the Subordinate Debt Service Fund and used to pay interest on, principal of or to redeem such Subordinate Bonds, or (b) to the Authority to be used to pay all or any portion of the Costs designated by the Authority and approved by Bond Counsel.

On or within five days after each Reserve Determination Date, the Trustee shall determine if the balance on deposit in the Subordinate Debt Service Reserve Fund was, as of the

Reserve Determination Date, at least equal to the Debt Service Reserve Requirement. In making such determination, any obligations in the Subordinate Debt Service Reserve Fund shall be valued in accordance with Section 6.07.

In the event the amount on deposit in the Subordinate Debt Service Reserve Fund exceeds the applicable Debt Service Reserve Fund Requirement, the Trustee shall (a) transfer such excess to the Debt Service Fund to be used to pay interest and principal on Bonds on the next Interest Payment Date, and (b) transfer such excess to the Authority to be used to pay all or any portion of Costs designated by the Authority and approved by Bond Counsel; provided, however, that if an Authorized Representative of the Authority calls for a Reserve Determination Date in connection with the refunding and/or defeasance of a Series of Subordinate Bonds, then the Trustee is authorized to take such refunding and/or defeasance into account in valuing the Subordinate Debt Service Reserve Fund securing such Series of Subordinate Bonds and is further authorized to apply the amount of any surplus arising from such valuation to reduce the amount of the refunding bonds and/or to provide for the defeasance of the Subordinate Bonds in such manner as the Authorized Representative of the Authority may direct.

The Trustee shall ascertain the necessity for a claim upon a Debt Service Reserve Fund Policy and provide notice to the Bond Insurer of any such claim in accordance with the Debt Service Reserve Fund Policy at least two Business Days prior to each Interest Payment Date. The Trustee shall without any direction from the Authority, transfer moneys from the Subordinate Debt Service Reserve Fund to the Subordinate Debt Service Fund or to any sinking, purchase or analogous fund to the extent that the moneys in the Subordinate Debt Service Fund or any sinking, purchase or analogous fund may on any Interest Payment Date be insufficient to make the payments for which the Subordinate Debt Service Fund or any sinking, purchase or analogous fund was established as the same shall become due. If and to the extent that cash has been deposited into the Subordinate Debt Service Reserve Fund in addition to a Debt Service Reserve Fund Policy, all such cash shall be used (or investments purchased with such cash shall be liquidated and the proceeds applied as required) prior to any drawing under the Debt Service Reserve Fund Policy, and repayment of any Policy Costs shall be made prior to replenishment of any such cash amounts.

If, in addition to the Debt Service Reserve Fund Policy, any other reserve fund substitute instrument ("Additional Reserve Fund Policy") is provided, drawings on the Debt Service Reserve Fund Policy and any such Additional Reserve Fund Policy, and of repayment of Policy Costs and reimbursement of amounts due under the Additional Reserve Policy, shall be made on a pro rata basis (calculated by reference to maximum amounts available thereunder) after applying all cash available in the Subordinate Debt Service Reserve Fund and prior to replenishment of any such cash draws, respectively.

If the Authority shall fail to pay any Policy Costs in accordance with the provisions of this Subordinate Indenture, the Bond Insurer shall be entitled to exercise any and all remedies under this Subordinate Indenture other than (i) acceleration of the maturity of the Subordinate Bonds, or (ii) remedies which would adversely affect Bondholders.

The Trustee shall notify the Bond Insurer of any withdrawal from the Subordinate Debt Service Reserve Fund due to a deficiency in any other fund or of any deficiency in the

Subordinate Debt Service Reserve Fund due to market fluctuation of the investments held therein.

The Authority's obligation to repay any Policy Costs to a Bond Insurer related to the Subordinate Debt Service Reserve Fund shall have the same priority and be paid in the same manner from the Revenue Fund as the obligation to maintain and refill the Subordinate Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Subordinate Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

Section 6.04 Subordinate Redemption Fund. The Authority may transfer to the Trustee for deposit to the credit of the Subordinate Redemption Fund such amounts as it may elect for the purchase of Subordinate Bonds or redemption of Subordinate Bonds at the option of the Authority and the Trustee shall apply such moneys to the redemption of Subordinate Bonds in the amounts directed, in writing, by the Authority. Upon any such purchase or redemption, the Trustee shall transfer from the Subordinate Debt Service Fund to the Subordinate Redemption Fund any amount deposited in the Subordinate Debt Service Fund with respect to interest on the Subordinate Bonds being redeemed and shall pay the interest due on the redemption date out of such moneys.

The Trustee shall provide for a mandatory sinking fund redemption of any Term Bonds in accordance with the schedules set forth in this Subordinate Indenture or in the Supplemental Indenture for such Subordinate Bonds; provided, however, that on or before the 45th day next preceding any such sinking fund payment date, the Authority may:

- (i) deliver to the Trustee for cancellation Term Bonds of the maturity required to be redeemed on such sinking fund payment date in any aggregate Principal Amount desired; or
- (ii) instruct the Trustee, in writing, to apply a credit against the Authority's next sinking fund redemption obligation for any such Term Bonds that previously have been redeemed (other than through the operation of the sinking fund) and canceled but not theretofore applied as a credit against any sinking fund redemption obligation.

Upon the occurrence of any of the events described in the subsections (i) or (ii) above, the Trustee shall credit against the Authority's sinking fund redemption obligation on the next sinking fund payment date the amount of such Term Bonds so delivered or previously redeemed. Any Principal Amount of such Term Bonds in excess of the Principal Amount required to be redeemed on such sinking fund payment date shall be similarly credited in such order as may be determined by the Authority against future payments to the Subordinate Redemption Fund and shall similarly reduce the Principal Amount of the Term Bonds of the applicable Series to be redeemed on the next sinking fund payment date. Within seven days of receipt of such Term Bonds or instructions to apply as a credit, any amounts remaining in the Subordinate Redemption Fund in excess of the amount required to fulfill the remaining required sinking fund redemption obligation on the next sinking fund payment date shall be used in such manner as determined at the direction of the Authority.

Section 6.05 Subordinate Rebate Fund. The Subordinate Rebate Fund related to the Subordinate Bonds is established with the Trustee separate and apart from the pledge of this Subordinate Indenture. The Trustee shall make deposits to and disbursements from the Subordinate Rebate Fund upon directions furnished by the Authority. The Authority will retain a Qualified Independent Consultant, experienced in preparing rebate reports, to assist the Authority with respect to rebate requirements related to the Subordinate Bonds. The Trustee has undertaken no duty, and is under no obligation to calculate any amount due with respect to such rebate, to verify amounts contained in any written request or direction, or to make such payments.

Section 6.06 Other Funds and Accounts. The Authority may establish in each Supplemental Indenture such other Funds and Accounts as the Authority determines to be desirable.

Section 6.07 Authorized Investments. At the written direction of the Authority, signed by any two of the Authorized Representatives of the Authority, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, a certified copy of which shall be on file with the Trustee, moneys to the credit of the following Funds shall be invested by the Trustee in the following securities:

(a) Obligations of the United States of America or any of its agencies or instrumentalities backed by the full faith and credit of the United States of America; and short term obligations of the United States Government or its agencies or instrumentalities.

(b) Deposits in savings accounts or time deposits or share accounts of institutions insured by the Federal Deposit Insurance Corporation or the National Credit Union Share Investment Fund to the extent such accounts are so insured and for any amounts above the insured maximum if the approved collateral as provided by law shall be pledged by the depository (including pursuant to Pennsylvania Act 72 of 1971, as amended).

(c) Obligations, participations or other instruments of any Federal agency, instrumentality or United States government-sponsored enterprise, including those issued or fully guaranteed as the principal and interest by Federal agencies, instrumentalities or United States government-sponsored enterprises, if the debt obligations are rated at least "A" or its equivalent by at least two Rating Agencies.

(d) Repurchase agreements with respect to United States Treasury bills or obligations, participations or other instruments of or guaranteed by the United States or any Federal agency, instrumentality or United States government-sponsored enterprise.

(e) Negotiable certificates of deposit or other evidences of deposit, with a remaining maturity of three years or less, issued by a nationally or State-chartered bank, a Federal or State savings and loan association or a State-licensed branch of a foreign bank. For obligations with a maturity of one year or less, the debt obligations of the issuing institution or its parent must be rated in the top short-term rating category by at least two Rating Agencies. For obligations with a maturity in excess of one year, the senior debt obligations of the issuing institution or its parent must be rated at least "A" or its equivalent by at least two Rating Agencies.

(f) Bills of exchange or time drafts drawn on and accepted by a commercial bank, otherwise known as bankers' acceptances, if the bankers' acceptances do not exceed 180 days' maturity and the accepting bank is rated in the top short-term category by at least two Rating Agencies.

(g) Commercial paper issued by corporations or other business entities organized in accordance with Federal or State law, with a maturity not to exceed 270 days, if the issuing corporation or business entity is rated in the top short-term category by at least two Rating Agencies.

(h) Shares of an investment company registered under the Investment Company Act of 1940 (54 Stat. 789, 15 U.S.C. § 80a-1 et seq.) whose shares are registered under the Securities Act of 1933 (48 Stat. 74, 15 U.S.C. § 77a et seq.), if all of the following conditions are met: (1) the investments of the company are the authorized investments under this definition; (2) the investment company is managed in accordance with 17 CFR 270-2a7 (relating to money market funds); and (3) the investment company is rated in the highest category by a Rating Agency.

(i) Savings or demand deposits placed in accordance with the following conditions: (1) the money is initially deposited and invested through a federally insured institution having a place of business in the Commonwealth which is selected by the Authority; (2) the selected institution arranges for the redeposit of the money in savings or demand deposits in one or more financial institutions insured by the Federal Deposit Insurance Corporation for the account of the Authority; the full amount of principal and any accrued interest of each such deposit is insured by the Federal Deposit Insurance Corporation; and (4) on the same date that the money is redeposited pursuant to paragraph (2), the selected institution receives an amount of deposits from customers of other financial institutions equal to or greater than the amount of money initially invested through the selected institution by the Authority.

All investments shall mature or shall be subject to withdrawal, as the case may be, not later than the date required for the operation of such Fund and in no event later than the date or the number of months or years after the date of such investment or deposit as specified in the following columns:

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<u>Fund</u>	<u>Period of Investment</u>
Construction Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Subordinate Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Subordinate Debt Service Reserve Fund	Not later than 7 years from the date of investment.
Subordinate Redemption Fund	Not later than the day prior to the redemption date with respect to which such deposit has been made.
Subordinate Rebate Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.

In any such case, the full purchase price (including accrued interest and premiums, if any) of obligations, shall be paid out of the Fund for which the investment was made. Upon a like direction by the Authority, or whenever the moneys in said Funds are to be applied and paid out pursuant to any provisions of this Subordinate Indenture, or, whenever the Trustee shall deem such action to be advisable, the Trustee shall sell all or any part of the obligations in which the moneys in one or more such Funds shall be invested or withdraw moneys from such accounts or certificates of deposit, and the proceeds of such sale or the amount of such withdrawal shall be deposited to the credit of the respective Fund or Funds. Interest and income derived from any such investments or deposits shall be held and transferred as follows, unless otherwise directed by the Authority:

- (a) Construction Fund – remain in that fund;
- (b) Subordinate Debt Service Fund - remain in that fund;
- (c) Subordinate Debt Service Reserve Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (d) Subordinate Redemption Fund - transferred to Revenue Fund; and
- (e) Subordinate Rebate Fund - remain in that fund.

Any loss resulting from any such investment shall be charged to the respective Fund or Funds, for which such investment was made. Obligations purchased as an investment of any of said Funds shall be deemed at all times to be a part of such Fund. The Trustee shall not be liable or responsible for any loss resulting from any investment made in accordance with the provisions of this Section or resulting from any sale by the Trustee of such investment made in accordance with instructions from the Authority.

Cash in each of the Funds and accounts therein and all certificates of deposit, repurchase agreements and investment agreements all as referred to in this Article, to the extent that the same is not insured or guaranteed by the Federal Deposit Insurance Corporation or other Federal agency, shall be continuously secured by a pledge of securities described in (a) and/or (b) of this Section having an aggregate market value, exclusive of accrued interest in the case of certificates of deposit and including accrued interest in the case of repurchase agreements or other investment agreements, at all times at least equal to 100% (or 102% in the case of repurchase agreements or investment agreements) of the balance on deposit (including interest earned in the case of repurchase agreements or investment agreements) in such Fund or account. Such securities shall be held by a Trustee or agent satisfactory to the Authority and to the Trustee. In the event the Authority determines that the market value of such security is determined by the Trustee to be less than the required amount, the Authority shall provide written instructions to Trustee to obtain additional security.

All Authorized Investments (except investment agreements) shall be valued by the Trustee as frequently as deemed necessary by a Bond Insurer, but not less often than annually, at the market value thereof, exclusive of accrued interest.

No later than 20 days before each Interest Payment Date, the Trustee shall advise the Authority of the amount of interest credited and to be credited to the Subordinate Debt Service Fund prior to the next Interest Payment Date to enable the Authority to determine the amount to be transferred from the Revenue Fund on such Interest Payment Date.

Ratings of authorized investments shall be determined at the time of purchase of such authorized investments and the Trustee shall have no responsibility to monitor the ratings thereof. The Trustee may make any and all such investments through its own investment department or that of its affiliates or subsidiaries, and may charge its ordinary and customary fees for such trades, including cash sweep account fees. In the absence of investment instructions from the Authority, the Trustee shall not be responsible or liable for keeping the moneys held by it hereunder fully invested in authorized investments. Although the Authority recognizes that it may obtain brokerage confirmations or written instructions containing comparable information at no additional cost, the Authority agrees that confirmations are not required to be issued by the Trustee for each month in which a monthly statement of investments is provided it; provided that no statement is required for any Fund and/or Account held by the Trustee for any month in which no investment activity occurred during such month in such Fund or Account.

ARTICLE VII

RATE COVENANT AND PARTICULAR COVENANTS

Section 7.01 Authority Rate Covenant. The Rate Covenant set forth in Section 7.01 of the Senior Indenture is incorporated by reference in this Section 7.01 of this Subordinate Indenture as if fully set forth herein, including all applicable definitions.

Section 7.02 No Extension of Payment. The Authority will not directly or indirectly extend or assent to the extension of the time of payment of any claim for interest upon any of the Subordinate Bonds by purchasing or funding such claim or by any other arrangement, and, in case the time for payment of any such claim for interest shall be extended, such claim shall not be entitled, in case of any default hereunder, to the benefits of this Subordinate Indenture, or to any payment out of the assets of the Authority, except subject to the prior payment of the principal of all Subordinate Bonds issued and Outstanding hereunder, and of such portion of the accrued interest thereon as shall not be represented by such extended claims.

Section 7.03 Appointment of Trustee. The Authority hereby irrevocably appoints the Trustee as its agent to maintain an office or agency at its corporate trust office in the City, where Subordinate Bonds may be presented for registration and transfer and where notices, presentations and demands in respect to the Subordinate Bonds, or of this Subordinate Indenture, may be served. The Trustee shall not be under any liability to the Authority or to any other corporation or person in respect of any such presentation, demand or notice. The Authority shall have the right to appoint a Paying Agent to perform any of the Trustee's duties hereunder with respect to the authentication, transfer, exchange or payment of the Subordinate Bonds hereunder.

Section 7.04 Corporate Existence. The Authority is duly authorized under its certificate of incorporation and all applicable laws to issue the Subordinate Bonds and execute and deliver this Subordinate Indenture and to pledge the Revenues pledged hereby, and all corporate action on its part to that end has been duly and validly taken; this Subordinate Indenture is and will be a legal, binding and enforceable instrument in accordance with its terms except to the extent that the enforcement of the remedies provided for herein may be limited by bankruptcy laws or the Act; and the Subordinate Bonds are and will be valid and binding obligations of the Authority entitled to the benefits and security of this Subordinate Indenture. The Authority will at all times preserve and protect the security of the Subordinate Bonds and the rights of the Trustee and the Bondholders hereunder.

Section 7.05 Compliance with Act; Maintenance of Existence. The Authority will at all times comply with the laws of the Commonwealth applicable to the Authority, particularly the Act and its amendments and supplements, and it will take such actions and proceedings as may be required, from time to time, to preserve its corporate existence, rights and franchises.

Section 7.06 Liens; Sale of Assets. So long as any of the Subordinate Bonds secured hereby are Outstanding, none of the Revenues shall be used for any purpose other than as provided in the Senior Indenture and this Subordinate Indenture, and no contract or contracts

will be entered into or any action taken by which the rights of the Trustee or of the Bondholders might be impaired or diminished.

The Authority will not voluntarily create or permit to be created any debt, lien or charge on a parity with (except pursuant to Section 3.03 hereof) or having priority over the lien of this Subordinate Indenture (except pursuant to the Senior Indenture) upon any of the Revenues pledged hereby or any other revenues or other amounts at any time pledged for the payment of the Subordinate Bonds. The Authority will not sell or otherwise dispose of or encumber the System or any part thereof except as herein and in the Senior Indenture otherwise having provided. No sale or other disposition of fixed properties having a fair market value in excess of One Million Dollars (\$1,000,000) shall be made unless the Consulting Engineer shall first have filed his certificate with the Authority and the Trustee recommending such sale or other disposition of said fixed properties and shall have stated in such certificate that the sale or other disposition of said properties is in the best interests of the Authority and will not impair the security of the Subordinate Bonds and the retention of said properties is not necessary for the efficient operation of the System. If, after receiving the certificate of the Consulting Engineer, the Authority determines to sell or otherwise dispose of said fixed properties, it shall by Resolution of the Authority adopted by a majority vote of a quorum of the Board, authorize such sale or other disposition and shall file a certified copy of such Resolution of the Authority with the Trustee.

The proceeds from such sale or other disposition of any such fixed properties shall be deposited in the Revenue Fund.

The Authority may from time to time sell or otherwise dispose of property other than fixed property included in the System if the Authority shall determine that the sale or other disposition of such property is in the best interests of the Authority and will not impair the security of the Subordinate Bonds and the retention of said properties is not necessary for the efficient operation of the System. The proceeds from the sale or other disposition of such property shall be deposited in the Revenue Fund.

In case the Authority shall have acquired any property constituting part of the System within or after the period for which any calculation of Net Revenues is made there shall be included in ascertaining the Net Revenues for such period, the net earnings or net losses, as the case may be, of such property for the whole of such period to the extent the same may not have been otherwise included. The net earnings or net losses, as the case may be, of such property for the period preceding its acquisition by the Authority shall be computed as if such property had been operated by the Authority during such period. If within or after the period for which any such calculation is made, the Authority shall have disposed of any property constituting part of the System, then the net earnings or net losses, as the case may be, of such property for the whole of such period shall be excluded, to the extent the same may not have been otherwise excluded, in ascertaining the Net Revenues for such period. If the rates, rents and charges during all or any part of the period for which any such calculation is made shall be different from the rates, rents and charges which are in effect at the time such calculation is made, there shall be added to or deducted from the Net Revenues so calculated, any increase or decrease of the Revenues for such period which would result from the computation of such

Revenues on the basis of the rates, rents and charges in effect at the date of said calculation, rather than the rates, rents and charges which were actually in effect during that period.

Section 7.07 Payment of Taxes and other Governmental Charges. The Authority will pay all taxes, assessments and other governmental charges lawfully imposed upon its properties or the Revenues when the same shall become due as well as all lawful claims for labor, material and supplies, which, if unpaid, might by law become a lien or charge on the System or the Revenues or any part thereof prior to or on a parity with the lien hereof, or which might impair the security of this Subordinate Indenture, so that the priority and security of this Subordinate Indenture shall be preserved, provided that nothing in this Section contained shall require the Authority to pay and discharge any such tax, assessment, charge or claim so long as the validity thereof shall be contested in good faith by appropriate proceedings diligently conducted (unless and until foreclosure, distraint, sale or other similar proceedings shall have been commenced) and if such reserves or other appropriate provisions, if any, as shall be required by generally accepted accounting principles shall have been made therefor.

Section 7.08 Insurance of System. The Authority will at all times cause all the property of the System which is of a character usually insured by persons operating properties of a similar nature to be properly insured and kept insured by a reputable insurance company or companies against loss or damage by fire or other hazards to the extent that such properties are usually insured by persons operating properties of a similar nature in the same or similar localities. All policies shall be so written that the Trustee will be notified of cancellation or amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. In case the Trustee shall at any time notify the Authority in writing that it disapproves of any insurance company issuing a policy of insurance covering any one or more such risks, the Authority will forthwith affect other insurance with companies satisfactory to the Trustee.

All such policies shall be for the benefit of the Trustee and the Authority as their interests may appear. All policies shall provide that claims in excess of \$5,000,000 shall be made payable to the Trustee and shall be deposited with the Trustee and the Trustee shall have the sole right to receive the proceeds of such policies and to collect and receipt for claims in excess of \$5,000,000 thereunder. The Trustee may accept as conclusive the adjustment of any loss or losses by the Authority and any insurance company. The proceeds of all such policies paid to the Trustee shall be held by it as additional security hereunder until paid out by it as herein provided. All claims of \$5,000,000 or less shall be paid to the Authority.

Section 7.09 Damage, Destruction or Condemnation of System; Application of Proceeds. In the event of any damage to the System covered by insurance or condemnation or taking by eminent domain of any part of the System for which the cost of repair or replacement shall exceed \$5,000,000, the proceeds shall be deposited in the Revenue Fund and the Authority shall promptly notify the Trustee and file with the Trustee a Consulting Engineer's certificate stating whether, in the signer's opinion, it is practicable and advantageous to repair or replace the damaged or condemned property. If the certificate states that repair or replacement is practicable and advantageous, the Consulting Engineer shall, if appropriate, prepare and file with the Trustee plans and specifications therefor with an estimate of the cost thereof, and the insurance or condemnation proceeds, if any, shall be transferred to the Operating Fund of the Senior Indenture

and applied thereto. If the certificate states that the repair or replacement is not practical and advantageous, the proceeds shall be deposited in the Revenue Fund. For purposes of this Section 7.09, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Subordinate Indenture.

Section 7.10 Employment of Consulting Engineer; Reports. The Authority will employ a Consulting Engineer to perform such duties as are imposed on the Consulting Engineer by the provisions of this Subordinate Indenture and the Senior Indenture.

It shall be the duty of the Consulting Engineer, in addition to the other duties prescribed elsewhere in this Subordinate Indenture, to prepare and file with the Authority and with the Trustee on or before thirty days prior to the beginning of each Fiscal Year thereafter, a report setting forth the following:

(a) Advice and recommendations as to the proper maintenance, repair and operation of the System during the next Fiscal Year and an estimate of the amounts of money that should be expended for such purposes;

(b) Advice and recommendations as to the Capital Additions that should be made during the next Fiscal Year, and an estimate of the amount of money that is recommended for such purposes; and

(c) Whether the properties of the System have been maintained in good repair and sound operating condition and the Consulting Engineer's estimate of the amount, if any, required to place such properties in such condition and the details of such expenditures and the approximate time required therefor.

Section 7.11 Adoption of Annual Budget. The Authority covenants that it will on or before each December 31, prior to the beginning of each Fiscal Year thereafter, prepare and adopt a budget of Current Expenses for the next Fiscal Year, which budget shall contain an estimate of the Revenues to be derived for the period covered by such budget, and a copy of such budget shall be promptly filed with the Trustee and each Bond Insurer. Any budget may be amended from time to time by the Authority and such amended budget shall be promptly filed with the Trustee and each Bond Insurer. The Annual Budget shall also be filed, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of the Annual Budget with EMMA and placement of the Annual Budget on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section.

Until the adoption of the Annual Budget of Current Expenses for a particular Fiscal Year, the budget for the preceding Fiscal Year shall be deemed to be in force for such particular Fiscal Year.

Section 7.12 Maintenance of System. The Authority will at all times maintain or cause to be maintained the System and every part thereof in good repair, working order and condition, will continuously operate the same and will, from time to time, make or cause to be made all needful and proper repairs, renewals and replacements so that the aggregate efficiency and capacity of the System shall at no time be unreasonably impaired or reduced.

Section 7.13 Employment of Independent Auditor; Annual Financial Report. Authority covenants that it has employed and will continue to employ an Independent Auditor to perform such duties as are imposed on the Independent Auditor by this Subordinate Indenture and the Senior Indenture.

The Authority has caused an accurate system of accounts to be installed as recommended by its Independent Auditor. The Authority will keep proper books of record and accounts in which complete and correct entries shall be made of all its dealings and transactions in accordance with generally accepted accounting principles, consistently applied. On or before July 17 of each year, the Authority will furnish to the Trustee and each Bond Insurer, and to any Holder of any of the Subordinate Bonds, at the written request of such Holder, a copy of its audit report for the preceding Fiscal Year. The Authority shall also file said audit report, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of said audit with EMMA and placement of said audit on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section. Said audit report shall, in each instance, have been prepared by an Independent Auditor after having made an audit of the Authority's books and accounts pertaining to the System for such year and shall include therein for the year in question a statement as to whether the schedule of rates then in effect complies with the covenants incorporated by reference in Section 7.01.

Section 7.14 Advances by Trustee. If the Authority shall fail to perform any of the covenants contained in this Article, the Trustee or any Bondholder through the Trustee may, but has no duty to, make advances to perform the same on behalf of the Authority, but shall be under no duty so to do; and all sums so advanced shall be at once repayable by the Authority and shall bear interest at the Prime Rate until paid, and shall be secured hereby, having the benefit of a lien hereby created on a parity with the Subordinate Bonds, but no such advances shall be deemed to relieve the Authority from any default hereunder.

Section 7.15 Further Assurances. The Authority shall execute and deliver such further instruments and do such further acts as may be necessary or proper to carry out more effectually the purposes of this Subordinate Indenture and the transfer to any new trustee of the estate, powers, instruments or funds held in trust hereunder. The Authority shall, on an ongoing basis, execute and deliver all documents and make or cause to be made all filings and recordings necessary or desirable in order to perfect, preserve and protect the interest of the Trustee in the Trust Estate to the extent possible under applicable law. The Trustee shall not be responsible for and makes no representation as to the legality, effectiveness or sufficiency of any security document or for the creation, perfection, priority or protection of any lien securing the Subordinate Bonds. The Trustee shall not be responsible for filing any financing or continuation statement or recording any documents or instruments in any public office at any time or otherwise for perfecting or maintaining the perfection of any lien or security interest in the trust estate it being understood that the Authority shall be obligated to make such filings on behalf of the Trustee and provide a copy of the filed initial financing statement to the Trustee.

Section 7.16 Construction of Construction Projects; Operation of System. The Authority covenants that upon the completion of any Construction Project it will operate and maintain the same as a part of the System. The Authority further covenants that it will operate the System in an efficient and economical manner.

Section 7.17 Covenant Against Encumbrances. The Authority further covenants that it will duly observe and comply with all valid requirements of any governmental authority relative to the System, that it will not create or suffer to be created any lien or charge upon the System or any part thereof, other than as provided in this Subordinate Indenture, and that it will pay or cause to be discharged, or will make adequate provision to satisfy and discharge all lawful claims and demands for labor, materials, supplies or other objects which, if unpaid, might by law become a lien upon the System or any part thereof or the Revenues; provided, however, that nothing contained in this Section shall require the Authority to pay or cause to be discharged, or make provisions for, any such lien or charge so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings.

Section 7.18 Use of Revenues. The Authority covenants and agrees that, so long as any of the Subordinate Bonds secured hereby shall be Outstanding, none of the Revenues will be used for any purpose other than as provided in this Subordinate Indenture and the Senior Indenture, and that no contract or contracts will be entered into or any action taken to impair or diminish the rights of Holders of the Subordinate Bonds. This provision, however, does not limit the Authority's ability to issue additional bonds under the terms of the Senior Indenture or to issue Secondary Subordinate Debt.

Section 7.19 No Free Service. The Authority will not render or cause to be rendered any free services of any nature by the facilities of the System nor will any preferential rates be established for users of the same class, excluding (a) as provided in the Cooperation Agreement, and (b) the provision to several municipalities of conveyance without charge of storm water and sanitary sewer flows through Authority trunk lines to the Allegheny County Sanitary Authority.

Section 7.20 Failure of Customers to Pay; Enforcement of Collections. The Authority will diligently enforce and collect the rates, fees and other charges from customers for the services of the System; will take all steps, actions and proceedings for the enforcement and collections of such rates, fees and charges as shall become delinquent to the full extent permitted or authorized by law; and will maintain accurate records with respect thereto. All such rates, fees, charges and revenues herein pledged shall, as collected, be held in trust to be applied as provided in this Subordinate Indenture and the Senior Indenture and not otherwise.

Section 7.21 Covenants with Bond Insurers, Letter Credit Banks, Liquidity Facility Issuer, etc. The Authority may make such covenants and agreements in a Supplemental Indenture and related documents as it may determine to be appropriate with any Bond Insurer, Letter of Credit Bank, Liquidity Facility Issuer, or other financial institution that agrees to insure or to provide credit or liquidity support to enhance the security or the value of any Subordinate Bonds.

Section 7.22 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered Owners, from time to time, of the Subordinate Bonds that no part of the proceeds of the Subordinate Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the Subordinate Bonds, would have caused the Subordinate Bonds to be arbitrage bonds within the meaning of Section 148 of the Code, and

that it will comply with the requirements of that section and the regulations throughout the term of the Subordinate Bonds. In the event the Authority is of the opinion that is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in any Tax Regulatory Certificate are incorporated herein.

Section 7.23 Amendments to Senior Indenture. The Authority will not amend the Senior Indenture in any way which will have a material adverse effect on the provisions of this Subordinate Indenture without the consent of the Holders of not less than a majority in principal amount of the Subordinate Bonds and the consent of the Bond Insurer.

ARTICLE VIII

EVENTS OF DEFAULT AND REMEDIES

Section 8.01 Events of Default. Each of the following events is hereby declared an "Event of Default" for any Subordinate Bond issued hereunder:

(a) failure by the Authority to pay the principal of, or the premium (if any) payable upon the redemption of, any Subordinate Bond when due and payable either at maturity, declaration, or by proceedings for redemption, or otherwise (no effect being given to payments made under a Bond Insurance Policy); or

(b) failure by the Authority to pay any installment of interest on any Subordinate Bond when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(c) the entry of an order or decree appointing a receiver or receivers of the System or of the Revenues with the consent or acquiescence of the Authority, or, if such order or decree shall have been entered without the acquiescence or consent of the Authority, the failure of the Authority to cause such order or decree to be vacated or discharged or stayed on appeal within ninety (90) days after entry; or

(d) the institution of any proceeding with the consent or acquiescence of the Authority for the purpose of effecting a composition between the Authority and its creditors, or for the purpose of adjusting the claims of such creditors pursuant to any Federal or Commonwealth statute now or hereafter enacted, if the claims of such creditors are under any circumstances payable out of the Revenues, or if such proceeding shall have been instituted without the consent or acquiescence of the Authority, the failure of the Authority to have such proceeding withdrawn, or any order entered therein vacated or discharged, within ninety (90) days after the institution of such proceeding or the entry of such order; or

(e) the entry of a final judgment against the Authority, which judgment constitutes or could result in a lien or charge upon the System or the Revenues, or which materially and adversely affects the ownership, control or operation of the System, if such judgment shall not be discharged within ninety (90) days from the entry thereof, or if an appeal shall not be taken

therefrom, or from the order, decree or process upon which or pursuant to which such judgment was granted or entered, in such manner as to conclusively set aside the execution or levy under such judgment, order, decree or process, or the enforcement thereof; or

(f) the failure or refusal of the Authority to comply with any provisions of the Act applicable to the Authority, or the rendering of the Authority, for any reason, incapable of fulfilling its obligations hereunder or thereunder; or

(g) the failure of the Authority to observe any other covenant, condition or agreement of the Authority contained in the Subordinate Bonds or in this Subordinate Indenture and the continuation of such failure for a period of sixty (60) days after written notice of such failure from the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then outstanding, provided that, the failure of the Authority to meet the Rate Covenant set forth in Section 7.01 hereof (which incorporates Section 7.01 of the Senior Indenture) shall not constitute an Event of Default hereunder, and provided further that if such failure is not capable of being remedied within sixty (60) days after such notice, no Event of Default shall exist if the Authority commences the actions necessary for the cure of such failure within such sixty (60) day period and diligently pursues such actions thereafter; or

(h) failure by the Authority to pay principal of, or the premium (if any) payable upon the redemption of any Subordinate Debt when due and payable either at maturity, or otherwise or to pay any installment of interest on any Subordinate Debt when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(i) the Trustee shall have received written notice from a Letter of Credit Bank that an Event of Default shall have occurred under the Reimbursement Agreement, with a direction from the Letter of Credit Bank to the Trustee to accelerate the principal and interest on the respective Series of Subordinate Bonds secured by such Letter of Credit Bank's Letter of Credit; or

(j) any acceleration of the payment of principal of any Series of Subordinate Bonds or the payment of Reimbursement Obligations pursuant to Section 8.02 shall have occurred; or

(k) failure by the Authority to pay the principal of any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement; or

(l) failure by the Authority to pay any installment of interest on any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement; or

(m) the occurrence of an Event of Default (as defined under the Senior Indenture) under the Senior Indenture.

The Trustee shall (i) provide immediate notice to each Bond Insurer of the occurrence of an Event of Default under clause (a), (b), (i) or (j) above and (ii) provide notice to

each Bond Insurer of any other Event of Default known to the Trustee within thirty (30) days of the Trustee's knowledge thereof.

Section 8.02 Acceleration of Principal. Upon the occurrence and continuance of any Event of Default described in Section 8.01, the Trustee may, and at the written request of Bondholders of not less than 25% in Principal Amount of the Subordinate Bonds then Outstanding, shall by written notice to the Authority, declare the Subordinate Bonds to be immediately due and payable, whereupon they shall, without further action, become and be immediately due and payable, anything in this Subordinate Indenture or in the Subordinate Bonds to the contrary notwithstanding, and the Trustee shall give notice thereof to the Authority and shall give notice thereof by certified mail to all Holders of Outstanding Subordinate Bonds.

A Bond Insurer or a Letter of Credit Bank securing a Series of Subordinate Bonds, provided the Bond Insurer or Letter of Credit Bank is not in default under its Bond Insurance Policy or Letter of Credit, may exercise all rights of the Bondholders of such Series under this Article VIII, including without limitation giving notice, making a request, giving a direction or giving a waiver under Section 8.01(g), Section 8.02, Section 8.03, Section 8.04 and Section 8.08. That is, the Bond Insurer or Letter of Credit Bank may, in such cases, vote the Subordinate Bonds of the Bondholders of the Series secured by such Bond Insurer or Letter of Credit Bank, as the case may be. If a Series of Subordinate Bonds is both insured by a Bond Insurance Policy and secured by a Letter of Credit, the Bond Insurer shall exercise such rights not the Letter of Credit Bank. In any such cases, the Trustee shall not take direction by the Owners of the Subordinate Bonds of such Series.

In addition, the Trustee shall be entitled to exercise any or all of the remedies granted to a trustee or under a Bond Insurance Policy, a Credit Facility or the Act.

The above provision, however, is subject to the condition that if, after the principal of said Subordinate Bonds shall have been so declared to be due and payable, all arrears of interest, if any, upon the Subordinate Bonds and interest on overdue installments of interest at the rate of interest specified therein, and the principal of all Subordinate Bonds which have matured other than by reason of such declaration, shall have been paid by the Authority, and the Authority shall also have performed all other things in respect to which it may have been in default hereunder, and shall have paid the reasonable charges of the Trustee and its counsel and of the Holders of said Subordinate Bonds, including reasonable attorneys' fees paid or incurred, then, and in every such case, the Holders of not less than a majority in aggregate Principal Amount of the Subordinate Bonds then outstanding, by written notice to the Authority and to the Trustee, may waive such default and its consequences and such waiver shall be binding upon the Trustee and upon all Holders of Subordinate Bonds issued hereunder; but no such waiver shall extend to or affect any subsequent default or impair any rights or remedy consequent thereon.

Upon the occurrence or continuance of an Event of Default, the Trustee may judicially seek specific performance with respect to the Rate Covenant. Notwithstanding any other provision herein,, however, for so long as the Senior Indenture is operative, the Trustee may not exercise rights or remedies hereunder with respect to the Revenues until and unless the

trustee of the Senior Indenture shall have instituted proceedings to exercise its rights pursuant to Article VIII of the Senior Indenture.

Section 8.03 Remedies of Trustee and Bondholders; Rights of Entry. Subject to Sections 8.02 and 9.06, upon the happening and during the continuance of any Event of Default specified in Section 8.01, then and in every such case, the Trustee may and, upon written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then Outstanding, shall enter into and upon and take possession of the System and each and every part thereof as for a condition broken and may exclude the Authority, its agents and employees and all persons claiming under them wholly therefrom and have, hold, use, operate, manage and control the same and each and every part thereof, and in the name of the Authority or otherwise as the Trustee shall deem best, conduct the business thereof and exercise all the rights and powers of the Authority with respect to the System and use all its then existing property, assets and franchises for that purpose and out of the Revenues, maintain, restore, insure and keep insured, the System against such hazards as are ordinarily insured against by a person operating a water, stormwater and sewer system similar to the System and from time to time may make all such necessary or proper repairs as to it may seem expedient, and establish, levy, maintain and collect such rates, rents and charges in connection with the System as it may deem necessary, proper, desirable and reasonable, and collect and receive all Revenues, and after deducting therefrom the expenses of operation, maintenance and repair and all expenses incurred hereunder and all other proper outlays herein authorized and all such payments which may be made for insurance and other proper charges, including just and reasonable compensation for its own services, and for the services of such attorneys, agents and employees as it may, in the exercise of its discretion, employ for any of the purposes aforesaid, the Trustee shall apply the rest and residue of the moneys received by it, as well as all cash and investments held by the Trustee in any fund hereunder, subject to the provisions hereof with respect to claims for principal and interest, to the payment of the principal of and interest on the Subordinate Bonds. Whenever all that is due upon such Subordinate Bonds and installments of interest and under any of the terms of this Subordinate Indenture shall have been paid or deposited with the Trustee and all defaults made good, the Trustee in possession shall surrender possession to the Authority, its successors or assigns. However, the same right of entry shall exist upon any subsequent default or defaults.

Section 8.04 Judicial Action. In case of the breach of any of the covenants or conditions of this Subordinate Indenture, the Trustee shall have the right and power to take appropriate judicial proceedings for the enforcement of its rights and the rights of the Bondholders hereunder, including, as appropriate, an action in mandamus. Upon the happening of an event of default hereunder, the Trustee may either after entry, or without entry, proceed by suit or suits, actions or special proceedings at law or in equity to enforce its rights and the rights of the Bondholders hereunder, and it shall be obligatory upon the Trustee to take action to that end, either by such proceedings or by the exercise of its powers with respect to entry or otherwise, as it may determine, upon being requested to do so by the Holders of twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then Outstanding hereunder and upon being indemnified as hereinafter provided.

No remedy by the terms of this Subordinate Indenture conferred upon or reserved to the Trustee or to the Bondholders is intended to be exclusive of any other remedy, but each

and every such remedy shall be cumulative and shall be in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or by statute.

The Holders of a majority in aggregate Principal Amount of the Subordinate Bonds then Outstanding hereunder, at any time, by an instrument in writing executed and delivered to the Trustee, may reasonably direct the method and place of conducting all proceedings to be taken for the enforcement of any of the rights of the Bondholders; provided that such direction shall not be otherwise than in accordance with the provisions of law or of this Subordinate Indenture.

Section 8.05 Payments by Authority. The Authority covenants that if any default shall be made in the payment of the principal of or interest on any Subordinate Bond hereby secured when the same shall become payable, the Authority will pay to the Trustee, upon demand, for the benefit of the Holders of the Subordinate Bonds so in default, the whole amount then due and payable for principal and interest, with interest upon the overdue principal and upon the overdue installments of interest at the rate of interest specified in the Subordinate Bonds from the date of default to the date of payment; and in case the Authority shall fail to pay the same forthwith upon such demand, the Trustee in its own name and as trustee of an express trust shall be entitled to sue for and to recover judgment for the whole amount so due and unpaid.

Section 8.06 Application of Moneys. Any moneys received by the Trustee or by any receiver from the operation of the System, shall, after payment of the costs and expenses of the operation thereof, be applied,

First: to the payment of the fees, counsel fees and expenses of the Trustee and of the receivers, if any, and all costs and disbursements allowed by the court, if there be any court action.

Second: to the payment of principal of and interest on the Senior Debt, and then to the payment of any Policy Costs related to the Debt Service Reserve Fund Policies for Senior Bonds or other amounts owed to an Insurer of Senior Debt.

Third: supplemental to the instructions in Section 8.06-Third of the Senior Indenture, to the payment of the whole amount of principal and interest which shall then be owing or unpaid upon the Subordinate Bonds, or to the payment of the whole amount of any Reimbursement Obligations which shall then be owing or unpaid, then to the payment of such principal and interest or Reimbursement Obligations ratably, without preference or priority of principal over interest or Reimbursement Obligations, Reimbursement Obligations over principal or interest or of interest over principal or Reimbursement Obligations or of any installment of interest over any other installment of interest and without preference or priority of any such payments over Periodic Payments (such principal and interest on Subordinate Bonds, amounts owing under Reimbursement Obligations and Periodic Payments to be paid ratably), then to the payment of Policy Costs related to the Debt Service Reserve Fund Policies for the Subordinate Bonds and any other amounts owed to an Insurer of Subordinate Bonds.

Fourth: to pay the principal of and interest on the Secondary Subordinate Debt.

Fifth: to the payment of the surplus, if any, to the Authority, or to whoever is lawfully entitled to receive the same or as a court of competent jurisdiction may direct.

Section 8.07 Trustee's Rights. Any right of action under this Subordinate Indenture, or under any of the Subordinate Bonds, may be enforced by the Trustee without the possession of any of the Subordinate Bonds or the production thereof on any trial or other proceedings relative thereto and any such suit or proceeding instituted by the Trustee shall be brought in its name as Trustee and any recovery of judgment shall be for the equal benefit of the registered Owners of the Subordinate Bonds in respect of which such judgment shall have been recovered, subject to the provisions hereof with respect to extended claims for interest.

Section 8.08 Limitations on Bondholders. No Holder of any Subordinate Bonds shall have any right to institute any suit, action, or proceeding in equity or at law for the enforcement of this Subordinate Indenture or for the execution of any trust hereof or for the appointment of a receiver or to exercise any other remedy hereunder, unless such Holder shall have previously given to the Trustee written notice of an event of default and of the continuance thereof as hereinbefore provided nor unless also the Holders of at least twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then Outstanding hereunder shall have made written request of the Trustee and shall have offered it reasonable opportunity either to proceed to exercise the powers hereinbefore granted or to institute such action, suit or proceeding in its own name nor unless also they shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liability to be incurred therein or thereby; and such notification, request and offer of indemnity are hereby declared in every such case at the option of the Trustee to be conditions precedent to the execution of the powers and trusts of this Subordinate Indenture or for the appointment of a receiver or for any other remedy hereunder; it being understood and intended that no one or more holders or registered Owners of the Subordinate Bonds shall have any right in any manner whatsoever to affect, disturb or prejudice the lien of this Subordinate Indenture by his own or their action or to enforce any right hereunder except in the manner herein provided, and that all such proceedings at law or in equity shall be instituted, had and maintained in the manner herein provided and for the benefit of all Holders of outstanding Subordinate Bonds, subject to the provisions hereof with respect to claims for interest.

Nothing in this Article shall, however, affect or impair the right of any Bondholder which is absolute and unconditional, to enforce the payment of the principal and interest of such Bondholder's Subordinate Bonds, or the obligation of the Authority which is also absolute and unconditional, to pay the principal of and interest on each of the Subordinate Bonds issued hereunder to the respective holders or registered Owners thereof at the time and place in said Subordinate Bonds expressed.

Section 8.09 Waiver by Authority. The Authority may waive any period of grace provided for in this Article.

Section 8.10 Waiver of Default; Delay or Omission of Trustee. No waiver of any default hereunder, whether by the Trustee, a Bond Insurer or the Bondholders shall extend to or shall affect any subsequent default or shall impair any rights or remedies consequent thereon. No delay or omission of the Trustee, a Bond Insurer or of any Holders of Subordinate Bonds

hereby secured to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default, or acquiescence therein; and every right, power and remedy given by this Subordinate Indenture to the Trustee, a Bond Insurer or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee, the Bond Insurer or in an appropriate case, by the Bondholders.

In case the Trustee shall have proceeded to enforce any right under this Subordinate Indenture by entry or otherwise, and such proceedings shall have been discontinued or abandoned for any reason, or shall have been determined adversely to the Trustee, then and in every such case the Authority and the Trustee shall be restored to their former positions and rights hereunder with respect to the pledged revenues, and all rights, remedies and powers of the Trustee shall continue as if no such proceedings had been taken.

Section 8.11 Appointment of Receiver. Subject to Section 8.02, as provided by the Act, as amended, the Trustee shall be entitled as a matter of right to the appointment of a receiver, and the Trustee, the Bondholders, the Bond Insurer of any Subordinate Bonds, any receiver so appointed and any Letter of Credit Bank then supporting any Series of Bonds with a Letter of Credit shall have all such rights and powers and shall be subject to such limitations and restrictions as are contained in the Act.

Section 8.12 Limitation on Rights to Transfer. It is expressly understood and agreed that nothing in the provisions of the Subordinate Bonds or in this Subordinate Indenture shall be taken to authorize the Trustee, or any receiver appointed hereunder to operate and maintain the System, or to sell, assign, mortgage or otherwise dispose of any of the assets of whatever kind and character belonging to the Authority.

Section 8.13 Issuer of Bond Insurance Policy as Subrogee of Holders of Subordinate Bonds. Any Subordinate Bond delivered to the Bond Insurer pursuant to the Bond Insurance Policy shall be deemed to continue to be Outstanding under and secured by this Subordinate Indenture.

ARTICLE IX

CONCERNING THE TRUSTEE

Section 9.01 Acceptance of Trust. The Trustee shall, prior to an Event of Default, and after the curing of all Events of Default which shall have occurred, perform such duties and only such duties as are specifically set forth in this Subordinate Indenture and shall not be liable except for the performance of such duties and obligations as are specifically set forth in this Subordinate Indenture, and no implied covenants or obligations shall be read into this Subordinate Indenture against the Trustee, as the case may be. The Trustee shall, during the existence of any Event of Default (which has not been cured), exercise such of the rights and powers vested in it by this Subordinate Indenture, and use the same degree of care and skill in their exercise, as prudent persons would exercise or use under the circumstances in the conduct of their own affairs. The Trustee shall not be liable to the parties hereto or deemed in breach or default hereunder if and to the extent its performance hereunder is prevented by reason of force majeure. The term “force majeure” means an occurrence that is beyond the control of the

Trustee and could not have been avoided by exercising due care. Force majeure shall include acts of God, terrorism, war, riots, strikes, floods, earthquakes, epidemics or other similar occurrences.

Section 9.02 Responsibility for Statements in Subordinate Indenture or Subordinate Bonds. The recitals of fact herein and in the Subordinate Bonds contained, except only the Trustee's certificate of authentication upon the Subordinate Bonds, shall be taken as the statements of the Authority and the Trustee assumes no responsibility for the correctness of the same. The Trustee makes no representations as to the validity or sufficiency of this Subordinate Indenture or the due execution or acknowledgment thereof on the part of the Authority or in respect of the Subordinate Bonds issued hereunder, and the Trustee shall incur no responsibility in respect of such matter.

Section 9.03 Maintenance of Insurance. The Trustee shall be under no obligation to effect or maintain insurance or to renew any policies of insurance or to inquire as to the adequacy of any insurance or for responsibility of insurers, or to report, make or file claims or proofs of loss for any loss or damage insured against or which may occur or to keep itself advised or informed as to the payment of any insurance premiums, taxes or assessments or to see to or require such payment to be made nor shall the Trustee be under any liability for the failure of the Authority to effect or renew any insurance; but the Trustee may, in its discretion, do any or all of the matters and things in this Section set forth, or require the same to be done.

Section 9.04 Disposition of Subordinate Bonds and Proceeds. The Trustee shall be under no responsibility or duty with respect to the disposition of the Subordinate Bonds authenticated and delivered hereunder or the application of the proceeds of any of the Subordinate Bonds or of any other moneys deposited with it and withdrawn in the manner provided in this Subordinate Indenture.

Section 9.05 Agents of Trustee; Responsibility for Default of Agents. The Trustee may execute any of the trusts or powers hereof and perform any duty hereunder by or through its attorneys or agents, and it shall not be answerable or accountable for any act, default, neglect or misconduct of any such attorney or agent, if reasonable care has been exercised in his appointment and retention, nor shall the Trustee be otherwise answerable or accountable under any circumstances whatever in connection with the Trust, except for its own gross negligence or willful misconduct.

Section 9.06 Indemnity; No Duty to Notice Default. The Trustee shall be under no obligation or duty to perform any act which would involve it in expense or liability or to institute or defend any suit in respect hereof unless properly indemnified against such expense or liability to its satisfaction. The Trustee shall not be required to take notice, or be deemed to have knowledge, of any default of the Authority hereunder, except a default pursuant to Section 8.01(a) or (b), and may conclusively assume that there has been no such default unless and until it shall have been specifically notified in writing of such default by the Authority or the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then Outstanding hereunder. The Trustee shall provide each Bond Insurer with immediate notice of a default pursuant to Section 8.01(a) or (b) and, within thirty (30) days of the Trustee's knowledge thereof, any other default known to the Trustee. The Trustee shall

not be under any obligation to take any action in respect of any default or otherwise, or to institute, appear in or defend any suit or other proceeding in connection therewith or to ascertain or inquire as to the performance of any of the covenants or agreements herein contained on the part of the Authority, unless requested in writing so to do by the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Subordinate Bonds then Outstanding hereunder and indemnified to its satisfaction but this provision shall not affect any discretionary power herein given to the Trustee. The Trustee shall, however, take actions pursuant to Section 13.02 hereof, as required therein.

The foregoing provisions are intended only for the protection of the Trustee, and shall not affect any discretion or power given by any provision of this Subordinate Indenture to the Trustee to take action in respect to any default without such notice or request from the Bondholders or without such security or indemnity. The Trustee may, at any time in its discretion, require of the Authority full information and advice as to the performance of any of the covenants, conditions and agreements, and may further make or cause to be made independent investigations at the expense of the Authority, concerning the affairs of the Authority insofar as such affairs are related to the System.

Section 9.07 Right to Rely Upon Documents. The Trustee shall be protected and shall incur no liability in relying, acting or proceeding in good faith upon any notice, resolution, request, consent, order, certificate, report, opinion, bond, telephonic notice, facsimile transmission, waiver, statement, affidavit, voucher, appraisal, application or other paper or document believed by it to be genuine and to have been signed, passed or presented by the proper person or authority, or to have been prepared and furnished pursuant to the provisions of this Subordinate Indenture, and before acting upon any of the same the Trustee shall not be bound to make any investigation into the matters stated therein.

The Trustee may consult with legal counsel to be selected and employed by it and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it hereunder in good faith and in accordance with the opinion of such counsel.

The Trustee shall not be bound to recognize any person as the Holder of a Subordinate Bond Outstanding hereunder unless and until his Subordinate Bond is submitted to the Trustee for inspection, if required, and his title thereto satisfactorily established, if disputed.

Whenever in the administration of the trusts imposed upon it by this Subordinate Indenture the Trustee shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action hereunder, such matter (unless other evidence in respect thereof be herein specifically prescribed) may be deemed to be conclusively proved and established by a certificate of the Authority, and such certificate shall be full warrant to the Trustee for any action taken or suffered in good faith under the provisions of this Subordinate Indenture in reliance upon such Certificate, but in its discretion the Trustee may, in lieu thereof, accept other evidence of such matter or may require such additional evidence as it may deem reasonable.

Any action taken, or omitted to be taken, by the Trustee in good faith pursuant to this Subordinate Indenture upon the request or authority or consent of any person who, at the time of making such request or giving such authority or consent, is a Bondholder, shall be conclusive and binding upon all future Bondholders and upon Subordinate Bonds executed and delivered in exchange therefore or in place thereof. The permissive right of the Trustee to do things enumerated in this Subordinate Indenture shall not be construed as a duty.

The Trustee shall have no responsibility, opinion or liability with respect to any information statement or recital found in any official statement or other disclosure material, prepared or distributed with respect to the issuance of the Subordinate Bonds, except for information provided by the Trustee.

Section 9.08 Trustee Compensation; Indemnification of Trustee. The Authority shall, out of the Revenues, pay to the Trustee, from time to time, reasonable compensation for all services rendered hereunder, and shall also reimburse the Trustee for all of its reasonable expenses, charges and other disbursements and those of its attorneys, agents and employees, incurred in and about the administration and execution of the trusts hereby created, and the performance of its powers and duties hereunder, and the Trustee shall have a lien on the Revenues therefor, prior and superior to the lien of the Subordinate Bonds issued hereunder. The Authority further covenants and agrees to protect, exonerate, defend, indemnify and save the Trustee and its officers, directors, employees and agents (collectively, the "Indemnitees") harmless from and against any and all liabilities, losses, damages, fines, suits, actions, demands, penalties, costs and expenses, including out-of-pocket, incidental expenses, legal fees and expenses, the allocated costs and expenses of in-house counsel and legal staff and the costs and expenses of defending or preparing to defend against any claim ("Losses") that may be imposed on, incurred by, or assessed against, the Indemnitees or any of them for following any instruction or other direction upon which the Trustee is authorized to rely pursuant to the terms of this Subordinate Indenture. In addition to and not in limitation of the immediately preceding sentence, the Authority also covenants and agrees to indemnify and hold the Indemnitees and each of them harmless from and against any and all Losses that may be imposed on, incurred by, or asserted against the Indemnitees or any of them in connection with or arising out of the Trustee's performance, as applicable, under this Subordinate Indenture provided that such party has not acted with negligence or engaged in willful misconduct. The provisions of this Section shall survive the termination of this Subordinate Indenture and the resignation or removal of the Trustee.

Section 9.09 Trustee's Right to Make Advances. If the Authority shall fail to perform any of the covenants or agreements contained in this Subordinate Indenture, the Trustee may, in its discretion and without notice to the Bondholders, at any time and from time to time, make advances to effect performance of the same on behalf of the Authority, but the Trustee shall be under no obligation so to do; and any and all moneys paid or advanced by the Trustee for any such purpose, together with interest thereon at the rate equal to 102% of the Prime Rate in effect at the time of such advance, shall be a lien in favor of the Trustee upon the Revenues prior and superior to the lien of the Subordinate Bonds issued hereunder; but no such advance shall operate to relieve the Authority from any default hereunder. Nothing herein shall be construed to require the Trustee to expend its own funds.

Section 9.10 Right to Own and Deal in Subordinate Bonds. The Trustee may become the Owner of Subordinate Bonds issued hereunder and secured hereby, with the same rights it would have if it were not Trustee. The Trustee may also engage in, or be interested in any financial or other transaction with the Authority and may act as depositary for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or to effect or aid any reorganization growing out of the enforcement of the Subordinate Bonds or this Subordinate Indenture, whether or not any such committee shall represent the Holders of a majority in Principal Amount of the Bonds Outstanding hereunder.

Section 9.11 Construction of Provisions of Indenture. The Trustee may construe any of the provisions of this Subordinate Indenture insofar as the same may appear to be ambiguous or inconsistent with any other provisions hereof; and any construction of any such provisions hereof by the Trustee in good faith shall be binding upon the Bondholders.

Section 9.12 Resignation or Replacement of Trustee. The Trustee may resign on its motion or may be removed at any time by an instrument or instruments in writing signed by (1) the Authority, provided no Event of Default has occurred and is continuing or (2) the Holders of not less than fifty percent (50%) of the Principal Amount of Subordinate Bonds then Outstanding, if an Event of Default has occurred and is continuing. No such resignation or removal shall become effective unless and until a successor Trustee (or temporary successor trustee as provided below) has been appointed and has assumed the trusts created hereby. Written notice of such resignation or removal shall be given to each Holder of a Subordinate Bond then Outstanding to the address then reflected on the books of the Trustee and such resignation or removal shall take effect upon the appointment, qualification and acceptance of a successor Trustee. A successor Trustee may be appointed at the direction of the Authority, or if the Authority shall fail to appoint a successor Trustee, a successor Trustee may be appointed at the direction of the Holders of not less than fifty percent (50%) in aggregate Principal Amount of Subordinate Bonds Outstanding. In the event a successor Trustee has not been appointed and qualified within sixty (60) days of the date notice of resignation or removal is given, the Trustee or any Bondholders may apply to any court of competent jurisdiction for the appointment of a temporary successor Trustee to act until such time as a successor is appointed as above provided. No resignation or removal of the Trustee shall be effective until a successor has been appointed and has accepted the duties of the Trustee hereunder.

Every successor shall always be a bank or trust company in good standing, qualified to act hereunder, and having a combined capital, surplus and undivided profits of not less than Fifty Million Dollars (\$50,000,000). Any successor appointed hereunder shall execute, acknowledge and deliver to the Authority an instrument accepting such appointment hereunder, and thereupon such successor shall, without any further act, deed or conveyance, become vested with all the estates, properties, rights, powers and trusts of its predecessor in the trust hereunder with like effect as if originally named as Trustee herein; but the Trustee retiring shall, nevertheless, on the written demand of its successor, execute and deliver an instrument conveying and transferring to such successor, upon the trusts herein expressed, all the estates, properties, rights, powers and trusts of the predecessor, who shall duly assign, transfer and deliver to the successor all properties and moneys held by it under this Subordinate Indenture. Should any instrument in writing from the Authority be required by any successor for more fully

and certainly vesting in and confirming to it all of such estates, properties, rights, powers and trusts, the Authority shall, on request of such successor, make, execute, acknowledge and deliver the deeds, conveyances and necessary instruments in writing.

The notices herein provided for shall be given by mailing a copy thereof to the registered Owners at their addresses as the same shall last appear on the Bond register. A copy shall be provided to each Bond Insurer.

The instruments evidencing the resignation or removal of the Trustee and the appointment of a successor hereunder together with all instruments provided for in this Section shall be filed and/or recorded by the successor Trustee in each recording office, if any, where this Subordinate Indenture shall have been filed and/or recorded.

Section 9.13 Successor Trustee by Merger. Any bank or trust company having power to execute the trusts of this Subordinate Indenture and otherwise qualified to act as Trustee hereunder, with or into which the Trustee may be merged or consolidated or any such bank or trust company resulting from any merger or consolidation to which the Trustee shall be a party, shall be the successor trustee under this Subordinate Indenture, without the execution or filing of any paper or the performance of any further act on the part of any other parties hereto, anything herein to the contrary notwithstanding.

Section 9.14 Appointment of Paying Agent. The Authority may appoint a successor Paying Agent or a co-paying agent at any time upon written notice to each Bond Insurer and the Trustee.

Section 9.15 Trustee to Notify S&P and Moody's. The Trustee hereby agrees to notify S&P and Moody's of (i) any change of the Trustee, (ii) any change in the Bond Insurance Policy, and (iii) any mandatory redemption of Subordinate Bonds other than mandatory sinking fund redemption. Notices shall be sent to Moody's Investors Service at 7 World Trade Center, 250 Greenwich Street, New York, New York 10007, Attention: Municipal Department/Structured Finance Group. Notices shall be sent to Standard & Poor's Corporation at 55 Water Street, New York, New York 10041.

ARTICLE X

CONCERNING THE HOLDERS OF THE SUBORDINATE BONDS

Section 10.01 Execution of Instruments. Whenever in this Supplemental Indenture it is provided that the Holders of a specified percentage or a majority of the Subordinate Bonds Outstanding hereunder may take any action (including the making of any demand or request, the giving of any notice, consent or waiver or the taking of any other action) the fact that at the time of taking any such action the Holders of such specified percentage or majority have joined therein may be evidenced by any instrument or any number of instruments of similar tenor executed by Bondholders in person or by agent or proxy appointed in writing.

Section 10.02 Proof of Ownership. Subject to the provisions of Article IX, proof of the execution of any instrument by a Bondholder or his agent or proxy and proof of the

holding by any persons of any of the Subordinate Bonds shall be sufficient if made in the following manner:

(1) The fact and date of the execution by any such persons of any instrument may be proved by the certificate of any notary public or other officer authorized to take acknowledgments of deeds to be recorded in any State within the United States, that the person executing such instrument acknowledged to him the execution thereof, or by an affidavit of a witness to such execution sworn to before any such notary or other such officer; and

(2) The ownership of Subordinate Bonds may be proved by the registration books for such Subordinate Bonds maintained by the Authority at the Principal Office of the Trustee.

The Trustee and any Paying Agent may require such additional proof of any matter referred to in this Section as it shall deem necessary or may accept such other proof as it may deem appropriate.

ARTICLE XI

AMENDMENTS AND MODIFICATIONS

Section 11.01 Waivers and Supplemental Indentures Not Requiring Consent of Bondholders. In addition to any Supplemental Indenture otherwise authorized by this Subordinate Indenture, the Authority, and the Trustee may, from time to time and at any time, enter into such indentures or agreements supplemental hereto as shall not be inconsistent with the terms and provisions hereof and which shall not adversely affect the rights of the Holders of the Subordinate Bonds Outstanding hereunder (which supplemental indentures or agreements shall thereafter form a part thereof) for the following purposes:

(a) to cure any ambiguity, formal defect or omission in this Subordinate Indenture or any Supplemental Indenture; or

(b) to grant or confer upon the Trustee for the benefit of the Bondholders any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Bondholders, or the Trustee; or

(c) to add to the covenants and agreements of the Authority in this Subordinate Indenture contained, other covenants and agreements thereafter to be observed, or to surrender any right or power herein reserved to or conferred upon the Authority; or

(d) to modify any of the provisions of this Subordinate Indenture or to relieve the Authority of any of the obligations, conditions or restrictions contained in this Subordinate Indenture, provided that such modification or relief shall not, by the express terms of the particular Supplemental Indenture, become effective until all Subordinate Bonds Outstanding on the date of the execution and delivery of such Supplemental Indenture shall no longer be Outstanding; or

(e) to make such provision in regard to matters or questions arising under this Subordinate Indenture as may be necessary or desirable and not inconsistent with this Subordinate Indenture; or

(f) to close this Subordinate Indenture against, or to restrict, in addition to the limitations and restrictions herein contained, the issue of Additional Bonds hereunder, by imposing additional conditions and restrictions to be thereafter observed, whether applicable in respect to all Subordinate Bonds issued and to be issued hereunder or in respect of one or more Series of Subordinate Bonds, or otherwise; or

(g) to modify, amend or supplement this Subordinate Indenture in such manner as required to permit the Authority to comply with the provisions of the Code relating to the rebate to the United States of America of earnings derived from the investment of the proceeds of Subordinate Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Subordinate Bonds; or

(h) to modify, amend or supplement this Subordinate Indenture in such manner as may be required by a Rating Agency to maintain or enhance its rating on the Subordinate Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Subordinate Bonds; or

(i) to modify, amend or supplement this Subordinate Indenture to implement any covenants or agreements contemplated by Section 7.21; or

(j) to authorize the issuance of, to describe the terms of, and to secure one or more Series of Additional Bonds pursuant to Article III; or

(k) to amend any agreement with a securities depository relating to a book-entry system to be maintained with respect to any Subordinate Bonds; or

(l) to modify, amend or supplement this Subordinate Indenture in any manner that the Trustee concludes is not materially adverse to the Holders of all Outstanding Subordinate Bonds; or

(m) to modify, amend or supplement the exhibits to this Subordinate Indenture containing Bond Insurer provisions, provided the Authority and the Bond Insurers consent to such modifications, amendments or supplements.

Section 11.02 Supplemental Indentures Requiring Consent of Bondholders. With the consent, evidenced as provided in Section 10.01, of the Holders of not less than the Approval Amount or, in the case one or more but less than all of the Series of the Subordinate Bonds then Outstanding are affected, then, in addition, with the consent of the Holders of the Approval Amount of each Series so affected, and with the consent of any guarantor of principal and interest of any Series of Subordinate Bonds issued under a Supplemental Indenture, the Authority and the Trustee may from time to time and at any time enter into an Indenture or Indentures Supplemental hereto for the purpose of eliminating any of the provisions of this Subordinate Indenture or of any Supplemental Indenture or of modifying in any manner the

rights of the Holders of the Subordinate Bonds so affected; provided, however, that no such supplemental Indenture shall (i) extend the fixed maturity date of any Subordinate Bond, or reduce the Principal Amount thereof, or reduce the rate or extend the time of payment of interest thereon, or reduce any premium payable upon the redemption thereof, without the consent of the Holder of each Subordinate Bond so affected, or (ii) permit the creation by the Authority of any lien prior to the lien of this Subordinate Indenture (except as provided in the Senior Indenture) upon any part of the Revenues, or reduce the Approval Amount, without the consent of the Holders of all Subordinate Bonds then Outstanding. It shall not be necessary for the consent of the Bondholders under this Section to approve the particular form of any proposed Supplemental Indenture, but it shall be sufficient if such consent shall approve the substance thereof. Nothing herein contained, however, shall be construed as making necessary the approval by the Bondholders of the execution of any Supplemental Indenture or agreement as authorized in Section 11.01.

Section 11.03 Authorization to Trustee; Opinion of Counsel. The Trustee shall join with the Authority in the execution of any Supplemental Indenture which the Authority is authorized to execute under the provisions of Section 11.01 or Section 11.02 upon the delivery by the Authority to the Trustee of the following:

(a) (i) A certified copy of a Resolution of the Board authorizing such Supplemental Indenture and requesting the execution thereof by the Trustee and (ii) evidence of consent to such amendment by any party whose consent is required hereunder;

(b) An opinion of counsel (i) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.01 and that all other conditions precedent have been satisfied, or (ii) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, that the consent of the Bondholders required has been secured and is evidenced by specified documents meeting the requirements of Section 10.01, and that all other conditions precedent have been satisfied; and

(c) If the opinion of counsel shall state that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, the documents evidencing the consent of the Bondholders as specified in said opinion;

provided, however, that the Trustee shall not be obligated to join in any such Supplemental Indenture which, in its opinion, adversely affects its own duties, rights or immunities under this Subordinate Indenture.

Section 11.04 Effectiveness of Amendments, Modifications. Upon the execution of any Supplemental Indenture pursuant to the provisions of this Article, this Subordinate Indenture shall be and be deemed to be modified and amended in accordance therewith and the respective rights, limitations of rights, obligations, duties and immunities under this Subordinate Indenture of the Trustee, the Authority and the Holders of Subordinate Bonds shall thereafter be determined, exercised and enforced hereunder subject in all respect to such modifications and amendments, and all the terms and conditions of any such Supplemental Indenture shall be and be deemed to be part of the terms and conditions of this Subordinate Indenture for any and all

purposes. The Authority shall provide each Bond Insurer with a full transcript of all proceedings relating to the execution of any supplement or amendment to this Subordinate Indenture. The Authority shall provide Moody's and S&P with a notice of each amendment to this Subordinate Indenture and a copy thereof at least fifteen (15) days in advance of its execution.

ARTICLE XII

DISCHARGE OF INDENTURE

Section 12.01 Release of Indenture. If the Authority, its successors or assigns, shall pay or cause to be paid unto the Holders of all Subordinate Bonds Outstanding hereunder the principal and interest to become due thereon and the premium thereon, if any, at the times and in the manner stipulated therein, then this Subordinate Indenture and the estate and rights hereby granted shall cease, determine and be void, and thereupon the Trustee shall, upon the request of the Authority, deliver to the Authority such instruments as shall be requisite to satisfy the lien hereof, and reconvey to the Authority the estate and title hereby conveyed, and assign and deliver to the Authority any property at the time subject to the lien of this Subordinate Indenture which may then be in the possession of the Trustee; but the Trustee shall take any such action only upon the receipt of an officer's certificate and an opinion of counsel, each stating in substance that in the opinion of the respective signers all conditions precedent provided for in this Subordinate Indenture relating to such release, cancellation and discharge have been complied with. In addition, this Subordinate Indenture shall not be discharged until all Policy Costs owing to any Bond Insurer shall have been paid in full.

Subordinate Bonds for the payment or redemption of which there shall have been deposited with the Trustee cash or Defeasance Obligations (which shall mean direct non-callable obligations of the United States of America and securities fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America, to which the direct obligation or guarantee of the full faith and credit of the United States of America has been pledged, Refcorp interest strips, CATS, TIGRS, STRPS, or defeased municipal bonds rated "AAA" by S&P or "Aaa" by Moody's, any combination thereof or any other security approved by the applicable Bond Insurer), the principal of and interest on which when due, will, without reinvestment of principal or interest, provide sufficient moneys to pay the Subordinate Bonds in full at maturity or the date fixed for redemption, shall be deemed to be paid within the meaning of this Article. In the event of an advance refunding, the Authority shall cause to be delivered a verification report of a Qualified Independent Consultant experienced in delivering verification reports. For purposes of determining whether any Outstanding Variable Rate Indebtedness is deemed paid and discharged pursuant to this Article XII, such Variable Rate Indebtedness shall be deemed to bear interest at the maximum rate of interest such Variable Rate Indebtedness may bear pursuant to the applicable Supplemental Indenture.

The release, cancellation and discharge of this Subordinate Indenture, however, shall be without prejudice to the right of the Trustee to be paid any compensation then due to it hereunder and to be protected and saved harmless by the Authority from any and all losses, liabilities, costs and expenses, including counsel fees, at any time incurred by the Trustee hereunder or connected with any Subordinate Bond issued hereunder, of and from which, if this Subordinate Indenture had not been released, cancelled and discharged, the Authority would

have been obligated by the terms of this Subordinate Indenture to protect and save the Trustee harmless, and the Authority hereby covenants to protect and save the Trustee harmless of and from such losses, liabilities, costs and expenses.

If any Subordinate Bond shall not be presented for payment when the principal thereof shall become due, either at maturity or otherwise, or at the date fixed for the redemption thereof, and if the Authority shall have deposited with the Trustee, for the purpose, or left with it in trust if previously so deposited, funds sufficient to pay the principal of such Subordinate Bond (and the premium, if any payable upon the redemption thereof), together with all interest due thereon, to the date of maturity thereof or to the date fixed for redemption thereof, for the benefit of the Holder or Holders thereof, respectively, all liability of the Authority to the Holder of such Subordinate Bond for the payment of the principal thereof, the interest thereon, and the premium, if any, shall forthwith cease, determine and be completely discharged, and thereupon it shall be the duty of the Trustee, to hold said fund or funds, without liability for interest thereon, for the benefit of the Holder of such Subordinate Bond who shall thereafter be restricted exclusively to said fund or funds for any claim of whatsoever nature on his part under this Subordinate Indenture or on, or with respect to, said Subordinate Bond.

Any moneys deposited with the Trustee, by the Authority, pursuant to the terms of this Subordinate Indenture, for the payment or redemption of Subordinate Bonds which remain unclaimed by the Holders of the Subordinate Bonds for five (5) years after the date of maturity or the date fixed for redemption, as the case may be, shall upon the written request of the Authority if the Authority is not at that time, to the knowledge of the Trustee, in default hereunder be paid to the Authority. Thereafter, such Holders of the Subordinate Bonds shall thereafter look only to the Authority for payment and then only to the extent of the amounts so received without interest thereon.

ARTICLE XIII

MISCELLANEOUS

Section 13.01 Limitation of Rights, Remedy or Claim. With the exception of rights herein expressly conferred, nothing in this Subordinate Indenture, expressed or implied, is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the parties hereto and the Holders of the Subordinate Bonds outstanding hereunder, any rights, remedy or claim under or by reason of this Subordinate Indenture or any covenant, condition or stipulation hereof; and all the covenants, stipulations, promises and agreements in this Subordinate Indenture contained by and on behalf of the Authority shall be for the sole and exclusive benefit of the parties hereto, and of the Holders of the Subordinate Bonds Outstanding hereunder.

Section 13.02 Notices to Rating Agencies. The Authority shall instruct the Trustee to give notice to the Rating Agencies upon an occurrence of any of the following that relates to the Subordinate Bonds:

- (i) expiration of any credit enhancement;

- (ii) termination of any credit enhancement;
- (iii) extension of any credit enhancement;
- (iv) substitution of any credit enhancement;
- (v) redemption;
- (vi) acceleration;
- (vii) conversion;
- (viii) changes in bond documents;
- (ix) changes in any Credit Facility;
- (x) changes in Trustee and/or any remarketing agent; or
- (xi) defeasance.

Section 13.03 Invalidity of Provisions. If any one or more of the covenants or agreements provided in this Subordinate Indenture on the part of the Authority or the Trustee to be performed should be finally determined by a court of competent jurisdiction to be contrary to law, then such covenant or covenants or agreement or agreements shall be null and void and shall be deemed separable from the remaining covenants and agreements, and shall in no way affect the validity of this Subordinate Indenture.

Section 13.04 Governing Law. This Supplemental Indenture shall be deemed to be and shall be construed as a Pennsylvania contract and wherever enforced shall be construed in accordance with the laws of the Commonwealth.

Section 13.05 Limitation of Liability. No covenant, agreement or obligation contained in the Subordinate Bonds or in this Subordinate Indenture shall be deemed to be the covenant, agreement or obligation of any member, agent or employee of the Authority in his individual capacity and neither the members of the Board of the Authority nor any official executing the Subordinate Bonds shall be liable personally on the Subordinate Bonds or be subject to any personal liability or accountability by reason of the issuance thereof.

Section 13.06 Execution in Counterparts. This Subordinate Indenture may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original; but such counterparts shall constitute but one and the same instrument.

Section 13.07 Payment on Saturday, Sunday or Legal Holiday. If any case where the date of maturity of interest on or principal of any Subordinate Bond or the date fixed for redemption or tender of any Subordinate Bond shall be a Saturday, Sunday or a legal holiday or a day on which banking institutions in the Commonwealth are authorized by law to close, then payment of such interest or principal and premium, if any, need not be made on such date but may be made on the next succeeding Business Day not a Saturday, Sunday nor a legal holiday

nor a day upon which banking institutions are authorized by law to close, with the same force and effect as if made on the date of maturity or the date fixed for redemption, and no interest shall accrue for the period after such date.

Section 13.08 Notices. Except as otherwise expressly provided in this Subordinate Indenture, or in any indenture supplemental hereto, any request, opinion, consent, demand, notice, order, appointment, or other direction required or permitted to be made or given by the Authority, shall be deemed to have been sufficiently made or given if executed on behalf of the Authority by an Authorized Representative of the Authority, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board.

Any notice to or demand upon the Trustee may be served, presented, or made at the Principal Office of the Trustee at The Bank of New York Mellon Trust Company, N.A., 500 Ross Street, 12th Floor, Pittsburgh, PA 15262, Attention: Corporate Trust Administration. Any notice to or demand upon the Authority shall be deemed to have been sufficiently given or served by the Trustee for all purposes, by being sent by certified or registered United States mail, postage prepaid, to the Authority at The Pittsburgh Water and Sewer Authority, 1200 Penn Avenue, Pittsburgh, Pennsylvania 15222, Attention: Executive Director or at such other address as may be filed in writing by the Authority with the Trustee.

The Trustee shall have the right to accept and act upon instructions, including funds transfer instructions (“Instructions”) given pursuant to this Subordinate Indenture and delivered using Electronic Means; provided, however, that the Authority shall provide to the Trustee an incumbency certificate listing Authorized Representatives of the Authority to provide such Instructions and containing specimen signatures of such Authorized Representatives of the Authority, which incumbency certificate shall be amended by the Authority whenever a person is to be added or deleted from the listing. If the Authority elects to give the Trustee Instructions using Electronic Means and the Trustee in its discretion elects to act upon such Instructions, the Trustee’s understanding of such Instructions shall be deemed controlling. The Authority understands and agrees that the Trustee cannot determine the identity of the actual sender of such Instructions and that the Trustee shall conclusively presume that directions that purport to have been sent by an Authorized Representative of the Authority listed on the incumbency certificate provided to the Trustee have been sent by such Authorized Representative of the Authority. The Authority shall be responsible for ensuring that only Authorized Representatives of the Authority transmit such Instructions to the Trustee and that the Authority and all Authorized Representatives of the Authority are solely responsible to safeguard the use and confidentiality of applicable user and authorization codes, passwords and/or authentication keys upon receipt by the Authority. The Trustee shall not be liable for any losses, costs or expenses arising directly or indirectly from the Trustee’s reliance upon and compliance with such Instructions notwithstanding such directions conflict or are inconsistent with a subsequent written instruction. The Authority agrees: (i) to assume all risks arising out of the use of Electronic Means to submit Instructions to the Trustee, including without limitation the risk of the Trustee acting on unauthorized Instructions, and the risk of interception and misuse by third parties; (ii) that it is fully informed of the protections and risks associated with the various methods of transmitting Instructions to the Trustee and that there may be more secure methods of transmitting Instructions than the method(s) selected by the Authority; (iii) that the security procedures (if any) to be followed in connection with its transmission of Instructions provide to

it a commercially reasonable degree of protection in light of its particular needs and circumstances; and (iv) to notify the Trustee immediately upon learning of any compromise or unauthorized use of the security procedures.

"Electronic Means" shall mean the following communications methods: S.W.I.F.T., e-mail, facsimile transmission, secure electronic transmission containing applicable authorization codes, passwords and/or authentication keys issued by the Trustee, or another method or system specified by the Trustee as available for use in connection with its services hereunder.

Section 13.09 Binding Effect of Covenants. All the covenants, promises and agreements in this Subordinate Indenture contained by or on behalf of the Authority, or by or on behalf of the Trustee shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

Section 13.10 Provisions Related to Bond Insurance and Reserve Policies. The provisions related to bond insurance set forth in Exhibit A hereto are incorporated herein by reference as if fully set forth herein. The provisions related to reserve policies set forth in Exhibit B hereto are incorporated herein by reference as if fully set forth herein.

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairman or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Subordinate Indenture to be executed by one of its authorized officers.

ATTEST: *Edward Barca*
E. Barca

John W. Turner

Secretary

[SEAL]

THE PITTSBURGH WATER AND SEWER AUTHORITY

By *Paul Lopez*

Chairman

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By _____
Authorized Officer
Title: _____

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairman or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Subordinate Indenture to be executed by one of its authorized officers.

ATTEST:

THE PITTSBURGH WATER AND SEWER AUTHORITY

Secretary

By _____
Chairman

[SEAL]

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By *Rhonda J. Branner*
Authorized Officer
Title: *Vice President*

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.8. Attach copies of the summaries of the company's projected revenues, expenses and capital budgets for the next 2 years.

RESPONSE:

Please see below for a summary of the total PWSA's projected revenues, expenses and capital budget for FTY, FPFTY, and 2023.

	FTY 12 Months Ending 12/31/2021	FPFTY 12 Months Ending 12/31/2022	Projected 12 Months Ending 12/31/2023
Projected Revenues & Expenses			
Total System Revenues	193,108,728	232,747,145	234,174,491
Direct Operating Expenses	(113,189,195)	(125,268,731)	(128,703,198)
Indirect Operating Expenses	(4,131,010)	(7,414,762)	(8,092,927)
Debt Service (Principal & Interest)	(67,046,831)	(89,407,273)	(94,814,737)
PAYGO	-	(1,000,000)	(2,000,000)
Distribution System Improvement Charge Expenses	(8,725,089)	(9,599,856)	(9,634,591)
<i>Rate Surplus / (Deficit)</i>	16,603	56,523	(9,070,962)
 Projected Capital Budget			
Water Treatment Plant	15,112,066	16,422,149	45,559,717
Water Pumping and Storage	56,863,770	70,939,529	106,366,346
Water Distribution	76,245,552	36,345,826	66,150,837
Wastewater System	35,741,675	45,109,155	29,580,401
Stormwater	34,696,272	21,721,607	13,237,377
Other	14,670,000	1,100,000	2,500,000
<i>Total Capital Requirements</i>	233,329,335	191,638,265	263,394,678

VII. RATE OF RETURN

VII.9. Describe long-term debt reacquisitions by company and parent as follows:

- a. Reacquisitions by issue by year.
- b. Total gain on reacquisitions by issue by year.
- c. Accounting of gain for income tax and book purposes.

RESPONSE:

PWSA does not have any long-term debt reacquisitions.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.10. Provide the following information concerning compensating bank balance requirements for actual per book test year:

- a. Name of each bank.
- b. Address of each bank.
- c. Type of accounts with each bank (checking, savings, escrow, other services, etc.).
- d. Average daily balance in each account.
- e. Amount and percentage requirements for compensating bank balances at each bank.
- f. Average daily compensating bank balance at each bank.
- g. Documents from each bank explaining compensating bank balance requirements.
- h. Interest earned on each type of account.

RESPONSE:

PWSA does not have compensating bank balances.

VII. RATE OF RETURN

VII.11. Provide the following information concerning bank notes payable for actual per book test year:

- a. Line of credit at each bank.
- b. Average daily balances of notes payable to each bank, by name of bank.
- c. Interest rate charged on each bank note (prime rate, formula).
- d. Purpose of each bank note, (for example, construction, fuel storage, working capital, debt retirement).
- e. Prospective future need for this type of financing.

RESPONSE:

- a. PWSA has a drawdown revolving line of credit facility with PNC Bank. At this time, the maximum amount that can be drawn and outstanding at any one time is \$150 million.
- b. The average daily amount outstanding in 2020 was approximately \$60.0 million.
- c. Each revolving advance bears interest at the LIBOR Index Rate + 1.61%, which ranged from 2.005% to 2.786% during the year ended December 31, 2020.
- d. PWSA uses this credit facility for financing certain capital costs. Once PWSA reaches the maximum, the intent is to refund the outstanding principal into long-term revenue bonds.
- e. PWSA will continue to rely on this type of borrowing instrument in the foreseeable future.

VII. RATE OF RETURN

VII.12. Submit details on company or parent common stock offerings for the past 5 years to present, as follows:

- a. Date of prospectus.
- b. Date of offering.
- c. Record date.
- d. Offering period including dates and number of days.
- e. Amount and number of shares of offering.
- f. Offering ratio, if rights offering.
- g. Percent subscribed.
- h. Offering price.
- i. Gross proceeds per share.
- j. Expenses per share.
- k. Net proceeds per share in (12.) i and j.
- l. Market price per share.
 - (1) At record date.
 - (2) At offering date.
 - (3) One month after close of offering.
- m. Average market price during offering.
 - (1) Price per share.
 - (2) Rights per share-average value of rights.
- n. Latest reported earnings per share at time of offering.
- o. Latest reported dividends at time of offering.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.13. Attach a chart explaining company's corporate relationship to its affiliates showing system structure.

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.14. If the utility plans to make a formal claim for a specified allowable rate of return, provide the following data in statement or exhibit form:

- a. Claimed capitalization and capitalization ratios with supporting data.
- b. Claimed cost of long-term debt with supporting data.
- c. Claimed cost of short-term debt with supporting data.
- d. Claimed cost of total debt with supporting data.
- e. Claimed cost of preferred stock with supporting data.
- f. Claimed cost of common equity with supporting data.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.15. Supply copies of the following documents for the company and, if applicable, its parent:

- a. Most recent annual report to shareholders including any statistical supplements.
- b. Most recent SEC form 10K.
- c. All SEC form 10Q reports issued within the preceding 12 months of the date of submittal of the rate increase request.

RESPONSE:

The following document is attached:

- Independent Auditor's Report - Years Ended December 31, 2019 and 2018.

**Pittsburgh Water and
Sewer Authority**

Single Audit

2019

MaherDuessel

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PITTSBURGH WATER AND SEWER AUTHORITY

YEARS ENDED DECEMBER 31, 2019 AND 2018

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PITTSBURGH WATER AND SEWER AUTHORITY

YEARS ENDED DECEMBER 31, 2019 AND 2018

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Independent Auditor's Report

**Board of Directors
Pittsburgh Water and
Sewer Authority**

Report on the Financial Statements

We have audited the accompanying financial statements of the Pittsburgh Water and Sewer Authority (Authority), a component unit of the City of Pittsburgh (City), Pennsylvania, as of and for the years ended December 31, 2019 and 2018, and the related notes to the financial statements, which collectively comprise the Authority's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

Board of Directors
Pittsburgh Water and Sewer Authority
Independent Auditor's Report
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We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Authority as of December 31, 2019 and 2018, and the changes in financial position and cash flows thereof for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages i through xi be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Authority's basic financial statements. The combining statements of net position and revenue, expenses, and changes in net position (combining statements) are presented for purposes of additional analysis and are not a required part of the basic financial statements. The schedule of expenditures of federal awards is presented for purposes of additional analysis as required by Title 2 U.S. *Code of Federal Regulations* (CFR) Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, and is also not a required part of the basic financial statements.

Board of Directors
Pittsburgh Water and Sewer Authority
Independent Auditor's Report
Page 3

The combining statements and the schedule of expenditures of federal awards are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the combining statements and the schedule of expenditures of federal awards are fairly stated in all material respects, in relation to the basic financial statements as a whole.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated April 17, 2020 on our consideration of the Authority's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Authority's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Authority's internal control over financial reporting and compliance.

Maker Duessel

Pittsburgh, Pennsylvania
April 17, 2020

PITTSBURGH WATER AND SEWER AUTHORITY

2019 Financial Statements Management's Discussion and Analysis

The Pittsburgh Water and Sewer Authority (Authority) comparative 2019 and 2018 fiscal year financial statements enclosed have been conformed to meet the requirements of Governmental Accounting Standards Board (GASB) Statement No. 34, *"Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments."* The financial statements incorporate three basic statements: The Statements of Net Position, the Statements of Revenues, Expenses, and Changes in Net Position, and the Statements of Cash Flows.

This Management's Discussion and Analysis (MD&A) is based upon facts, decisions, and conditions known as of the date of the audit report. Please note that the historical information provided in the financial statements and MD&A reflects the results of past operations and is not necessarily indicative of results of future operations. Future operations will be affected by various factors, including, but not limited to, regulatory mandates, rate changes, weather, labor contracts, population changes, business environment and other matters, the nature and effect of which cannot now be determined.

Using This Financial Report – Overview of Reporting Changes

The Statements of Net Position present information about the resources which are available to the Authority and claims against these resources. Both assets and liabilities are classified in a format which segregates current from noncurrent. In addition, assets available for special purposes – labeled "restricted assets" - are segregated from those assets available for operations. The Authority's restricted assets represent money on deposit with the bond trustee to meet indenture, debt service, and construction program requirements. Liabilities have a similar classification segregating claims on restricted assets from claims on assets available for operations. The net position section of the Statements of Net Position classifies the total net position as net investment in capital assets, restricted, and unrestricted.

The Statements of Revenues, Expenses, and Changes in Net Position summarize operating and non-operating activity for the fiscal year and the resulting impact on the Authority's net position.

The Statements of Revenues, Expenses, and Changes in Net Position include wastewater treatment revenues and expenses for services provided by the Allegheny County Sanitary Authority (ALCOSAN). There are no outstanding bond issues associated directly or indirectly with wastewater revenue streams.

The Statements of Cash Flows have been prepared using the direct method. The statements provide an analysis of the Authority's cash by operating, investing, and capital and related financing activities over the respective fiscal year.

Financial Highlights 2019 and 2018

In 2019, operating income increased by 6.7% or \$4.1 million to \$65.8 million. The Authority realized an overall net income of \$5.9 million, a result of increases in operating revenues being greater than increases in operating expenses combined with increases in non-operating expenses.

Below are the 2019 financial highlights:

Total operating revenues in 2019 were up \$17.3 million or 7.5% to \$249.0 million when compared to 2018. Wastewater treatment revenues increased by \$3.7 million, attributable to ALCOSAN's rate increase being offset by decreases in consumption. Water and sewer conveyance revenues increased \$12.2 million from 2018, attributable to rate increases by the Authority, offset by decreases in consumption. Other operating income increased by \$1.4 million from 2018, attributable to the sum of various miscellaneous payments.

Total net non-operating revenues (expenses) changed by \$19.9 million from 2018 to a net expense of \$37.6 million in 2019 compared to a net expense of \$17.7 million in 2018. This increase in expenses is attributable to higher

interest and amortization, \$2.4 million in bond issuance costs in 2019 compared to no bond issuance cost in 2018, an investment loss of \$4.2 million from the change in swap fair market value, a decrease in donated property of \$13.5 million from 2018 to 2019, and grant revenue of \$6.9 million in 2019 compared to no grant revenue in 2018.

Total operating expenses increased in 2019 to \$183.2 million compared to \$170.1 million in 2018. Significant operating expenses included the following factors:

- Salary and employee benefit expenses were up \$4.1 million or 16.6%. The increase is attributed to an average salary rate increase of 3% and increased employee headcount in 2019.

The majority of Authority employees are represented by one of three labor unions. The Pittsburgh Joint Collective Bargaining Committee (PJCBC) represents blue-collar employees. The American Federation of State, County and Municipal Employees (AFSCME) represents Local 2719 employees and Local 2037. A new four-year agreement with AFSCME became effective January 1, 2017 and will expire December 31, 2020. A new four-year agreement with the PJCBC became effective January 1, 2017 and expires December 31, 2020.

- Sewage Treatment expense (paid to ALCOSAN) increased by \$0.6 million to \$72.4 million in 2019 from \$71.8 million in 2018. This is attributable to ALCOSAN'S rate increase offset by decreased consumption.
- Most direct operating cost categories increased from 2018 to 2019, in many cases, due to planned spending to result in more investment in the system than the Authority has done in the past. A breakdown by category is as follows:
 - Chemical expenses increased 17.3% or \$0.6 million from 2018 to \$4.5 million in 2019, attributable to the addition of orthophosphate usage and increased ferric chloride pricing and utilization.
 - Equipment expenses increased 109% or \$0.82 million from 2018 to \$1.57 million in 2019, attributable to various machinery and equipment purchases under capitalization thresholds.
 - Material expenses increased 10.9% or \$0.05 million from 2018 to \$0.5 million in 2019.
 - Operating Contract expenses increased by 3.8% or \$0.4 million from 2018 to \$11.3 million in 2019.
 - Repair and Maintenance expenses increased by 23.8% or \$1.9 million from 2018 to \$9.7 million in 2019, attributable to increased spending for repairs to facilities, as well as an increase in surface restoration costs.
 - Miscellaneous Direct Operating expenses increased by 58.6% or \$0.4 million from 2018 to \$1.0 million in 2019, attributable to increased testing.
 - Inventory expense increased by 38.2% or \$0.6 million from 2018 to \$2.0 million in 2019, a function of overall increased work.
 - Administrative Fee expenses increased by 25.3% or \$0.2 million from 2018 to \$1.0 million in 2019, mainly attributable to increased credit card fees.
 - Freight and Postage expenses increased by 58.2% or \$0.2 million from 2018 to \$0.7 million in 2019, attributable to increased postage costs.
 - Lease and Rent expenses increased by 44.2% or \$0.4 million to \$1.2 million in 2019, attributable to additional office space and increased equipment rental.
 - Professional Service expenses increased by 23.8% or \$3.4 million from 2018 to \$17.6 million in 2019, attributable mainly to increased non-capital engineering spending of \$2.8 million, and an accrual for \$0.6 in payments owed to the City of Pittsburgh for the next ten years relating to Addison Terrace.
 - Supply expenses increased by 62.9% or \$0.2 million from 2018 to \$0.6 million in 2019, mainly attributable to the increased ground and maintenance supply purchasing.
 - Travel and Training expenses increased by 138.2% or \$0.1 million from 2018 to \$0.2 million in 2019, attributable to increased training for staff.

- Utility expenses decreased by 1.8% or \$0.1 million from 2018 to \$4.9 million in 2019.
- Miscellaneous Administrative expenses increased by 433% or \$3.4 million from 2018 to \$4.2 million in 2019, mainly attributable to a sizeable increase in bad debt expense offset by a sizeable decrease in inventory adjustments from the prior year. In 2018, there was a credit to bad debt expense, a result of a conservative approach to calculating necessary uncollectible reserves in 2017 for customer accounts with significant balances. Efforts of the collection team in 2018 resulted in these accounts either being paid down or adjusted, which ultimately resulted in a lower allowance for uncollectible accounts and a credit to bad debt expense. The same conservative approach to calculating the reserve has been used in subsequent years, including 2019; however, the large balances that existed in 2017, which were collected or adjusted in 2018 were no longer a factor in the 2019 calculation, which resulted in a more typical expense, in line with typical Authority collection percentages. In 2018, there was a large, one-time inventory write-off as a result of procedural reviews and reconciliations to correct balances that built up over multiple years. The 2019 adjustment was one-year worth of typical adjustments.
- Reimbursements for City of Pittsburgh services dropped by 59.5% or \$2.9 million from \$4.9 million in 2018 to \$2.0 million in 2019, the decrease being attributable to credits related to the City receiving State Pension Aid for all enrolled Authority employees. The expense of water provided to other entities, mainly comprised of subsidy payments to Pennsylvania American Water Company (PAWC) decreased by 64.9% or \$2.5 million to \$1.3 million in 2019 compared to \$3.8 million in 2018, a result of the Authority's rate increase.

Interest expense increased 12.7% or \$4.4 million to \$38.7 million in 2019 compared to \$34.4 million in 2018. This change is attributable to increased interest payments on borrowings to fund capital projects.

In 2019, the Authority expended \$22.3 million replacing private lead lines.

In 2019, cash collections increased by \$11.6 million, with \$244.7 million collected from billings compared to \$233.1 million in 2018 due to rate increases by both the Authority and ALCOSAN.

Other 2019 highlights include:

- As a result of the Authority's initial rate case settlement with the Pennsylvania Public Utility Commission, the Authority's contract with Jordan Tax Service, Inc. (JTS) was terminated effective June 30, 2019.
- Accounts Receivable for Billed Wastewater Treatment decreased by \$4.9 million from \$7.0 million in 2018 to \$2.1 million in 2019. The biggest contributing factor to this decrease was a \$2.3 million dollar adjustment to the City of Pittsburgh accounts for Sewage Treatment balances. Instead of a cash payment, the Authority applied a \$2.3 million credit to the reimbursement payment that they made to the City of Pittsburgh at the end of 2019 and made an adjustment to accounts receivable. Other factors impacting this decrease include payment plans set up in prior years being paid off in 2019 and other collections and adjustments applied to the older debt.
- Debt service coverage was 1.58 in 2019 and 1.71 in 2018. These coverage factors exceed the 1.25 coverage ratio required under the bond indenture in 2019, and the 1.2 coverage ratio required under the bond indenture in 2018.
- The Authority expended \$107.9 million on capital projects in 2019, an increase of \$38.7 million, or approximately 56% over the \$69.2 million expended in 2018. \$83.4 million of the capital expenditures spent in 2019 were funded by the revolving line of credit, and \$24.5 million were funded by PENNVEST as part of the 2019 Lead Service Line Replacement funding award. Of the \$24.5 million funded by PENNVEST, \$17.7 million was a loan, and \$6.8 million was a grant. It is

anticipated that the Authority will spend the remaining amount of the PENNVEST funding award in 2020.

- In July 2016, the Authority entered into a drawdown, revolving line of credit financing with JPMorgan Chase Bank N.A. The maximum amount that could be drawn and outstanding at any one time was \$80.0 million and has an initial term of four years. In September 2018, the maximum draw amount was increased from \$80.0 million to \$150.0 million. The Authority utilizes funds borrowed under this vehicle to finance capital projects. As of December 31, 2019, the Authority has drawn \$62.5 million on this facility.
- In August 2018, the Authority entered into a drawdown, revolving line of credit with PNC Bank, National Association, to provide additional liquidity that can be used for operating expenses. The maximum amount that can be drawn and outstanding at any one time is \$20.0 million with a one-year term. The drawdown, revolving line of credit expired in August 2019 and was not renewed or replaced. No drawdowns ever occurred on this facility.
- As a result of the December 2017 bond refunding activity, a modernized bond indenture sprung into effect on December 28, 2017. The new indenture establishes an improved rate covenant calculation applicable to the 2019 financials, which will be viewed more favorably by rating agencies and credit providers. The modernized indenture and rate covenant will allow the Authority additional financing opportunities and a lower cost of capital, supporting a larger capital spending plan.
- In March 2019, the Authority closed on a funding award from PENNVEST for the purpose of financing the 2019 Lead Service Line Replacement program. The funding offered to the Authority consists of \$13.7 million in grants and a \$35.4 million loan at an interest rate of 1% for a total funding award of \$49.1 million. The award will fund the replacement of approximately 3,400 public lead service lines and 3,400 associated private lead lines in 2019. Replacement locations will be focused in neighborhoods with a likelihood of at-risk populations, like children with high blood lead levels, pregnant mothers, and young children.
- In July 2019, the Authority issued \$109.0 million (fixed-rate) Series A First Lien Water and Sewer Revenue Bonds and \$104.3 million (fixed-rate) Series B Subordinate Water and Sewer Revenue Bonds. The proceeds from the Series A of 2019 Bonds were used to pay down the balance of the drawdown, revolving line of credit used to finance capital projects. The proceeds from the Series B of 2019 were used to refund the Series C-1 and C-2 of 2008 Water and Sewer System Revenue Bonds and terminate the associated swaps. The cost to terminate the swaps was \$27.6 million, of which \$5.7 million was funded with a cash contribution. The refunding was completed to reduce the Authority's exposure from the risks associated with swaps.
- HB 1490 was passed into law in December 2017. HB 1490 establishes the Authority as a "Utility" as defined by the Public Utility Code, resulting in Public Utility Commission (PUC) regulation of the Authority's rate making, its operating effectiveness, debt issuances, and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Effective April 1, 2018, the PUC began oversight of the Authority. PUC oversight requires compliance and conformity with their established regulations regarding administration, finances, operations, reporting, capital expenditures, and customer service for water and wastewater utilities. The PUC now approves all PWSA rates and fees through tariff filings.
- The City of Pittsburgh is the largest of the 83 municipalities that convey raw sewage to ALCOSAN for treatment. On January 29, 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (Order) regarding sanitary and combined sewer overflows within the City of Pittsburgh. The other signatories to the Order are the Pennsylvania Department of Environmental Protection (DEP) and the Allegheny County Health Department, which executed the Order on April 21, 2004. The Long-Term Control Plan to address combined and sanitary

sewer overflows required under the order was submitted on schedule on July 31, 2013. Due to the complexities of regional governance, the Authority's regulatory body was switched from the DEP to the US Environmental Protection Agency (EPA). On January 21, 2016, the EPA issued a Clean Water Act Section 308 Information Request (308 Request) to the Authority. The request is meant to provide a jurisdictional basis for EPA to engage the Authority and the City of Pittsburgh in enforcement action by consent. The Authority intends that through such an action, it can more fully participate in the implementation of interim regional wet weather activities, controls, and improvements. The action will also permit the Authority and the City of Pittsburgh to participate more fully in the identification and implementation of any final wet weather control measures for the region. The Authority fulfilled the first portion of the 308 Request, the assessment and modeling of the sewer system, by the due date of March 31, 2016. The second phase of the 308 Request was fulfilled by the completion of a source reduction study, which was submitted on December 1, 2016, and the construction of Green Infrastructure (GI) Demonstration projects and submission of project performance evaluations were completed by December 1, 2017. The Authority continues to implement neighborhood Green Infrastructure based stormwater abatement projects to mitigate Combined Sewer Overflows. The Authority anticipates a new Consent Order negotiation related to Combined Sewer Overflows with the USEPA at some point in the future.

The 308 Request does not contain fines or penalties for past non-compliance but does propose binding obligations for work on a going forward basis. The Authority continues to meet the requirements of the 308 Request. The Final Consent Order will be adjudicated between the City, the Authority, and the USEPA to establish the extent of improvements that will be required to be complete within a specified time frame. Based upon initial discussions with the regulators, the Authority anticipates that the final recommendations implementation plan will be modified to assure its affordability to the Authority's rate payers. See Note 14 – Consent Agreement for additional details.

Financial Highlights 2018 and 2017

In 2018, operating income increased by 108.3% or \$32.1 million to \$61.7 million. The Authority realized an overall net income of \$39.5 million due to increases in operating revenues, decreases in operating expenses and decreases in non-operating expenses, up from a \$6.3 million net loss in 2017.

Below are the 2018 financial highlights:

Total operating revenues in 2018 were up \$28.7 million or 14.1% to \$231.7 million when compared to 2017. Wastewater treatment revenues decreased by \$1.7 million, attributable to ALCOSAN's rate increase being offset by decreases in consumption and adjustments. Water and sewer conveyance revenues increased \$31.0 million from 2017, attributable to rate increases by the Authority. Other operating income decreased by \$0.6 million from 2017, attributable to the sum of various miscellaneous payments.

Total non-operating revenues (expenses) decreased by \$18.2 million from 2017, largely impacted by \$13.6 million in donated property revenue as well as bond issuance costs dropping to zero in 2018 compared to \$3.9 million in 2017, from \$35.9 million in 2017 to \$17.7 million in 2018.

Total operating expenses decreased in 2018 to \$170.1 million compared to \$173.4 million in 2017. Significant operating expenses included the following factors:

- Salary and employee benefit expenses were up \$3.1 million or 14.3%. The increase is attributed to an average salary rate increase of 2%, and increased employee headcount in 2018. Part of this increase is offset by a decrease in professional service expense.

The majority of Authority employees are represented by one of three labor unions. The Pittsburgh Joint Collective Bargaining Committee (PJCBC) represents blue-collar employees. The

American Federation of State, County and Municipal Employees (AFSCME) represents Local 2719 employees and Local 2037. A new four-year agreement with AFSCME became effective January 1, 2017 and will expire December 31, 2020. A new four-year agreement with the PJCBC became effective January 1, 2017 and expires December 31, 2020.

- Expenses stayed relatively flat from 2017 to 2018 for multiple cost categories, including chemicals, equipment, materials, inventory, utilities, and overall administrative expenses.
- There were cost categories that decreased significantly from 2017 to 2018, in many cases due to one-time expenses that occurred in 2017. The sewage treatment expense (paid to ALCOSAN) dropped by \$3.3 million from \$75.1 million in 2017 to \$71.8 million in 2018. In addition to net changes in consumption, this is also attributable to the net of catch up billings in 2017 and adjustment made in 2018. Equipment rentals dropped by \$0.8 million from 2017, when there was a one-time emergency rental. Engineering related professional services decreased \$1.7 million from 2017, as positions once filled by consultants in 2017 became filled by Authority employees in 2018. Bad debt expense decreased by \$7.7 million from \$4.2 million in 2017 to a \$3.5 million credit in 2018. The large swing in bad debt expense is attributable to a conservative approach to calculating necessary uncollectible reserves in 2017 for customer accounts with significant balances. Efforts of the collection team in 2018 resulted in these accounts either being paid down or adjusted, which ultimately resulted in a lower allowance for uncollectible accounts and a credit to bad debt expense.
- In 2018, large inventory adjustments and write-offs totaling \$3.1 million were booked as a result of procedural reviews and reconciliations to ensure that inventory reporting was accurate. Other significant non-salary direct operating expense increases from 2017 to 2018 include surface restoration costs, which increased by \$1.9 million, and urgent water and sewer repairs, which increased by \$1.0 million. Administrative expenses that increased from 2017 to 2018 include legal expenses, which increased by \$1.0 million, a result of regulatory costs, and claims, which increased by \$0.6 million, mainly attributable to accrued contingencies for legal settlements.
- Reimbursements for City of Pittsburgh services dropped by 8.4% or \$0.5 million from \$5.4 million in 2017 to \$4.9 million in 2018, as the calculation for this payment switched from a lump sum basis to a transactional basis. The expense of water provided to other entities, mainly comprised of subsidy payments to Pennsylvania American Water Company (PAWC) decreased by 31.8% or \$1.8 million to \$3.8 million in 2018 compared to \$5.6 million in 2017.

Interest expense decreased 1.6% or \$0.5 million to \$34.4 million in 2018 compared to \$34.9 million in 2017. This drop is attributable to the net effect of increased interest payments on borrowings to fund capital projects offset by the Authority no longer having costs associated with credit and remarketing of variable rate debt, a result of the December 2017 refunding, which changed the debt structure.

In 2018, the Authority expended \$4.5 million replacing private lead lines.

In 2018, cash collections increased by \$43.0 million, with \$233.1 million collected from billings compared to \$190.1 million in 2017 due to rate increases by both the Authority and ALCOSAN.

Other 2018 highlights include:

- The Authority continued its relationship with Jordan Tax Service, Inc. (JTS) as its Collector and the law firm of Goehring, Rutter & Boehm, P.C. as Special Legal Counsel for the collection of delinquent water, sewer, and sewage treatment charges. The agreement calls for a collection commission, plus other administrative and legal proceeding costs, to be added to all Authority delinquent claims not paid within 90 days of the initial billing date. If fully collected, the Authority stands to collect 100% of delinquent balances without incurring a collection agency fee. JTS collected for the Authority \$1.5 million during 2018.

- Debt service coverage was 1.71 in 2018 and 1.29 in 2017. These coverage factors exceed the 1.2 coverage ratio required under the bond indenture.
- The Authority expended \$69.2 million on capital projects in 2018, an increase of \$37.2 million or approximately 116% over the \$32.0 million expended in 2017. All capital expenditures in 2018 were funded by the revolving line of credit, which was put in place in July 2016. Pennvest funding was not utilized in 2018. However, in October 2018, the PENNVEST Board approved a funding award of \$49.1 million to be used for the replacement of both public and private lead service lines. The award is made up of a \$13.6 million grant and \$35.4 million one percent interest loan. The state funding award, the largest ever granted to the Authority, will fund the replacement of approximately 3,400 public lead service lines and 3,400 associated private lead lines in 2019. Replacement locations will be focused in neighborhoods with a likelihood of at-risk populations, like pregnant mothers and young children. The Authority will close on this funding award in 2019.
- In July 2016, the Authority entered into a drawdown, revolving line of credit financing with JPMorgan Chase Bank N.A. The maximum amount that could be drawn and outstanding at any one time was \$80.0 million and has an initial term of four years. In September 2018, the maximum draw amount was increased from \$80.0 million to \$150.0 million. The Authority utilizes funds borrowed under this vehicle to finance capital projects. As of December 31, 2018, the Authority has drawn \$113.0 million on this facility.
- In August 2018, the Authority entered into a drawdown, revolving line of credit with PNC Bank, National Association. The maximum amount that can be drawn and outstanding at any one time is \$20.0 million and has a term of one year. The line of credit provides additional liquidity that can be used for operating expenses. No drawdowns have ever occurred on this facility. As of December 31, 2018, the Authority has drawn \$0.0 million on this facility.
- As a result of the December 2017 bond refunding activity, a modernized bond indenture sprung into effect on December 28, 2017. The new indenture establishes an improved rate covenant calculation applicable to the 2019 financials, which will be viewed more favorably by rating agencies and credit providers. The modernized indenture and rate covenant will allow the Authority additional financing opportunities and a lower cost of capital, supporting a larger capital spending plan.
- HB 1490 was passed into law in December 2017. HB 1490 establishes the Authority as a “Utility” as defined by the Public Utility Code, resulting in Public Utility Commission (PUC) regulation of the Authority’s rate making, its operating effectiveness, debt issuances, and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Effective April 1, 2018, the PUC began oversight of the Authority. PUC oversight requires compliance and conformity with their established regulations regarding administration, finances, operations, reporting, capital expenditures, and customer service for water and wastewater utilities. The PUC now approves all PWSA rates and fees through tariff filings.
- The City of Pittsburgh is the largest of the 83 municipalities that convey raw sewage to ALCOSAN for treatment. In January 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (Order) regarding sanitary and combined sewer overflows within the City of Pittsburgh. The other signatories to the Order are the Pennsylvania Department of Environmental Protection (DEP) and Allegheny County Health Department, which executed the Order on April 21, 2004. The Long-Term Control Plan to address combined and sanitary sewer overflows required under the order was submitted on schedule on July 31, 2013. Due to the complexities of regional governance, the Authority’s regulatory body was switched from the DEP to the US Environmental Protection Agency (EPA). On January 21, 2016, the EPA issued a Clean Water Act Section 308 Information Request (308 Request) to the Authority. The request is meant to provide a jurisdictional basis for EPA to engage the Authority and the City of Pittsburgh in an

enforcement action by consent. The Authority intends that through such an action, it can more fully participate in the implementation of interim regional wet weather activities, controls, and improvements. The action will also permit the Authority and the City of Pittsburgh to participate more fully in the identification and implementation of any final wet weather control measures for the region. The Authority has fulfilled the first portion of the 308 Request, which was due on March 31, 2016. The second phase of the 308 Request supplied a source reduction study, which was submitted on December 1, 2016 and GI Demonstration projects must be constructed and performance evaluations completed by December 1, 2017. The demonstration project evaluations were submitted on time on December 1, 2017.

The 308 Request does not contain fines or penalties for past non-compliance, but does propose binding obligations for work on a going forward basis. The Authority continues to meet the requirements of the 308 Request. The Final Consent Order will be adjudicated between the City, the Authority, and the USEPA to establish the extent of improvements that will be required to be complete within a specified time frame. Based upon initial discussions with the regulators, the Authority anticipates that the final recommendations implementation plan will be modified to assure its affordability to the Authority's rate payers. See Note 14 – Consent Agreement for additional details.

CONDENSED FINANCIAL STATEMENTS

CONDENSED STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

	December 31,		Variance	
	2019	2018	Dollars	%
Capital assets:				
Producing assets	\$ 695,291	\$ 618,177	\$ 77,114	12.47%
Construction in progress	135,287	139,303	(4,016)	-2.88%
Hedging derivative - interest rate swap	-	4,750	(4,750)	0.00%
Restricted assets	25,964	23,326	2,638	11.31%
Current assets	91,392	78,787	12,605	16.00%
Total Assets	947,934	864,343	83,591	9.67%
Deferred Outflows of Resources	112,363	103,291	9,072	8.78%
Liabilities:				
Current liabilities	79,366	69,662	9,704	13.93%
Long-term liabilities	979,396	897,581	81,815	9.12%
Total Liabilities	1,058,762	967,243	91,519	9.46%
Deferred Inflows of Resources	-	4,750	(4,750)	0.00%
Net Position:				
Net investment in capital assets	(15,365)	(14,892)	(473)	3.18%
Restricted	19,320	16,388	2,932	17.89%
Unrestricted	(2,420)	(5,855)	3,435	-58.67%
Total Net Position	\$ 1,535	\$ (4,359)	\$ 5,894	-135.21%

CONDENSED STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

(Dollars expressed in thousands)

	Year Ended December 31,		Variance	
	2019	2018	Dollars	%
			Increase (Decrease)	
Operating revenues	\$ 249,049	\$ 231,734	\$ 17,315	7.47%
Operating expenses:				
Direct operating	89,512	72,633	16,879	23.24%
Wastewater treatment	72,389	71,822	567	0.79%
Reimbursement for City of Pittsburgh services	1,991	4,911	(2,920)	-59.46%
Subsidy of non-customer City residents	1,338	3,814	(2,476)	-64.92%
Depreciation	18,011	16,894	1,117	6.61%
Total Operating Expenses	183,241	170,074	13,167	7.74%
Operating income	65,808	61,660	4,148	6.73%
Non-operating revenues (expenses):				
Federal and private grants	6,922	-	6,922	0.00%
Donated property	110	13,649	(13,539)	-99.19%
Interest revenue	719	469	250	53.30%
Interest expense and other	(45,382)	(31,823)	(13,559)	42.61%
Total Non-operating Revenues (Expenses)	(37,631)	(17,705)	(19,926)	112.54%
Special item: private lead line replacement	(22,283)	(4,478)	(17,805)	397.61%
Total Special Items	(22,283)	(4,478)	(17,805)	397.61%
Net Income/(Loss)	\$ 5,894	\$ 39,477	\$ (33,583)	-85.07%

Financial Condition 2019 and 2018

The Authority's financial condition in 2019 remained stable for a seventeenth consecutive year. Water utility revenues increased to \$171.7 million from \$159.5 million. The rate increase effective March 1, 2019 had a positive impact on utility revenue and unrestricted cash. Total cash and cash equivalents stood at \$64.7 million at year-end 2019. Investment interest rates remain near historic lows, impacting the return on reserves invested.

CONDENSED FINANCIAL STATEMENTS

CONDENSED STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

	December 31,		Variance	
	2018	2017	Dollars	%
Capital assets:				
Producing assets	\$ 618,177	\$ 589,567	\$ 28,610	4.85%
Construction in progress	139,303	100,240	39,063	38.97%
Hedging derivative - interest rate swap	4,750	-	4,750	0.00%
Restricted assets	23,326	29,948	(6,622)	-22.11%
Current assets	78,787	46,417	32,370	69.74%
Total Assets	864,343	766,172	98,171	12.81%
Deferred Outflows of Resources	103,291	113,605	(10,314)	-9.08%
Liabilities:				
Current liabilities	69,662	62,962	6,700	10.64%
Long-term liabilities	897,581	860,651	36,930	4.29%
Total Liabilities	967,243	923,613	43,630	4.72%
Deferred Inflows of Resources	4,750	-	4,750	0.00%
Net Position:				
Net investment in capital assets	(14,892)	(29,609)	14,717	-49.70%
Restricted	16,388	13,240	3,148	23.78%
Unrestricted	(5,855)	(27,467)	21,612	-78.68%
Total Net Position	\$ (4,359)	\$ (43,836)	\$ 39,477	-90.06%

CONDENSED STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
(Dollars expressed in thousands)

	Year Ended December 31,		Variance	
	2018	2017	Dollars	%
			Increase (Decrease)	
Operating revenues	\$ 231,734	\$ 202,996	\$ 28,738	14.16%
Operating expenses:				
Direct operating	72,633	71,156	1,477	2.08%
Wastewater treatment	71,822	75,107	(3,285)	-4.37%
Reimbursement for City of Pittsburgh services	4,911	5,363	(452)	-8.43%
Subsidy of non-customer City residents	3,814	5,594	(1,780)	-31.82%
Depreciation	16,894	16,172	722	4.46%
Total Operating Expenses	170,074	173,392	(3,318)	-1.91%
Operating income	61,660	29,604	32,056	108.28%
Non-operating revenues (expenses):				
Donated property	13,649	1,595	12,054	755.74%
Interest revenue	469	460	9	1.96%
Interest expense and other	(31,823)	(37,972)	6,149	-16.19%
Total Non-operating Revenues (Expenses)	(17,705)	(35,917)	18,212	-50.71%
Special item: private lead line replacement	(4,478)	-	(4,478)	0.00%
Total Special Items	(4,478)	-	(4,478)	0.00%
Net Income/(Loss)	\$ 39,477	\$ (6,313)	\$ 45,790	-725.33%

Financial Condition 2018 and 2017

The Authority's financial condition in 2018 remained stable for a sixteenth consecutive year. Water utility revenues increased to \$159.5 million from \$128.5 million. The rate increase effective March 1, 2019 should have a positive impact on utility revenue and unrestricted cash. Total cash and cash equivalents stood at \$46.9 million at year-end 2018. Investment interest rates remain near historic lows, impacting the return on reserves invested.

Requests for Information

This financial report is designed to provide a general overview of the Authority's finances for all those with an interest in its finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the Executive Director, Penn Liberty Plaza I, 1200 Penn Ave., Pittsburgh, PA 15222.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

Assets	2019	2018
Current assets:		
Cash and cash equivalents	\$ 64,680	\$ 46,920
Accounts receivable, net:		
Water:		
Billed	7,138	8,537
Unbilled	8,965	8,583
Total water	16,103	17,120
Wastewater treatment:		
Billed	2,130	7,014
Unbilled	3,725	3,719
Total wastewater treatment	5,855	10,733
Other receivables	2,450	1,510
Total accounts receivable, net	24,408	29,363
Prepaid expenses	707	520
Inventory	1,597	1,984
Total current assets	91,392	78,787
Noncurrent assets:		
Restricted assets:		
Cash and cash equivalents	16,360	13,970
Investments	9,604	9,356
Total restricted assets	25,964	23,326
Hedging derivative - interest rate swap	-	4,750
Capital assets, not being depreciated	135,287	139,303
Capital assets, net of accumulated depreciation	695,291	618,177
Total noncurrent assets	856,542	785,556
Total Assets	947,934	864,343
Deferred Outflows of Resources		
Deferred charge on refunding	99,012	102,534
Accumulated decrease in fair value of hedging derivatives	13,351	757
Total Deferred Outflows of Resources	112,363	103,291

(Continued)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

(Continued)

	2019	2018
Liabilities		
Current liabilities:		
Bonds and loans payable	27,022	23,400
Accrued payroll and related obligations	989	1,373
Accounts payable wastewater treatment	19,017	19,349
Accounts payable and other accrued expenses	22,720	20,911
Accrued interest payable from restricted assets	9,618	4,629
Total current liabilities	79,366	69,662
Noncurrent liabilities:		
Unearned revenue	121	143
Accrued payroll and related obligations	621	558
Swap liability	13,351	13,254
Bonds and loans payable, net	965,303	883,626
Total noncurrent liabilities	979,396	897,581
Total Liabilities	1,058,762	967,243
Deferred Inflows of Resources		
Accumulated increase in fair value of hedging derivatives	-	4,750
Net Position		
Net investment in capital assets	(15,365)	(14,892)
Restricted	19,320	16,388
Unrestricted	(2,420)	(5,855)
Total Net Position	\$ 1,535	\$ (4,359)

(Concluded)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

(Dollars expressed in thousands)

YEARS ENDED DECEMBER 31, 2019 AND 2018

	2019	2018
Operating Revenues:		
Residential, commercial, and industrial water sales	\$ 171,681	\$ 159,506
Wastewater treatment	70,970	67,261
Other	6,398	4,967
Total operating revenues	249,049	231,734
Operating Expenses:		
Direct operating expenses	89,512	72,633
Wastewater treatment	72,389	71,822
Reimbursement for City of Pittsburgh services	1,991	4,911
Expense of water provided by other entities:		
Subsidy of customers located in the City	1,338	3,814
Depreciation	18,011	16,894
Total operating expenses	183,241	170,074
Operating Income	65,808	61,660
Non-operating Revenues (Expenses):		
Federal and private grants	6,922	-
Donated property	110	13,649
Interest revenue	719	469
Investment income (loss) - change in fair value of swap	(4,180)	2,542
Interest and amortization	(38,740)	(34,365)
Bond issuance costs	(2,462)	-
Total non-operating revenues (expenses)	(37,631)	(17,705)
Net Income before Special Item	28,177	43,955
Special Item:		
Private lead line replacement	(22,283)	(4,478)
Net Income	5,894	39,477
Net Position:		
Beginning of year	(4,359)	(43,836)
End of year	\$ 1,535	\$ (4,359)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF CASH FLOWS

(Dollars expressed in thousands)

YEARS ENDED DECEMBER 31, 2019 AND 2018

	2019	2018
Cash Flows From Operating Activities:		
Cash received from customers	\$ 252,010	\$ 236,767
Cash paid to suppliers and employees and customer refunds	(84,867)	(68,688)
Cash paid to City of Pittsburgh for reimbursement of services	(1,991)	(4,911)
Cash paid to other water companies for subsidy of customers located in the City of Pittsburgh	(1,338)	(3,814)
Cash paid to ALCOSAN for wastewater treatment	(72,721)	(70,336)
Net cash provided by (used in) operating activities	91,093	89,018
Cash Flows From Investing Activities:		
Purchase of investment securities	(77,528)	(92,905)
Proceeds from sale and maturities of investment securities	76,561	94,036
Interest income	719	469
Net cash provided by (used in) investing activities	(248)	1,600
Cash Flows From Capital and Related Financing Activities:		
Purchase/construction of property, plant, and equipment	(91,137)	(70,918)
Grant proceeds	5,937	-
Private lead line replacements	(22,283)	(4,478)
Proceeds from issuance of bonds	259,235	-
Proceeds from revolving line of credit	80,700	69,200
Proceeds from Pennvest Loans	15,323	-
Payment to refunding bond escrow agent	(103,660)	-
Payment made for bond issuance costs	(2,462)	-
Principal payments on debt	(23,140)	(24,603)
Principal payments on revolving line of credit	(131,200)	-
Principal payments on capital lease	(454)	(438)
SWAP termination payment	(27,605)	-
SWAP receipts	4,464	4,430
SWAP payments	(8,243)	(10,564)
Liquidity and remarketing fees	-	(307)
Interest paid on borrowings	(26,170)	(21,390)
Net cash provided by (used in) capital and related financing activities	(70,695)	(59,068)
Increase (Decrease) in Cash and Cash Equivalents	20,150	31,550
Cash and Cash Equivalents:		
Beginning of year	60,890	29,340
End of year	\$ 81,040	\$ 60,890
Consists of		
Restricted cash and cash equivalents	\$ 16,360	\$ 13,970
Unrestricted cash and cash equivalents	64,680	46,920
	\$ 81,040	\$ 60,890
Reconciliation of Operating Income to Net Cash Provided by (Used in) Operating Activities:		
Operating income	\$ 65,808	\$ 61,660
Adjustments to reconcile operating income to net cash provided by (used in) operating activities		
Depreciation	18,011	16,894
Reserve for uncollectible amounts	2,979	(3,506)
Change in		
Accounts receivable - water and wastewater	2,916	5,469
Other accounts receivable	45	(436)
Prepaid expenses	(187)	154
Inventory	387	1,793
Accounts payable wastewater treatment	(332)	1,486
Accounts payable and other accrued expenses	1,809	5,405
Accrued payroll and related obligations	(321)	120
Unearned revenue	(22)	(21)
Net cash provided by (used in) operating activities	\$ 91,093	\$ 89,018
Schedule of Non-Cash Capital and Related Financing Activities:		
Donated property	\$ 110	\$ 13,649

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

1. Organization

The Pittsburgh Water and Sewer Authority (Authority) provides water to approximately 80,000 residential, commercial, and industrial customers located in the City of Pittsburgh (City), Pennsylvania, and collects wastewater throughout the City.

A Board of Directors (Board) appointed by the Mayor of the City governs the Authority.

The Authority is a body politic and corporate, organized and existing under the Pennsylvania Municipalities Authorities Act. The Authority was established by the City in 1984 to assume responsibility from the City for management, operation, maintenance, and improvement of virtually the entire City water supply, distribution, and wastewater collection systems (the "Water and Wastewater System" or "System"). The Authority's term of existence is through 2045. At inception, the City contributed \$5.3 million to the Authority in the form of customer accounts receivable. The Authority is authorized to issue bonds and notes payable solely from the Authority's revenues.

Prior to April 1, 2018, the Authority had the right to establish user fees and charges without being subject to the approval of any department, board, or agency of Pennsylvania or the City. Effective April 1, 2018, the Public Utility Commission (PUC) began oversight of the Authority. PUC oversight requires compliance and conformity with their established regulations regarding administration, finances, operations, reporting, capital expenditures, and customer service for water and wastewater utilities. The PUC now approves all Authority rates and fees through tariff filings.

2. Summary of Significant Accounting Policies

Reporting Entity

These financial statements present the financial position, changes in net position, and cash flows of the Authority. The Authority is a component unit of the City in accordance with applicable guidance. The Authority's financial statements are not intended to present the financial position or results of operations of the City taken as a whole.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

Basis of Accounting and Measurement Focus

The accompanying financial statements have been prepared using the economic resources measurement focus and the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America, as prescribed by the Governmental Accounting Standards Board (GASB). Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The Authority functions as a Business-Type Activity, as defined by GASB.

Classification of Net Position

The Authority's net position is classified into three components – net investment in capital assets; restricted; and unrestricted. These classifications are defined as follows:

- Net investment in capital assets – This component of net position consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of bonds, mortgages, notes, or other borrowings that are attributable to the acquisition, construction, or improvement of those assets. Deferred outflows of resources and deferred inflows of resources that are attributable to the acquisition, construction, or improvement of those assets or related debt are also included in this component of net position. If there are significant unspent related debt proceeds or deferred inflows of resources at the end of the reporting period, the portion of the debt or deferred inflows of resources attributable to the unspent amount is not included in the calculation of net investment in capital assets. Instead, that portion of the debt or deferred inflow of resources is included in the same net position component (restricted or unrestricted) as the unspent amount.
- Restricted – This component of net position consists of restricted assets reduced by liabilities and deferred inflows of resources related to those assets. Generally, a liability relates to restricted assets if the asset results from a resource flow that also results in the recognition of a liability or if the liability will be liquidated with the restricted assets reported.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

- **Unrestricted** – This component of net position is the net amount of the assets, deferred outflows of resources, liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or the restricted components of net position.

When an expense is incurred that can be paid using either restricted or unrestricted resources, the Authority's policy is to first apply the expense towards restricted resources and then towards unrestricted resources.

Deposits and Investments

The Authority's cash and cash equivalents are considered to be cash on hand, demand deposits, and all highly liquid investments, both restricted and unrestricted, with maturity of three months or less at date of purchase.

Investments are recorded at fair value. Accordingly, the change in fair value of investments is recognized as an increase or decrease to investment assets and investment income.

Fair Value Measurements

The Authority categorizes its fair value measurements within the fair value hierarchy established by accounting principles generally accepted in the United States of America. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs.

Premiums and Discounts

Original issue bond premiums and discounts are amortized over the life of the related bonds using the straight-line method of amortization, which is materially comparable to the effective interest method. The unamortized balance of premiums and discounts is presented net on the statements of net position as a decrease or increase to bonds payable.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

Deferred Charge on Refunding

In accordance with applicable guidance, the excess of the reacquisition price over the net carrying amount of refunded debt is recorded as a deferred outflow of resources on the statements of net position and amortized as a component of interest expense over the shorter of the term of the refunding issue or refunded bonds.

Capital Assets

Capital assets owned by the Authority are recorded at cost. Depreciation of capital assets owned by the Authority is provided on the straight-line method based on the estimated useful lives of the various classes of assets. Utility assets have estimated useful lives ranging from 30 to 70 years. Non-utility assets have estimated useful lives ranging from five to 10 years.

The Authority also receives donated property relating mostly to dedicated water and sewer lines. These assets are capitalized at acquisition value at the date of the donation and depreciated in accordance with the estimated useful lives noted above.

The water and sewer system represents assets leased from the City. Amortization of capital lease assets is provided on the straight-line basis applying an estimated average remaining useful life from the inception of the lease.

Maintenance and repairs are charged to expense as incurred.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of financial position reports a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net position that applies to a future period(s) and so will not be recognized as an outflow of resources (expense) until then.

In addition to liabilities, the statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflow of resources, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (revenue) until that time.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

Classification of Revenues

The Authority has classified its revenues as either operating or non-operating revenues according to the following criteria:

- Operating revenues – Operating revenues include activities that have the characteristics of exchange transactions, such as residential, commercial, and industrial water sales and wastewater treatment.
- Non-operating revenues – Non-operating revenues include activities that have the characteristics of non-exchange transactions, such as grants, interest income and other revenue sources.

Compensated Absences

A liability for vacation, personal, and sick days is accrued when related benefits are attributable to services rendered and to the extent it is probable that the Authority will ultimately compensate employees.

Inventory

Inventory is stated at cost, on a moving average price basis.

Accounts Payable Wastewater Treatment

The Authority has adopted a methodology for recording estimated wastewater treatment accounts payable that assumes a uniform meter reading date for all customers in each cycle. The estimate is based on the portion of wastewater treatment invoices paid after year-end with usage estimated to have occurred during the previous fiscal year. Generally, the methodology assumes either 33%, 66%, or 100% of a cycle remains unbilled at year-end.

Special Item

The Authority has recorded a special item for private line lead replacements. In accordance with GASB Statement No. 34, a special item is defined as an expenditure within control of

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

management and either unusual or infrequent in occurrence. The Authority has determined that private lead line replacements qualify as a special item.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets, deferred outflows of resources, liabilities, deferred inflows of resources, and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Adoption of Accounting Standards

The following Governmental Accounting Standards Board (GASB) statements were adopted for the year ended December 31, 2019: Statement Nos. 83 (Certain Asset Retirement Obligations), 84 (Fiduciary Activities), 88 (Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements), and 90 (Majority Equity Interests). These statements had no significant impact on the Authority's financial statements for the year ended December 31, 2019.

Pending Standards

GASB has issued statements that will become effective in future years, including Statement Nos. 87 (Leases), 89 (Accounting for Interest Cost Incurred before the End of a Construction Period), 91 (Conduit Debt Obligations), 92 (Omnibus 2020) and 93 (Replacement of Interbank Offered Rates). Management has not yet determined the impact of these statements on the financial statements.

3. Transactions with the City of Pittsburgh

During July 1995, the City and the Authority entered into a Capital Lease Agreement and a Cooperation Agreement (collectively referred to as the "Agreements"). The Cooperation Agreement was renegotiated by the Authority's Board of Directors and the City Mayor's Office.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

Cooperation Agreement

Under the terms of the previous Cooperation Agreement, City Water Department employees became employees of the Authority. As a result, the Authority assumed various obligations from the City. The City and the Authority provided various services to each other in accordance with the Cooperation Agreement, and the Authority reimbursed the City for direct and indirect costs attributed by the City to the operation and maintenance of the System.

Under the previous Agreement, the Authority provided up to 600 million gallons of water annually for the City's use without charge. Also, the Authority assumed the City's obligation for the cost of subsidizing water service to residents of the City situated beyond the Authority's service area so that those water users pay charges that mirror the rates of the Authority.

On February 4, 2019, the Authority's Board issued a resolution that the existing Cooperation Agreement shall be terminated in accordance with the terms of the agreement, 90 days after the approval of the resolution. City and Authority officials have collaborated on a New Cooperation Agreement to further implement efficiencies and improvements, including: permitting the Authority to reimburse the City for pension costs for Authority employees covered by the City's pension plans, allowing the City to charge the Authority the usual rates that other utilities pay for permit fees, and charging the City for water, wastewater, and ALCOSAN usage, with a five-year phase-in starting in 2020. The Board implemented the new Cooperation Agreement as of October 3, 2019. This agreement has been filed with the Pennsylvania Public Utility Commission (Commission) according to Title 66, § 507 of the Public Utility Code, and can be modified by order of the Commission.

System Leases

The Capital Lease Agreement stipulates minimum lease payments of approximately \$101 million, all of which were satisfied during the initial three years of the capital lease.

The Capital Lease Agreement has a term of thirty years and provides the Authority with the option to purchase the System for one dollar in 2025.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

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Pension

Most Authority employees participate in the City's Municipal Pension Fund Plan (Plan). Employees who became members of the Plan prior to January 1, 1988 are required to contribute 5% of pre-tax pay. Those joining thereafter are required to contribute 4%. Participation in the Plan is closed to non-union employees hired after March 1, 2019. The Authority's 2019 and 2018 payroll covered by the Plan was approximately \$19,239 and \$15,883, respectively. Employee contributions for the years 2019 and 2018 amounted to \$750 and \$614, respectively.

The City's obligations relative to the Plan are determined in accordance with various Pennsylvania statutes. The extent of the Authority's participation in such obligations with respect to those former City employees whose membership continued upon becoming employees of the Authority, as well as new members, is determined by the Cooperation Agreement.

For the years ended December 31, 2019 and 2018, the City and the Authority determined upon a payment of approximately \$3,627 and \$3,905, respectively, for the Authority's share of the City's pension costs, prior to adjustment for the Authority's portion of the state aid received by the City for pension costs. The Authority's payment was calculated based on a percentage of its covered payroll to the total covered payroll, which approximates 15.4% for 2019 and 2018.

Normal retirement benefits are available upon attainment of age sixty and completion of twenty service years. Early retirement benefits are available upon attainment of age fifty and completion of eight service years. Early retirement benefits may be deferred until age sixty or may be obtained upon retirement at a reduced level. A member who terminates employment after attaining age forty and completing eight service years can sustain eligibility for benefits by continuing contributions through age fifty. A member who terminates employment after attaining fifteen service years, but has been a member since before January 1, 1975, can be vested by continuing contributions through age fifty.

Retirement benefits for employees who were members of the Plan are based upon a percentage of either three-year or four-year average pay, depending on date of hire, subject to certain specified minimum monthly benefit amounts. Special membership and benefit rules apply to those experiencing disability.

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The "net pension liability" is an actuarial present value of credited projected benefits (a standardized measure for financial statement disclosure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future by the Plan as a result of members' service to date) less the pension plan's net position available for paying such benefits. The measure is intended to help users assess the Plan's funding status on a going concern basis, assess progress made in accumulating sufficient assets to pay benefits when due, and make comparisons among public employee retirement systems. The Plan has not reported or attributed measurements of assets or the net pension liability on the basis of the group of members who are Authority employees. The City's net pension liability at December 31, 2019 and 2018 and is \$212,094 and \$233,514, respectively.

Additional information about the Plan and required supplementary information showing the Plan's progress in accumulating sufficient assets to pay benefits when due is presented in the City's Comprehensive Annual Financial Report.

4. Revenue and Accounts Receivable

Water

Water sales revenue is recognized as earned during the period when water is supplied to customers. Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings. The Authority recognizes unbilled accounts receivable for water service provided prior to year-end that is billed during the following year.

Water accounts receivable are presented net of a reserve for uncollectible amounts. This reserve, based on an analytical review of outstanding accounts and historical collection data, is recognized coincident with recognition of revenue. At December 31, 2019 and 2018, the reserve for uncollectible water accounts was approximately \$21.12 million and \$19.75 million, respectively. The Authority has rights to utilize collection agencies, service terminations, liens, and real property sales to protect its interests, limit further losses, and motivate payments from delinquent customers.

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Wastewater Treatment

Although the Authority does not provide wastewater treatment, it assumed responsibility for certain wastewater treatment revenue and expenses beginning in 1996. Effective May 2004, the Authority began direct billing City residents for current and delinquent wastewater treatment charges and remitting to ALCOSAN the aggregate amount of service charges billed. Wastewater treatment activity and the related assets and liabilities appear on the statements of revenue, expenses and changes in net position and the statements of net position, respectively. The related estimated amount of unbilled accounts receivable at year-end has been recorded on the statement of net position. At December 31, 2019 and 2018, the reserve for uncollectible wastewater accounts was approximately \$11.34 million and \$10.61 million, respectively.

Bad Debt Recovery/Expense

For the year ended December 31, 2019, bad debt expense was \$2.98 million and is included in direct operating expenses on the statement of revenues, expenses, and changes in net position. For the year ended December 31, 2018, bad debt recoveries of \$3.5 million included in direct operating expenses on the statement of revenues, expenses, and changes in net position relate in part to collection on City-owned accounts negotiated to be payable and the resolution of large outstanding balances from other local government entities.

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5. Capital Assets

Capital assets consisted of the following at December 31, 2019 and 2018:

	Balance at January 1, 2019	Additions	Deletions/ Reclassification	Balance at December 31, 2019
Capital assets, not being depreciated:				
Construction in progress	\$ 139,303	\$ 91,247	\$ (95,263)	\$ 135,287
Capital assets, being depreciated:				
Utility assets	919,999	95,211	(16,315)	998,895
Non-utility assets	23,819	52	(11,690)	12,181
Total capital assets, being depreciated	943,818	95,263	(28,005)	1,011,076
Less accumulated depreciation	(325,641)	(18,011)	27,867	(315,785)
Total capital assets, being depreciated, net	618,177	77,252	(138)	695,291
Total capital assets	<u>\$ 757,480</u>	<u>\$ 168,499</u>	<u>\$ (95,401)</u>	<u>\$ 830,578</u>
	Balance at January 1, 2018	Additions	Deletions/ Reclassification	Balance at December 31, 2018
Capital assets, not being depreciated:				
Construction in progress	\$ 100,240	\$ 84,567	\$ (45,504)	\$ 139,303
Capital assets, being depreciated:				
Utility assets	875,597	44,402	-	919,999
Non-utility assets	22,717	1,102	-	23,819
Total capital assets, being depreciated	898,314	45,504	-	943,818
Less accumulated depreciation	(308,747)	(16,894)	-	(325,641)
Total capital assets, being depreciated, net	589,567	28,610	-	618,177
Total capital assets	<u>\$ 689,807</u>	<u>\$ 113,177</u>	<u>\$ (45,504)</u>	<u>\$ 757,480</u>

During 2019 and 2018, the Authority received donated utility assets of \$110 and \$13,649, respectively, related to various development projects.

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6. Payroll and Related Obligations

Payroll and related obligations presented on the statements of net position are comprised of:

	Balance at December 31, 2018	Change	Balance at December 31, 2019	Current Portion
Compensated absences	\$ 456	\$ 123	\$ 579	\$ 81
Workers' compensation	167	(44)	123	-
Payroll, withholdings, and taxes	1,308	(400)	908	908
	<u>\$ 1,931</u>	<u>\$ (321)</u>	<u>\$ 1,610</u>	<u>\$ 989</u>

	Balance at December 31, 2017	Change	Balance at December 31, 2018	Current Portion
Compensated absences	\$ 462	\$ (6)	\$ 456	\$ 55
Workers' compensation	200	(33)	167	10
Payroll, withholdings, and taxes	1,149	159	1,308	1,308
	<u>\$ 1,811</u>	<u>\$ 120</u>	<u>\$ 1,931</u>	<u>\$ 1,373</u>

7. Defined Contribution Plan

During 2019, the Authority established a 401(a) profit-sharing plan available to all full-time employees (part-time employees with over 1,000 hours of service) who do not participate in the City's Plan. As part of its fiduciary role, the Authority has an obligation of due care in selecting the third-party administrator. The Authority does not control the assets of the 401(a) profit-sharing plan, and thus the plan is not considered a fiduciary fund of the Authority.

Benefit terms are established and amended by the Authority. Employee contributions are made after-tax and the Authority offers a single match rate up to 5%. Employees become

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vested after three years. For the year ended December 31, 2019, the Authority contributed \$11 to the 401(a) profit-sharing plan.

8. Bonds and Loans Payable

Series 1998

In March 1998, the Authority issued \$36,440 Series B First Lien Revenue Bonds ("1998 Series B Bonds"), the proceeds of which are dedicated to a capital improvements program.

The 1998 Series B Bonds are capital appreciation bonds with an original issuance amount of \$36,440. During 2017, \$12,406 (par) of the 1998 Series B Bonds with an accreted value of \$34,625 were refunded with the Series 2017 A bonds. The remaining 1998 Series B Bonds have maturity values ranging from \$26,930 to \$14,660 from 2027 to 2030. The bonds were issued to yield rates from 5.18% to 5.3%. The 1998 Series B Bonds accrue and compound interest on a semi-annual basis and are carried at cost plus accrued interest. Total maturity value of the 1998 Series B Bonds is \$95,450.

The 1998B Bonds at December 31, 2019 and 2018 have carrying amounts of approximately \$59,900 and \$56,800, respectively.

Series 2008

During June 2008, the Authority issued \$320,515 Series 2008 Water and Sewer System First Lien Revenue Bonds ("2008 Variable Rate Demand Bonds"): \$145,495 Series B of 2008 (variable rate demand), \$51,910 Series C-1 of 2008 (variable rate demand), \$51,885 Series C-2 of 2008 (variable rate demand), and \$71,225 Series D-2 of 2008 (variable rate demand). The purpose of this bond issue was to currently refund the Series 1998A and Series 1998C, to currently refund certain maturities of the Series 2007 B-1 and Series 2007 B-2 Bonds, to advance refund certain maturities of the Series 1998B Bonds, to fund approximately \$98 million of certain capital additions, to fund the premium for the Bond Insurance Policy securing payments on 2008 Variable Rate Demand Bonds, and to fund termination payments on certain interest rate swaps. During 2019, the Series C-1 and C-2 Bonds were currently refunded with the Series 2019B Bonds. As part of the Series 2019B refunding, the related 2008 Series C swaps were terminated, see Note 8: interest rate swaps.

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In connection with these advance refundings, portions of the proceeds of the 2008 Bonds were deposited into irrevocable trusts with an escrow agent to provide for certain debt service payments on the refunded bonds.

The maturity value of defeased 1998B compound interest bonds outstanding at December 2019 and 2018 was \$19,300 and \$19,800, respectively.

Series 2013

During December 2013, the Authority issued \$130,215 Series A First Lien Revenue Refunding Bonds ("2013 Series A Bonds"), the proceeds of which were used to defease through current refunding the entire balance of the Series 2003, Series 2007 B-1, and Series 2007 B-2 and pay certain amounts in respect of termination of certain interest rate swap agreement related to the Series 2007 B-1 and B-2 bonds; \$86,695 Series B First Lien Revenue Bonds ("2013 Series B Bonds"), the proceeds of which are to fund certain water and sewer system capital improvement projects and reimburse the Authority for certain capital expenditures paid for by the Authority.

The 2013 Bonds were issued at a bond premium of \$14,828, which is being amortized as an adjustment to interest expense over the life of the bonds.

During 2017, \$42,340 of Series 2013 B bonds outstanding were currently refunded with Series 2017 A bonds.

The 2013 Bonds at December 31, 2019 and 2018 have carrying amounts of \$114,190 and \$124,880, respectively.

Series 2017

During December 2017, the Authority issued \$165,390 First Lien Revenue Refunding Bonds composed of Series A (159,795) and Series B (taxable) (\$5,595). The proceeds of the bonds were used to fund the costs of the refunding of all or a portion of the Authority's outstanding Series of 1998B, 2008A, 2008D-1, and 2013B water and sewer system revenue bonds.

The 2017 A and B Bonds were issued at a bond premium of \$23,374, which is being amortized as an adjustment to interest expense over the life of the bonds.

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The 2017 A Bonds at December 31, 2019 and 2018 have carrying amounts of \$142,605 and \$151,870, respectively. The 2017 B Bonds were paid off during 2018.

During December 2017, the Authority issued \$218,805 Series C First Lien Revenue Refunding Bonds, the proceeds of which were used to fund the costs of refunding the Authority's outstanding Series 2008 B-1, B-2, and D-2 water and sewer system revenue bonds. The Bonds bear interest at the LIBOR index rate. Upon the phase out of LIBOR in 2021, the interest rate will be replaced by the Federal Funds Rate if not renegotiated prior to the phase out.

The 2017 C Bonds at December 31, 2019 and 2018 have a carrying amount of \$218,805.

Series 2019

During June 2019, the Authority issued \$109,855 Series A First Lien Revenue Bonds, the proceeds of which were used to refund interim debt incurred by the Authority to fund costs of capital projects; and \$104,290 Series B Subordinate Revenue Refunding Bonds, the proceeds of which were used to currently refund all of the Authority's outstanding Series of 2008 C-1 and C-2 bonds, including swap termination payments on interest rate swaps associated with the refunded bonds. The refunding was completed to reduce the Authority's volatility due to the nature of the related swaps and to obtain cash flows savings of \$1,882. After consideration of the Authority's contribution of \$5,700, the net cash outlay and economic loss were \$4,000.

The 2019 A and B Bonds were issued at a bond premium of \$45,090, which is being amortized as an adjustment to interest expense over the life of the bonds.

The 2019 A and B Bonds at December 31, 2019 have carrying amounts of \$109,855 and \$104,290, respectively.

Deferred Charge on Refunding

In conjunction with the debt refundings described above, the Authority has recorded a deferred charge on refunding, which is shown as a deferred outflow of resources on the statements of net position. The deferred charge on refunding at December 31, 2019 and 2018 is as follows:

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	Balance at December 31, 2018	Additions	Amortization	Balance at December 31, 2019
Deferred charge on refunding	\$ 102,534	\$ 4,686	\$ 8,208	\$ 99,012
	Balance at December 31, 2017	Additions	Amortization	Balance at December 31, 2018
Deferred charge on refunding	\$ 110,326	\$ -	\$ 7,792	\$ 102,534

Capital Revolving Line of Credit – Direct Borrowing

In July 2016, the Authority obtained an \$80,000 revolving line of credit to finance certain capital projects. In October 2018, the capital revolving line of credit was amended to increase the maximum amount that can be drawn and outstanding at any one time to \$150,000. The capital revolving line of credit is secured by the revenues of the Authority. The Authority has until July 1, 2020 to request revolving advances on the line of credit, at which time the Authority has the option to convert the unpaid principal amount of the outstanding revolving advances to a term loan advance. The term loan advance base interest rate would be the greater of; prime plus 1.5%, the Federal effective rate plus 1.5% or 8.50%. The capital revolving line of credit contains a provision that in the event of a default, the outstanding amounts under this line of credit become immediately due; and the commitment amount be reduced to \$0; Each revolving advance bears interest at the LIBOR Index Rate, which ranged from 2.85% to 3.429% and 2.04% to 3.429% for the years ended December 31, 2019 and 2018, respectively. At December 31, 2019 and 2018, the interest rate was 2.85% and 3.429%, respectively. At December 31, 2019 and 2018, the Authority had \$62,500 and \$113,000, respectively, in outstanding revolving advances.

Operating Line of Credit – Direct Borrowing

In August 2018, the Authority obtained a \$20,000 revolving line of credit for operating expenses. The operating line of credit was secured by the revenues of the Authority. Amounts outstanding under the operating line of credit bore interest at a rate per annum equal to the daily LIBOR rate plus 0.65%. No draws were made on the operating line of credit during 2018 or 2019. The operating line of credit expired on August 30, 2019 and was not renewed.

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State Loans – Direct Borrowing

The Authority has several loans outstanding from PENNVEST for various capital projects and water and sewer improvement projects, with carrying amounts of \$39,948 and \$27,810 at December 31, 2019 and 2018, respectively. Interest rates vary from 1.00% to 3.25%. The State Loans are secured by the project collateral related to each loan. In an event of default on the State Loans, the entire unpaid principal, plus accrued interest, plus all other amounts due and payable to PENNVEST shall at the option of PENNVEST become due and payable immediately upon request.

Capital Lease

During 2015, the Authority entered into a lease agreement as lessee for financing the acquisition of a utility assets valued at \$7,445. The utility assets have a ten-year estimated useful life. Depreciation on the utility assets began in 2016, with accumulated depreciation totaling \$2,979 and \$2,234 for the years ended December 31, 2019 and 2018, respectively. This lease agreement qualifies as a capital lease for accounting purposes and, therefore, has been recorded at the value of future minimum lease payments as of the inception date. At December 31, 2019 and 2018, the outstanding balance of the capital lease was \$5,439 and \$5,893, respectively.

Swap Borrowing – Direct Borrowing

During November 2014, the Authority terminated the original 2008 Series 2008 C-1A, C-1B, C-1C, and C-2 swaps and reissued and restructured the swaps to bear interest based upon 70% of one-month LIBOR. At termination, those derivative instruments had an aggregate fair value of (\$9,471), which is considered a swap borrowing from the counterparty. The swap borrowing was terminated during the year ended December 31, 2019 with the issuance of the 2019 Series B Bonds. At December 31, 2018, the unamortized balance was \$7,587.

During December 2017, the Authority terminated the original 2008 Series B-1, B-2, and D swaps and reissued and restructured the swaps to bear interest based upon 70% of one-month LIBOR. Upon the phase out of LIBOR in 2021, the interest rate will be replaced by the Federal Funds Rate if not renegotiated prior to the phase out. At termination, those derivative instruments had an aggregate fair value of (\$70,869), which is considered a swap borrowing from the counterparty. The swap borrowing is being amortized over the

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remaining life of the bond. At December 31, 2019 and 2018, the unamortized balance is \$64,837 and \$67,649, respectively.

Bonds, state loans payable, revolving line of credit, capital lease, and swap borrowing consisted of the following at December 31, 2019 and 2018:

	Balance at December 31, 2018	Additions	Accretion	Reductions	Balance at December 31, 2019
Bonds and loans payable:					
Revenue bonds:					
1998 Series B	\$ 56,823	\$ -	\$ 3,047	\$ -	\$ 59,870
2008 Series C-2	51,820	-	-	(51,820)	-
2008 Series C-1A	10,000	-	-	(10,000)	-
2008 Series C-1B	10,000	-	-	(10,000)	-
2008 Series C-1C	5,000	-	-	(5,000)	-
2008 series C-1D	26,840	-	-	(26,840)	-
2013 Series A	86,120	-	-	(10,690)	75,430
2013 Series B	38,760	-	-	-	38,760
2017 Series A	151,870	-	-	(9,265)	142,605
2017 Series C	218,805	-	-	-	218,805
2019 Series A	-	109,855	-	-	109,855
2019 Series B	-	104,290	-	-	104,290
	<u>656,038</u>	<u>214,145</u>	<u>3,047</u>	<u>(123,615)</u>	<u>749,615</u>
Direct borrowings:					
State loans (PENNVEST)	27,810	15,323	-	(3,185)	39,948
Revolving line of credit	113,000	80,700	-	(131,200)	62,500
Swap borrowing	75,236	-	-	(10,399)	64,837
Capital lease	5,893	-	-	(454)	5,439
	<u>877,977</u>	<u>310,168</u>	<u>3,047</u>	<u>(268,853)</u>	<u>922,339</u>
Unamortized bond (discount) premium	29,049	45,090	-	(4,153)	69,986
Total bonds and loans, net	<u>\$ 907,026</u>	<u>\$ 355,258</u>	<u>\$ 3,047</u>	<u>\$ (273,006)</u>	<u>\$ 992,325</u>

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	Balance at December 31, 2017	Additions	Accretion	Reductions	Balance at December 31, 2018
Bonds and loans payable:					
Revenue bonds:					
1998 Series B	\$ 53,911	\$ -	\$ 2,912	\$ -	\$ 56,823
2008 Series C-2	51,820	-	-	-	51,820
2008 Series C-1A	10,000	-	-	-	10,000
2008 Series C-1B	10,000	-	-	-	10,000
2008 Series C-1C	5,000	-	-	-	5,000
2008 series C-1D	26,840	-	-	-	26,840
2013 Series A	93,825	-	-	(7,705)	86,120
2013 Series B	38,760	-	-	-	38,760
2017 Series A	159,795	-	-	(7,925)	151,870
2017 Series B	5,595	-	-	(5,595)	-
2017 Series C	218,805	-	-	-	218,805
	<u>674,351</u>	<u>-</u>	<u>2,912</u>	<u>(21,225)</u>	<u>656,038</u>
Direct borrowings:					
State loans (PENNVEST)	31,188	-	-	(3,378)	27,810
Revolving line of credit	43,800	69,200	-	-	113,000
Swap borrowing	78,431	-	-	(3,195)	75,236
Capital lease	6,331	-	-	(438)	5,893
	<u>834,101</u>	<u>69,200</u>	<u>2,912</u>	<u>(28,236)</u>	<u>877,977</u>
Unamortized bond (discount) premium	32,076	-	-	(3,027)	29,049
Total bonds and loans, net	<u>\$ 866,177</u>	<u>\$ 69,200</u>	<u>\$ 2,912</u>	<u>\$ (31,263)</u>	<u>\$ 907,026</u>

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Debt service payments on the Revenue Bonds at December 31, 2019 are as follows:

	Revenue Bonds		
	Principal	Interest	Total
2020	\$ 23,300	\$ 31,258	\$ 54,558
2021	24,255	30,090	54,345
2022	25,430	28,873	54,303
2023	26,775	27,597	54,372
2024	27,370	26,277	53,647
2025-2029	98,671	177,624	276,295
2030-2034	173,484	101,908	275,392
2035-2039	229,665	46,631	276,296
2040-2044	79,939	7,076	87,015
	708,889	477,334	1,186,223
Accretion	40,726	(40,726)	-
Total	<u>\$ 749,615</u>	<u>\$ 436,608</u>	<u>\$ 1,186,223</u>

Debt service payments of the State Loans at December 31, 2019 are as follows:

	State Loans		
	Principal	Interest	Total
2020	\$ 3,668	\$ 615	\$ 4,283
2021	4,064	554	4,618
2022	4,087	492	4,579
2023	3,963	431	4,394
2024	3,789	372	4,161
2025-2029	16,224	1,056	17,280
2030-2034	4,042	92	4,134
2035	111	-	111
	<u>\$ 39,948</u>	<u>\$ 3,612</u>	<u>\$ 43,560</u>

Repayment of the revolving line of credit will begin once the Authority has drawn all available advances from the line, but no later than July 2020.

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Minimum lease payments of the capital lease at December 31, 2019 are as follows:

	Capital Lease		Total
	Principal	Interest	
2020	\$ 469	\$ 178	\$ 647
2021	486	161	647
2022	502	145	647
2023	520	127	647
2024	537	109	646
2025-2029	2,925	256	3,181
	<u>\$ 5,439</u>	<u>\$ 976</u>	<u>\$ 6,415</u>

Amortization on the swap borrowing is as follows:

Year Ending December 31,	Principal	Interest
2020	\$ 2,882	\$ 1,582
2021	2,953	1,510
2022	3,027	1,437
2023	3,102	1,362
2024	3,179	1,285
2025-2029	17,117	5,203
2030-2034	19,288	2,971
2035-2039	12,872	757
2040	417	5
	<u>\$ 64,837</u>	<u>\$ 16,112</u>

Interest payments were calculated for the Variable Rate Bonds using the synthetic fixed rate interest rates as described in Note 9.

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Interest and amortization expense for the years ended December 31 is as follows:

	<u>2019</u>	<u>2018</u>
Bond, loan and swap interest	\$ 30,638	\$ 24,327
Accretion	3,047	2,912
Amortization of deferred refunding loss, discounts and premiums	2,708	4,765
Other	2,347	2,361
	<u>\$ 38,740</u>	<u>\$ 34,365</u>

In accordance with the provisions of the trust indentures for the 1998, 2013, 2017, and 2019 Bonds, the Authority has created a number of funds that are restricted for specific purposes. The complement of these restricted funds, collectively referred to on the statements of net position as "Restricted Assets," at December 31, 2019 and 2018 was:

	<u>2019</u>	<u>2018</u>
Capital project funds	\$ 1	\$ 1
Debt service and reserve funds	6,643	6,937
Operating reserve account	18,712	15,792
Other funds	608	596
	<u>\$ 25,964</u>	<u>\$ 23,326</u>

Among the Authority's debt covenants is one which requires that rates charged by the Authority will be sufficient to satisfy a formula which is intended to ensure that the Authority will be able to satisfy debt service requirements. If the Authority fails to comply with the rate covenant, the Authority shall request a Qualified Independent Consultant (QPI) to submit a written report and recommendations with respect to increases in the Authority's rates, fees and other charges and improvements in the operations and the services rendered and the Authority's accounting and billing procedures necessary to bring the Authority into compliance. Any failure to meet the rate covenant will not result in an event of default if within 180 days after the tested year end, the Authority files the report of the QPI and the Authority revises its rates, fees and charges and alter its operations and services to conform to the report of the QPI to the extent permitted by law.

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The trust indenture also requires that revenue collections be deposited into a Revenue Fund and disbursed therefrom as provided for in the trust indenture. This Revenue Fund constitutes the vast majority of unrestricted funds cash and cash equivalents. At December 31, 2019 and 2018, the Authority was in compliance with these covenants.

9. Interest Rate Swaps

Interest rate swaps disclosures (not in thousands) as of December 31, 2019 and 2018 are presented below.

Interest rate swaps at December 31, 2019:

Current Notional Amount	Effective Date	Maturity Date	Interest Rate Paid	Interest Rate Received	Counterparty Credit Rating	Underlying Bonds
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Hedging Derivatives, Cash Flow Hedges, Receive Variable - Pay Fixed, Interest Rate Swaps:

\$ 72,747,500	12/28/2017	9/1/2039	1.732%	70% 1mo LIBOR	A-	Series 2017 C *
72,747,500	12/28/2017	9/1/2039	1.732%	70% 1mo LIBOR	A+	Series 2017 C *
71,225,000	12/28/2017	9/1/2040	1.735%	70% 1mo LIBOR	A+	Series 2017 C *

* - Represents a hybrid instrument comprised of an on-market swap and a borrowing. The information above reflects the on-market rate as of the date on which the swap was associated with the underlying bonds.

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Interest Rate Swap – Fair Value Information:

Notional Amount	12/31/2017 Fair Value *	Change in Fair Value	12/31/2018 Fair Value *	Change in Fair Value	Swap Termination	12/31/2019 Fair Value *	Underlying Bonds
Hedging Derivatives, Cash Flow Hedges, Receive Variable - Pay Fixed, Interest Rate Swaps:							
\$ 72,747,500	\$ (484,501)	\$ 2,021,053	\$ 1,536,552 **	\$ (5,911,917)	\$ -	\$ (4,375,365) ***	Series 2017 C
41,464,000	(1,834,140)	1,077,156	(756,984) ***	(10,171,016)	10,928,000	-	Series 2008 C
72,747,500	(484,501)	2,020,053	1,535,552 **	(5,910,917)	-	(4,375,365) ***	Series 2017 C
71,225,000	(475,904)	2,154,251	1,678,347 **	(6,278,978)	-	(4,600,631) ***	Series 2017 C
	(3,279,046)	7,272,513	3,993,467	(28,272,828)	10,928,000	(13,351,361)	
Investment Derivatives, Receive Variable - Pay Fixed, Interest Rate Swap:							
62,196,000	(15,039,536)	2,542,135	(12,497,401) ***	(4,179,599)	16,677,000	-	Series 2008 C
Total	\$ (18,318,582)	\$ 9,814,648	\$ (8,503,934)	\$ (32,452,427)	\$ 27,605,000	\$ (13,351,361)	

* The fair value is an estimated net present value of the expected cash flows calculated using relevant mid-market data inputs and based on the assumption of no unusual market conditions or forced liquidation.

** Reported as hedging derivative - interest rate swap on the Statement of Net Position.

*** Reported as swap liability on the Statement of Net Position.

Description of the Swaps

During fiscal year 2008, the Authority entered into five pay-fixed, receive-variable interest rate swap contracts. The 2008 C interest rate swaps were effective June 12, 2008. Beginning September 1, 2008, the Authority began to make semi-annual interest payments on the 1st of each March and September through September 1, 2035 (two swaps); September 1, 2039 (two swaps); and, September 1, 2040 (for one swap), respectively. The Counterparties make monthly interest payments on the 1st of each calendar month, which began July 1, 2008 through September 1, 2035 for two of the swaps; September 1, 2039 for two of the swaps; and September 1, 2040 for one swap.

The intention of the 2008 swaps was to effectively change the Authority's variable interest rate on the \$145,495 Water and Sewer System (Variable Rate Demand) First Lien Revenue Refunding Bonds Series B of 2008, on the \$71,225 Water and Sewer System (Variable Rate Demand) First Lien Revenue Bonds Series D-2 of 2008, and on the \$103,795 Water and Sewer System (Variable Rate Demand) Subordinate Revenue Refunding Bonds Series C of 2008 (the bonds) to synthetic fixed rates of 4.038%, 4.103%, and 3.998%, respectively.

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During November 2014, the 2008 Series C Bonds were reissued and restructured to bear interest based upon 70% of one-month LIBOR. In conjunction with this reissuance/restructuring, the floating rate on the Series 2008 C swaps was converted from SIFMA to 70% of one-month LIBOR and the fixed rate was amended from 3.998% to 3.50%. With respect to the Series 2008 C swap treated as an effective hedge, this "off-market" swap is considered to be a hybrid instrument consisting of an on-market swap and a borrowing. The on-market swap rate is calculated as of the date of reissuance. The borrowing will be amortized over the remaining life of the swap and is included in bonds and loans payable on the statement of net position. See Note 7: Bonds and Loans Payable for detail on the borrowing.

The bonds will accrue interest at a weekly rate that is determined by a remarketing agent on each effective rate date. The interest rate on the bonds may not exceed 12%. Per the interest rate swap agreements, the Authority will receive SIFMA Municipal Swap Index while paying fixed rates as noted in the chart above.

The interest payments on the 2008 interest rate swaps are calculated based on notional amounts, all of which reduce, beginning on September 1, 2012 for the 2008 C Bonds, September 1, 2032 for the 2008 D2 Bonds and September 1, 2035 for the 2008 B Bonds, so that the notional amounts approximate the principal outstanding on the respective bonds. The interest rate swaps expire consistent with the final maturity of the respective bonds.

During December 2017, the swaps that were previously associated with the 2008 B-1, 2008 B-2 and 2008D bonds were newly associated with the 2017C refunding Bonds.

During 2019, the swaps associated with the Series 2008C bonds were terminated as part of the issuance of the Series 2019B Bonds.

Description of 2017 C Swaps

During fiscal year 2017, the Authority restructured three pay-fixed, receive-variable interest rate swap contracts. The original interest rate swaps were effective June 12, 2008. Beginning December 28, 2017, the Authority will make semi-annual interest payments on the 1st of each March and September through September 1, 2039 (two swaps); and, September 1, 2040 (for one swap), respectively. The Counterparties make monthly interest payments on the 1st of each calendar month, which begin February 2018 through September 1, 2039 for two of the swaps; and, September 1, 2040 for one swap.

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The intention of the 2017 swaps restructuring is to effectively change the Authority's variable interest rate on the \$216,720,000, Water and Sewer System First Lien Revenue Refunding Bonds Series C of 2017 with notional amounts of \$71,225,000, \$72,747,500, and \$72,747,500 to fixed rates of 3.8255%, 3.770%, and 3.7835%, respectively.

The bonds will accrue interest at a weekly rate that is determined by a remarketing agent on each effective rate date. The interest rate on the bonds may not exceed 12%. Per the interest rate swap agreements, the Authority will receive 70% of one-month LIBOR.

The interest payments on the interest rate swaps are calculated based on notional amounts, all of which reduce beginning on September 2032, so that the notional amounts approximate the principal outstanding on the respective bonds. The interest rate swaps expire consistent with the final maturity of the respective bonds.

Accounting and Risk Disclosures

During the years ended December 31, 2019 and 2018, the Authority paid \$8,243 and \$10,564, respectively, fixed and received \$4,464 and \$4,430, respectively, variable related to their outstanding swap agreements.

As noted in the tables above, current period changes in fair value for the interest rate swaps that are accounted for as hedges are recorded on the statements of net position as an adjustment to hedging derivative – interest rate swap, deferred outflows or deferred inflows. Additionally, current period changes in fair value for the interest rate swap accounted for as an investment is recorded on the statements of revenues, expenses, and changes in net position as a component of investment income. The fair value of the outstanding interest rate swaps as of December 31, 2019 and 2018 is reported on the statements of net position as a swap liability. The swaps are valued using significant other observable inputs (Level 2 inputs).

The Authority has the ability to early terminate the interest rate swaps and to cash settle the transaction on any business day by providing at least two business days' written notice to the counterparty. Evidence that the Authority has sufficient funds available to pay any amount payable to the counterparty must be provided at the time notice is given. At early termination, the Authority will be required to pay or receive a settlement amount which is comprised of the fair value of the terminated transaction(s) based on market quotations and any amounts accrued under the contract(s).

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Through the use of derivative instruments such as interest rate swaps, the Authority is exposed to a variety of risks, including credit risk, interest rate risk, termination risk, basis risk, and rollover risk.

- Credit risk is the risk that a counterparty will not fulfill its obligations. The credit ratings by Moody's Investors Service, Inc., a nationally recognized statistical rating organization for the respective counterparties are listed in the table above. If a counterparty failed to perform according to the terms of the interest rate swap agreement, there is some risk of loss to the Authority, up to the fair value of the swaps.

The Authority currently does not enter into master netting arrangements with its counterparties. As such, each derivative instrument should be evaluated on an individual basis for credit risk. As of December 31, 2019, the Series 2017 C derivative instruments currently have a negative fair value position to the Authority; therefore, the Authority is not exposed to credit risk.

Concentration of credit risk: The Authority's outstanding market value as of December 31, 2019 and 2018, respectively, is \$(8,974,996) and \$(9,283,582) with one counterparty and \$(4,375,365) and \$779,568 with the second counterparty. Both counterparties operate in the same markets and could be similarly impacted by changes in economic or other conditions.

It is the Authority's policy to require counterparty collateral posting provisions in its non-exchange traded derivative instruments. Their terms require collateral to be posted if the respective counterparty's credit rating falls below BBB- by Standard & Poor's and the swap insurer becomes bankrupt. The amount of collateral to be posted is calculated based on derivatives in asset positions to the Authority. As of year-end, the counterparties had not and were not required to post collateral for these transactions.

- Termination risk is the risk that a derivative's unscheduled end will affect the Authority's asset/liability strategy or will present the Authority with potentially significant unscheduled termination payments to the counterparty. The counterparties to the interest rate swaps do not have the ability to voluntarily terminate the interest rate swap; however, the Authority is exposed to termination risk in the event that one or more of the counterparties default. The Authority has

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the ability to voluntarily terminate the swaps with prior written consent of the insurer by providing between 2 and 20 business days notice to the counterparty. The Authority must demonstrate the ability to pay all amounts due to the counterparty on the termination date. During 2017, the 2008 B-1, B-2, and D swaps were terminated and reissued. During 2019, the 2008C swaps were terminated through the Series 2019B bond issuance.

- Interest rate risk is the risk that changes in interest rates will adversely affect the fair values of a government's financial instruments or cash flows. The interest rate swap that is accounted for as an investment exposes the Authority to interest rate risk. The interest rate swap is highly sensitive to changes in interest rates; changes in the variable rate will have a material effect on the swap's fair value. The interest rate swap will terminate on September 4, 2035. The interest rate swap was terminated during 2019.
- Basis risk is the risk that arises when variable interest rates on a derivative and an associated bond or other interest-paying financial instrument are based on different indexes. The Authority is subject to basis risk on the 2008 C swaps as the interest index on the variable rate arm of the swaps is based on the 70% of one-month LIBOR and the variable interest rate on the bonds is based on a different index, a weekly rate that is determined by a remarketing agent. Although expected to correlate, the relationships between different indexes vary and that variance could adversely affect the Authority's calculated payments, and as a result cost savings or synthetic interest rates may not be realized.

The Authority is further subject to basis risk in the event that the underlying bonds become fixed rate Bank Bonds or that the maturity of the underlying bonds is accelerated.

Upon the phase out of LIBOR in 2021, the interest rate will be replaced by the Federal Funds Rate if not renegotiated prior to the phase out.

- Rollover risk is the risk that a derivative associated with the Authority's debt does not extend to the maturity of that debt. When the derivative terminates, the associated debt will no longer have the benefit of the derivative. The Authority is not exposed to rollover risk as the swap agreements terminate on the same day the last payment is due on the respective bonds.

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Contingencies

All of the Authority's derivative instruments include provisions that require the Authority to post collateral in the event that the credit ratings of its credit support provider's senior long term, unsecured debt credit rating falls below BBB- by Standard & Poor's and FSA, the swap insurer, becomes bankrupt. The collateral is to be posted in the form of cash, U.S. Treasuries or other approved securities. As of year-end, the Authority was not required to post collateral for these transactions.

10. Deposits and Investments with Financial Institutions

The Authority is authorized to invest in: obligations of the U.S. Government and government-sponsored agencies and instrumentalities; fully insured or collateralized certificates of deposits; commercial paper of the highest rating; repurchase agreements collateralized by government obligations or securities; highly rated bank promissory notes or investment funds or trusts; and, as to trustee assets, as otherwise permitted by the trust indenture as supplemented and amended in 2019. Throughout the years ended December 31, 2019 and 2018, the Authority invested its funds in such authorized investments. The Authority has a formal investment policy which addresses custodial credit risk, interest rate risk, credit risk, or concentration of credit risk.

GASB Statement No. 40, "*Deposit and Investment Risk Disclosures*," requires disclosures related to the following deposit and investment risks: credit risk (including custodial credit risk and concentration of credit risk), interest rate risk, and foreign currency risk. The following is a description of the Authority's deposit and investment risks:

Custodial Credit Risk – Custodial credit risk is the risk that in the event of a bank failure, the Authority's deposits may not be returned to it. As of December 31, 2019 and 2018, \$73,827 and \$51,969, respectively, of the Authority's bank balance of \$74,077 and \$52,219, respectively, was exposed to custodial credit risk; \$73,827 and \$51,969 of these amounts exposed to custodial credit risk are collateralized in accordance with Act 72 of the Pennsylvania state legislature, which requires the institution to pool collateral for all governmental deposits and have the collateral held by an approved custodian in the institution's name. These deposits have carrying amounts of \$64,680 and \$46,920 as of December 31, 2019 and 2018, respectively, all of which is reported as current assets in the statements of net position.

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At December 31, 2019, the Authority held the following investment balances:

	Carrying value	Maturity in years Less than 1 year
PA INVEST	\$ 8,997	\$ 8,997
Money market	16,360	16,360
U.S. Treasury bills	607	607
Total Investments	\$ 25,964	\$ 25,964

At December 31, 2018, the Authority held the following investment balances:

	Carrying value	Maturity in years Less than 1 year
PA INVEST	\$ 8,761	\$ 8,761
Money market	13,970	13,970
U.S. Treasury bills	595	595
Total Investments	\$ 23,326	\$ 23,326

Money market funds are included in cash and cash equivalents as non-current restricted assets on the statements of net position.

The carrying value of the Authority's investments is the same as their fair value amount. U.S. Treasury bills are valued using quoted market prices (Level 1 inputs).

The Authority's investments in money markets and PA INVEST (external investment pool) are the same as the value of the pool shares and are reported at amortized cost, which approximates market. All investments in an external investment pool that are not SEC-registered are subject to oversight by the Commonwealth. The Authority can withdraw funds from INVEST without limitations or fees.

Interest Rate Risk – Interest rate risk is the risk that changes in the interest rates will adversely affect the fair value of the Authority's investments. The Authority is not

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subject to interest rate risk, as all of its investments at December 31, 2019 and 2018 had maturities of less than one year.

Credit Risk – Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. As of December 31, 2019, the Authority's investments in PA INVEST were rated AAAm by Standard & Poor's. The Authority's investments in U.S. Treasury bills at December 31, 2019 were rated AA+ by Standard & Poor's.

Concentration of Credit Risk – Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investments in a single issuer. The Authority has the following limits, applicable at the time of purchase:

Security Type	Maximum Allocation	Maximum Issuer
U.S. Government Securities	100%	N/A
U.S. Government Agencies & Instruments:		
Guaranteed by the full faith and credit of the United States	100%	N/A
Not guaranteed by the full faith and credit of the United States	60%	40%
Bank Certificates of Deposit	30%	20%
Negotiable Certificates of Deposit	30%	10%
Bank Acceptances	15%	3%
Commercial Paper	20%	3%
Money Market Funds	100%	N/A
Local Government Investment Pools	100%	N/A
Savings or demand deposits	100%	N/A
Repurchase Agreements	25%	10%

The Authority was in compliance with the established limits at December 31, 2019 and 2018.

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11. Net Position

Net position represents the difference between assets, deferred outflows of resources, and liabilities. An analysis of net position amounts is as follows:

	December 31,	
	2019	2018
Net investment in capital assets:		
Net property, plant, and equipment	\$ 830,578	\$ 757,480
Debt subject to capital improvements	(886,762)	(794,111)
Swap liability net of deferred outflow and inflow	-	(12,497)
Swap borrowing	(64,837)	(75,236)
Deferred charge on refunding	99,012	102,534
Restricted for capital activity and debt service:		
Capital projects	1	1
Debt service and reserve funds	6,643	6,937
	<u>(15,365)</u>	<u>(14,892)</u>
Restricted assets:		
Operating reserve account	18,712	15,792
Other funds	608	596
	<u>19,320</u>	<u>16,388</u>
Unrestricted	<u>(2,420)</u>	<u>(5,855)</u>
Total net position	<u>\$ 1,535</u>	<u>\$ (4,359)</u>

12. Operating Lease

Operating Lease

The Authority leases office space. The term of the lease is for twenty years commencing on August 1, 2007 and ending on July 31, 2027. The lease is subject to an automatic roll-over for five years, if the Authority does not communicate in writing one year prior to expiration that it desires not to extend the lease. The general terms of the lease require the lessor to provide for utilities, building repairs, maintenance, and real estate taxes.

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The total minimum future commitments under the lease for year ended December 31, 2019 are as follows:

2020	\$	815
2021		815
2022		823
2023		844
2024		844
2025-2027		<u>2,320</u>
	\$	<u>6,461</u>

The total annual rental for office space was approximately \$913 and \$707 for 2019 and 2018, respectively.

13. Commitments and Contingencies

The Authority is proceeding with a capital improvement program which the Authority's independent engineer has estimated will entail expenditure of the existing construction funds and potential future bond issues.

The Authority was insured for general liability coverage through 2001; however, effective January 1, 2002, it became self-insured. In previous years, the Authority established a fund to pay for deductibles, small claims, and other litigation costs. At year-end, the balance in this fund was approximately \$607. This fund is grouped with "Restricted Assets" on the statements of net position. During 2019 and 2018, the Authority paid \$0 from this fund for claims.

In addition to the matters discussed below and in Note 14, Consent Agreement, various other claims and lawsuits are pending against the Authority.

Attorney General Criminal Complaint

On September 6, 2017, the Authority self-reported violations of the Safe Drinking Water Act, dating back to July of 2016, to the Pennsylvania Department of Environmental Protection (PADEP). The Authority failed to provide at least 45-day notice prior to

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commencing partial water line replacements to affected residents and failed to collect representative water samples from residences within 72 hours of completion of the partial water line replacements.

On November 17, 2017, the Authority and the PADEP entered into a voluntary Consent Order and Agreement in full satisfaction of these violations whereby the Authority paid the PADEP a fine of \$2,400 with \$1,800 of the fine designated for the Authority to perform a Community Environmental Project acceptable to the PADEP. The fine was paid, and the Community Environmental Project was designated and approved by the PADEP as a grant to assist low income homeowners in the Authority's service system in their replacement of privately-owned lead service lines on their property.

At some point after the Authority self-reported these violations to the PADEP, the PADEP referred the matter to the PA Attorney General's Office for investigation of potential criminal liability. After investigation, the PA Attorney General's Office concluded that no individuals were criminally liable for any of the violations of the Safe Drinking Water Act.

However, on February 1, 2019, the PA Attorney General's Office filed a criminal complaint against the Authority as a corporation. The complaint alleged the same self-reported violations, the same type of monetary penalties, and the same suggested type of Community Environmental Project as the Authority already paid under the voluntary Consent Order and Agreement dated November 17, 2017.

The Authority is contesting these duplicative charges and penalties.

Lead Mitigation

The Authority has implemented a number of critical initiatives to comply with the lead service line replacement consent order, and other requirements mandated by the PADEP. These initiatives include: (1) a lead service line identification program to be completed by 2020 for residential properties and 2022 for commercial properties, (2) a water treatment program to mitigate lead corrosion so as to comply with current water quality standards, and (3) a lead service line replacement program. These requirements are stipulated in the PADEP consent order with the Authority dated November 2017.

Lead Service Line Identification Program: The lead service line identification program determines the materials of manufacture for each existing water service line in the

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Authority's system. The first phase of that program was completed with the digitization of existing records, which is currently available to the public via the Authority's website. The second phase, which has evolved since the signing of the consent order, consists of a combination of video inspection of accessible service lines to evaluate the materials of manufacture, identification of private service lines while replacing meters, the development of a machine-learning predictive model in conjunction with the University of Pittsburgh and further records mining with the Authority, City of Pittsburgh and Allegheny County Plumbing Department. All updated records are made publicly available on the Authority's website as soon as possible, but no more than 120 days after a video inspection is completed and accepted by the Authority. The third phase includes identifying service line locations that were unable to be confidently determined using the above methods. The identification program will culminate in a complete digital file and mapping of all service lines within the Authority's service territory.

Water Treatment: Chemical treatment testing of orthophosphate application to the Authority's finished water demonstrates rapid mitigation of lead and copper corrosion to levels well below any current federal drinking water standard. The Authority fully implemented the introduction of orthophosphate to the drinking water system in April 2019, and the latest 6-month round (December 2019) of lead monitoring results were at 10.0 parts per billion (ppb), below the 2018 and June 2019 reported levels of up to 22 ppb and below Federal action level of 15.0 ppb. [Action levels are the EPA's established standard for water system compliance with the Federal Lead and Copper Rule.]

Lead Service Line Replacement: The Authority was ordered by PADEP to replace 1,341 public owned lead service lines by June 30, 2018 and an additional 7 percent of the public owned lead service lines by December 31, 2018 (a total of about 2,200). By the end of 2018 a total of 2,765 public lead service lines had been replaced. In addition, the Authority is required to continue to replace 7 percent of the initial number of lead service lines in the system (revised to 855 based upon PWSA data) until two consecutive 6-month monitoring period sampling events are below the lead action level. In January 2019, the Authority awarded \$35.9 million in contracts for lead line replacements. Since the June 2019 monitoring results exceeded the lead action level, an additional 855 public lead service lines were replaced, prior to the June 2020 deadline. As of the date of this report, over 6,800 public lead service lines have been replaced.

In March 2019, the Authority started work on the 2019 Neighborhood LSLR project with \$49.1 million in funding through PENNVEST, of which \$35.4 million is a loan and \$13.7

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million is a grant. As of the date of this report the Authority has replaced the initial planned number of lead service lines (3,400) and estimates that over 4,300 public lead service lines will be replaced with the available funding. Moving forward, the Authority will begin replacing lead service lines in concert with a water main replacement program. In this manner, the Authority can minimize the overall cost for water main and service line replacements. Most of the remaining lead service lines are connected to the oldest water mains in the system, most subject to breakage and failure. The Authority is implementing a small diameter water main program throughout the city to replace the oldest pipes and services at the same time, with construction bids received in February 2020 for the current program of 15 miles of water main replacement. The Authority will strive to implement this program at the lowest possible cost to the Authority, while addressing those water mains that have the highest likelihood of failure. The Authority's investment in water main replacement will continue unabated to ensure that the Authority can mitigate the amount of annual pipe breaks and minimize the risk of service disruption to its customers. The Authority's program intends to achieve an average water main life more in line with national standards.

Environmental Protection Agency

The Authority has been cooperating with the Environmental Protection Agency ("EPA") in an investigation related to The Authority's Aspinwall Water Treatment Plant. The investigation is ongoing and involves potential violations of the Clean Water Act, Sections 1319(c)(2) and (4) in 2016 and prior years, which may result in penalties. The Authority has redoubled its training and operations monitoring under the auspices of the PADEP and USEPA to provide greater assurance of full regulatory compliance.

14. Consent Agreement

The Authority is subject to federal regulation under the Clean Water Act (1977) and regulations adopted under that Act. Among the specific requirements applicable to the Authority's system are those imposed by the United States Environmental Protection Agency's Combined Sewer Overflow (CSO) Policy (1994). On January 29, 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (COA) regarding wet weather sewer overflows within the City. The other signatories to the COA are the Pennsylvania Department of Environmental Protection (DEP) and the Allegheny County Health Department (ACHD).

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Generally, the COA requires the Authority and the City to assess the City sewers to develop a plan with ALCOSAN to address wet weather sewer overflows within the City. The COA is part of a sewer assessment program for all municipalities served by ALCOSAN. To date, assessment activities have been completed for all accessible critical sewers and separate sanitary sewers with the exception of any additional sewers discovered through continued research and investigation. Ongoing pipe and manhole repairs are being completed to provide CCTV access to remaining inaccessible critical/sanitary sewer pipes. Assessment activities for non-critical sewers are to be completed on a longer schedule. The majority of accessible non-critical manholes have been inspected with ongoing efforts to complete any remaining or newly identified. The required Wet Weather Feasibility Study (WWFS) was submitted to the DEP and ACHD on time in July of 2013. This long-term control plan outlined system-wide improvements, including Green Infrastructure (GI) that the Authority would implement over the next 20 years.

As this COA with the DEP expired in March 2015, the U.S. Environmental Protection Agency (USEPA) became the main regulatory body to which the Authority is responsible. On January 21, 2016 the USEPA issued a Clean Water Act Section 308 Information Request to the Authority. The nature of the request is to provide a jurisdictional basis for USEPA to engage the Authority/City in an enforcement action by consent, or a Consent Decree (CD). The Authority intends that through such an action, it can more fully participate in the implementation of interim regional wet weather activities, controls, and improvements. The Authority further understands that such an action will also permit the Authority/City to participate more fully in the identification and implementation of any final wet weather control measures for the region. The USEPA 308 request required the Authority to submit detailed information on past CSO performance and activities. It also required the Authority to conduct a source reduction analysis for the entire service area, followed by GI demonstration projects.

The Authority hired two engineering firms to assess and model the sewer system, fulfilling the first phase of responding to the USEPA 308 request, which was due by March 31, 2016. The second phase of responding to the request was fulfilled by the completion of a source reduction study, which was submitted by the due date of December 1, 2016, and the construction of GI Demonstration Projects and submission of project performance evaluations, which were completed prior to the due date of December 1, 2017. An additional 308 request from the USEPA was received in October 2016 seeking more detailed information and further actions regarding the assessment of the Authority's sewer system. The response to the October 2016 was delivered, on time, in January 2017.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2019 AND 2018

In addition to the assessment, the USEPA 308 request also requires the Authority and the City to continue implementing the Nine Minimum Controls to reduce combined sewer overflows, and to perform repairs and maintenance of deficiencies revealed by the assessment. The Authority maintains an expedited response to significant structural failures of the sewer system where imminent structural failures are determined by a professional engineer and prioritized for repair. Ongoing sewer line replacement, point repair, lining, point lining, and gunite projects have been implemented to address structural deficiencies. The USEPA 308 request also requires the submission of monthly reports updating the progress of the evaluations and improvements, as well as water quality impacts. These reports are submitted monthly.

The Authority, along with the other impacted local municipalities, are awaiting a response from the USEPA and the DEP on its proposed regional plan. Given the broad scope of a potential CD, the size of the City sewer system, and the various conditions and/or deficiencies that may be discovered by the assessment, it is difficult to predict the total cost of compliance with the CD. Moreover, it is difficult to predict what, if any, largescale and/or regional capital improvements may be required after the completion of the assessment to address wet weather sewer overflows in the City and in the ALCOSAN service area. Costs associated with CD and COA compliance will be reflected in the capital improvement program and funded by proceeds of potential future bond issuances.

15. Subsequent Event

In early 2020, an outbreak of a novel strain of coronavirus was identified and infections have been found in a number of countries around the world, including the United States. The coronavirus and its impact on trade including customer demand, travel, employee productivity, supply chain, and other economic activities has had, and may continue to have, a potentially significant effect on financial markets and business activity. The extent of the impact of the coronavirus on our operational and financial performance is currently uncertain and cannot be predicted. The Authority continues to implement critical infrastructure projects to sustain and improve operations, as well as satisfy our regulatory requirements.

SUPPLEMENTARY INFORMATION

PITTSBURGH WATER AND SEWER AUTHORITY

COMBINING STATEMENT OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019

	Water	Sewer	Sewer Treatment	Total
Assets				
Current assets	\$ 61,233	\$ 30,159	\$ -	\$ 91,392
Noncurrent assets	573,883	282,659	-	856,542
Total Assets	635,116	312,818	-	947,934
Deferred Outflows of Resources				
Deferred charge on refunding	66,338	32,674	-	99,012
Accumulated decrease in fair value of hedging derivatives	8,945	4,406	-	13,351
Total Deferred Outflows of Resources	75,283	37,080	-	112,363
Liabilities				
Current liabilities	53,175	26,191	-	79,366
Noncurrent liabilities	682,957	284,287	12,152	979,396
Total Liabilities	736,132	310,478	12,152	1,058,762
Net Position				
Net investment in capital assets	(10,295)	(5,070)	-	(15,365)
Restricted	12,944	6,376	-	19,320
Unrestricted	(28,382)	38,114	(12,152)	(2,420)
Total Net Position	\$ (25,733)	\$ 39,420	\$ (12,152)	\$ 1,535

PITTSBURGH WATER AND SEWER AUTHORITY

COMBINING STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

(Dollars expressed in thousands)

YEAR ENDED DECEMBER 31, 2019

	Water	Sewer	Sewer Treatment	Total
Operating Revenues	\$ 110,610	\$ 67,469	\$ 70,970	\$ 249,049
Operating Expenses:				
Direct operating expenses	59,973	29,539	-	89,512
Wastewater treatment	-	-	72,389	72,389
Reimbursement for City of Pittsburgh services	1,991	-	-	1,991
Expense of water provided by other entities:				
Subsidy of customers located in the City	1,338	-	-	1,338
Depreciation	12,067	5,944	-	18,011
Total operating expenses	75,369	35,483	72,389	183,241
Operating Income (Loss)	35,241	31,986	(1,419)	65,808
Non-operating Revenues (Expenses):				
Federal grants	4,638	2,284	-	6,922
Donated property	74	36	-	110
Interest revenue	482	237	-	719
Investment income - change in fair value of swap	(2,801)	(1,379)	-	(4,180)
Interest and amortization	(25,956)	(12,784)	-	(38,740)
Bond issuance costs	(1,650)	(812)	-	(2,462)
Total non-operating revenues (expenses)	(25,213)	(12,418)	-	(37,631)
Net Income (Loss) before Special Item	10,028	19,568	(1,419)	28,177
Special Item:				
Private lead line replacement	(22,283)	-	-	(22,283)
Net Income (Loss)	(12,255)	19,568	(1,419)	5,894
Net Position:				
Beginning of year	(13,506)	19,880	(10,733)	(4,359)
End of year	\$ (25,761)	\$ 39,448	\$ (12,152)	\$ 1,535

PITTSBURGH WATER AND SEWER AUTHORITY

SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS

YEAR ENDED DECEMBER 31, 2019

<u>Federal Grantor/Pass-Through Grantor/Program Title</u>	<u>Federal CFDA Number</u>	<u>Pass through Grantor's Number</u>	<u>Expenditures</u>	<u>Amounts Provided to Subrecipients</u>
United States Environmental Protection Agency:				
Passed through the Pennsylvania Department of Environmental Protection:				
Drinking Water State Revolving Fund Cluster:				
Capitalization Grants for Drinking Water State Revolving Funds	66.468	81091	\$ 21,985,519	\$ -
Total Expenditures of Federal Awards			<u>\$ 21,985,519</u>	<u>\$ -</u>

See accompanying notes to schedule of expenditures of federal awards.

PITTSBURGH WATER AND SEWER AUTHORITY

NOTES TO SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS

YEAR ENDED DECEMBER 31, 2019

1. Basis of Presentation

The accompanying schedule of expenditures of federal awards (schedule) of the Pittsburgh Water and Sewer Authority (Authority) is presented on the accrual basis of accounting. The information in this schedule is presented in accordance with the requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Because the schedule presents only a selected portion of the operations of the Authority, it is not intended to and does not present the net position, changes in net position, or cash flows of the Authority.

2. Summary of Significant Accounting Policies

Expenditures reported on the schedule are reported on the accrual basis of accounting. Such expenditures are recognized following the cost principles contained in the Uniform Guidance, wherein certain types of expenditures are not allowable or are limited as to reimbursement. The Authority has elected to not use the 10-percent de minimis indirect cost rate allowed under the Uniform Guidance.

3. Determination of Federal Expenditures

The amount of federal expenditures for the United States Environmental Protection Agency loans represents the expenditures incurred under the loan during the year ended December 31, 2019 in addition to expenditures funded by grant proceeds. The United States Environmental Protection Agency requires that the current year expenditures incurred under the loan be reported on the schedule rather than the beginning balance of the loans.

Pittsburgh Water and Sewer Authority

Independent Auditor's Reports
Required by the Uniform Guidance

Year Ended December 31, 2019



Independent Auditor’s Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

**Board of Directors
Pittsburgh Water and
Sewer Authority**

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Pittsburgh Water and Sewer Authority (Authority), a component unit of the City of Pittsburgh (City), Pennsylvania, as of and for the year ended December 31, 2019, and the related notes to the financial statements, which collectively comprise the Authority’s basic financial statements, and have issued our report thereon dated April 17, 2020.

Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Authority’s internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Authority’s internal control. Accordingly, we do not express an opinion on the effectiveness of the Authority’s internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity’s financial statements will not be prevented, or detected and corrected, on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Board of Directors
Pittsburgh Water and Sewer Authority
Independent Auditor's Report on Internal Control over Financial
Reporting and on Compliance and Other Matters

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Authority's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Mahe Duessel

Pittsburgh, Pennsylvania
April 17, 2020



Independent Auditor's Report on Compliance for the Major Program and on Internal Control over Compliance Required by the Uniform Guidance

**Board of
Directors
Pittsburgh
Water and
Sewer
Authority**

Report on Compliance for the Major Federal Program

We have audited Pittsburgh Water and Sewer Authority's (Authority), a component unit of the City of Pittsburgh (City), Pennsylvania, compliance with the types of compliance requirements described in the *OMB Compliance Supplement* that could have a direct and material effect on the Authority's major federal program for the year ended December 31, 2019. The Authority's major federal program is identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

Management's Responsibility

Management is responsible for compliance with federal statutes, regulations, and the terms and conditions of its federal awards applicable to its federal programs.

Auditor's Responsibility

Our responsibility is to express an opinion on compliance for the Authority's major federal program based on our audit of the types of compliance requirements referred to above. We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Those standards and the Uniform Guidance require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about the Authority's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for the major federal program. However, our audit does not provide a legal determination of the Authority's compliance.

Bord of Directors
Pittsburgh Water and Sewer Authority
Independent Auditor's Report on Compliance
for the Major Program

Opinion on the Major Federal Program

In our opinion, the Authority complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on its major federal program for the year ended December 31, 2019.

Report on Internal Control over Compliance

Management of the Authority is responsible for establishing and maintaining effective internal control over compliance with the types of compliance requirements referred to above. In planning and performing our audit of compliance, we considered the Authority's internal control over compliance with the types of requirements that could have a direct and material effect on each major federal program to determine the auditing procedures that are appropriate in the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of the Authority's internal control over compliance.

A deficiency in internal control over compliance exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A material weakness in internal control over compliance is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A significant deficiency in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or

Bord of Directors
Pittsburgh Water and Sewer Authority
Independent Auditor's Report on Compliance
for the Major Program

significant deficiencies. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

Mahe Duessel

Pittsburgh, Pennsylvania
April 17, 2020

PITTSBURGH WATER AND SEWER AUTHORITY

SCHEDULE OF FINDINGS AND QUESTIONED COSTS

YEAR ENDED DECEMBER 31, 2019

I. Summary of Audit Results

1. Type of auditor's report issued: Unmodified, prepared in accordance with Generally Accepted Accounting Principles

2. Internal control over financial reporting:

Material weakness(es) identified? yes no

Significant deficiencies identified that are not considered to be material weakness(es)?

yes none reported

3. Noncompliance material to financial statements noted? yes no

4. Internal control over major programs:

Material weakness(es) identified? yes no

Significant deficiencies identified that are not considered to be material weakness(es)?

yes none reported

5. Type of auditor's report issued on compliance for major programs: Unmodified

6. Any audit findings disclosed that are required to be reported in accordance with 2 CFR Section 200.516(a)? yes no

7. Major Programs:

CFDA Number(s)

66.468

Name of Federal Program or Cluster

DWSRF Cluster:

Capitalization Grants for Drinking Water State
Revolving Funds

8. Dollar threshold used to distinguish between type A and type B programs: \$750,000

9. Auditee qualified as low-risk auditee? yes no

II. Findings related to the financial statements which are required to be reported in accordance with GAGAS.

No matters were reported.

III. Findings and questioned costs for federal awards

No matters were reported.

PITTSBURGH WATER AND SEWER AUTHORITY

SUMMARY SCHEDULE OF PRIOR AUDIT FINDINGS

YEAR ENDED DECEMBER 31, 2019

NO SINGLE AUDIT IN THE PRIOR YEAR

VII. RATE OF RETURN

VII.16. Supply copies of the company's balance sheets for each month for the last 2 years.

RESPONSE:

Please see the response to FR XI.1.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.17. Provide the bond rating history for the company and, if applicable, its parent from the major credit rating agencies for the last five years.

RESPONSE:

The long-term debt issuer ratings, and their effective dates, for PWSA for the last five years are as follows:

<i>Moody's Underlying Rating</i>		<i>S&P Underlying Rating</i>	
Rate	Date	Rate	Date
A3	10/05/2020	A	10/10/2020
A3	06/04/2019	A	06/06/2019
A3	10/15/2018	A	11/20/2017
A2	1/17/2018	A	12/12/2013
A2	9/18/2017		
A2	11/20/2013		
A2	9/10/2013		
A2	2/1/2012		

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.18. Provide copies of all bond rating reports relating to the company and, if applicable, its parent for the past 2 years.

RESPONSE:

Please see attached.

RatingsDirect®

Summary:

Pittsburgh Water and Sewer Authority; Water/Sewer

Primary Credit Analyst:

Theodore A Chapman, Farmers Branch (1) 214-871-1401; theodore.chapman@spglobal.com

Secondary Contact:

Edward R McGlade, New York (1) 212-438-2061; edward.mcglade@spglobal.com

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Rating Action

Stable Outlook

Credit Opinion

Related Research

Summary:**Pittsburgh Water and Sewer Authority;
Water/Sewer****Credit Profile**

US\$93.36 mil wtr and swr 1st ln rev bnds ser 2020 B due 09/01/2050		
<i>Long Term Rating</i>	A/Stable	New
US\$1.015 mil wtr and swr 1st ln rev bnds ser 2020 A due 09/01/2050		
<i>Long Term Rating</i>	A/Stable	New
Pittsburgh Wtr & Swr Auth WTRSWR		
<i>Long Term Rating</i>	A/Stable	Affirmed
Pittsburgh WS (AGM)		
<i>Unenhanced Rating</i>	A-(SPUR)/Stable	Affirmed
Pittsburgh WS (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed

Rating Action

S&P Global Ratings assigned its 'A' rating to the Pittsburgh Water and Sewer Authority's (PWSA) \$1.015 million taxable series 2020A and \$93.36 million series 2020B first-lien revenue bonds. At the same time, S&P Global Ratings also affirmed the 'A' rating on PWSA's \$218.805 million series 2017C (subseries 1 through 4) first-lien revenue refunding bonds, which are being remarketed with a three-year soft put on Dec. 1, 2023. In the event of a failed remarketing, the series 2017 bonds would reset to the maximum permitted interest rate, not to exceed 12%. The outlook is stable.

The series 2017C bonds will likely be remarketed in floating rate mode; the subseries 1, 2, and 3 will each be associated with a basis swap to effectively convert the variable-rate bonds to the Securities Industry and Financial Markets Association (SIFMA) index rate from 70% of the London Interbank Offering Rate (LIBOR). The counterpart for this overlay swap is Merrill Lynch Capital Services Inc. with a notional amount of \$216.72 million. In addition, subseries 1 is already synthetically fixed by way of an interest rate swap with JPMorgan Chase Bank N.A.; subseries 2 is synthetically fixed by way of an interest rate swap with Bank of America Merrill Lynch N.A.; and subseries 3 is synthetically fixed using an interest rate swap also with JPMorgan Chase Bank N.A. Although only a point-in-time snapshot and--barring a termination event such as the rating on PWSA falling below 'BBB-'--not an actual liability, those swaps are currently substantially out of the money. Subseries 4 is not hedged.

We also affirmed our 'A' rating on PWSA's approximately \$624 million in outstanding first-lien revenue bonds and our 'A-' rating on PWSA's \$104.3 million in subordinate-lien revenue bonds. PWSA also has about \$157 million in subordinate-lien state loans, and--following these transactions--about \$2 million drawn on a \$150 million subordinate-lien committed line of credit with PNC Bank N.A. in place through 2022. The outlook is stable.

Summary: Pittsburgh Water and Sewer Authority; Water/Sewer

The first-lien bonds are secured by a senior-lien pledge on the net revenues of the authority's waterworks and sanitary sewer system. A fully funded common reserve in the amount of the lesser of maximum annual debt service (MADS), 125% of average annual debt service or 10% of par provides additional liquidity on the senior-lien bonds; an amendment in 2017 to the master trust indenture permits a surety to be used to satisfy any future series-by-series reserve fund requirement. The 2017 amendments additionally strengthened the covenants by eliminating consideration of the use of certain cash reserves toward compliance with the rate covenant, and limiting the frequency with which transfers in from the rate stabilization fund can be used toward meeting the rate covenant.

The authority will use the proceeds of the taxable series 2020A bonds to finance the cost of issuance related to the remarketing of the series 2017C bonds. The proceeds of the series 2020B bonds will be used to repay draws of \$107 million on the \$150 million line of credit.

We have applied our primary utility revenue bond criteria to determine the authority's general creditworthiness and have applied this rating to its senior-lien issues. We rate PWSA's subordinate lien one notch lower based on the application of our criteria "Assigning Issue Credit Ratings Of Operating Entities" (published May 20, 2015) given the open status of the senior lien and the likelihood that PWSA will continue to use the senior lien from time to time.

Credit overview

Our view of PWSA's general creditworthiness is based on its very strong enterprise risk profile and its strong financial risk profile. The enterprise risk profile reflects our view of Pittsburgh's:

- Role as the anchor and economic engine for western Pennsylvania, based on an employment base that has reinvented itself from one that once relied heavily on manufacturing and industrial jobs;
- Rates for service that have been pressured over the past decade by the unfunded mandates, and will now need to be reviewed by the state's rate regulator; and
- Operational management assessment (OMA) that we view as good even despite the aforementioned challenges.

The financial risk profile reflects our view of the system's:

- Extremely high leverage, with \$1.2 billion in capital commitments identified through fiscal 2025 likely to continue to pressure the financial profile;
- Strong on-balance sheet liquidity, supported further by available credit lines; and
- Financial management practices and policies we consider good.

The stable outlook reflects our expectation that when PWSA does need to propose a rate case to the state Public Utility Commission (PUC) there will generally be a credit-supportive relationship, observed by both the timing and magnitude of rate adjustments that PWSA is likely to request, versus what the PUC ultimately grants. We are assuming that the financial profile will be further stabilized by the sufficiency test in the rate covenant--which does not allow for the use of cash transfers. We will also likely keep in place the one-notch distinction between the first- and subordinate-lien debt.

*Summary: Pittsburgh Water and Sewer Authority; Water/Sewer***Environmental, social, and governance factors**

In our view, PWSA has outside risks related to each of environmental, social, and governance factors, although each of these are generally trending favorably. The authority in previous years faced scrutiny from local and state elected officials who voiced concerns over its operations. An auditor general's opinion released in November 2017 cited "aging and deteriorating infrastructure issues and financial and operational long-term viability issues" and was an important factor in legislation that ultimately placed PWSA under Pennsylvania Public Utility Commission's (PUC) oversight as of April 1, 2018. The PUC now regulates the authority's rates and fees, and must approve additional debt. PWSA's management team has worked closely with regulators and other stakeholders and has already achieved several measures that are likely to improve operations and financial capacity. This includes tentative approval of a distribution system improvement charge that will be dedicated to underground infrastructure rehabilitation. PWSA has also implemented various socially directed programs such as lead service line replacements and customer bill-pay assistance programs. We view the latter as a credit quality stabilizer that could allay affordability concerns. PWSA's moratorium on shut-offs and disconnections remains in place as well, out of health and safety concerns related to COVID-19. PWSA's own environmental compliance mandates, as well as drinking water efficiency are two key programs in PWSA's capital budget and have been the major drivers for the need to consider additional rate adjustments; the authority has the ability to administratively pass through and recover costs from its wholesale wastewater treatment provider. PWSA, under its Green First plan, is also piloting approximately a dozen projects to experiment with different approaches to green infrastructure and overflow reduction that could also present capital budget cost savings.

Stable Outlook**Downside scenario**

If, as S&P Global Economics projects, credit conditions for all governments and their related utilities face headwinds such as elevated unemployment for the next several years because of a potentially uneven and prolonged recovery, this could increase the likelihood of unfavorable variances to budget.

Upside scenario

Management has represented that total debt service coverage (DSC) will generally trend toward about 1.25x and on-balance sheet available reserves equivalent to four-five months of operating expenses. Consistently outperforming financial projections while meeting the long-term challenges presented by an aging system, compounded by regulatory pressures, would be the key to achieving a higher rating.

Credit Opinion**Enterprise risk**

PWSA provides drinking water and sewer collection to more than 81,000 metered accounts in most, but not all, of the city, as well as five neighboring municipalities and three wholesale customers for needs ranging from emergency interconnections and peaking to full requirements. It also provides sewer collection to the entire city. Although median household effective buying income (MHHEBI) is only 78% that of the U.S., the local economy has long since

Summary: Pittsburgh Water and Sewer Authority; Water/Sewer

transitioned from its historical manufacturing base. Those sectors are still part of the employment base. Financial services, health care, and a booming technology sector are all increasingly important contributors to the metropolitan statistical area (MSA) and prior to the COVID-19 pandemic and the subsequent recession were all exhibiting steady growth. The diversification and growth have made the MSA's economy more resilient; as of September 2020 the 8.2% unemployment rate--while still very high--is half of what it was just five months earlier. We do not view there to be any dependence on the authority's principal customers, given they include another water authority and the University of Pittsburgh. Regional water authority wholesale customers do have some minimum contractual payments to PWSA, lending further stability to cash from operations.

Based on our organizational management assessment, we view PWSA to be a '4' on a scale of 1-6, with '1' being the strongest. An assessment of standard, in our opinion, implies that overall alignment between the system's operational characteristics and its management is sufficient although there are areas of opportunity. The 2019 consulting engineer's report noted that although the existing infrastructure is adequate to safely and reliably serve the current customer base, "significant structural, operational, and maintenance improvements are required and must be undertaken in the near term to address longstanding deficiencies in both the water and sewer systems." Although rate regulation of municipal-owned systems is less common in Pennsylvania, we view this as currently neutral to credit quality. We have noted that generally, rate regulation in Pennsylvania is supportive of credit quality, although the relationship between the two entities is still developing. We will look primarily to the magnitude of what is awarded versus what is requested in future rate cases, as well as the timing, and how much of the substantial capital improvement plan (CIP) can be put into the rate base with each review; the PUC is compelled to respond within 270 days. In our view, while serious, the move to PUC oversight is indicative of the identified need for infrastructure investments, which we have observed all parties seem to agree are necessary. The CIP contains projects that are both based on PWSA's prioritization as well as those reflecting consent decrees.

Much of the existing infrastructure was also built to serve a much larger population and a workforce much different from today's. While we note, for example, that the city has an essentially unlimited raw-water supply from the Allegheny River and overall system capacity that could support a population several times the size of the current one, it is also the case that the authority's main focus remains the renewal and replacement of its aging underground infrastructure. The water distribution system is also an identified area of opportunity given the high non-revenue water percentage, attributable to line losses. However, under a 2019 cooperation agreement, the city will no longer receive free service, which alone should help improve non-revenue water. The renegotiated agreement will not affect the capital lease agreement, and PWSA still intends to purchase the system from the city for \$1 in 2025 under the terms of the current agreement.

PWSA is also dealing--directly and indirectly--with mandates from environmental regulators to address combined sewer overflows and wastewater treatment requirements. For example, Allegheny County Sanitary Authority's (ALCOSAN) 2008 consent decree is expected to cost \$2.0 billion by 2036; PWSA represents about 35% of ALCOSAN's total operating revenues based on the 2020 budget. While PWSA may see rising costs from ALCOSAN, it is not party to nor directly financially responsible for ALCOSAN's consent decree. PWSA has also been working its way through its own consent decree since 2004. Most of the projects in scope for PWSA's consent decree have already reached substantial completion, and some of the remaining projects have been proposed to environmental authorities to be

Summary: Pittsburgh Water and Sewer Authority; Water/Sewer

addressed using green infrastructure. Although management has been separating the sewer system in the areas of growth and redevelopment, 77% of the collection system is still a combined storm and sanitary infrastructure. In 2018, PWSA notified the city that the authority intends to assume responsibility for the stormwater system, allowing for more efficient integrated planning and mitigation.

The PUC approved a rate increase of approximately 13% in February 2019, although less than the requested 17.1%; a \$19 million increase to operating revenues for fiscal 2021 (about an 11% increase) is pending final approval from the PUC. PWSA is able to administratively fully pass through and recover ALCOSAN billings and the surcharge for distribution system improvements. Management intends to implement stormwater charges by fiscal 2022. For fiscal 2020, the average customer--using 3,000 gallons of both water and sewer service plus ALCOSAN's treatment surcharge--pays about \$102 per month, or 3% of MHHEBI. As costs increase over time to support the capital plan, headroom for affordability, especially to lower-income customers, could diminish.

Financial risk

Although a moratorium on shut-offs and disconnections remains in place, through the first three quarters of 2020 revenues were only off 2.9% versus budget. All-in DSC by our calculation was below 1x in 2016-2017, but strengthened to almost 1.5x in 2018 and even further, almost 1.7x, in 2019 following the rate increase. Based on our review of management's projections, all-in DSC is likely to trend toward 1.25x assuming additional debt and a supportive relationship with the PUC. All-in DSC is S&P Global Ratings' adjusted DSC metric that includes all obligations of the system regardless of lien or accounting treatment.

The system's liquidity remains an area of consistency and credit strength. Total available reserves also include the line of credit, designated as an interim funding mechanism for capital projects that will be almost completely repaid following the 2020 transactions. A \$20 million line also with PNC to support the operating budget expired in 2019 and was not renewed. All told, cash and equivalents held by PWSA remains sound, usually equivalent to four-six months of operating expenses. At the end of fiscal 2019, the authority had \$65 million in on-balance sheet working capital (exclusive of any undrawn capacity on the credit line), equivalent to four months of total operating expenses (even including the ALCOSAN costs). Even with the COVID-19-related impact to revenues, management's most recent monthly interim financials project a year-end cash balance of \$51 million for fiscal 2020. In addition to the increased revenues related to the 2019 elimination of free service to the city, operating expenses will also be relieved of an annual payment to an adjacent investor-owned water utility, and will have greater defined clarity regarding the financial relationship for indirect costs owed to the city's general fund, further protecting utility cash reserves.

Approximately one-fourth of PWSA's debt is variable rate, most of which is synthetically fixed by way of interest rate swaps. We view the contingent liquidity risk as remote, as the most prominent termination event would be if the ratings on PWSA were to be lowered to below investment grade. Although the current positions of the interest-rate swaps remain materially unfavorable, PWSA has not had to post collateral to its counterparts. Other liabilities include legacy obligations to the city related to PWSA employees who are a part of the city's municipal pension fund plan; PWSA supports about 15% of the \$212 million net pension liability based on authority payroll as a percentage of total municipal employees. This equated to about a \$3.6 million payment in fiscal 2019; the net pension liability reflects a very weak funded level of 46.5%. Beginning in 2019, the pension plan was closed to non-union new hires, who participate in a defined contribution plan, limiting the worsening of the liability. However, the main credit factor that

Summary: Pittsburgh Water and Sewer Authority; Water/Sewer

will determine the future of the rating is the capital plan, given that PWSA has identified over \$1.2 billion of capital needs through fiscal 2025 and expects to debt-finance the bulk of them.

Based on our financial management assessment (FMA), we view the authority to be a '3' on a scale of 1-6, with '1' being the strongest. An FMA of good indicates that we consider practices currently good, but not comprehensive. The authority maintains many best practices we believe are critical to supporting credit quality, particularly in the finance department. These practices, however, may not be institutionalized or formalized in policy, or may not be as robust as those of comparable utilities with an FMA of strong. The FMA of good includes a long-term financial plan that management intends to implement in partnership with the PUC to support its identified capital commitments. The authority also has implemented new, more comprehensive and conservative budgeting assumptions that better capture annual revenue requirements. We understand that the authority's management team regularly tracks budget-to-actual performance and that the new management team is instituting a number of additional best practices to target consistently higher levels of financial performance.

Related Research

- Through The ESG Lens 2.0: A Deeper Dive Into U.S. Public Finance Credit Factors, April 28, 2020

Ratings Detail (As Of November 10, 2020)

Pittsburgh Wtr & Swr Auth WTRSWR <i>Long Term Rating</i>	A/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM) <i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM) <i>Unenhanced Rating</i>	A-(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM) <i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM) <i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM) <i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Many issues are enhanced by bond insurance.		

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Pittsburgh Water and Sewer Authority, PA 'A' Senior Debt Rating Affirmed

June 6, 2019

NEW YORK (S&P Global Ratings) June 6, 2019--S&P Global Ratings assigned its 'A' rating to the Pittsburgh Water and Sewer Authority (PWSA), Pa.'s series 2019A first-lien revenue bonds and its 'A-' rating to PWSA's 2019B subordinate-lien revenue refunding bonds. At the same time, we affirmed our 'A' long-term rating on the authority's senior debt and our 'A-' rating on the subordinate debt. The outlook is stable.

"Our view of PWSA's general creditworthiness is based on its very strong enterprise risk profile and its strong financial risk profile," said Ms. Boeke Burke.

The authority has been subject to scrutiny from local and state elected officials who voiced concerns over authority operations. An auditor general's opinion released in November 2017 cited "aging and deteriorating infrastructure issues and financial and operational long-term viability issues..." and was an important factor in HB 1490, which placed PWSA under the state Public Utility Commission's (PUC) oversight as of April 1, 2018. The PUC now regulates the authority's rates and fees, and must approve additional debt. PWSA's board additionally terminated the Cooperation Agreement with Pittsburgh in February 2019 and is currently negotiating a new agreement with the city, which will redefine the authority's and the city's respective responsibilities and cost allocations. We expect the agreement will provide for transactional payments between the city and PWSA based on actual expenses, in accordance with customary utility practices under the PUC.

"The stable outlook reflects our expectation that both the timing and magnitude of rate adjustments that PWSA is likely to request, versus what the Public Utility Commission ultimately grants, will generally prove to be aligned," she added. We are assuming that the financial profile will be further stabilized by the sufficiency test in the rate covenant--which does not allow for the use of cash transfers. We will also likely keep in place the one-notch distinction between the first- and subordinate-lien debt.

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at www.standardandpoors.com for further information. Complete ratings information is available to subscribers of RatingsDirect at www.capitaliq.com. All ratings affected by this rating action can be found on S&P Global Ratings' public website at www.standardandpoors.com. Use the Ratings search box located in the left column.

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Pittsburgh Water and Sewer Authority, PA 'A' Senior Debt Rating Affirmed

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CREDIT OPINION

4 June 2019

 Rate this Research

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Pittsburgh Water & Sewer Authority, PA

Update to credit analysis

Summary

The Pittsburgh Water & Sewer Authority, PA's (A3 stable) credit profile has benefitted from improvements to operations and controls implemented through Pennsylvania Public Utility Commission (PUC) oversight, effective as of April 2018, as well as the strength of its new management team. Both changes to PWSA's governance have contributed to its improved financial position as of fiscal 2018 year end.

The authority continues to face material pressure to improve its infrastructure given years of disinvestment. Coupled with a substantial consent decree pertaining to combined sewer overflows during wet weather events and elevated lead levels in the city's water, the authority will necessarily add to its already elevated debt burden in the near term. High leverage, elevated fixed costs, and the system's major capital needs remain primary credit concerns.

Moody's affirmed the A3 rating for Pittsburgh Water & Sewer Authority, PA's First Lien Revenue Bonds on June 4, 2019 and assigned an A3 rating to the authority's \$109 million Water and Sewer System First Lien Revenue Bonds, Series A of 2019. The outlook was revised to stable from negative.

Credit strengths

- » Diverse, urban Pittsburgh (A1 stable) service area, supported by strong "eds & meds" presence
- » Considerable size; system assets include water conveyance and treatment, and sewer conveyance that ties to ALCOSAN
- » Significant, recently implemented rate increases boost revenues; PUC oversight should bring improvements and controls

Credit challenges

- » Substantial debt burden; debt ratio is 101%
- » Narrow liquidity versus similarly sized peers
- » Long term inadequate maintenance of infrastructure has led to severe inefficiencies and has contributed to a projected \$2 billion in capital improvement needs; plan to be implemented over ten - twenty years
- » Exposure to a large regional consent decree through ALCOSAN

- » Elevated lead levels in water

Rating outlook

The outlook has been revised to stable from negative, reflecting the authority's improved financial position as well as the credit-positive impact of PUC oversight and the strength of PWSA's new management team, which will serve to stabilize the authority's finances and operations in the near term.

PWSA is still in the beginning stages of addressing its major capital needs and operating deficiencies, and future rating reviews will consider whether the authority is able to execute its capital plans while maintaining a healthy financial position.

Factors that could lead to an upgrade

- » Substantial improvement in liquidity that is maintained over several reporting periods
- » Meaningful reduction of debt
- » Sustained improvements in debt service coverage

Factors that could lead to a downgrade

- » Material narrowing of debt service coverage and liquidity position
- » Inability to raise rates sufficiently to meet debt service coverage covenants while also funding significant deferred capital improvements
- » Failure to effectively deploy new revenues address near term infrastructure and operating needs
- » Escalation of environmental concerns, particularly lead levels in treated drinking water

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

Key indicators

Exhibit 1

Pittsburgh Water and Sewer Authority					
System Characteristics					
Asset Condition (Net Fixed Assets / Annual Depreciation)	45 years				
System Size - O&M (in \$000s)	\$153,180				
Service Area Wealth: MFI % of US median	87.6%				
Legal Provisions					
Rate Covenant (x)	1.10				
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test (Aa)				
Management					
Rate Management	A				
Regulatory Compliance and Capital Planning	A				
Financial Strength					
	2014	2015	2016	2017	2018
Operating Revenue (\$000)	\$164,255	\$174,164	\$180,727	\$202,996	\$231,734
System Size - O&M (\$000)	\$125,766	\$131,694	\$148,593	\$157,220	\$153,180
Net Revenues (\$000)	\$53,014	\$57,455	\$49,174	\$47,071	\$81,565
Net Funded Debt (\$000)	\$765,960	\$757,490	\$738,176	\$821,167	\$875,669
Annual Debt Service (\$000)	\$47,519	\$58,346	\$59,380	\$57,818	\$58,963
Annual Debt Service Coverage (x)	1.12	1.12	0.92	0.81	1.37
Cash on Hand	91 days	78 days	53 days	26 days	112 days
Debt to Operating Revenues (x)	4.7x	4.3x	4.1x	4.0x	3.8x

Source: Moody's Investors Service, Pittsburgh Water and Sewer Authority audited financial statements

Profile

PWSA is an authority of the city of Pittsburgh (A1 stable), providing water treatment and conveyance to 84% of the city's population of roughly 305,000 residents and sewer conveyance for the entire city.

Detailed credit considerations

Service area and system characteristics: Large and stable Pittsburgh service area; Considerable aged infrastructure concerns

The authority provides water distribution and wastewater collection and conveyance for the city of Pittsburgh and neighboring municipalities. The city's healthy and growing economy, as well as its exposure to the strong "eds & meds" presence from healthcare and higher education institutions, are positives for the authority.

The authority's 10 largest customers (3.7% of revenues) include University of Pittsburgh Medical Center (A1 negative), University of Pittsburgh (Aa1 stable), Fox Chapel Authority, Allegheny Health Network, Carnegie Mellon University, Allegheny County (Aa3 stable), the city's public housing authority, and a state prison. All of the authority's five largest customers have been in the city for at least 75 years.

The authority continues to maintain an ample water supply, providing water to a population of approximately 305,000. The system is permitted to draw up to 100 million gallons per day (MGD) from the Allegheny River, its sole water source, though average demand for water is well below that level, at 70 MGD. The authority treats drinking water at one plant located on the river, as well as a microfiltration plant at one of its reservoirs. The authority has capacity to store approximately 3 days' worth of finished water for uninterrupted supply to its customers.

The authority does not treat wastewater. It transmits all of its sewage to the Allegheny County Sanitary Authority. There is no contractual limit to the amount of sewage that can be conveyed, however, during wet weather events, the existing system frequently overflows.

The system currently experiences unusually large water loss. One of the authority's current major infrastructure projects is a complete metering and mapping of its system. Metering will not only address the system's water loss but will also help PWSA target repairs such that widespread boil water advisories should become less frequent. Some of the authority's other important near term improvements include hiring an expanded workforce to carry out maintenance of the system's general infrastructure up to current industry standards, and replacing water mains in line with accepted industry norms.

Ordinary system updates and routine infrastructure improvements had been sorely lacking at PWSA, and years of deferred maintenance have led to cost inefficiencies and exacerbated the natural wear and tear on an already aged system. We believe that new oversight, under the purview of the PUC, will help PWSA bring its system to good working order by setting guidelines for system improvements based on industry-wide standards.

In April of 2016, the authority was ordered by the Pennsylvania Department of Environmental Protection (PADEP) to test for lead in the drinking water treated by PWSA, related to an unauthorized use of alternative corrosion control chemicals. Samples from 100 homes in June 2016 found lead of 22 parts per billion (ppb) at the 90th percentile. The EPA action level for lead at the 90th percentile is 15ppb, at which level additional testing in terms of frequency and number of samples is required and mitigation efforts are needed.

PWSA has since tested for elevated lead levels each June and December. The authority has yet to realize two consecutive testing periods where lead is below the EPA requirement. However, the authority was approved to treat its water with orthophosphate in March of 2019, and expects that this new treatment will bring lead levels to within the required range by December 2019.

Debt service coverage and liquidity: Rate increases have strengthened finances, though cash still somewhat narrow

As cited in prior reviews, the authority's overall credit profile has been severely impacted by its limited liquidity, with days' cash on hand declining to a very narrow 29 days' as of 2017 year end. Favorably, the authority's cash position has materially improved as of audited 2018 financial statements, and reported cash is a more healthy \$47 million, or 112 days' cash on hand. This is more in line with the authority's historical operating norms, but is still somewhat weak versus similarly sized peers. Median days' cash on hand for Moody's-rated water and sewer systems in the US generating revenues between \$100 million and \$500 million annually is 473 days.

Beginning in 2019, the authority must meet a 1.10x coverage test on its consolidated debt service and a 1.25x coverage test on its senior debt service without the use of free cash. Positively, PWSA met both of these requirements as of audited 2018 financials, reporting senior lien debt service coverage of 1.89x and overall coverage of 1.37x.

The authority implemented a 28% rate increase in early 2018. The authority also implemented a 13% rate increase in early 2019, which was the first rate plan approved by the PUC. PWSA expects to end 2019 with net revenues before debt service of roughly \$75 million, which would result in senior lien debt service coverage of 1.7x and overall coverage of 1.32x, favorable metrics given the authority's current credit profile.

The authority's rate increases were prompted by its substantial capital needs. Improved revenues will shore up reserves somewhat, but more will be required to support future debt issuance and increased expenditures for its expanded workforce, technology upgrades, and any pay-go capital needs. The authority's current estimate for capital improvements is \$2.0 billion over 20 years, with more than \$900 million of new money debt expected to be issued over the next five years.

LIQUIDITY

The authority's ending days' cash on hand for 2018 is materially improved over prior years, to 112 days' when pass through expenses for ALCOSAN are included, and 166 days' when ALCOSAN expenses are excluded. The authority expects to maintain liquidity in this range for 2019.

Liquidity for capital expenditures is supported by an \$150 million revolving credit facility with JP Morgan Chase Bank, NA (Aa1 (cr)). An emergency \$20 million liquidity line is in place with PNC Bank, NA (A2 (cr)).

Debt and legal covenants: High leverage likely to increase, satisfactory and improved legal

The authority introduced a new indenture in 2017, which strengthened the rate covenant. The new requirement is 125% of senior debt service coverage plus 110% of subordinate debt service coverage. Free cash will no longer be used to increase coverage under the new indenture. The new test is effective for fiscal year 2019. The debt service reserve is funded at the lesser of the three-pronged test.

DEBT STRUCTURE

The additional borrowing implied by the authority's capital needs will increase an already elevated debt burden. The authority's total debt is equal to 101% of fixed assets as of 2018 year end, well above similarly sized peers. The outstanding debt amortizes slowly, with only 44% of principal scheduled to be repaid in the next 10 years.

The authority will reduce its variable rate debt outstanding with its Series 2019 A&B issuance. At fiscal year end 2018, the authority's debt profile includes total bonded debt of \$656 million, of which \$552 million is senior-lien bonds, and \$103 million is privately placed subordinate-lien bonds, all of which is variable rate. Subsequent to the 2019 issuance, the subordinate lien debt will be refunded with fixed rate bonds, the associated swaps will be terminated, and the debt will be publicly offered.

The Series 2019 A&B issuance will reduce the authority's variable rate debt to roughly 28.6% of total bonded debt outstanding, down from 49% as of 2018 fiscal year end. Assured Guaranty Municipal Corp. (A2 stable insurance financial strength) insures much of the authority's variable rate bonds and all of the authority's swaps, and provides the surety policy for all debt service reserve funds. This counterparty concentration may adversely impact the authority should AGM's credit quality deteriorate. Subsequent to the subordinate refunding, there will be no liquidity support facilities outstanding.

The authority also maintains \$28 million outstanding in PennVest loans and an \$150 million revolving credit facility, of which \$113 million is currently drawn. Given an intercreditor agreement, PennVest, JPM, and PNC share a third lien priority on system revenues.

DEBT-RELATED DERIVATIVES

The authority has entered into floating-to-fixed rate swaps in connection with substantially all of its variable rate debt (\$322 million as of YE18) under ISDA Master Agreements with JP Morgan Chase Bank N.A. (64%) and Merrill Lynch Capital Services (36%), whereby the authority pays a fixed interest rate semi-annually (3.67% on average) and receives 70% of LIBOR.

AGM provides swap insurance for all swaps and, despite a negative \$86 million aggregate mark-to-market as of April 2019, no collateral is required to be posted unless an Insurer Event occurs. The amortization schedule for each swap mirrors that of the corresponding bonds and the swaps terminate at bond maturity. For all of the swaps, per the 2017 indenture, regularly scheduled swap payments are subordinate to subordinate bond debt service. Early termination is optional for the authority only, and termination by the counterparty depends upon specified termination events, including the downgrade of PWSA's underlying rating below investment grade. An authority termination payment would be subordinate to first and second lien debt service payments.

PENSIONS AND OPEB

The authority's employees participate in the city's pension program. It is anticipated that the authority's share of its pension contribution will be provided for through a renegotiated Cooperation Agreement with the city.

Management and Governance

Continued turnover at the senior managing level of the authority had been a considerable credit concern. Favorably, however, the authority's current management team has developed a comprehensive plan to bring operations to good working order and to proceed with much needed capital improvements. Management views its relationship with the PUC as well as the DEP and EPA as an opportunity for partnership and has proactively sought to engage these agencies as PWSA moves forward with its substantial CIP. This is a definitive, positive change from the authority's prior actions, and has informed our stable outlook on PWSA's current credit profile.

The authority is currently managed by a seven member board, with six members appointed by the mayor and one by the city council. The authority currently provides water at no cost to city-owned buildings and public areas. The city and authority are in the process of renegotiating their cooperation agreement to more accurately reflect the exchange of services provided.

Pennsylvania's Public Utility Commission began oversight of the authority in April 2018. The PUC is responsible for regulating the authority's rate making, operating effectiveness, and debt issuance. We expect that the PUC will bring standardization and effective

governance to the authority's future operations. The PUC is required to approve rate increases that will ensure PWSA complies with its bondholder covenants, though we note that the approval process for increases can be lengthy.

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CREDIT OPINION

5 November 2020

 Rate this Research

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Pittsburgh Water & Sewer Authority, PA

Update to credit analysis

Summary

The Pittsburgh Water & Sewer Authority, PA's (A3 stable) credit profile continues to improve, with financial metrics steadily strengthening over the last three years. Liquidity is particularly improved and is expected to be maintained at roughly 140 days' cash on hand at the end of fiscal 2020, up from a critically low 29 days' cash at fiscal 2017 year end. The Authority (or "PWSA") continues to benefit from improvements to operations and controls implemented through Pennsylvania Public Utility Commission (PUC) oversight, effective as of April 2018, as well as the strength of its own management team. Both changes to PWSA's governance have contributed to its satisfactory financial position over the past three years.

The Authority continues to face material pressure to improve its infrastructure given years of disinvestment. Coupled with its own consent decree pertaining to combined sewer overflows during wet weather events, which will be negotiated starting 2021, the Authority will necessarily add to its already elevated debt burden in the near term. PWSA anticipates roughly \$1.2 billion in capital spending over the next five years, largely funded by debt. This will add to leverage substantially, and future credit reviews will focus on the Authority's ability to manage additional debt while maintaining satisfactory cash and coverage metrics; largely dependent on PWSA's ability to increase rates as needed.

The Authority provides water distribution and wastewater collection and conveyance for the city of Pittsburgh (A1 stable) and neighboring municipalities. The city's diverse economy is a credit positive for the Authority. Favorably, PWSA reports continued strong revenue collections despite the onset of the coronavirus pandemic; average monthly collections stand at 97.43% as of September 2020, compared to 99.2% for 2019.

The Authority's 10 largest customers (3.7% of revenues) include major Pittsburgh institutions, such as the Fox Chapel Water Authority, Allegheny County (Aa3 stable), University of Pittsburgh (Aa1 stable), and Allegheny Health Network. All of the Authority's five largest customers have been in the system for at least 75 years. Notably, given a newly renegotiated cooperation agreement with the city of Pittsburgh, most city buildings are now metered for water going, with the city paying for water usage - something it had not done previously.

The Authority continues to maintain an ample water supply, providing water to a population of approximately 305,000. The system is permitted to draw up to 100 million gallons per day (MGD) from the Allegheny River, its sole water source, though average demand for water is well below that level, at 70 MGD. The Authority treats drinking water at one plant located on the river, as well as a microfiltration plant at one of its reservoirs. The Authority

has capacity to store approximately 3 days' worth of finished water for uninterrupted supply to its customers.

The Authority does not treat wastewater. It transmits all of its sewage to the Allegheny County Sanitary Authority. There is no contractual limit to the amount of sewage that can be conveyed, however, during wet weather events, the existing system frequently overflows.

The system currently experiences unusually large water loss. One of the Authority's current major infrastructure projects is a complete metering and mapping of its system. Metering will not only address the system's water loss but will also help PWSA target repairs such that widespread boil water advisories should become less frequent. Some of the Authority's other important near term improvements include hiring an expanded workforce to carry out maintenance of the system's general infrastructure up to current industry standards, and replacing water mains in line with accepted industry norms. The Authority has already implemented considerable workforce expansion plans to this end, and now employs a staff of 349 as of September 2020, compared to 247 employees in 2016.

Ordinary system updates and routine infrastructure improvements had been sorely lacking at PWSA, and years of deferred maintenance have led to cost inefficiencies and exacerbated the natural wear and tear on an already aged system. PUC oversight since 2018 has already served to remediate some of this by establishing guidelines for system improvements based on industry-wide standards.

This additional operational oversight by the PUC is a strong credit positive, especially given the onset of the coronavirus pandemic and the possibility of a longer term recessionary impact. During past periods of economic stress, the Authority used capital deferral as a tool to maintain satisfactory finances, and rate increases were heavily influenced by local politics. Through the PUC's oversight, rate increases are still measured against affordability, but are not as politicized. Further, while certain capital projects may be slowed to accommodate softening revenue if necessary, a complete sidelining of the capital plan and required maintenance is unlikely.

Beginning in 2019, the Authority was required to meet a covenant of 125% of senior debt service coverage plus 110% of subordinate debt service coverage without the use of free cash. PWSA met both of these requirements in both fiscal 2019 - with Moody's calculated coverage of 1.97 and 1.68 times, respectively - as well as fiscal 2018, with PWSA reporting senior lien debt service coverage of 1.89x and overall coverage of 1.37x.

The Authority expects a 10.8% rate increase for fiscal 2021, which would bring in an additional \$19 million in revenue if realized. This will be the second rate increase implemented with approval from the PUC; the first was a 13% rate increase in early 2019.

The Authority's rate increases have been prompted by its substantial capital needs. While improved revenues will continue to shore up reserves, consistent rate increases over the long term more will be required to support future debt issuance. Key drivers of Moody's future credit reviews will continue to include management and governance of the Authority, maintenance of satisfactory coverage and liquidity metrics, and PWSA's ability to satisfy environmental and capital improvements while effectively managing leverage and fixed costs.

In November 2017, the Authority entered into a Consent Order and Agreement with PA DEP related to elevated lead levels within the distribution system. To counteract the increased lead levels, the Authority has replaced over 8,000 lead lines since 2016 and implemented an approved corrosion control treatment called orthophosphate into the water system. As of June 2020, the Authority has achieved two consecutive 6 month lead testing periods with results well below the federal action level. The PWSA is now in compliance with the lead action level and has satisfied all obligations under the Consent Order and Agreement.

Credit strengths

- » Diverse, urban Pittsburgh service area, supported by strong "eds & meds" presence
- » Considerable size; system assets include water conveyance and treatment, and sewer conveyance that ties to ALCOSAN
- » Significant, recently implemented rate increases boost revenues; PUC oversight brings improvements and controls

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Credit challenges

- » Substantial debt burden; debt ratio is 103%
- » Narrow, though improved, liquidity versus similarly sized peers
- » Projected \$1.2 billion in capital needs over the next five years, to be primarily funded with debt
- » Consent decree to remediate combined sewer overflows not yet finalized

Rating outlook

The stable outlook reflects the authority's improved financial position as well as the credit-positive impact of PUC oversight and the strength of PWSA's management team, which we believe will serve to keep the Authority's finances and operations stable in the near term.

Factors that could lead to an upgrade

- » Substantial improvement in liquidity that is maintained over several reporting periods
- » Meaningful reduction of debt
- » Sustained improvements in debt service coverage

Factors that could lead to a downgrade

- » Material narrowing of debt service coverage and liquidity position
- » Inability to raise rates sufficiently to meet debt service coverage covenants while also funding significant deferred capital improvements
- » Failure to effectively deploy new revenues to address near term infrastructure and operating needs
- » Substantial new or worsening long-term environmental concerns

Key indicators

Exhibit 1

Pittsburgh Water & Sewer Authority - PA

System Characteristics					
Asset Condition (Net Fixed Assets / Annual Depreciation)	46 years				
System Size - O&M (in \$000s)	\$165,230				
Service Area Wealth: MFI % of US median	88.84%				
Legal Provisions					
Rate Covenant: (x)	125% Senior plus 110% subordinate debt service				
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test (Aa)				
Management					
Rate Management	A				
Regulatory Compliance and Capital Planning	A				
Financial Strength					
	2015	2016	2017	2018	2019
Operating Revenue (\$000)	\$174,164	\$180,727	\$202,996	\$231,734	\$249,049
System Size - O&M (\$000)	\$116,908	\$131,936	\$157,220	\$153,180	\$165,230
Net Revenues (\$000)	\$57,455	\$49,174	\$47,071	\$81,565	\$87,280
Net Funded Debt (\$000)	\$747,615	\$727,526	\$817,394	\$871,040	\$915,696
Annual Debt Service (\$000)	\$51,412	\$53,174	\$57,818	\$59,406	\$52,010
Annual Debt Service Coverage (x)	1.1x	0.9x	0.8x	1.4x	1.7x
Cash on Hand	88 days	60 days	26 days	112 days	143 days
Debt to Operating Revenues (x)	4.3x	4.0x	4.0x	3.8x	3.7x

Source: Moody's Investors Service, Authority audited financial statements

Profile

PWSA is an authority of the city of Pittsburgh (A1 stable), providing water treatment and conveyance to 84% of the city's population of roughly 305,000 residents and sewer conveyance for the entire city.

Debt and Pensions

The additional borrowing implied by the authority's capital needs will increase an already elevated debt burden. The authority's total debt is equal to 103% of fixed assets as of 2019 year end, well above similarly sized peers. The outstanding debt amortizes slowly, with only 42% of principal scheduled to be repaid in the next 10 years.

The Authority introduced a new indenture in 2017, which strengthened the rate covenant. The new requirement is 125% of senior debt service coverage plus 110% of subordinate debt service coverage. Free cash will no longer be used to increase coverage under the new indenture. The new test was effective for fiscal year 2019. The debt service reserve is funded at the lesser of the three-pronged test.

Debt structure

The Authority materially reduced its variable rate debt outstanding with its Series 2019 A&B issuance. Variable rate debt has been reduced to 29% of the total debt portfolio as of fiscal 2019, from 44%. When the Authority refunded out of this variable rate exposure, it also terminated associated swaps, materially reducing its swap counterparty risk.

There is one variable rate issuance outstanding currently - the Authority's senior lien Series 2017C bonds - which will be remarketed on December 1, 2020. The bonds will be remarketed with a rate indexed to SIFMA, rather than LIBOR. Since the fixed-to-floating rate swaps associated with the 2017C bonds are LIBOR-based, the Authority will layer on a basis swap alongside the remarketing in order to convert the variable rate received on the swaps to SIFMA from LIBOR, creating an effective hedge for the bonds.

Assured Guaranty Municipal Corp. (A2 stable insurance financial strength) insures the authority's variable rate bonds and all of the authority's swaps, except the 2020 basis swap, and provides the surety policy for all debt service reserve funds, except the reserve associated with PWSA's 2013 bonds, which is cash funded.

This counterparty concentration may adversely impact the authority should AGM's credit quality deteriorate.

The Authority also maintains \$123 million outstanding in PennVest loans as of September 2020 and an \$150 million revolving credit facility, of which \$106 million is currently drawn. The Authority will apply proceeds from its Series 2020 issuance to pay down the credit line. Given an intercreditor agreement, PennVest and PNC share a third lien priority on system revenues.

Debt-related derivatives

The authority maintains floating-to-fixed rate swaps in support of its Series 2017C issuance under ISDA Master Agreements with JP Morgan Chase Bank N.A. (64%) and Merrill Lynch Capital Services (36%), whereby the authority pays a fixed interest rate semi-annually (3.79% weighted average) and receives 70% of LIBOR. The Authority will enter into a basis swap in 2020 to convert the LIBOR received rate to SIFMA.

AGM provides swap insurance for all swaps. The aggregate swap mark to market has been reduced to a negative \$13.5 million as of fiscal year end 2019 from a negative \$86 million aggregate mark-to-market prior to the elimination of PWSA's subordinate variable rate debt and associated swaps during the year. The elimination of material, concentrated, counterparty risk is a strong credit positive to the Authority's debt profile.

The floating-to-fixed rate swaps are included in the parameters of a credit support annex (CSA), though there is no collateral posting requirement unless an Insurer Event occurs. The basis swap is excluded from the CSA. The amortization schedule for each swap mirrors that of the corresponding bonds and the swaps terminate at bond maturity. The basis swap terminates in December 2023 with the next mandatory tender of the Series 2017 C bonds. For all of the swaps, per the 2017 indenture, regularly scheduled swap payments are subordinate to subordinate bond debt service. Early termination is optional for the authority only, and termination by the counterparty depends upon specified termination events, including the downgrade of PWSA's underlying rating below investment grade. An authority termination payment would be subordinate to first and second lien debt service payments.

Pensions and OPEB

Most of the authority's employees participate in the city's pension program. The Authority's share of its pension contribution is now accurately provided for through its renegotiated cooperation agreement with the city. Beginning in 2019, all new full time non-union PWSA employees are eligible to participate in a 401(a) retirement plan and do not have the option of enrolling in the city's municipal pension fund plan.

ESG considerations

Environmental

The Pittsburgh metropolitan area faces a high risk of elevated rainfall levels. Demonstrated elevated rainfall levels in the region have directly impacted PWSA, as wet weather events overwhelm the system's current combined sewer infrastructure. This is the reason for the Authority's consent decree related to combined sewer overflows.

Social

Pittsburgh's population is relatively stable at roughly 305,000 and the five year average annual growth rate of the city's full value is a robust 6% as of fiscal 2020, well above the US median of 0.6%. Nevertheless, the city's wealth indicators remain below average with median family income at just 88% of the nation. Poverty is also elevated at 21%. As PWSA has increased rates, it has also implemented a rate relief program for qualifying residents, acknowledging this weakness in its rate base.

The coronavirus pandemic is considered a social risk under our ESG framework. PWSA's current credit profile considers the pandemic's impact on the Authority's finances and operations. Favorably, customer account collections are reportedly down just modestly in 2020 compared to the prior year, and the Authority continues to project a solid liquidity position at year end. If our view of the credit quality of PWSA changes, we will update the our opinion at that time.

Governance

The Authority's current management team has developed a comprehensive plan to bring operations to good working order and to proceed with much needed capital improvements. Strong governance controls at the Authority are evidenced by three consecutive years of materially improved financial performance.

Management views its relationship with the PUC as well as the DEP and EPA as an opportunity for partnership and has proactively sought to engage these agencies as PWSA moves forward with its substantial CIP. This is a definitive, positive change from the authority's prior actions, and informs our stable outlook on PWSA's current credit profile.

The Authority's Board consists of nine members recommended by a nominating committee, appointed by the Mayor, and approved by City Council. Currently, seven of the nine Board seats are filled. Starting in 2020, city water charges are being phased in pursuant to a cooperation agreement, effective as of October 2019. The Authority provided water to the city at no cost prior to 2020. Among other things, the cooperation agreement also provides for payments between the city and the PWSA to be based upon actual, verifiable, direct expenses, and in accordance with customary utility practices under the PUC Code, and importantly, confirms that payments by the PWSA to the city will continue to be subordinate to all debt obligations of the PWSA.

Pennsylvania's Public Utility Commission began oversight of the authority in April 2018. The PUC is responsible for regulating the authority's rate making, operating effectiveness, and debt issuance. We expect that the PUC will bring standardization and effective governance to the authority's future operations. The PUC is required to approve rate increases that will ensure PWSA complies with its bondholder covenants, though we note that the approval process for increases can be lengthy.

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REPORT NUMBER 1252594

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81 3 5408-4100
EMEA	44-20-7772-5454

VII. RATE OF RETURN

VII.19. Supply copies of all presentations by the company's and, if applicable, its parent's management and securities analysts during the past 2 years, including presentations of financial projections.

RESPONSE:

Please see attached.



Pittsburgh
Water & Sewer
Authority

THE PWSA RATING AGENCY PRESENTATION

October 28, 2020





The Pittsburgh Water and Sewer Authority



William J. Pickering,
Executive Director

Edward Barca,
Director of Finance

Jennifer Presutti,
Deputy Executive Director

John Potanko,
Program Manager – Capital Projects

Financial Advisor: Public Resources Advisory Group



Tom Huestis,
Senior Managing Director

Christine Fay,
Senior Managing Director

Senior Manager: Morgan Stanley and Bank of America

Morgan Stanley



Richard Weiss,
Executive Director

Eugene Spinelli,
Executive Director





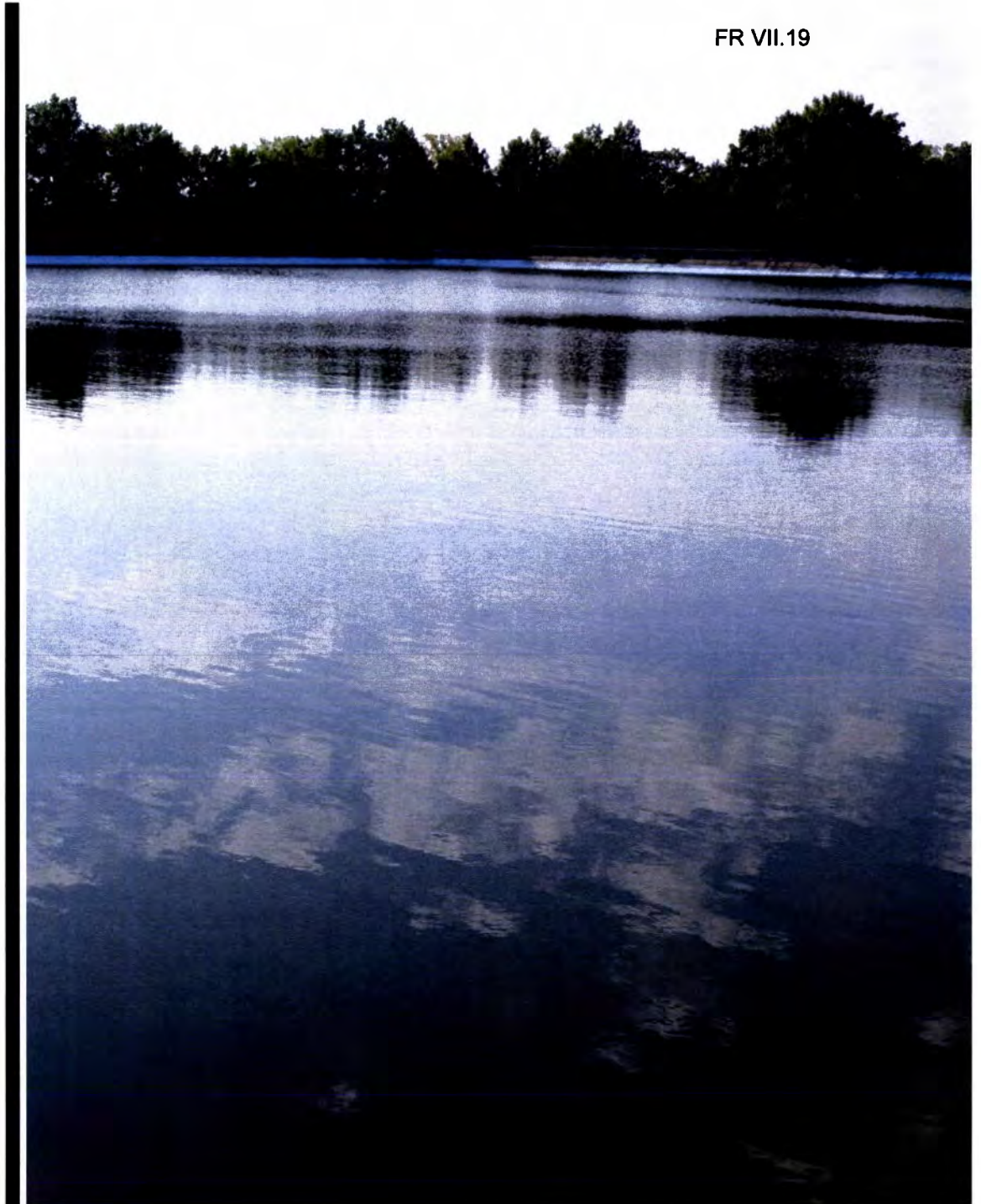
CONTENTS

- Section 1: Management Highlights
- Section 2: Authority Service Areas and Customer Base
- Section 3: Water and Sewer System Facilities and Operations
- Section 4: Capital Planning and CIP
- Section 5: Financial Condition of the Water and Sewer System
- Section 6: Pro Forma Projections
- Section 7: Plan of Finance
- Section 8: Conclusion



Section 1:

Management Highlights

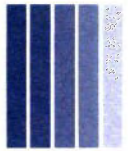




EXECUTIVE DIRECTOR OPENING REMARKS

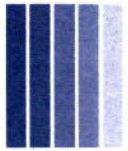


- Appointed June 2020
 - Previously the Deputy Executive Director
- Vision and Strategic Direction
- Recent PWSA Accomplishments



GOVERNANCE

Board Member	Board Title	Years on Board	Experience
Paul Leger	Chairperson	<6	Retired, Former Director of Finance, City of Pittsburgh
Erika Strassburger	Vice Chairperson	>1	Councilwoman, City of Pittsburgh
James Turner	Secretary	<3	Retired, Former Professor, University of Pittsburgh GSPIA
Michael Domach	Assistant Secretary/Treasurer	<1	Professor, Carnegie Mellon University
Dr. Audrey Murrell	Member	<1	Professor, University of Pittsburgh, College of Business Administration
BJ Leber	Member	<1	President & CEO, Adagio Health
Rosamaria Cristello	Member	<1	Executive Director, Latino Community Center
Vacant	-	-	-
Vacant	-	-	-



MANAGEMENT

Key Management Position	Title	Experience
William Pickering	Executive Director	Appointed in June 2020. Previously the Deputy Executive Director of the PWSA. Prior experience working for municipal water authorities and local and federal government entities.
Jennifer Presutti	Deputy Executive Director	Appointed in June 2020. Previously the Director of Finance of the PWSA. Has 15 years of public sector finance and budgeting experience including positions with the City of Pittsburgh and various not-for-profit entities.
Debbie Lestitian, CPA, Esquire	Chief Corporate Counsel / Chief of Administration	Appointed February 2018. Holds current Pennsylvania licenses as an Attorney and as a Certified Public Accountant with over 25 years of business experience in the private sector.
Edward Barca	Director of Finance	Appointed in June 2020. Previously the Deputy Finance Director/Treasurer of the PWSA. Prior experience working for the City of Pittsburgh as the Assistant Finance Director.
Cyril “Rick” Obermeier	Chief of Field Operations	Appointed September 2017. Has had increasing operations and engineering responsibilities with PWSA and previously the City of Pittsburgh Water Department since 1982.
Julie Quigley	Director of Administration	Appointed October 2017. Has spearheaded critical technological innovations. Created the current Customer Assistance Program and reformed the entire PWSA Customer Service Department.
Barry King, PE	Director of Engineering and Construction	Appointed May 2019. Has over 24 years of engineering experience with a nationally recognized consulting engineer firm and with Calvert County, Maryland.
William “BJ” McFaddin	Director of Field Operations	Appointed in 2019. Has over 20 years experience in the water and sewer industry.



PWSA ORGANIZATIONAL STRUCTURE

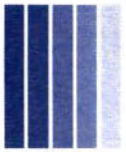


Workforce Expansion:

- Department Directors and Senior Management
- Employee Count (102 new employees, 41% increase)
 - 2016 – 247 Employees
 - 2017 – 267 Employees
 - 2018 – 295 Employees
 - 2019 – 331 Employees
 - Sept. 2020 – 349 Employees

Department	2016 Employee Count	2017 Employee Count	2018 Employee Count	2019 Employee Count	Sept. 2020 Employee Count
Customer Service	36	42	49	59	62
Engineering	22	24	27	32	39
Water and Sewer Operations	121	129	129	140	132
Water Treatment Plant	35	38	42	43	45
TOTAL	214	233	247	274	278





MANAGEMENT INITIATIVES

Lead Mitigation Initiatives

Lead Service Line Replacement Program

- Over 8,000 public lead service lines replaced since 2016
- In March 2020, the PWSA received a 1% loan from the Pennsylvania Infrastructure Investment Authority (“PENNVEST”) totaling over \$65.0 million to fund the replacement of the 2,000 water lines as well as 850 public lead service lines
- **Water Treatment Program**
- As of April 29, 2019, the entire Water System receives orthophosphate treatment which ensures rapid mitigation of lead and copper corrosion to levels well below current federal drinking water standards
- This, along with lead service line replacements, have resulted in lead levels well below the EPA lead action level

Development and Training

- An expanded infrastructure improvement program, with \$200 million to \$300 million annual capital expenditures, and enhanced water and sewer operations will require a larger workforce
- The PWSA workforce has increased more than 40% since 2016
- The eventual goal is to have a workforce of more than 500 people by FY 2025

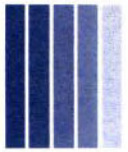
PGH20 2030 Plan

- In October 2018, PWSA laid out its vision for rebuilding and upgrading the drinking water, stormwater, and sewer systems, known as the PGH20 2030 Plan
- Capital improvement program includes \$1.2 billion in spending over the next five years, including for upgrading the water treatment plant, drinking water, stormwater and sewer systems, and building green infrastructure
- Adopted long-term financial planning initiatives that include implementing financial policies, monitoring financial metrics, and modernizing the capital and operating budget process
- Improved operating efficiencies through the use technology and streamlined systems and processes
- Target of reducing non-revenue water to below 20% in ten years

Customer Assistance Programs

- The PWSA customer assistance program, which helps customers who need it the most with bill assistance
- Customers under 150% of the federal poverty level are eligible to apply.
- The winter shut off moratorium provides single-family residential customers earning an annual income that is at or below 250% of the federal poverty level assurance that their water service will not be shutoff from December 1st through March 31st if they are unable to pay their bill
- **TENTATIVE Per Rate Settlement:**
 - **Threshold for winter shut off moratorium would increase from 250% of the federal poverty level to 300%**
 - **Fix base charges would increase from 75% to 100% for customers enrolled in the Bill Discount Program.**





MANAGEMENT INITIATIVES (CON'T)

Advanced Metering Infrastructure Program

- In 2017, the PWSA selected Sensus USA, a global leader in utility infrastructure systems, to provide state of the art Advanced Metering Infrastructure (AMI) technology throughout the City of Pittsburgh
- The innovative AMI system has greatly enhance monthly automated meter reads with a wireless system that collects multiple remote reads per day, allowing for better leak detection, increased billing features, and improved customer service
- Installed networked meters has allowed customers to monitor water usage in real time

Stormwater System

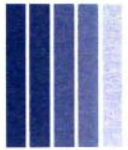
- Currently, stormwater management is a joint responsibility with the City of Pittsburgh
- During 2018, the PWSA gave notice that it intends to assume responsibility for the stormwater system within the City of Pittsburgh
- Due to the nature of the combined collection system (sewage and stormwater conveyed in the same pipe), the PWSA has interest in taking full responsibility for the combined sources of flow into these conveyances to improve overall operations and for environmental compliance to mitigate CSO, street flooding and basement backup with one investment to lower overall investments
- The PWSA plans to implement a stormwater fee in FY 2022

Technology Initiatives

- Implementation of an e-Builder Project Information System beginning in July 2015 to improve project management
- e-Builder was supported by the development of a Program Management Plan to codify processes, activities, and procedures for CIP project planning and delivery
- Projected 2021 go-live for a new document management system (DocuWare) and human resources information system (Ceridian's Dayforce)
- Enterprise Resource Planning (SAP) project will kick-off in 2021
- Future technology implementation will include a new Computerized Maintenance Management System (CMMS)

De-Risking of Debt Portfolio

- Where possible, the PWSA will continue to de-risk the debt portfolio to eliminate or reduce the exposure to variable rate debt and related swaps
- In 2019, the PWSA refunded roughly \$104 million of subordinate variable-rate debt and terminated the associated swaps
- Reduce exposure to LIBOR



PENNSYLVANIA PUBLIC UTILITY COMMISSION

Jurisdiction Established

- Act 65 of 2017 was passed into law on December 21, 2017 and established the PWSA as a “Utility”, resulting in regulation of PWSA’s rate making, operating effectiveness, debt issuance, and other aspects of conducting business

Compliance Plan

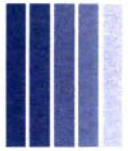
- The PUC issued a Tentative Implementation Order on January 18, 2018 which included methods by which the PUC and affected entities can carry out the Act 65 provisions
- The PUC issued a Final Implementation Order on March 15, 2018 which directed (1) the filing of a water and wastewater tariff filings no later than July 2, 2018, and, (2) a compliance plan to the PUC no later than September 28, 2018 to address how it will achieve full regulatory compliance including provisions to bring the Authority’s existing information technology, accounting, billing, collections, and other operating systems and procedures into compliance with the applicable PUC requirements
- The PWSA complied with both requirements and received approval of its Initial PUC Tariffs effective March 1, 2019. PWSA’s Compliance Plan was filed on September 28, 2018 and supplemented on February 1, 2019
 - Stage 1 – Urgent infrastructure remediation and improvement and the revenue and forecasting requiring of maintaining service that support public health and safety
 - Stage 2 – Stormwater and Customer Service

Long-Term Infrastructure Improvement Plan

- The PWSA filed a draft Long-Term Infrastructure Improvement Plan (“LTIIIP”) with the PUC on September 28, 2018 which will be updated to support a Distribution System Improvement Charge (“DSIC”) in the future
- The PUC approved the LTIIIP on August 27, 2020

Tariff Approval Processes

- **FINAL** - On February 7, 2019, the PUC approved a joint settlement which increases PWSA annual revenues by \$21 million (~13 %)
- **TENTATIVE** – On September 30, 2020, filed a proposed settlement with the PUC regarding the 2021 rate proposal
 - Increases annual revenues by \$19 million (~11%)
 - \$9.09 million: Water and Wastewater DSIC Revenue
 - \$9.91 million: Water and Wastewater Base Rates



CITY OF PITTSBURGH/PWSA COOPERATION AGREEMENT

New Cooperation Agreement

- On October 3, 2019, the City and the PWSA entered into a new Cooperation Agreement that, among other things, reflects
 - Changes in their respective rights and obligations
 - Accurately reflects the division of services related to the system
 - Provides for payments between the City and the PWSA to be based upon actual, verifiable, direct expenses, and in accordance with customary utility practices under the PUC Code
 - Confirms that payments by the PWSA to the City will continue to be subordinate to all debt obligations of the PWSA
 - Provides for cooperation by the City and the PWSA in their respective capital projects which may impact each other
 - Provides for clarification of the responsibilities of the PWSA with respect to City Regional Parks and other City properties
 - Confirms that the system will remain under public ownership
 - Sets forth certain other provisions relating to the roles and responsibilities of the City and the PWSA with respect to the system

Payments to the City

- Pension reimbursement
- Permits and licenses
- Payroll tax
- Fuel usage
- Vehicle repair

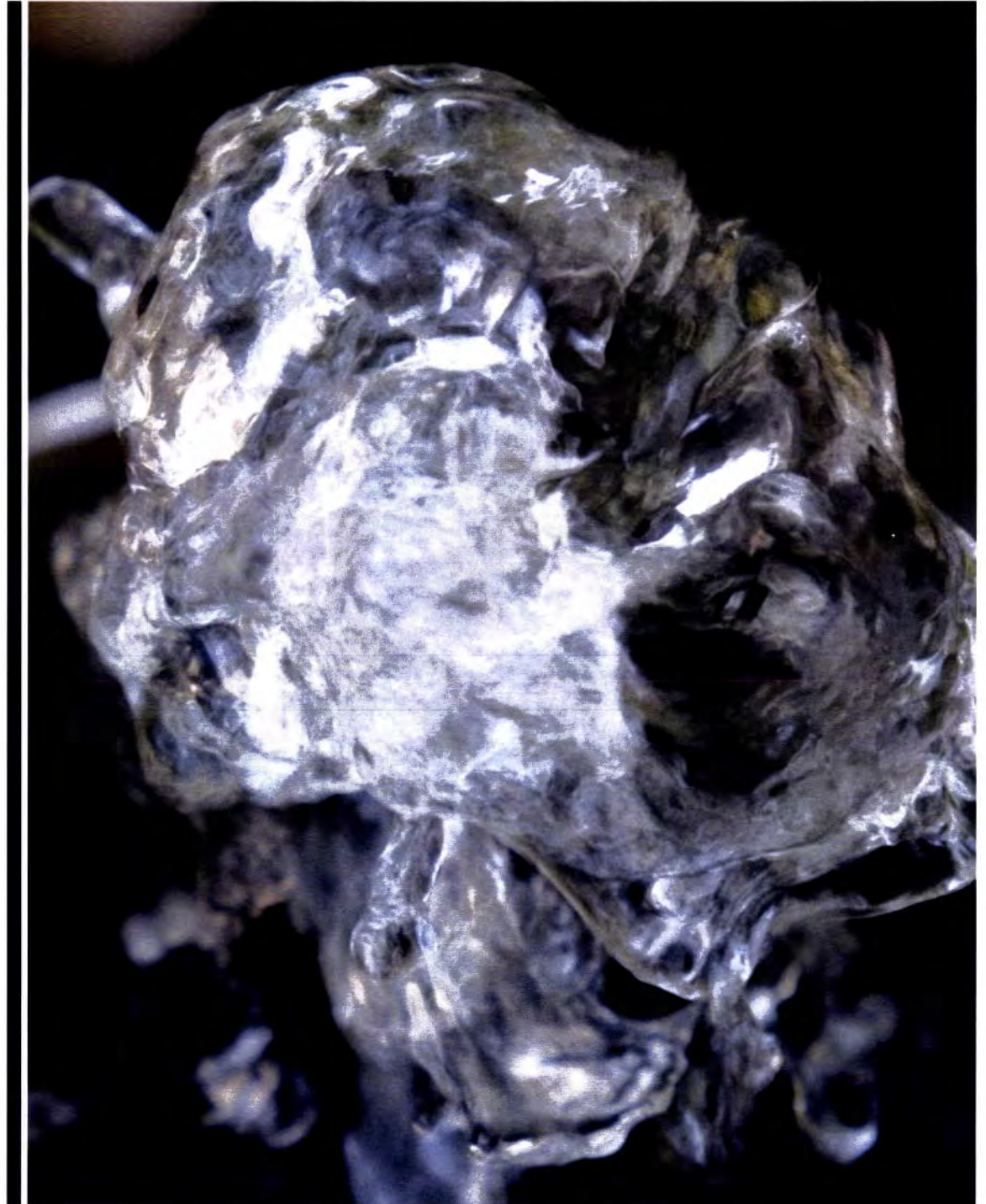


Payments to the PWSA

- PWSA water charges
- ALCOSAN charges
- 50% of the metering costs for City facilities

Section 2:

Authority Service Areas
and Customer Base





CITY OF PITTSBURGH ECONOMY

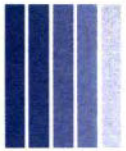
Strategic location with highly skilled and educated workforce



- Role as the anchor and economic engine for western Pennsylvania, based on an employment base that has reinvented itself from one which once relied heavily on manufacturing jobs to one with a prevalent healthcare and education presence
- Three signature rivers make it US's second largest inland port
- 18 commercial railroad systems
- Interstate highway access
- Access to 50%+ of US buying power within 500 miles
- University of Pittsburgh Medical Center has become the largest employer in the Commonwealth
- Competitive advantage through highly-skilled workforce, world-class research institutions, and technology-intense advanced manufacturing
 - In 2016, per capita university R&D spending was nearly 2.5 times the national average
- In 2019, Pittsburgh business startups received nearly \$3 billion in outside investment

Companies with Recent Investments in Pittsburgh





CITY OF PITTSBURGH ECONOMY (CON'T)

2019 Top 10 Employers⁽¹⁾

Company	Industry	Employment
University of Pittsburgh Medical Center	Healthcare	53,000
Highmark Health	Healthcare	27,279
U.S. Government	Government	18,473
Commonwealth of Pennsylvania	Government	15,972
PNC Financial Services Group, Inc.	Financial Services	13,000
University of Pittsburgh	Higher Education	12,338
Giant Eagle	Retail	10,394
Wal-Mart Stores, Inc.	Retail	9,000
Allegheny County	Government	7,164
BNY Mellon	Financial Services	7,000

2019 Pittsburgh Fortune 500 Companies⁽²⁾

Company	Annual Revenue
PNC Financial Services Group, Inc.	\$21.6 billion
PPG Industries Inc.	\$15 billion
Howmet Aerospace Inc.	\$14 billion
United States Steel Corp.	\$12.9 billion
Alcoa Corp.	\$10 billion
WESCO International Corp.	\$8.3 billion
Wabtec Corp.	\$8.2 billion

Source:

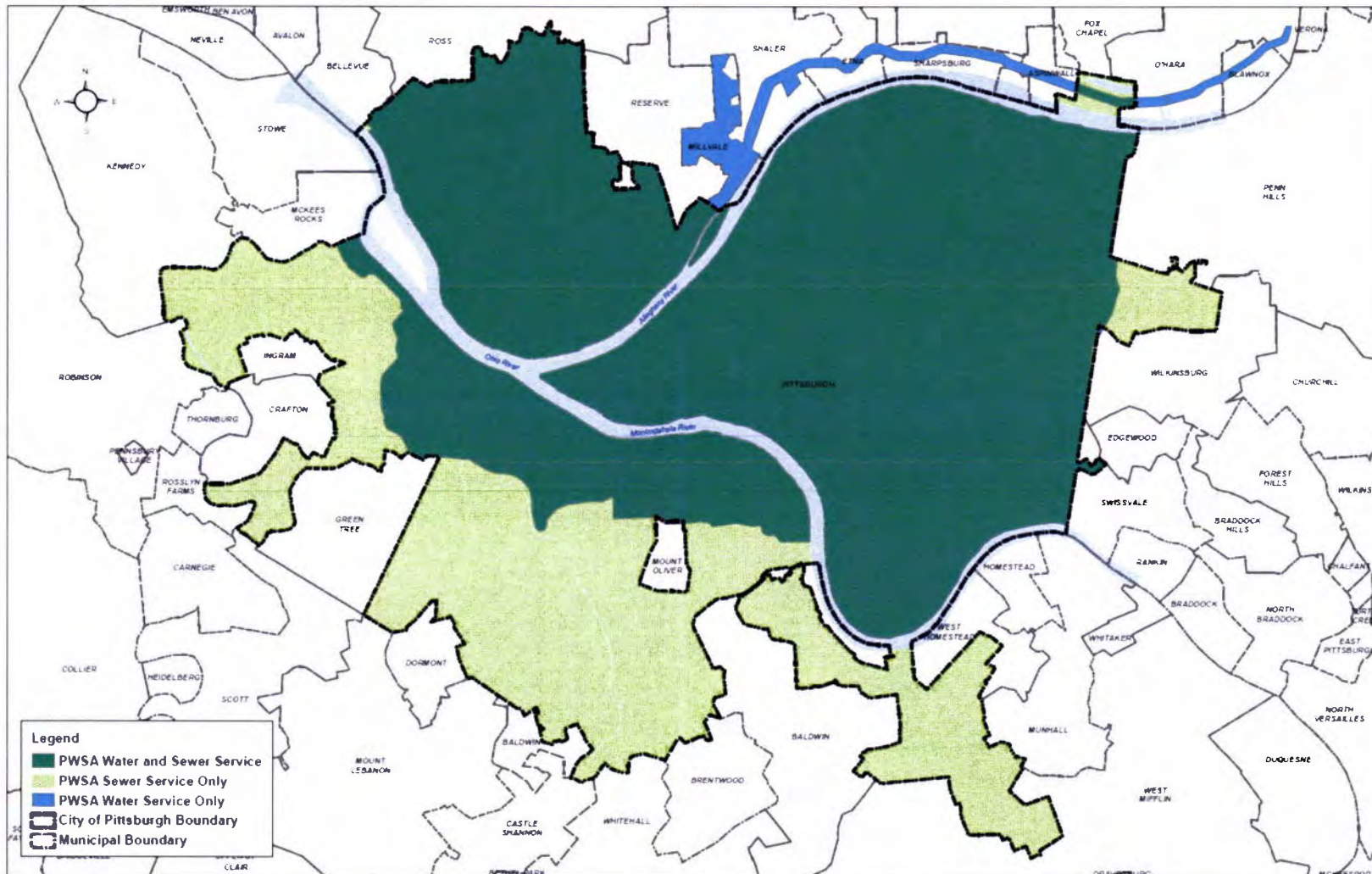
1) 2019 City of Pittsburgh Comprehensive Annual Financial Report

2) Pittsburgh Business Times





PWSA SERVICE AREA





PWSA CUSTOMER BASE

2019 Top Ten Largest Customers by Consumption

Rank	User	% of Total Consumption
1	Fox Chapel Water Authority	8.63
2	Allegheny County Government	1.52
3	University of Pittsburgh	1.40
4	Reserve Water Department	1.31
5	Housing Authority of the City of Pittsburgh	0.93
6	Veterans Affairs Financial Services	0.80
7	Borough of Aspinwall	0.79
8	Allegheny County Sanitary Authority	0.71
9	West Penn Hospital	0.67
10	Allegheny Health Network	0.53
TOTAL		17.29

2019 Water Consumption by Customer Class

User	# of Customers	% of Usage
Residential	69,637	34
Commercial	7,862	38
Industrial	86	3
Wholesale	20	10
Other	1,954	15
TOTAL	79,559	100

- Provides ample water supply to a population of approximately 306,000
- Five largest customers (~14% of total revenue) have been in the System for at least 75 years
- In addition to its sales to residential, commercial, and industrial customers, the PWSA has agreements with the five adjacent municipalities or authorities listed below with three of those being wholesale water customers:
 - Fox Chapel Water Authority (Wholesale Customer)
 - Reserve Township (Wholesale Customer)
 - Borough of Aspinwall (Wholesale Customer)
 - Hampton-Shaler Water Authority
 - West View Water Authority
- The PWSA purchased the neighboring Borough of Millvale's water system in 2010, adding nearly two thousand customers to its customer base

Section 3:

Water and Sewer System

Facilities and

Operations





WATER SYSTEM OVERVIEW

System Supply

- Sole source of water for the Water System is the Allegheny River
- Authority and its predecessors have held withdrawal permits since 1943

Treatment, Pumping, and Distribution Facilities

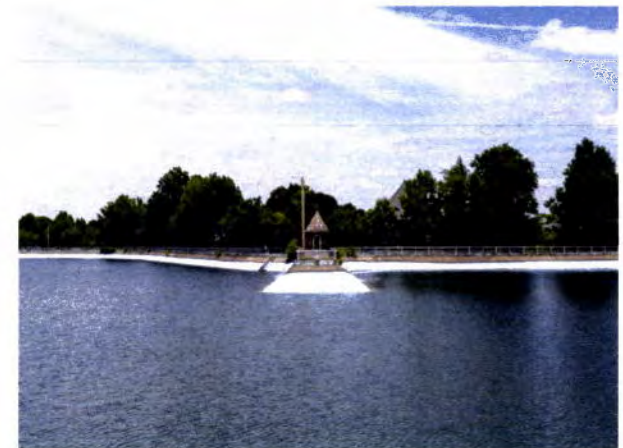
- 117 MGD rapid sand water treatment plant near the Borough of Aspinwall
- 26 MGD secondary membrane micro filtration plant in the Highland Park section of the City to retreat water from the Highland #1 Reservoir (enabling the reservoir to remain uncovered) before it goes into the water distribution system
- 964 miles of water mains plus 80,864 individual service connections
- 24,900 valves
- 7,450 fire hydrants
- 11 pumping stations (one raw water, two finished water, and eight distribution)
- Four reservoirs (one uncovered source water and three covered finished water) and 10 distribution storage tank reservoirs with 455 million gallons of total capacity (two to three days of uninterrupted supply)

Production and Demand

- In 2018, the water treatment plant treated over 24.8 billion gallons of water
- Average withdrawal is approximately 70 MGD



Lanpher Reservoir Cover



Highland Park Reservoir

WASTEWATER SYSTEM OVERVIEW

Overview

- Conveys wastewater collected from 24 neighboring suburban municipalities and generated within City boundaries to ALCOSAN interceptors along the rivers of the City for conveyance to ALCOSAN's Woods Run Sewage Treatment Plant (the "WWTF") on the Ohio River

PWSA Sewage Collection and Pumping Facilities

- Comprised of an extensive network of approximately
 - 1,213 miles of sanitary, storm, and combined sewers
 - 29,000 manholes (which includes flow dividers and diversion chambers)
 - 30,000 inlets (which includes catch basins and storm inlets)
 - 38 combined sewer overflow (CSO) outfalls
 - 185 storm sewer outfalls
 - Four wastewater pump stations
 - Approximately 23% of the PWSA Sewer System consists of separate sewers that consist of dedicated separate sanitary and storm sewer pipelines

ALCOSAN Treatment Capacity

- Permitted dry weather capacity of 190 MGD and wet weather capacity of 250 MGD
- Flow regulation at the plant limits peak wet weather flow to the permitted capacity
- Combined sewage which exceeds the capacity of the flow regulators at the trunk sewers, interceptors, and the WWTF is discharged as CSOs to receiving waters
- ALCOSAN maintains 53 diversion structures and an additional 153 diversion structures are maintained by the PWSA and other authorities
- Major upgrades to the WWTP are mandated by the USEPA COA Recently Negotiated with Between EPA and ALCOSAN



Smallman Street Sewer



RELATIONSHIP BETWEEN THE PWSA AND ALCOSAN

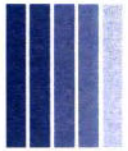
The Pittsburgh and Water Authority (“PWSA”)

- Approximately 77% of PWSA’s Sewer System is combined sewers that are designed so that during wet weather events a portion of the collected stormwater and diluted wastewater that exceeds ALCOSAN’s conveyance and treatment capacity is discharged into natural waters through 98 combined sewer overflow (“CSO”) diversion chambers, some of which includes PWSA’s CSO
- PWSA’s combined sewers also convey wastewater from 24 neighboring suburban municipalities pursuant to agreements with the City
- The remaining 23% of the Sewer System includes dedicated separate sanitary sewers and storm sewers
- The PWSA serves as the billing agent for ALCOSAN

(Almost all of the 83 municipalities and authorities are billing agents for ALCOSAN)

Allegheny County Sanitary Authority (“ALCOSAN”)

- ALCOSAN Established in 1947 Provides County-wide Sewage Treatment
- Wastewater is conveyed from the PWSA’s Sewer System to ALCOSAN interceptors located along rivers and tributaries which deliver flow to ALCOSAN’s WWTF for treatment prior to discharge into the Ohio River
- ALCOSAN’s interceptor system includes shallow-cut pipes, deep tunnels, and diversion structures to which PWSA’s sewer system connects
- The ALCOSAN WWTF currently operates under the National Pollutant Discharge Elimination System Permit No. 0025984
- In total, the ALCOSAN WWTF receives wastewater flows from 83 municipalities and authorities



ENVIRONMENTAL REGULATION

Consent and Order Agreement with DEP Replaced with Consent Decree with the USEPA

Clean Water Act Section 308 Information Request

- PWSA's Consent and Order Agreement ("COA") with the DEP expired in March 2015. The City and PWSA as joint permit holders requested that the USEPA become the primary regulatory body to which the Authority is responsible
- On January 21, 2016, the USEPA issued a Clean Water Act Section 308 Information Request to the Authority
- The nature of the request is to provide a jurisdictional basis for USEPA to engage the Authority/City in an enforcement action by consent, or a Consent Decree ("CD"), which requires the PWSA to:
 - Submit detailed information on past CSO performance and activities
 - Conduct a green infrastructure ("GI") and source reduction study for the service area, followed by GI demonstration projects
 - Continue implementing Nine Minimum Controls to reduce combined sewer overflows and perform repairs and maintenance of deficiencies
 - Ongoing sewer line replacement, point repair, lining, point lining, and Gunite projects have been implemented to address structural deficiencies
 - Submission of monthly reports updating the progress of evaluations and improvements as well as water quality impacts
- The PWSA hired two international engineering firms to assess and model the Sewer System, and has fulfilled the first portion of the USEPA 308 request due by March 31, 2016
- The second phase of the USEPA request required a GI and source reduction study which was completed in November 2016 and titled PWSA's Green First Plan. Four GI demonstration projects have been completed and additional projects are in design for construction in 2019 and 2020 to show how the Green First Plan will contribute to Regional Water Quality improvement



ENVIRONMENTAL REGULATION (CON'T)

Ongoing Commitment to Maintain Regulatory Compliance

- An additional 308 request from EPA was received in October of 2016 seeking more detailed information and further actions regarding the assessment of the PWSA's Sewer System
 - This response was delivered on time in January 2017 and continues to require additional monthly reporting. The demonstration project evaluations were submitted on time on December 1, 2017
- The PWSA's Green First Plan is a comprehensive regional CSO and SSO reduction implementation plan for the City and other communities that proposes at least \$46 million for stream removal projects and at least \$690 million for distributed GI and source control projects over the next 20 years to achieve the required CSO control levels. The PWSA, along with the other impacted local municipalities, is awaiting a response from the USEPA and the DEP on its proposed regional plan. PWSA and the City also intend to defray its ratepayer costs by obtaining ALCOSAN Grants

New Consent Order

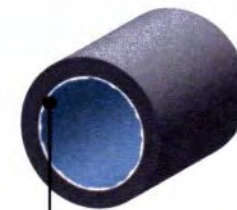
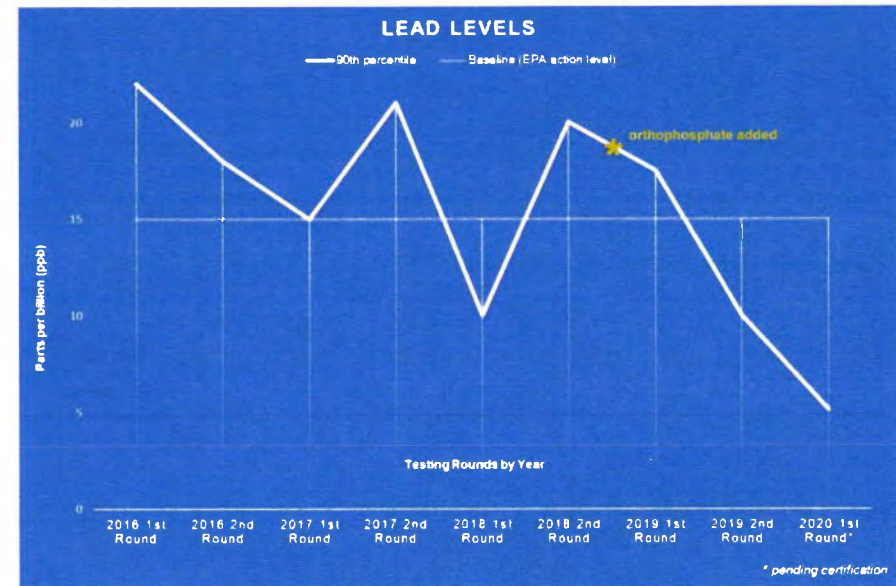
- The negotiation of a new Consent Order with the USEPA is expected to start in 2021
- Given the broad scope of a potential Consent Order, the size of the City Sewer System, and the various conditions and/or deficiencies that may be discovered by the assessment, it is difficult to predict the total cost of compliance; however, PWSA's integrated management approach will provide the least cost strategy for PWSA, and will present more opportunities for PWSA to be awarded Grow Funds from ALCOSAN
- Costs associated with Consent Order compliance will be reflected in the capital improvement program



ENVIRONMENTAL REGULATION (CON'T)

The PWSA is a national leader in managing lead and replacing lead service lines

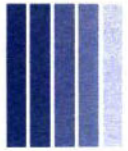
- Since 2016, the PWSA has replaced over 8,000 lead service lines
- In April 2019, the PWSA began adding orthophosphate to the water system. Orthophosphate is a food-grade additive that forms a protective layer inside the lead service lines, creating a barrier between the lead pipes and the water flowing through them
- On July 22, 2020, the PWSA announces the lowest lead testing in over 20 years and the second consecutive round of testing below the federal action level
- Lead service line reimbursement program
- Additional information on the community lead response team can be found at: <http://lead.pgh2o.com/>



A protective layer of *Orthophosphate* forms to prevent pipe corrosion.



Lack of corrosion control allows lead to leach from pipes into water.



CYBERSECURITY AND RESILIENCY

Cybersecurity

- The PWSA has engaged the U.S. Department of Homeland Security to conduct Cyber Hygiene vulnerability scans. Weekly reports will be delivered to the PWSA describing the results
- The PWSA has a current cyber risk insurance policy that covers computer fraud, funds transfer fraud, and E-commerce extortion. In addition, the policy covers expenses related to crisis management, security breach remediation, computer program and electronic data restoration, and business interruption expenses

Data and Asset Security

- Firewall hardware and anti-virus software are in place. A third party managed services contractor identifies and recommends server and device patching/updates
- Homeland Security and the FBI are assisting PWSA evaluate and plan upgrades to address any existing deficiencies

Phishing

- Since July 2018, the PWSA has conducted three phishing training campaigns with all users via a third party service. Additionally, a “Report a Phishing Email” button was added to MS Outlook for all users

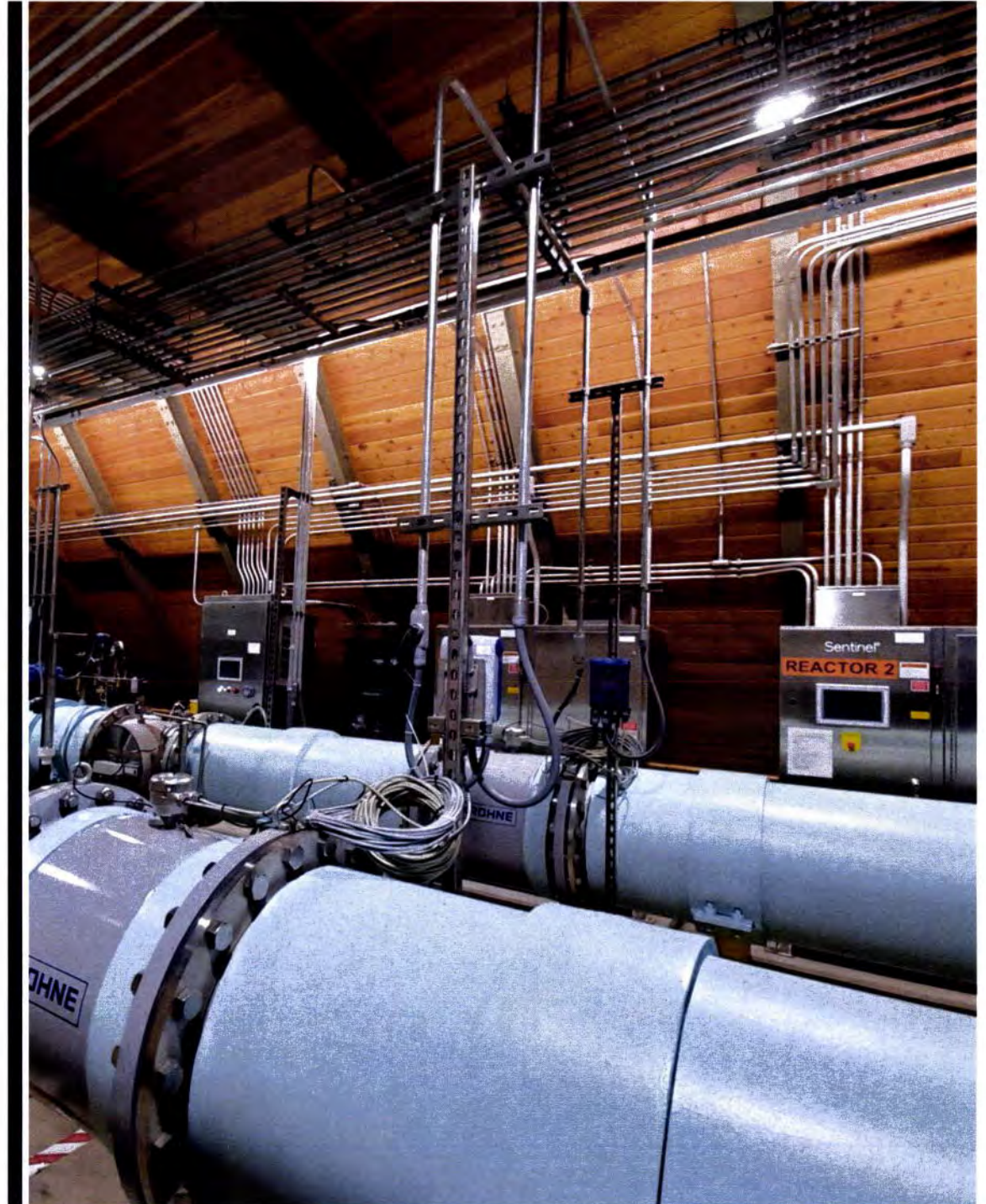
Disaster Recovery Plan

- The PWSA has partnered with a third party to provide disaster recovery and business continuity services

Section 4:

Capital Planning and

CIP





CAPITAL PLANNING PROCESS

Overview

- The PWSA Capital Improvement Program (“CIP”) focuses on sustaining cost-effective operations, while optimizing the system's asset performance and life expectancy

Development and Approval Process

- The Annual CIP process begins each year around March/April when project nominations are solicited from the entire organization
- Following the nomination period, the Finance and Engineering departments evaluate nominated projects and make recommendations for what should be considered for immediate priorities
- Further planning efforts consist of the preparation of a Project Sheet, which provides more detailed information on a project’s potential scope options, risks, schedule, and the development of a preliminary cost estimate
- This process lasts several months and culminates with the presentation of the updated CIP to PWSA’s Board of Directors

Capital Project Prioritization:

- The following criteria are used to evaluate and prioritize capital projects:
 - Capacity – Meets community health needs and growth, as needed
 - Level of Service – Improvement to customer service
 - Operations and Maintenance Efficiency – Potential for operating cost savings
 - Regulatory Compliance – Regulatory compliance schedule and potential fines for non-compliance
 - Regional Cooperation/Stewardship – Coordination with external stakeholders and local communities
 - Reliability/Operational Flexibility – Location, age, and condition of infrastructure and risk if action is not taken
 - Safety – Potential health and safety risks to personnel and the public if action is not taken
 - Sustainability – Energy efficiency and “green” approach to improving water quality



FY 2021-2025 CAPITAL IMPROVEMENT PLAN

Capital Requirements

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Water Treatment Plant	\$ 15,112,066	16,422,149	45,559,717	23,358,443	26,105,966	\$ 126,558,340
Water Pumping and Storage	56,863,770	70,939,529	106,366,346	49,645,737	51,176,787	334,992,169
Water Distribution	76,245,552	36,345,826	66,150,837	119,049,668	169,246,024	467,037,906
Wastewater System	35,741,675	45,109,155	29,580,401	34,664,259	38,980,692	184,076,182
Stormwater	34,696,272	21,721,607	13,237,377	14,764,949	11,479,750	95,899,955
Other ⁽²⁾	14,670,000	1,100,000	2,500,000	2,500,000	1,500,000	22,270,000
Total Capital Requirements	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553

Funding Sources

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Debt (Revenue Bonds)	\$ 169,262,753	173,670,904	249,823,825	233,482,080	287,988,242	\$ 1,114,227,804
Debt (Project Fund)	17,219,270	7,466,387	3,069,877	-	-	27,755,534
DSIC - Water ⁽¹⁾	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,253
DSIC - Sewer ⁽¹⁾	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,254
PENNVEST	37,038,708	-	-	-	-	37,038,708
Total Funding Sources	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553

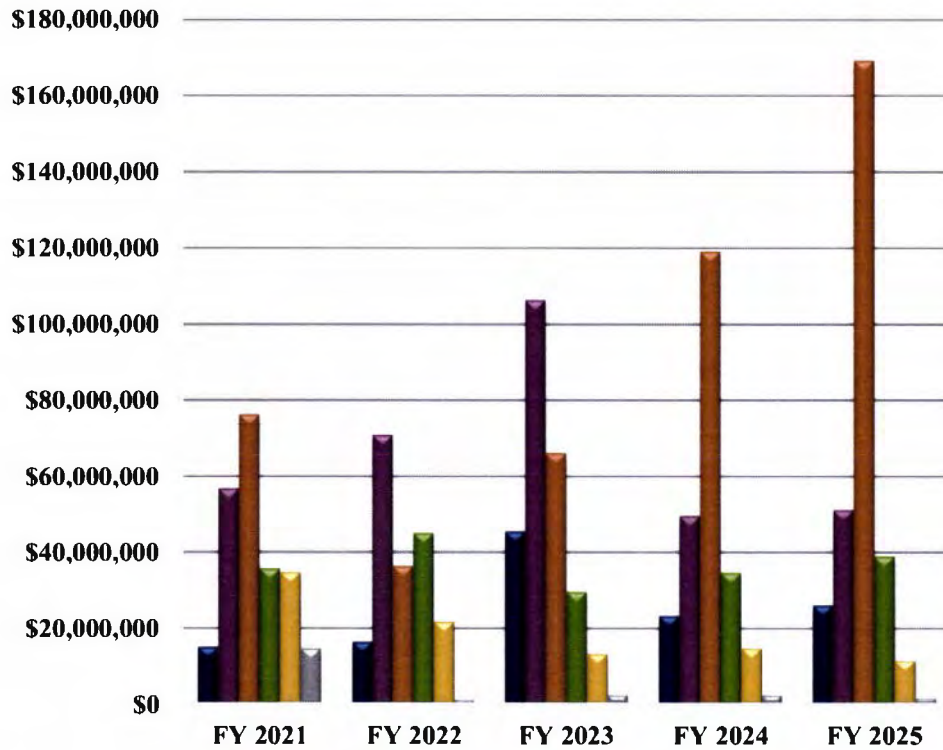
Notes:

- 1) Total 2021 DSIC revenues for water and sewer are slightly lower than the tentative 2021 rate settlement. This is a result of the 2021-2025 CIP being approved prior to the completion of the tentative 2021 rate settlement.
- 2) FY 2021 includes separate contract costs for surface restoration that is used for all projects. Starting in FY 2022, surface restoration costs will be built into the budget for each project that requires surface restoration.



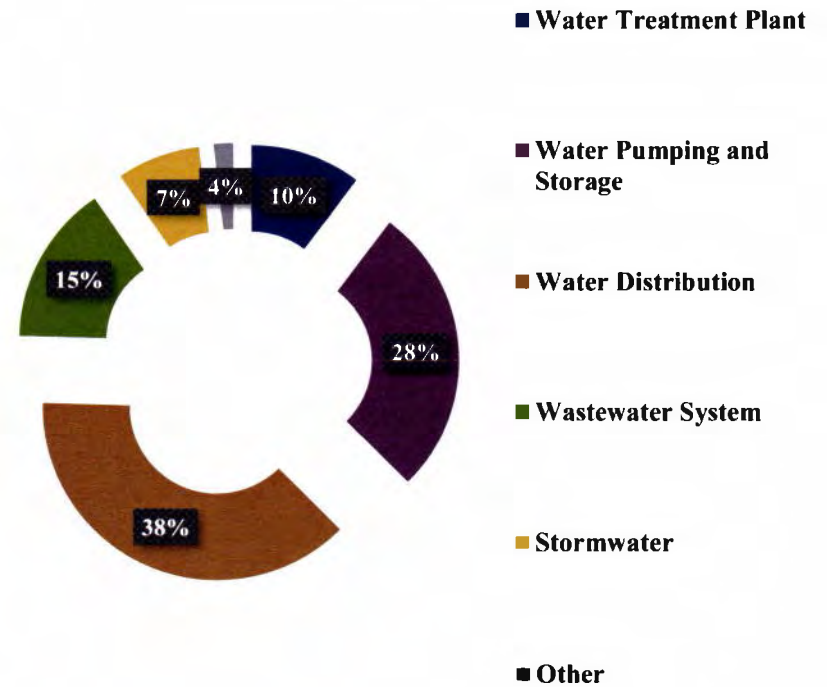
FY 2021-2025 CAPITAL IMPROVEMENT PLAN (CON'T)

Allocation by Project Type



- Water Treatment Plant
- Water Pumping and Storage
- Water Distribution
- Wastewater System
- Stormwater
- Other

Allocation by Project Type (Percentage)





PRIORITY PROJECTS

COA Projects	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Aspinwall Pump Station Improvements	\$ 2,135,526	8,490,526	18,090,526	-	-	\$28,716,578
Aspinwall Pump Station to Lanpher Rising Main	5,000,000	16,661,613	34,338,387	-	-	56,000,000
Bruecken Pump Station Improvements	1,668,553	6,182,033	16,600,073	-	-	24,450,659
Clearwell Emergency Response	1,986,316	8,406,316	16,606,316	-	-	26,998,918
Clearwell Improvements	200,000	200,000	1,502,024	29,842,950	25,264,517	57,009,491
Highland No. 2 Reservoir Improvements	17,893,400	8,946,700	-	-	-	26,840,100
Large Diameter Water Main Replacement – 3 & 4	11,000,000	12,561,806	5,016,194	-	-	28,578,000
Total	\$ 39,883,795	64,467,035	89,135,479	29,842,950	25,264,517	\$248,593,776

Consent Order and Agreement (COA) Projects

- Effective September 6, 2019
- The PWSA is required to construct a treated water bypass system to enable it to remove the existing outdated clearwell from service and replace it with a new redundant storage system
- Reconstructing the clearwell will refurbish a facility that is more than a century old and serves the entire PWSA distribution system
- The clearwell is a water storage structure where the final step of the water treatment process – disinfection – occurs. In the clearwell, the water is first dosed with chlorine and allowed sufficient "contact time" to ensure that the chlorine effectively kills any bacteria or pathogens before consumption



PRIORITY PROJECTS (CON'T)

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Small Diameter Water Main Replacement Program	\$ 45,838,708	19,950,643	38,647,977	75,436,736	103,691,564	\$283,563,628
Small Diameter Sewer Rehabilitation Program	19,499,567	24,602,865	16,845,092	21,725,979	21,052,095	103,725,599
Large Diameter Water Main Replacement Program	5,500,000	-	2,248,276	11,366,207	21,966,552	41,081,035
Intermediate Diameter Water Main Replacement Program	-	-	2,847,356	12,768,391	22,965,287	38,581,035
Water Treatment Plant Raw Water Intakes	1,228,500	1,228,500	9,850,500	9,850,500	2,457,000	24,615,000
Total	\$ 72,066,775	45,782,008	70,439,201	131,147,813	172,132,468	\$461,568,265

Priority Projects

- Large, intermediate, and small meter replacements
- Ross Pump Station at the Water Treatment Plant
- SCADA upgrade
- Valve replacement
- 31st Ward sewer system rehabilitation
- Catch basin and inlet replacement
- Four Mile Run stormwater infrastructure improvements



CONSULTING ENGINEER'S 2019 ANNUAL REPORT

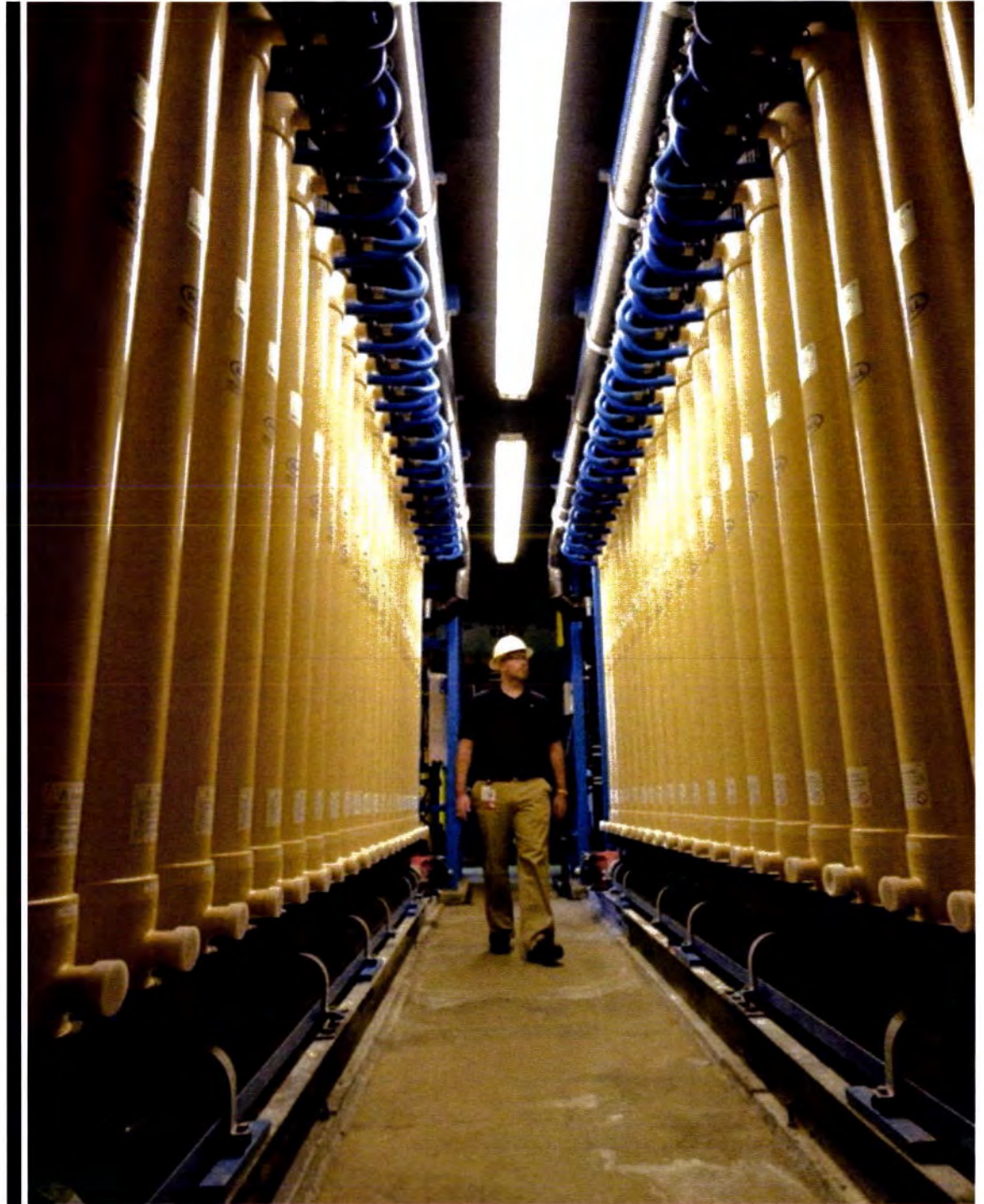
Overview

- The System is described as functional but in need of upgrades to satisfy future operational needs
- All critical recommendations and a majority of the recommended system upgrades are included in the current CIP
- ***“During 2019, the PWSA made significant progress on their quest to improve the water, sewer, stormwater and operational systems for which they are responsible. They improved their project controls, financial controls, operational abilities, added key staff and worked to engage key customers and stakeholders on the work at hand.”***
- ***“In summary, it is the opinion of the Consulting Engineer, based on our understanding of the many infrastructure needs of the PWSA and the progress made during 2019, that the 2020-2024 Capital Improvement Plan coupled with the oversight of the Commission, there will be sufficient funding to advance the goals and obligations of the PWSA.”***



Section 5:

Financial Condition of
the Water and Sewer
System





RATE SETTING HISTORY

Demonstrated ability to raise rates to meet financial obligations

2018 Rate Increase

- 28% in 2018 – approved by the PWSA Board and enacted

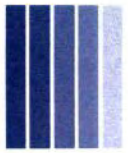
2019 Rate Increase

- 13% in 2019 – approved by the PWSA Board and the PUC

2021 Rate Increase (Tentative)

- 10.8% in 2021 – tentative rate settlement with final PUC approval expected on or before January 14, 2021

Year	Residential		Commercial		Industrial		Wholesale	Health and Education		DSIC
	Rate (\$)	Increase (%)	Rate (\$)	Increase (%)	Rate (\$)	Increase (%)	Increase (%)	Rate (\$)	Increase (%)	Rate (\$)
2011	7.50	7.70	7.74	7.70	7.26	7.70	7.70	10.59	7.70	5.00
2012	8.08	5.00	8.13	5.00	7.62	5.00	5.00	11.12	5.00	7.00
2013	8.48	0.00	8.13	0.00	7.62	0.00	0.00	11.12	0.00	7.00
2014	8.48	9.60	9.15	11.00	8.37	9.00	1.80	13.55	17.90	7.00
2015	9.38	2.10	9.34	2.00	8.55	2.10	Var.	13.84	2.10	7.00
2016	9.58	0.70	9.41	0.70	8.61	0.70	Var.	13.94	0.70	7.00
2017	11.80	22.30	11.42	21.30	10.40	20.80	Var.	17.04	22.20	0.00
2018	16.33	38.40	15.04	31.70	13.08	25.80	Var.	19.85	16.50	0.00
2019	18.47	13.10	17.04	13.30	14.79	13.10	Var.	22.53	13.50	0.00
2020	18.47	0.00	17.04	0.00	14.79	0.00	Var.	22.53	0.00	0.00



PUC RATE-SETTING PROCESS

Act 65 brings PUC oversight to PWSA's rate-setting process

PUC Oversight

- Act 65 was enacted by the legislature on December 21, 2017 and established the Authority as a “Utility,” resulting in PUC regulation of the PWSA’s rate making, operating effectiveness, debt issuance, and other aspects of conducting business
- *Includes provisions to impose, charge, or collect rates or charges as necessary to permit the Authority to comply with its bond and financing covenants*
- The initial rate filing process requires the Authority to also file a compliance plan related to information technology, accounting, billing, collections, and other operating System procedures as well as a long-term infrastructure plan
- The PUC rate-setting process can last a **maximum of 270 days (or about 9 months)** unless all parties agree on a joint settlement sooner
- The PUC has been supportive in helping the PWSA achieve its operational and financial objectives

2021 Tentative Rate Increase

- On September 30, 2020, the Pittsburgh Water and Sewer Authority filed a proposed settlement with the Pennsylvania Public Utility Commission (“PUC”) regarding its 2021 water and wastewater rate proposal. The settlement is still to be reviewed by the presiding PUC administrative law judges as well as the full Commission with a final decision expected on or before January 14, 2021
- The settlement includes a 5.7% total increase in base water and wastewater charges, and a 5% distribution system improvement charge (“DSIC”) for both water and wastewater. The rate increase will result in an annual \$14,150,000 increase in water revenue and a \$4,850,000 increase in wastewater revenue
- 10.8% total revenue increase (base rates + DSIC)

2022 Planned Rate Filing

- The PWSA plans to submit a rate request to the PUC during the first quarter of 2021 to take effect in 2022
- The amount of the requested rate increase is to be determined
- This rate filing will include a stormwater fee

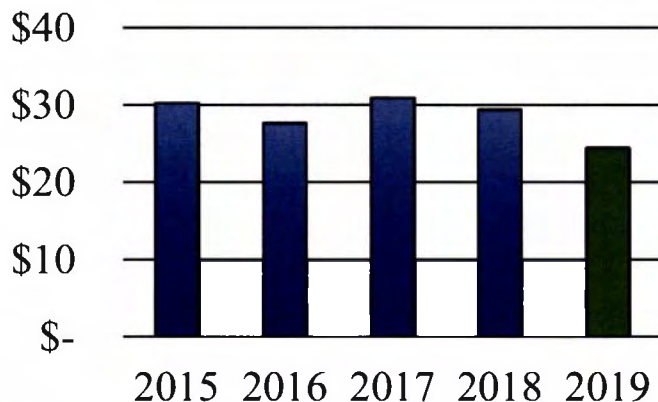


BILLING AND COLLECTIONS HISTORY AND PROCEDURES

Collections History⁽¹⁾

Year	Cash Collections (\$MM)	YOY % Increase
2015	164.9	4.24%
2016	174.3	5.70%
2017	190.1	9.06%
2018	233.1	22.62%
2019	244.7	4.98%

Net Accounts Receivables (\$MM)⁽¹⁾



Source:

1) As per 2015, 2016, 2017, 2018, and 2019 financial audit

PWSA Water and Sewer Services

- Sales revenue is recognized as earned during the period when water and sewer services are supplied to customers
- Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings
- Unbilled accounts receivables for service provided prior to year-end is billed during the following year
- Bills are due 20 days after the billing date and interest is applied on the next invoicing date
- Collections calls are made to customers of any accounts eligible to be terminated
- If the customer is unresponsive, liens can be applied to the property for non-payment
- Water services are terminated when necessary

ALCOSAN Services

- Although PWSA does not provide wastewater treatment, since 2004 it has assumed responsibility as ALCOSAN’s agent for billing and collecting wastewater treatment service charges to PWSA customers
- ALCOSAN bills PWSA quarterly while PWSA bills customers monthly
- Given PWSA’s role as billing agent, revenues collected for ALCOSAN and associated expenses should be netted out in assessing PWSA’s cash as a percentage of operating expenses





AFFORDABILITY PROCEDURES FOR LOW-INCOME CUSTOMERS

The PWSA is proud to offer a customer assistance program that helps customers who need it most

Bill Discount Program

- The Bill Discount Program provides eligible customers with a 75% discount on PWSA's fixed water and wastewater conveyance charges for one year
- Customers earning an annual income that is at or below 150% of the federal poverty level are eligible for the Bill Discount Program
- The Bill Discount Program applies to renters when the tenant is the responsible billing party

Winter Shut Off Moratorium

- The Winter Shut Off Moratorium provides qualifying customers with the assurance that their water service will not be shutoff from December 1st through March 31st
- The Winter Moratorium is available to single-family residential customers earning an annual income that is at or below 250% of the federal poverty level

Cash Assistance Program

- This program provides cash grants up to \$300 per year for customers at or below 150% of the federal poverty level

Free Private Lead Line Replacement Program

- This program provides free private side lead line replacements for homeowners or tenants who are at or below 300% of the federal poverty level

Additional information on the customer assistance programs can be found at: <http://www.pgh2o.com/CAP>

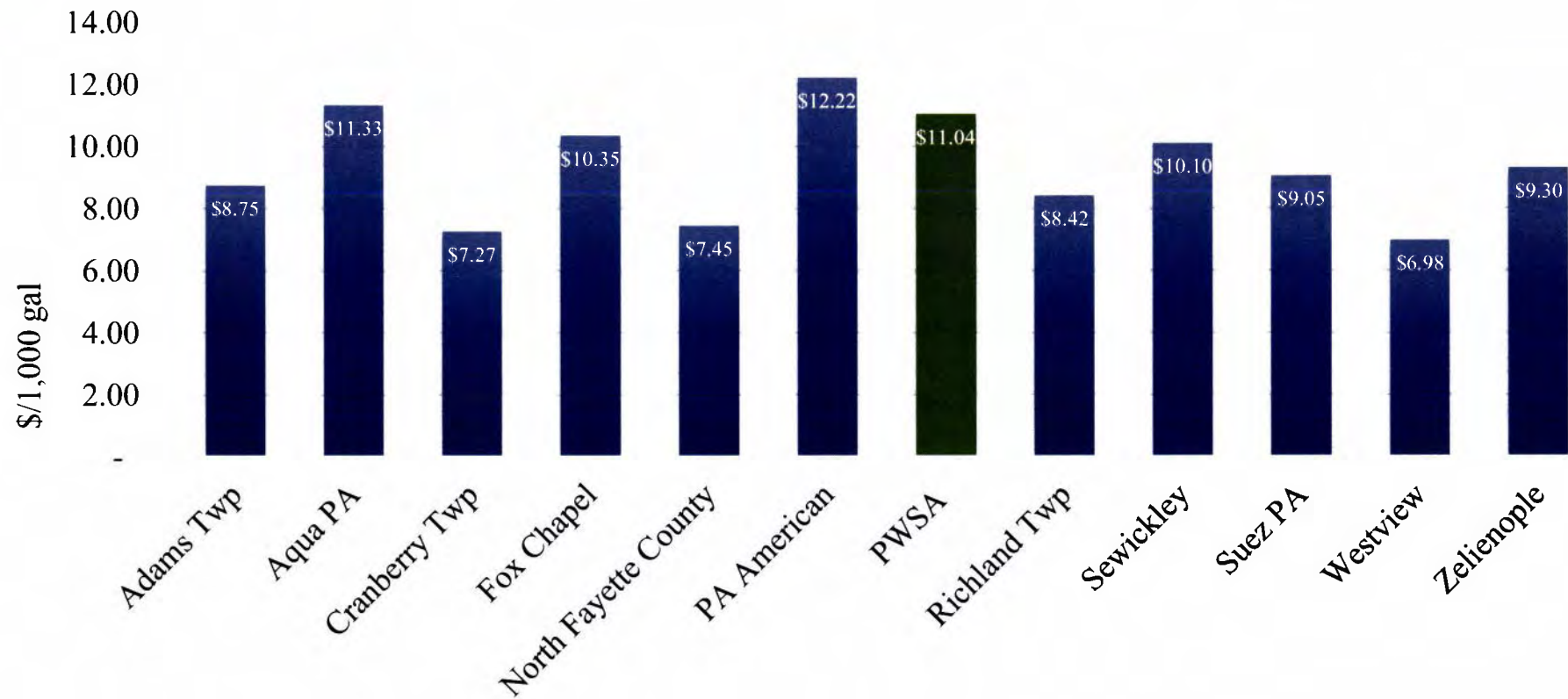
TENTATIVE 2021 Rate Settlement

- Threshold for winter shut off moratorium would increase from 250% of the federal poverty level to 300%
- Fix base charges would increase from 75% to 100% for customers enrolled in the Bill Discount Program



COMPARABLE WATER AND SEWER SYSTEM USE CHARGES

Water System Rate Comparison, 2020⁽¹⁾



Source:

1) The Pittsburgh Water and Sewer Authority

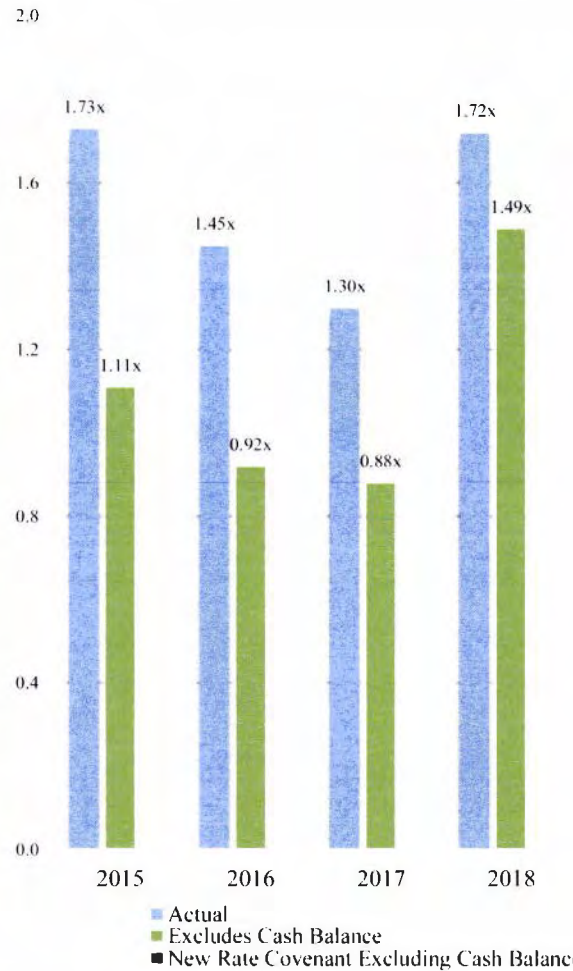


HISTORICAL AND CURRENT FINANCIAL METRICS

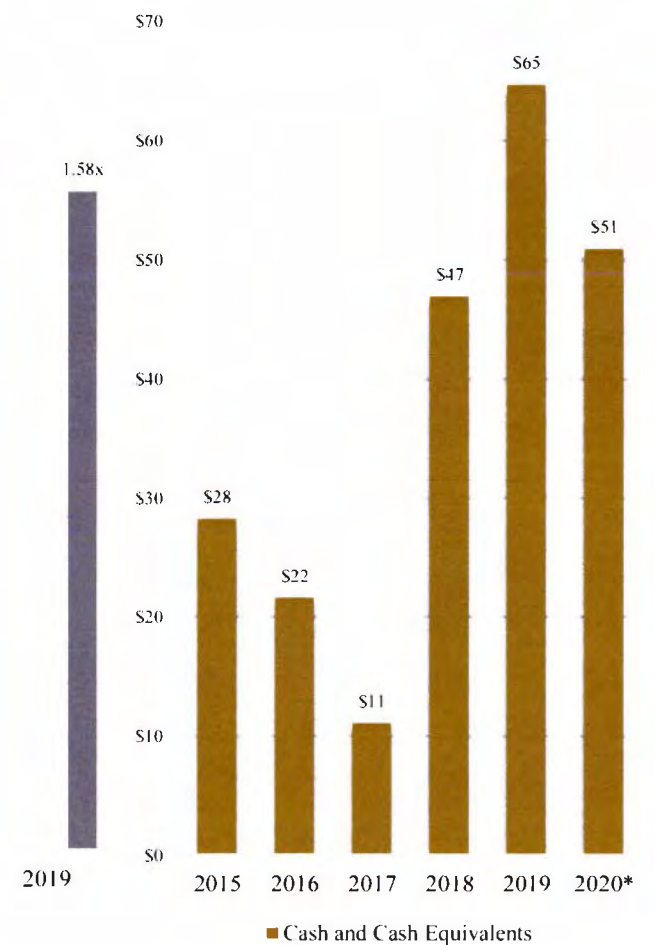
Operating Revenue and Expenditures (\$MM)



Debt Service Coverage Ratio ⁽¹⁾ (x)



Cash and Cash Equivalents (\$MM)



Notes:

1) Rate Covenant debt service coverage calculations through FY 2018 include unrestricted Revenue Fund cash and investments at the beginning of the year. Starting in FY 2019, unrestricted Revenue Fund cash and investments will no longer be used to compute Rate Covenant compliance under the Amended and Restated Trust Indenture

* As of 09/30/2020 (Cash Basis)



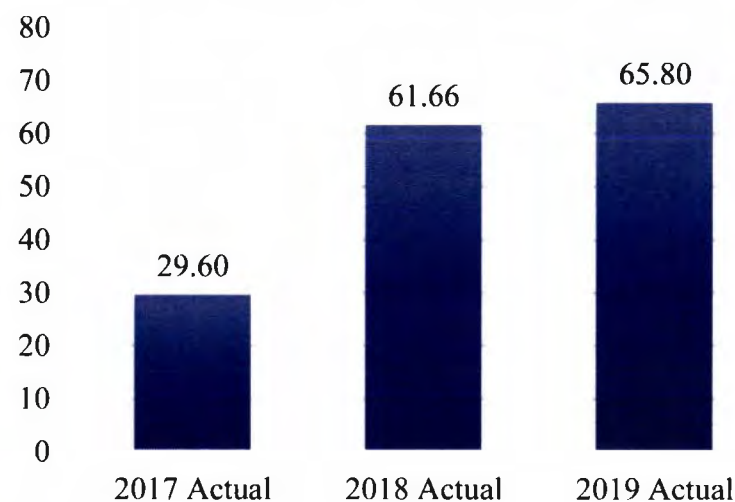


FINANCIAL HISTORY

Audited Financial Statements (\$000's) ⁽¹⁾

	FY 2017	FY 2018	FY 2019
Operating Revenues			
Residential Water and Conveyance Sales	\$ 128,488	\$ 159,506	\$ 171,681
Wastewater Treatment (ALCOSAN)	68,935	67,261	70,970
Other	5,573	4,967	6,398
Total Operating Revenues	\$ 202,996	\$ 231,734	\$ 249,049
Operating Expenses			
Direct Operating Expenses	\$ 71,156	\$ 72,633	\$ 89,512
Wastewater Direct Expenses	75,107	71,822	72,389
Cooperation Agreement Costs	5,363	4,911	1,991
Subsidy of Customers Located in the City	5,594	3,814	1,338
Depreciation	16,172	16,894	18,011
Total Operating Expenses	\$ 173,392	\$ 170,074	\$ 183,241
Net Operating Income	\$ 29,604	\$ 61,660	\$ 65,808
Other Revenues (Expenses)			
Federal Grants	\$ -	\$ -	\$ 6,992
Donated Property	1,595	13,649	110
Interest Revenue	460	469	719
Inv. Inc. Change From Market Swap Value	835	2,542	(4,180)
Interest & Amortization	(34,913)	(34,365)	(38,740)
Bond Issuance Costs	(3,894)	-	(2,462)
Total Other Revenue (Expenses)	\$ (35,917)	\$ (17,705)	\$ (37,631)
Special Item			
Private Lead Line Replacement	\$ -	\$ (4,478)	\$ (22,283)
Net Income / (Loss)	\$ (6,313)	\$ 39,477	\$ 5,894

Net Operating Income (\$MM) ⁽¹⁾



Source:

¹⁾ As per 2017, 2018, and 2019 financial audit.





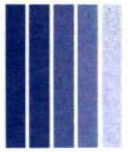
SUMMARY OF YEAR-TO-DATE FY 2020 BUDGET

	YTD 2019 Actual ⁽¹⁾	YTD 2020 Actual ⁽²⁾	YTD Growth	2020 Budget	2020 Forecast
Receipts					
Water and Conveyance	\$125,202,875	\$121,975,795	-2.6%	\$174,797,265	\$160,059,709
ALCOSAN Collections	53,918,178	49,479,336	-8.2%	76,286,841	65,663,004
Other Misc. and Fee Operating Receipts	3,276,819	5,596,656	70.8%	5,242,920	6,875,877
Total Receipts	\$182,397,871	\$177,051,787	-2.9%	\$256,327,027	\$232,598,590
Operating Expenses					
Executive Director's Office	\$2,544,691	\$2,279,002	-10.4%	\$2,504,143	\$2,583,342
Customer Service	5,412,207	5,621,420	3.9%	7,156,543	7,137,173
Management Information Systems	1,330,496	1,517,805	14.1%	3,216,255	2,567,817
Finance	2,388,084	5,501,721	130.4%	12,081,298	11,032,911
Procurement	246,800	-	-100%	-	-
Human Resources	783,211	523,694	-33.1%	1,150,036	740,691
Legal	2,831,400	3,310,563	16.9%	4,751,354	4,514,300
Warehouse	297,405	279,196	-6.1%	572,896	406,919
External Affairs	740,504	751,512	1.5%	1,335,051	999,431
Engineering and Construction	4,612,736	20,008,031	333.8%	31,081,077	25,456,992
Environmental Compliance	1,150,502	562,880	-51.1%	2,739,522	963,941
General Administration	19,544	14,875	-23.9%	-	14,875
Water Quality	1,707,667	1,497,785	-12.3%	2,158,960	1,963,398
Water Treatment Plant	11,960,704	13,100,281	9.5%	21,962,891	17,831,550
Water Distribution	19,103,902	9,812,409	-48.6%	14,477,335	13,281,660
Sewer Operations	9,236,235	2,568,618	-72.2%	4,868,514	3,558,287
ALCOSAN Expenses	54,067,663	54,061,595	0.0%	77,049,709	72,645,344
Cooperation Expenses	4,007,008	-	-100.0%	-	-
Water Subsidy	1,194,940	-	-100.0%	-	-
Total Operating Expenses	\$123,635,178	\$121,411,386	4.6%	\$187,105,584	\$165,698,631
Net Operating Income	\$58,762,693	\$55,640,401	-5.3%	\$69,221,443	\$66,899,959
Transfers to Reserves					
Transfers to Reserves	\$1,883,237	\$ -	-100.0%	\$ -	\$ -
Debt Service	57,887,834	59,835,466	3.4%	66,547,366	62,010,466
Total Costs	\$183,369,249	\$181,246,851	-1.2%	\$253,652,950	\$227,709,097
Net Cashflows	\$(998,378)	\$(4,195,064)		\$2,674,077	\$4,889,493

Note:

1) As of 09/30/2019 (Cash Basis)

2) As of 09/30/2020 (Cash Basis)



COVID-19 IMPACTS

Financial Impact

- Revenues are down 2.9% or \$5,346,084 as of 09/30/2020
- This decline can be attributed to the following factors:
 - Commercial consumption and revenues have decreased due to the Governor’s order to temporarily shut down all non-essential businesses in May 2020. Businesses have slowly started to reopen. However, there are still limitations in place that are prohibiting businesses from functioning at “pre COVID” levels.
 - The economic downturn has caused uncertainty around whether residential customers can continue to pay their bills. In addition, the PWSA has a “No Shut Off” moratorium in place. These factors are putting pressure on residential revenues.
- The PWSA has taken a proactive approach in reducing or delaying O&M expenses to counteract any reduction in revenues. This approach has resulted in the solid financial performance that the PWSA has experienced to date
- The PWSA has performed well financially relative to other business / utilities. At the start of the pandemic, some utilities were projecting revenue declines between 15-25% for the year
- The PWSA Finance team will continue to closely monitor the financial performance of the organization

COVID-19 Relief

- The PWSA has not been eligible for any state or federal COVID-19 relief. However, the PWSA will continue to monitor all opportunities
- The PWSA has incurred more than \$1 million in COVID related expenses to date (testing, cleaning, admin leave, construction signage, etc.)



PENSION AND RETIREMENT BENEFITS

Pension Overview

- Employees of the PWSA have historically participated in the City's Municipal Pension Fund Plan (“Plan”) and the City’s obligations relative to the Plan were determined in accordance with various Pennsylvania statutes
 - Employees who became members prior to January 1, 1998 are required to contribute 5%
 - Those who became members after January 1, 1998 are required to contribute 4%

457 Plan

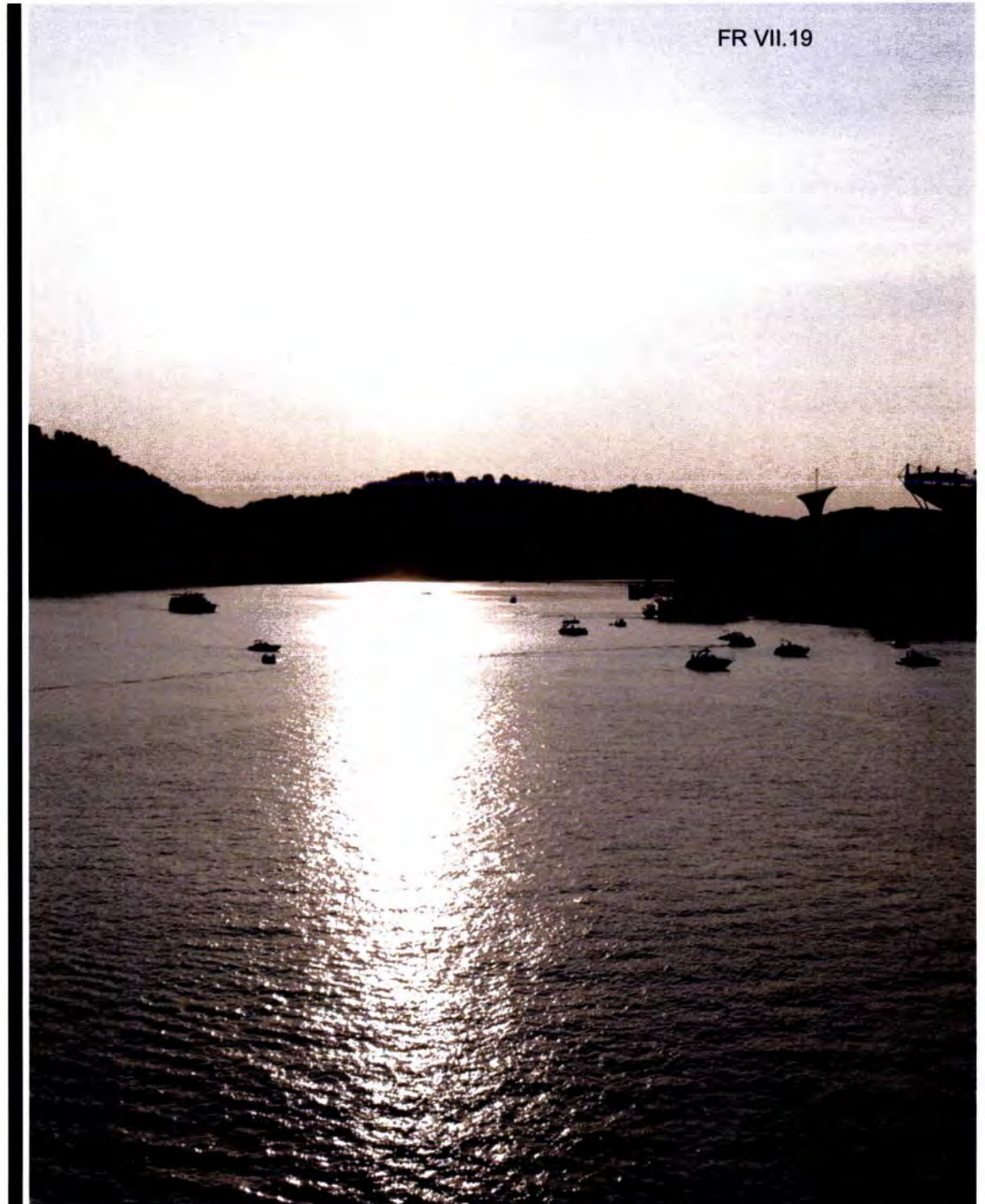
- Employees of the PWSA have the ability to participate in a voluntary 457 plan
- All contributions are made up of 100% pre-tax and/or after-tax employee salary deferrals

401(a) Plan

- Beginning in 2019, all new full-time non-union employees will be eligible to participate in a 401(a) retirement plan instead of being enrolled in the City’s Municipal Pension Fund Plan

Section 6:

Pro Forma Projections





IMPLEMENTING FINANCIAL PLANNING

The PWSA will continue implementing and achieving sound fiscal management

Past Performance Issues

- Decades of Minimal Investment in Infrastructure
- Lack of Budget for Maintenance and Upgrades
- “Fix it When it Fails” Mentality
- Inconsistent Regulatory Compliance

Current Performance Achievements

- 5-Year \$1 Billion Capital Plan
- Staffing and Equipment at Needed Levels
- Implementation of Financial Policies and Improved Financial Reporting
- Getting Ahead of the Curve on Replacement
- New, Committed Executive Leadership Team
- New Compliance Team, Comprehensive Reporting

In addition to the achievements listed above, the PWSA will additionally strive to achieve the following:

Utilizing Additional Financing Sources

- Exploring Commonwealth and Federal programs, including grants and low-interest loans.
- WIFA Letter of Interest
- The PWSA has a proven track record of successfully competing for these funding programs and is in a strong position to continue to do so moving forward

Implementing Financial Policies

- The PWSA has and will continue to adopt and follow best practices for financial policies and governing principles
 - Providing guidance on the capitalization of assets, issuance of debt, cash management, and financial management

Modernizing Capital and Operating Budget Process

- Strengthened interdepartmental communication and planning.
- PUC oversight informs budgeting process
- Ensuring that operating expenses are appropriate and support enhanced O&M and capital project management

Monitoring Financial Metrics

- Debt service coverage ratios of 1.35x for the First Lien (“Senior Lien”) and 1.15x for all debt
- Maintain cash reserves (operating reserves, rate stabilization fund, and revenue fund reserves) at a level of over 100 days cash on hand, which is consistent with industry norms
 - The PWSA had over 200 days cash on hand in FY 2019.



FIVE-YEAR FINANCIAL PROJECTIONS

Assumptions

- Revenues reflect the 2021 tentative rate settlement with the PUC. All anticipated rate increases assumed for fiscal years 2022, 2023, 2024, and 2025 are subject to PUC approval.
- Expense increases are attributable to costs of expected staffing increases and increased use of contractors as necessary to improve service levels and implement the CIP, and are dependent upon related revenue increases.
 - Operating Expenses also excludes the estimated City Co-op Payment of \$4.5 million in 2021, 2022, 2023, 2024 and 2025 as the expense is subordinate to debt service obligations.
- Includes projected future bonded debt necessary to implement the CIP outlined in slide 28.
- Total Debt Service includes debt service on the Senior Debt, Subordinated Debt, PENNVEST Loans and interest on the Construction Loan Facility.

Projected Revenues, Expenses, and Debt Service

(\$000)	2021	2022	2023	2024	2025
Revenues	\$275,167	\$287,354	\$319,667	\$347,648	\$372,966
Operating Expenses	(189,106)	(192,789)	(199,405)	(207,074)	(215,155)
Net Revenue Available for Debt Service	\$86,061	\$94,565	\$120,262	\$140,574	\$157,811
Senior Lien Debt Service	\$54,800	\$61,345	\$81,605	\$94,883	\$108,176
Senior Lien Debt Service Coverage	1.57x	1.54x	1.47x	1.48x	1.45x
Net Revenue After Senior Lien Debt Service⁽¹⁾	\$31,261	\$33,220	\$38,657	\$45,691	\$49,635
Combined Debt Service	\$69,539	\$77,364	\$98,217	\$110,994	\$123,932
Combined Debt Service Coverage	1.24x	1.22x	1.22x	1.27x	1.27x
Net Revenue After Total Debt Service⁽¹⁾	\$16,522	\$17,201	\$22,045	\$29,580	\$33,879

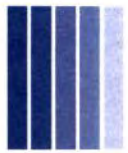
Note:

(1) The difference between these two lines is Subordinate Bonds and PENNVEST loans debt service and construction loan facility interest. PENNVEST loans include interest and amortization of principal of loans that have not reached "close out".

Section 7:

Plan of Finance



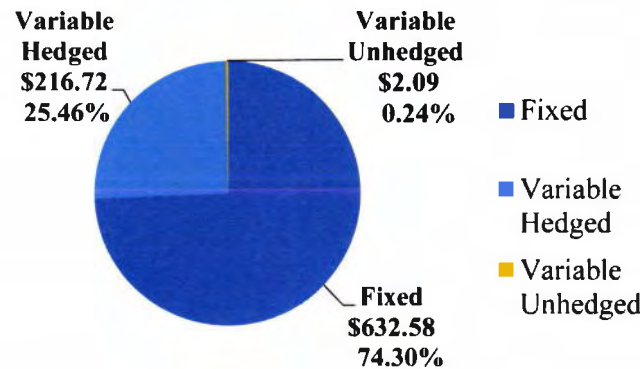


PWSA'S CURRENT DEBT PORTFOLIO

As of September 30, 2020

Existing Debt Composition^(1,2)

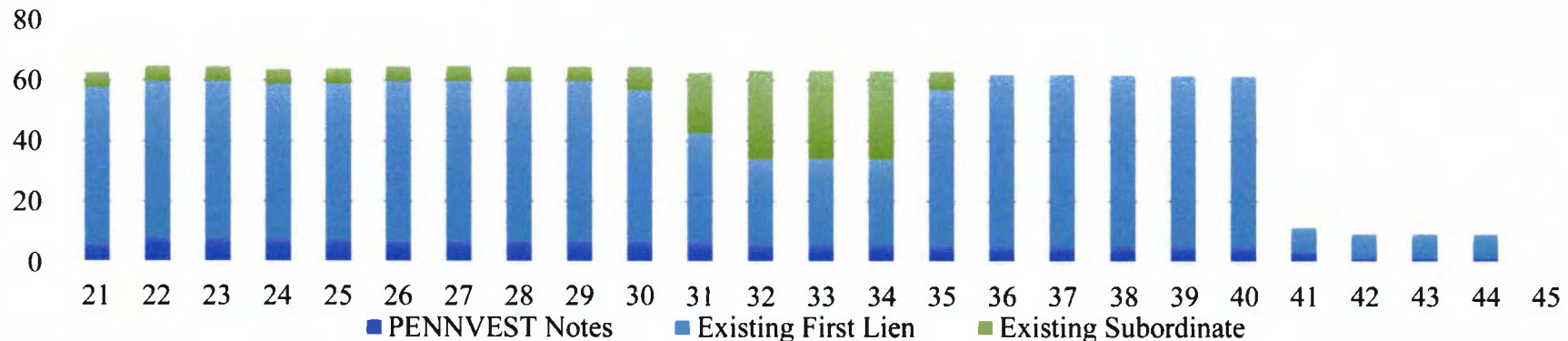
(\$MM)



- \$851.38 million of debt outstanding with a final maturity in 2045
 - \$405.46 million of First Lien Bonds
 - \$216.72 million of interest rate swaps related to the Series C1-3 of 2017 Bonds
 - \$104.29 million of Subordinate Bonds
 - \$229.34 million of subordinated Subordinate debt
 - \$122.83 million borrowed under the PENNVEST loan program⁽²⁾
 - \$106.51 million drawn from the revolving \$150 million Capital Line of Credit with PNC Bank

Existing Debt Service Profile^(1, 2, 3, 4, 5, 6,)

(\$MM)



Notes:

- 1) Series B of 1998 Capital Appreciation Bonds, includes accreted value as of September 30, 2020
- 2) PENNVEST Loans as of September 30, 2020
- 3) Interest on Series 2017C-1 Senior Lien Bonds is calculated at a rate of 4.424% representing the associated swap rate of 3.784% with the JPMorgan Chase Bank, N.A. plus Public Market FRN fees.
- 4) Interest on Series 2017C-2 Senior Lien Bonds is calculated at a rate of 4.41% representing the associated swap rate of 3.77% plus with the Bank of America, N.A. plus Public Market FRN fees.
- 5) Interest on Series 2017C-3 Senior Lien Bonds is calculated at a rate of 4.466% representing the associated swap rate of 3.826% with the JPMorgan Chase Bank, N.A. plus Public Market FRN fees.
- 6) Interest on Series 2017C-4 Senior Lien Bonds is calculated at a rate of 2.50% representing Public Market FRN fees.





PLAN OF FINANCE

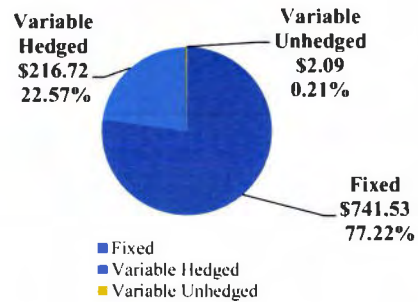
- The Plan of Finance contemplates the remarketing of the Series C of 2017 Bonds and the issuance of two series of additional bonds
 - The remarketing of the Series C of 2017 Bonds will involve the conversion of all four subseries into the SIFMA Index Mode at the mandatory tender date on December 1, 2020, an interest rate swap related to the C1-3 subseries to effectively convert the floating-rate index from 70% of LIBOR to SIFMA, and the maintenance of Assured Guaranty bond insurance on all four subseries
 - The Series C of 2017 Bonds in SIFMA mode will be remarketed for three years, with a soft tender on December 2023 and callable at June 1, 2023.
 - New issuance of approximately \$1.02 million of First Lien Bonds (Series A of 2020) to pay the costs related to the remarketing of the Series C of 2017 Bonds
 - New money issuance of approximately \$93.36 million of First Lien Bonds (Series B of 2020) to pay down all or part of the outstanding principal amount under a PNC capital line of credit note, in the maximum amount of \$150,000,000
 - As part of the financing, the Authority expects to insure all or a portion of the maturities of the Series B of 2020 Bonds

Sources:	Series 2017 C1-C4 Remarketing	Series A of 2020 (Federally Taxable)	Series B of 2020	Total 2020 Series A & B
Remarketing / New Money Par Amount:	\$218,805,000.00	\$1,015,000.00	\$93,360,000.00	\$94,375,000.00
Premium:	-	-	14,576,072.65	14,576,072.65
Total Sources:	\$218,805,000.00	\$1,015,000.00	\$107,936,072.65	\$108,951,072.65
Uses:	Series 2017 C1-C4 Remarketing	Series A of 2020 (Federally Taxable)	Series B of 2020	Total 2020 Series A & B
Series 2017 C1-C4 Remarketing Issuance Costs:	-	\$1,000,000.00	-	\$1,000,000.00
Capital Line of Credit Repayment:	-	-	\$107,000,000.00	107,000,000.00
Mandatory Tender of Series C of 2017:	\$218,805,000.00	-	-	-
Issuance Costs:	-	15,000.00	936,072.65	951,072.65
Total Uses:	\$218,805,000.00	\$1,015,000.00	\$107,936,072.65	\$108,951,072.65

PWSA'S PRO FORMA DEBT SERVICE SCHEDULE

- The taxable First Lien Series A of 2020 Bonds will have a bullet maturity in 2022
- The tax-exempt First Lien Series B of 2020 Bonds, together with the Series A of 2020 Bonds, will have a level debt service structure beginning in 2022 with a 30-year final maturity

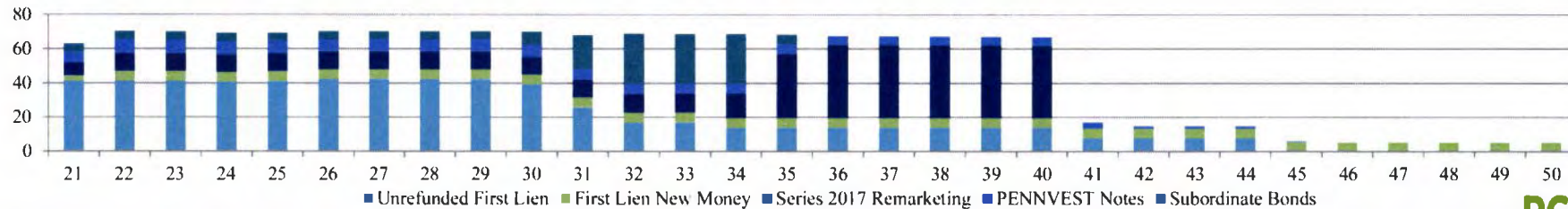
Pro Forma Debt Summary^(1,2) (SMM)



Fiscal Year (ending 12/31)	Existing and Pro Forma Debt Service				Total Subordinate Bonds Debt Service	Other Subordinate Debt Service ⁽²⁾	Pro Forma Debt Service
	Existing First Lien Debt Service	Series 2017 C1-C4 Remarketing Debt Service	Series A of 2020 (Fed. Taxable) Debt Service	Series B of 2020 Debt Service			
2021	41,298,000.00	10,508,370.24	4,485.18	2,984,025.00	4,877,900.00	6,089,176.84	65,766,957.26
2022	41,260,250.00	10,508,370.24	1,027,646.90	4,633,700.00	4,877,900.00	8,113,721.40	70,421,588.54
2023	41,333,750.00	10,508,370.24		5,659,050.00	4,877,900.00	7,951,557.24	70,330,627.48
2024	40,590,000.00	10,508,370.24		5,656,050.00	4,877,900.00	7,718,645.01	69,350,965.25
2025	41,171,500.00	10,508,370.24		5,657,800.00	4,877,900.00	7,257,127.26	69,472,697.50
2026	42,355,500.00	10,508,370.24		5,655,050.00	4,877,900.00	6,952,454.04	70,349,274.28
2027	42,395,937.50	10,508,370.24		5,657,800.00	4,877,900.00	6,952,454.04	70,392,461.78
2028	42,360,937.50	10,508,370.24		5,655,550.00	4,877,900.00	6,952,454.04	70,355,211.78
2029	42,375,587.50	10,508,370.24		5,658,300.00	4,877,900.00	6,952,454.04	70,372,611.78
2030	39,241,975.00	10,508,370.24		5,655,550.00	7,867,900.00	6,952,454.04	70,226,249.28
2031	25,715,475.00	10,508,370.24		5,657,300.00	20,133,400.00	6,236,911.56	68,251,456.80
2032	16,892,325.00	11,258,370.24		5,658,050.00	29,558,150.00	5,649,258.36	69,016,153.60
2033	16,942,125.00	11,398,962.24		5,657,550.00	29,313,150.00	5,649,258.36	68,961,045.60
2034	13,855,837.50	14,451,775.24		5,655,550.00	29,226,400.00	5,649,258.36	68,838,821.10
2035	13,850,500.00	37,669,852.12		5,656,800.00	6,011,200.00	5,397,015.23	68,585,367.35
2036	13,852,362.50	42,984,490.80		5,656,000.00		5,197,448.40	67,690,301.70
2037	13,849,887.50	42,848,554.08		5,655,400.00		5,197,448.40	67,551,289.98
2038	13,852,050.00	42,705,486.08		5,659,800.00		5,197,448.40	67,414,784.48
2039	13,852,312.50	42,512,161.16		5,658,800.00		5,197,448.40	67,220,722.06
2040	13,849,387.50	42,404,373.00		5,657,400.00		5,197,448.40	67,108,608.90
2041	7,792,000.00			5,655,400.00		3,697,982.79	17,145,382.79
2042	7,796,500.00			5,657,600.00		1,598,131.56	15,052,231.56
2043	7,794,750.00			5,658,600.00		1,598,131.56	15,051,481.56
2044	7,796,250.00			5,658,200.00		1,598,131.56	15,052,581.56
2045				5,656,200.00		532,710.52	6,188,910.52
2046				5,657,400.00			5,657,400.00
2047				5,656,400.00			5,656,400.00
2048				5,658,000.00			5,658,000.00
2049				5,656,800.00			5,656,800.00
2050				5,657,600.00			5,657,600.00
Total	\$602,075,200.00	\$403,826,097.60	\$1,037,132.08	\$166,017,725.00	\$166,011,300.00	\$135,486,529.81	\$1,474,453,984.49

Pro Forma Debt Service Profile

(SMM)



Notes:

- 1) Series B of 1998 Capital Appreciation Bonds, includes accreted value as of September 30, 2020
- 2) Includes PENNVEST loans with existing amortizations as of September 30, 2020. Does not include future PENNVEST drawdown amounts of capital line of credit interest.





AMENDED AND RESTATED INDENTURES

<p>Rate Covenant (Senior Lien Trust Indenture)</p>	<ul style="list-style-type: none"> • The Authority shall set rates, fees, and other charges so that Rate Covenant Net Revenues satisfy the following three requirements in each fiscal year: <ol style="list-style-type: none"> (1) Shall be sufficient to: <ul style="list-style-type: none"> – Pay Annual Debt Service on Senior Debt, meet the Reserve Requirements for each Series Debt Service Reserve Requirement, pay Annual Debt Service on Subordinate Debt (including associated reserves), meet the Operating Reserve Requirement, and pay all other amounts which the Authority is by law or contract obligated to pay (2) Must not be less than 125% of Annual Debt Service for Senior Debt and 110% of aggregate Annual Debt Service for Subordinate Debt (3) Excluding Rate Stabilization Fund transfers to the Revenue Fund and grant proceeds, must be at least 100% of Annual Debt Service on Senior and Subordinate Debt 	<ul style="list-style-type: none"> • As a result of the changes made to the Senior Lien Indenture in 2017: <ul style="list-style-type: none"> – Fund balances are no longer used in calculating debt service coverage – Rate Stabilization Fund transfers can be used to increase or decrease debt service coverage on a one-time basis
<p>Additional Bonds Tests (Senior Lien and Subordinate Trust Indentures)</p>	<p>Bonds Issued to Pay Costs</p> <ul style="list-style-type: none"> • Secured by a Common Debt Service Reserve, the Common Reserve will be fully funded in an amount sufficient to pay the least of the standard three-prong test; if the bonds have a Series Debt Service Reserve, the Series Reserve will be fully funded in an amount specified for such Series upon issuance of the Bonds • Certificate of a Qualified Independent Consultant that PWSA will be able to meet the Rate Covenant in the Senior Indenture, taking into account: <ul style="list-style-type: none"> – Maximum Annual Debt Service on the proposed Bonds – Additional Net Revenues from rates, fees, and other charges adjusted to reflect any rate increases that had not been effect throughout the Test Period but have been approved and implemented by the PWSA by the issuance of the bonds and go into effect within five years – Additional Net Revenues that PWSA may realize within the following five years from the addition of assets it proposes to finance through the issuance of the bonds <p>OR</p> <ul style="list-style-type: none"> • Certificate of a the Authorized Representative of the Authority stating that based on the Authority's financial records for the Test Period, the Authority has met the Rate Covenant in the Senior Indenture, taking into account the maximum Annual Debt Service on the proposed Series of Additional Bonds • For purposes of these tests, Additional Indebtedness Test Net Revenues are used in place of Rate Covenant Net Revenues 	<p>Senior Lien or Subordinate Lien Bonds Issued to Refund any Indebtedness</p> <ul style="list-style-type: none"> • PWSA must deliver the following: <ul style="list-style-type: none"> – Evidence that PWSA has made provision for the payment or redemption of all Indebtedness to be refunded – A Certificate of an Authorized Representative of PWSA showing that the refunding will not increase Annual Debt Service payable in any year – If the proposed refunding does not comply with the above, it is subject to the same requirements as the issuance of Bonds to pay costs
<p>Debt Service Reserve Fund Requirement (Senior Lien and Subordinate Trust Indentures)</p>	<ul style="list-style-type: none"> • Can be a Common Debt Service Reserve or a Separate Series Debt Service Reserve <ul style="list-style-type: none"> – Common Debt Service Reserve Requirement shall mean that for all Bonds secured by the Common Reserve, the reserve is sufficient to pay the least of the standard three-prong test 	<ul style="list-style-type: none"> • Can be any form of Credit Facility in lieu of cash and investments



FINANCING SCHEDULE

October 2020							November 2020							December 2020						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7			1	2	3	4	5
4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12
11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19
18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26
25	26	27	28	29	30	31	29	30						27	28	29	30	31		

 Key transaction date

 Market holiday

Anticipated Financing Schedule⁽¹⁾

Receipt of Ratings:	By COB November 4, 2020
Post Remarketing Circular / POS:	Week of November 2, 2020
Remarketing / Pricing:	Week of November 9, 2020
Series C of 2017 Mandatory Tender Date:	December 1, 2020
Settlement:	December 1, 2020

Note:

1) Preliminary, subject to change

Section 8:

Conclusion





CREDIT STRENGTHS

Committed Management Team

- Current management team is experienced and committed to delivering quality, reliable service to PWSA ratepayers
- PGH₂O 2030 is a strategic plan for the utility that identifies over \$1 billion of high priority capital improvements and includes a number of financial targets including maintaining a minimum 1.35x debt service coverage ratio on the Senior Lien and 1.15x on total debt service

Solid Rate Management Record

- Long standing history of willingness to raise rates, predating PUC process
- Positive trajectory following February 2019 PUC joint settlement
 - Rates were raised by roughly 13%

Strong and Diversified Customer Base and Service Area

- Robust and diverse service area economy of Pittsburgh with strong higher education and healthcare presence
- Healthy economic area that has demonstrated a unique ability to reinvent itself
- Well established customer base with the top five customers located in the System for at least 75 years

Water and Sewer Systems Operations and Capital Planning

- Ample water supply, providing water to approximately 306,000 people
- Water demand of 70 million gallons per day (MGD) while supply allows for up to 100 MGD
- Demonstrated improvement in lead monitoring levels and progress in lead service line replacement
- In the process of implementing a regional strategy for CSO and SSO reductions





CONTACT INFORMATION



The Pittsburgh Water and Sewer Authority (“PWSA”)

Edward Barca Director of Finance (412) 255-8947



Financial Advisor: Public Resources Advisory Group

Tom Huestis Senior Managing Director (610) 580-7007



Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.20. Provide a listing of all securities issuances for the company and, if applicable, its parent projected for the next 2 years. The response shall identify for each projected issuance the date, dollar amount, type of security, and effective cost rate.

RESPONSE:

PWSA expects to utilize a combination of long-term debt and available cash to meet financing needs during the next two years. Based on the current financial plan and CIP, PWSA expects to issue the debt shown below during 2021 and 2022.

2021 Projected

Revenue Bonds: \$130,000,000 4.00% 30 Year Term

2022 Projected

Revenue Bonds: \$130,000,000 4.00% 30 Year Term

Bank Loan: \$12,900,000 4.00% 5 Year Term

VII. RATE OF RETURN

VII.21. Identify any plan by the company to refinance high cost long-term debt or preferred stock.

RESPONSE:

There is a potential cost savings in the taxable refunding of the Series 2013 A and B bonds. The PWSA will consider completing this taxable refunding when going back to the capital markets to issue new money bonds during the summer or fall of 2021.

VII. RATE OF RETURN

VII.22. Provide copies of all securities analysts' reports relating to the company and its parent, or both, issued within the past 2 years.

RESPONSE:

Please see PWSA's response to FR VII.18.

VII. RATE OF RETURN

VII.23. If applicable, supply a listing of all common equity infusions from the parent to the company over the past 5 years. In each case, identify date and dollar amount.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.24. If applicable, identify the company's common dividend payments to its parent for each of the last 5 years.

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.25. Provide the latest year-by-year financial projections for the company for the next 5 years. Also, please indicate the date these projections were prepared; whether approved by management; and whether the projections have been submitted to bond rating agencies. The information will be treated in a confidential manner, if requested by the company in writing, as set forth in 52 Pa. Code § 5.423.

RESPONSE:

Please refer to the direct testimony of Edward Barca. These projections were developed for the purpose of this rate case filing and Cost of Service analysis. These projections, developed in conjunction with PWSA by Raftelis Financial Consultants, Inc., have been approved by PWSA management but they have not been submitted to bond rating agencies.

VII. RATE OF RETURN

VII.26. Provide the company's 5-year construction budget.

RESPONSE:

Please see below.

Year	Construction Budget
2021	\$ 233,329,335
2022	191,638,266
2023	263,394,678
2024	243,983,056
2025	298,489,218
Total	\$ 1,230,834,553

VII. RATE OF RETURN

VII.27. Identify the company's and, if applicable, its parent's capital structure targets (percentages of capital types). Provide the complete basis for the capital structure targets.

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.28. For each month, of the most recent 24 months, supply the company's:

- a. Short-term debt balance.
- b. Short-term debt interest rate.
- c. Balance of construction work in progress.
- d. Balance of construction work in progress which is eligible for AFUDC accrual:

RESPONSE:

- a. PWSA does not have any short-term debt. The only debt-related current liabilities on PWSA's balance sheet is the current portion of long term debt.
- b. Please see the response to VII.28a
- c. Please see the table below.

CWIP	2020	2019
January	128,859,462	132,955,540
February	136,396,143	137,805,044
March	149,786,201	144,039,995
April	155,794,192	153,319,772
May	161,399,574	160,190,788
June	166,036,656	170,973,537
July	177,613,997	177,725,303
August	187,752,649	185,282,000
September	202,440,551	193,782,592
October	214,753,248	203,086,300
November	229,128,440	213,425,552
December	141,711,776	224,471,050

- d. Not applicable.

VII. RATE OF RETURN

VII.29. Fully identify all debt, other than instruments traded in public markets, owed to all shareholders, corporate officers, or members of the board of directors, its affiliates, parent company, or subsidiaries.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.30. Provide a summary statement of all stock dividends, splits, or par value changes during the 2-year calendar period preceding the rate case filing.

RESPONSE:

Not applicable.

VII. RATE OF RETURN

VII.31. If a claim of the filing utility is based on utilization of the capital structure or capital costs of the parent company and consolidated system, the reasons for this claim must be fully stated and supported.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

VII.32. To the extent not provided elsewhere, supply financial data of the company, and its parent, if applicable, for the last 5 years.

- a. Times interest earned ratio—pre- and post tax basis.
- b. Preferred stock dividend coverage ratio—post tax basis.
- c. Times fixed charges earned ratio—pre tax basis.
- d. Dividend payout ratio.
- e. AFUDC as a percent of earnings available for common equity.
- f. Construction work in progress as a percent of net utility plant.
- g. Effective income tax rate.
- h. Internal cash generations as a percent of total capital requirements.

RESPONSE:

- a. Please see the table below.

Times interest earned	2016	2017	2018	2019	2020
Pre-Tax	0.95	0.82	3.12	2.57	1.87
Post-Tax	N/A	N/A	N/A	N/A	N/A

- b. Not applicable.
- c. Please see the table below.

Times Fixed Charges Earned	2016	2017	2018	2019	2020
Pre-Tax	0.95	0.82	3.12	2.57	1.87
Post-Tax	N/A	N/A	N/A	N/A	N/A

- d. Not applicable
- e. Not applicable
- f. Please see the table below.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VII. RATE OF RETURN

	2016	2017	2018	2019	2020
CWIP as Percent of Net Utility Plant	13.13%	14.53%	18.39%	16.29%	11.29%

g. Not applicable

h. Since 2013, PWSA has financed capital assets almost entirely with funds from bond issuances, Pennvest loans, and, more recently, utilizing their revolving line of credit. However, starting in FY 2020, the PWSA has a goal of funding at least 10% of capital expenditures with internally generated funds (PAYGO), as measured on a five-year basis. Please refer to the direct testimony of Edward Barca and Tom Huestis for more information.

VIII. RATE STRUCTURE AND COST OF SERVICE

VIII.1. Provide a complete, fully allocated, cost of service study if an interval of 3 years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water or wastewater rate structure is fair and equitable to all classifications of water or wastewater customers (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

- a. A description of the allocation methods used. A comparison of the allocated cost of service by class with the present and proposed revenues. A cost of service schedule showing the rate of return produced by present and proposed rates by class of service.
- b. Indicate if the method used for establishing the allocation factors in the cost of service study deviates from the previous study submitted in the last rate case. If yes, indicate which allocation factors were changed and discuss the reason for the changes.
- c. Supply the average day, the maximum day and the maximum hour deliveries to the system adjusted for storage for the historic test year and 2 prior years. Also provide workpapers, analyses, comparative data or other documentation supporting the estimated maximum day and peak hour demands by customer class reflected in the company's cost of service study.
- d. Explain thoroughly the methodology employed if the company distinguishes between transmission and distribution or collection mains in its allocation of costs.
- e. Provide a detailed explanation of how storage is utilized to meet base, maximum day and maximum hour demands.
- f. Provide workpapers, calculations and supporting documentation which develop the equivalent meters and equivalent service line weights reflected in the company's cost of service study.
- g. Provide all workpapers and supporting documentation for the fire flow requirement and duration utilized in the cost of service study.

Pittsburgh Water and Sewer Authority's Base Rate Filing

VIII. RATE STRUCTURE AND COST OF SERVICE

- h. Provide a breakdown of the number and size of private fire services according to the general water service class of customer.
- i. Provide a calculation of the company's base cost of water or wastewater per unit of consumption or usage.
- j. Provide a detailed cost analysis that supports the company's customer charges, by meter size, showing all direct and indirect costs included.

RESPONSE:

Please refer to the direct testimony and accompanying exhibits of Harold J. Smith for the above filing requirement.

VIII. RATE STRUCTURE AND COST OF SERVICE

VIII.2. Provide a listing of negotiated special rate contracts which includes a comparison of revenues under special rate contracts and under tariff rates. Provide the cost of service treatment of any deficiency in revenues resulting from the negotiated special rate contracts. Special rates are defined as rates not contained in the currently effective tariff.

RESPONSE:

Please see attached.

PWSA provides service under negotiated special rate contracts for eight wholesale customers. In the cost of service, wholesale revenues are treated as an offset to the retail water revenue requirement. For additional information please refer to the direct testimony and accompanying exhibits of Harold J. Smith.

Pittsburgh Water & Sewer Authority
Wholesale & Contract Customers - Current Contract vs. Proposed Tariff Rates

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Wholesale/Contract Customers	Description	Meters	Fixed Charges	Volume Charges	2021 Charges at Current Rates	2022 Charges at Contract Rates	2022 Charges at Proposed Tariff Wholesale Rates	Difference
Aspinwall	Wholesale services to Allegheny; No minimum charge; Escalated by Inflation	2 - 6" Meter 1 - 8" Meter	\$ 0.00/mo	\$ 3.40/kgal	218,833	220,759	751,478	(530,719)
Fox Chapel	Wholesale water services to Fox Chapel; 6-tier decreasing block rate; Escalated by Overall User Charge Increase	1 - 8" Meter 1 - 10" or Larger Meter	\$ 4,589.90/mo	0-15,000k: \$3.74 15,000k-30,000k: \$2.96 30,000k-75,000k: \$2.69 75,000k-120,000k: \$2.62 120,000k-180,000k: \$2.58 > 180,000k: \$2.52	2,272,727	2,718,400	7,893,301	(5,174,901)
Hampton (1)	Wholesale water services to Hampton; 3-tier decreasing block rate; Escalated by Overall User Charge Increase	2 - 4" Meters 1 - 10" Meter	\$ 0.00/mo	0-5,000k: \$6.65 5,000k-25,000k: \$4.10 25,000k-50,000k: \$2.36	-	-	153,961	(153,961)
PAWC (1)	Wholesale services to PAWC; 548kgal Allowance; Escalated by Inflation	1 - 10" or Larger Meter	\$ 6,515.43/mo	\$ 6.74/kgal	83,062	83,062	120,841	(37,779)
RSRV - 10"	Wholesale services to Reserve (10" meter); No Allowance; Escalated by agreed-upon amount	1 - 10" or Larger Meter	\$ 3,354.94/mo	\$ 3.89/kgal	419,358	440,001	1,084,932	(644,930)
RSRV - 6"	Wholesale services to Reserve (6" meter); 175kgal Allowance; Escalated by agreed-upon amount	2 - 6" Meters	\$ 1,193.56/mo	\$ 3.89/kgal	67,180	70,507	155,930	(85,424)
Sharpsburg (1)	Wholesale services to Sharpsburg; 175kgal Allowance; Escalated by Overall User Charge Increase	1 - 10" or Larger Meter	n/a	\$ 8.55/kgal	-	-	120,841	(120,841)
Westview (1)	Wholesale services to Westview (4 meters); 175kgal Allowance; Escalated by Overall User Charge Increase	4 - 6" Meters	\$ 2,554.23/mo	\$ 8.55/kgal	131,553	157,404	160,097	(2,693)
								\$ (6,751,249)

(1) Denotes customer that exhibits "Emergency" usage characteristics. No usage is forecasted for these customers. If PWSA renegotiates these contracts, a fixed charge would be proposed by PWSA to capture "Readiness-to-Serve" costs. As such, charges in Column H for these customers include a retail minimum charge based on each customer's meter(s). Actual charges would be contingent upon negotiation.

IX. QUALITY OF SERVICE

IX.1. Indicate whether the company is in violation of any provision of the Pennsylvania Safe Drinking Water Act (SDWA) or any rule, regulation or order, or any condition of any permit, variance or exemption granted by the Pennsylvania Department of Environmental Protection (PA-DEP), or its predecessor.

a. Provide information indicating whether the company is in compliance with SDWA provisions at 25 Pa. Code § 109.407 regarding general public notification requirements:

- (i) Provide a copy of each public notification given in accordance with this section, since the last rate proceeding.
- (ii) Provide a detailed explanation of all actions taken to remedy an acute violation, and to comply with the requirements prescribed by a variance or exemption.
- (iii) State whether any fines or penalties were assessed by PA-DEP, and indicate the amounts paid by the company.

b. Provide the most recent copies of all annual consumer confidence reports Issued pursuant to SDWA Amendments of 1996 since the last rate proceeding.

- (i) Provide any annual consumer confidence reports which reflect violations of State and Federal safe drinking water requirements.
- (ii) Explain how these violations were resolved.

RESPONSE:

PWSA received a Consent Order and Agreement for Violations of the Safe Drinking Water Act on November 17, 2017 relating to Lead Action Level Exceedances and Failure to Treat as Permitted. PWSA has introduced orthophosphate, a corrosion control treatment, for the system as well as implemented a successful lead service line replacement program.

- a. PWSA is in compliance with all public notification requirements. PWSA has provided the following notifications to the public (see below).
 - i. PWSA had the following Public Notifications: Loss of Positive Pressure – May 21, 2020; Loss of Positive Pressure – July 8, 2020; Loss of Positive Pressure – August 12, 2020; Loss of Positive Pressure – August 20, 2020; Loss of Positive Pressure – October 16, 2020; Loss of Positive Pressure – October 17, 2020;

IX. QUALITY OF SERVICE

Loss of Positive Pressure – December 15, 2020; Loss of Positive Pressure – December 19, 2020. See copies of Public Notifications attached.

- ii. PWSA received an Administrative Order from the PA-DEP on October 25, 2017. This order requires PWSA to address the following items: Apply for the use of UV disinfection at the Membrane Filtration Plant, Replace the cover and liner of the Lanpher Reservoir, Ensure Reliability of Bruecken Pump Station, Install Pressure Sensors in the Distribution System, and Provide the Department with a detailed list of Capital Improvement Projects. PWSA worked with the PA-DEP and responded as required, having since completed all required actions to address the items. The Membrane Filtration Plant improvements project was completed in June 2020, having received the Public Water Supply Operating Permit on June 17, 2020. The MFP was restored to full routine operation on September 14, 2020. The Lanpher Reservoir cover and liner replacement were completed in June 2019, receiving the Public Water Supply Operating Permit on June 19, 2019. The Standby Power Generators were installed and commissioned on April 21, 2020. The installation of the 24 continuous recording pressure monitors, located throughout the PWSA water distribution system (System) was completed on July 8, 2018. These 24 monitors were located in coordination with the PA-DEP in 10 of PWSA's total 17 System pressure zones. Additionally, and for reference, to ensure compliance with Pennsylvania Code, Title 52, 'Public Utilities Law', Chapter 65, 'Water Service', Subchapter 6, Pressures, Subsection (b), the PWSA completed the installation of an additional 37 pressure monitors on January 21, 2021, ensuring that there is at least one or more continuous recording pressure monitors in each separate pressure zone throughout the distribution system. There are 61 continuous recording pressure monitors now operational in PWSA's system. Finally, the full detailed listing of Capital Improvement Projects (CIP) was provided to PA-DEP on January 23, 2018, with a presentation on the CIP conducted for PA-DEP and EPA staff on January 23, 2018 in Harrisburg PA. All requirements under the October 25, 2017 Administrative Order were completed on or before June 17, 2020.

In addition, the PWSA entered into the Consent Order and Agreement (COA) with the PA-DEP related to "Violations of the Pennsylvania Safe Drinking Water Act and the Rules and Regulations Promulgated Pursuant Thereto" for the Clearwell Response Projects on September 6, 2019 (hereto referenced as the 2019 COA). Under the 2019 COA, PWSA is

IX. QUALITY OF SERVICE

required to construct a bypass system to enable the Authority to remove the existing single-cell clearwell from service and replace it with a new multi-celled clearwell. PWSA is obligated to submit a construction permit to DEP on or before January 1, 2023 and to complete construction of a clearwell bypass system within two years of DEP's issuance of a construction permit. As a result of the existing single-cell clearwell basin condition and design, a clearwell bypass system is essential to ensure uninterrupted water supply service should the existing clearwell should prematurely fail. PWSA is also required by the 2019 COA to: (i) rehabilitate or replace Rising Main #3 (from the Breucken Pump Station) to PWSA's Highland 2 Reservoir; (ii) rehabilitate or replace Rising Main #4 (from the Breucken Pump Station) to PWSA's Highland 2 Reservoir; (iii) construct a new redundant rising main from the Aspinwall Pump Station to the Lanpher Reservoir to replace the existing 100 year old transmission main which has suffered 3 major failures in the past 5 years; (iv) replace the cover and liner of the Highland 2 Reservoir to comply with existing regulatory standards, and facilitate the clearwell bypass system construction; and (v) replace or rehabilitate the existing Aspinwall and Bruecken pump stations. With respect to the completion of the clearwell bypass, assuming that PWSA submits the application on January 1, 2023, and that PADEP approves on an assumed 90-day construction permit review time frame, the resultant required construction completion deadline will be March 2025. Under this timing scenario, the clearwell bypass would be the last project to be completed prior to taking the existing clearwell offline for replacement. To date, the PA-DEP has granted PWSA 90-day extensions of the deadlines for submitting the requisite Construction Permit Applications for: Rising Main #3 Rehabilitation Project (which was due "on or before September 1, 2020", but with the 90 day extension, the revised date was "11/30/20" (which PWSA achieved, submitting on 11/30/2020)); for Aspinwall Pump Station to Lanpher Reservoir Rising Main Project (which as due "on or before December 30, 2020", but currently with the 90 day extension, the revised date is "3/31/21" (which PWSA achieved, submitting on 3/30/21); for the Aspinwall and Burecken Pump Station Improvements Projects (which was due "on or before January 1, 2021", but with the 90 day extension, the revised date was "4/1/21", and with a second approved extension, are due on or before 9/31/21)); and for the Washout Disconnection (which was due "on or before June 1, 2020", but with the 90 day extension, the revised date was "8/31/20" (achieved, we submitted on 8/31/20). PWSA is currently on schedule for all projects, having achieved all milestone

IX. QUALITY OF SERVICE

deliverable dates thus far for the COA-stated deadlines for submitting Construction Permit Applications for the above referenced projects due prior to the completion of this report.

Note, PWSA and the PA-DEP continue to conduct bi-weekly Coordination Meetings to continue strengthening the working relationship and addressing concerns as they arise.

iii. No State fines or penalties were assessed by PA-DEP in FY 2020 related to the violations described in IX a(ii).

b. Please see attached.

i. Please see attached.

ii. Not applicable.

IX.1.a.i: PWSA - BWA List			
Date of Break	Address of Break	Number of Connections	Number of Customers Affected
5/21/2020	Ruthven St.	411	110.97
7/8/2020	Wiltsie Street	24	6.48
8/12/2020	Apple Street	860	232.2
8/20/2020	Steuben Street	200	54
10/16/2020	Bismark, Forest, and Charles (due to flushing)	10	2.7
10/17/2020	Garfield Tank Sensor Failure	300	81
12/15/2020	Wabash and Plank Streets	20	5.4
12/19/2020	Steuben Street	120	32.4

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ESTE INFORME CONTIENE INFORMACION MUY IMPORTANTE SOBRE SU AGUA DE BEBER.
TRADUZCALO O HABLE CON ALGUIEN QUE LO ENTIENDA BIEN.**

The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On May 21, 2020, at approximately 3:30 p.m., PWSA experienced a loss of positive water pressure due an 8-inch water main break on Ruthven Street in Polish Hill, causing low and no water pressure for localized customers in the Polish Hill Neighborhood in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 3:30 p.m. on May 21, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

What happened? What is being done?

The main break was isolated, and PWSA began to restore pressure at approximately 3:30 p.m. on May 21, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On July 8, 2020, at approximately 11:30 a.m., PWSA experienced a loss of positive water pressure due an 8-inch water main break on Wiltsie Street in Lincoln-Lemington-Belmar, causing low and no water pressure for localized customers in the Lincoln-Lemington-Belmar neighborhood in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 12:13 p.m. on July 8, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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What happened? What is being done?

The main break was isolated, and PWSA began to restore pressure at approximately 12:13 p.m. on July 8, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

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What should I do?

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- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

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What happened? What is being done?

The main break was isolated, and PWSA began to restore pressure at approximately 3:15 a.m. on August 12, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On August 20, 2020, at approximately 3:30 a.m., PWSA experienced a loss of positive water pressure due to a 6-inch water main break on Steuben Street in Elliott, causing low and no water pressure for localized customers in the Elliott neighborhood in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 6:00 a.m. on August 20, 2020. A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

Until further notice, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

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What happened? What is being done?

The main break was isolated, and PWSA began to restore pressure at approximately 6:00 a.m. on August 20, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On October 16, 2020, at approximately 2:00 p.m., PWSA experienced a loss of positive water pressure due to hydrant flushing in the Borough of Millvale, causing low and no water pressure for localized customers on Bismark, Forest, and Charles Streets. Return to water service began at approximately 2:15 p.m. on October 16, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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What happened? What is being done?

PWSA began to restore pressure at approximately 2:15 p.m. on October 16, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On October 17, 2020, at approximately 11:00 a.m., PWSA experienced a loss of positive water pressure due to a temporary sensor failure at the Garfield Tank caused by damage during T-Mobile construction work. This damage resulted in low and no water pressure for localized customers in the Stanton Heights and Garfield neighborhoods in the City of Pittsburgh. The return to water service began at approximately 1:30 p.m. on October 17, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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What happened? What is being done?

PWSA restored pressure at approximately 1:30 p.m. on October 17, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On December 15, 2020, at approximately 9:55 a.m., PWSA experienced a loss of positive water pressure due to an 8-inch water main break at Wabash and Plank Streets, causing low and no water pressure for localized customers in the West End neighborhood in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 12:00 p.m. on December 15, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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What happened? What is being done?

PWSA began to restore pressure at approximately 12:00 p.m. on December 15, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.

We routinely monitor the conditions in the distribution system. On December 19, 2020, at approximately 9:26 p.m., PWSA experienced a loss of positive water pressure due to an 6-inch water main break on Steuben Street, causing low and no water pressure for localized customers in the Elliot and Westwood neighborhoods in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 10:45 p.m. on December 19, 2020.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

What should I do?

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- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

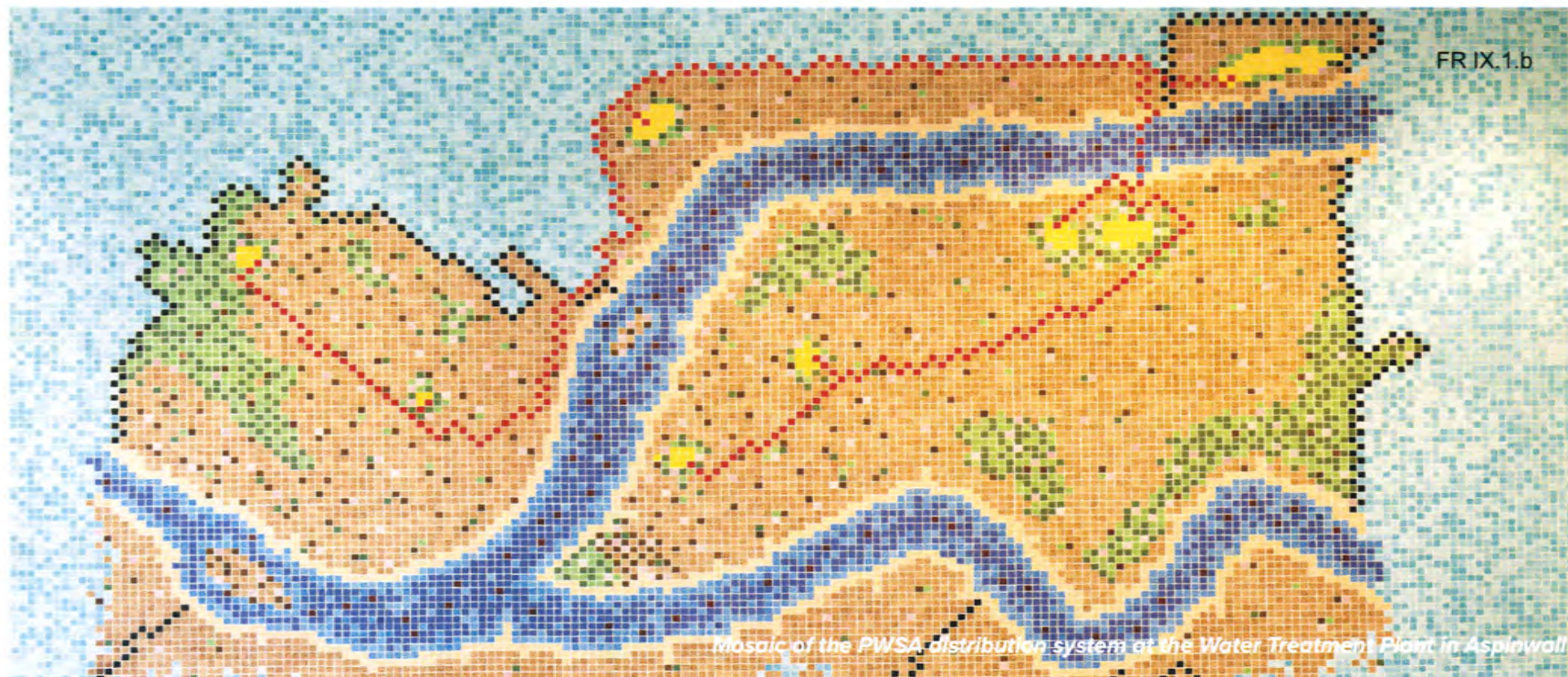
What happened? What is being done?

PWSA began to restore pressure at approximately 10:45 p.m. on December 19, 2020. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by The Pittsburgh Water and Sewer Authority



The Pittsburgh Water and Sewer Authority's Annual Drinking Water Quality Report 2019

PA Public Water Supply ID No. 5020038

Our mission is to provide you with a high quality, dependable, and ample supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and to protect our water resources. We are committed to ensuring the quality of your water. If you have any questions about the report, please contact our Water Treatment Plant at 412.782.7552.

We want customers to be informed about their water. The Water Quality Report and additional information are available on our website; pgh2o.com. Additional copies may be obtained by calling Customer Service at 412.255.2423 and customers can be transferred to an interpreter by request if they speak a language other than English. If you want to learn more, please attend any of our regularly scheduled Board of Directors meetings typically held on the fourth Friday of every month at 1200 Penn Avenue, Pittsburgh, PA, 15222. More information can be found at pgh2o.com/about-us/board-board-meetings.

PWSA provides water and sewer service to more than 300,000 customers throughout the City of Pittsburgh and surrounding areas. We are the largest combined water and sewer authority in Pennsylvania producing an average of 70 million gallons of water daily. In addition, PWSA provides bulk water sales to Reserve Township, Fox Chapel Borough, and Aspinwall Borough, along with being interconnected to several other regional water systems for emergency purposes. The PWSA drinking water system contains approximately 965 miles of water lines, five reservoirs and 11 tanks with a storage capacity of 455 million gallons of water.

Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, ó hable con alguien que lo entienda. (This report contains important information about your drinking water. Have someone translate it for you, or speak with someone who understands it.)



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Where Does Your Water Come from and How is it Treated?

PWSA draws its water from the Allegheny River. We do not use ground or well water. On average, 70 million gallons of water are treated each day at our drinking water treatment plant. The plant is capable of producing over 100 million gallons of water per day. The treatment process takes three full days and consists of three separate stages:

STAGE 1: Clarification

River water passes through a process called "clarification," in which silts and clays are removed. This stage involves the addition of treatment chemicals (coagulants) which form clumped particles called "floc," which are then physically removed by gravity sedimentation.

STAGE 2: Filtration

The clarified water next passes slowly through anthracite and sand filters in order to remove the fine particles and microorganisms.

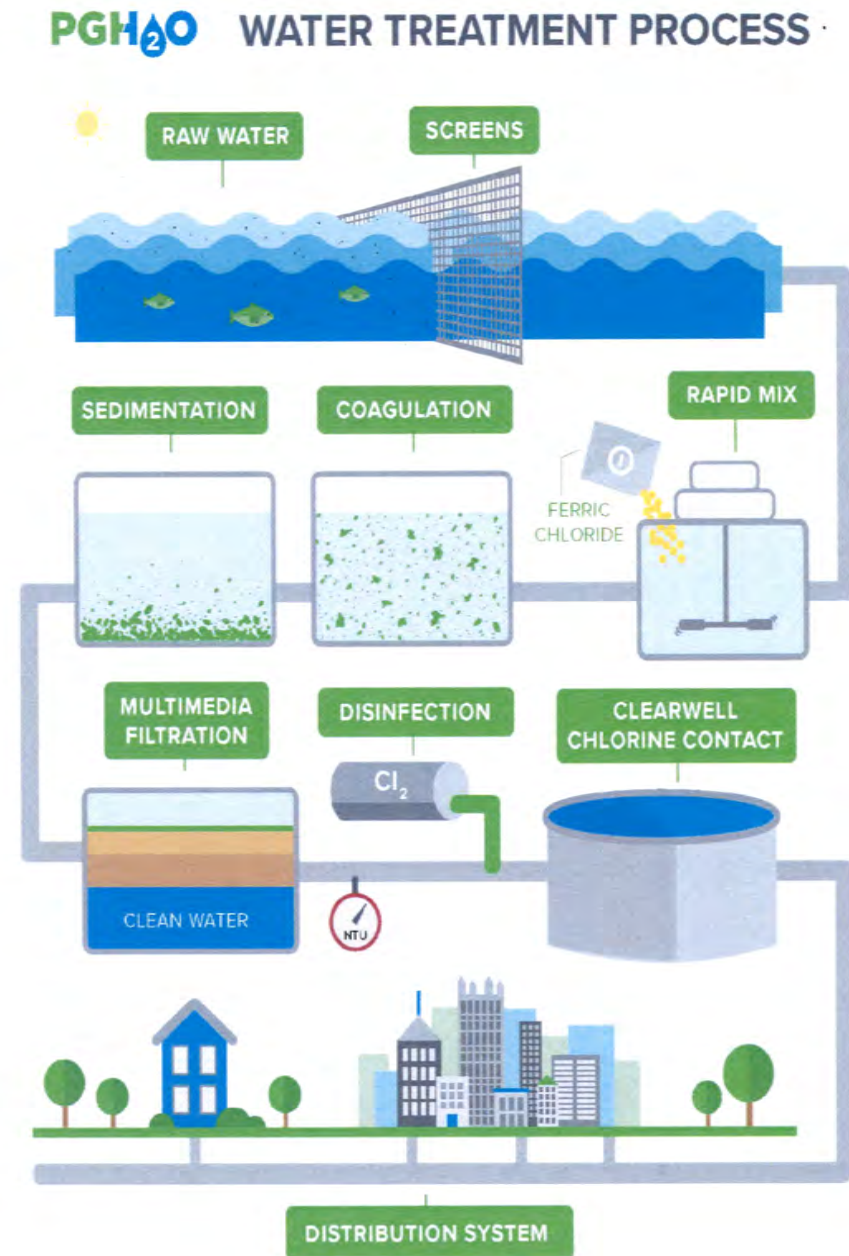
STAGE 3: Disinfection

The filtered water is treated with chlorine to ensure removal of any harmful microorganisms. During this process, several additional chemicals are added to complete treatment. These include sodium carbonate to adjust the pH of the water and fluoride to prevent cavities.

Secondary Treatment of Reservoir Water

In addition to our primary water treatment plant located near Aspinwall, PWSA operates a secondary treatment plant known as the Microfiltration Plant in Highland Park.

All of the water stored in the open-air Highland Reservoir #1 is originally treated in our primary plant. Then, before the Highland Reservoir #1 water is distributed to the public, it is retreated in our secondary plant. This membrane filtration plant utilizes state-of-the-art microfiltration and chlorination to remove any impurities that may have entered the water during storage in the reservoir.





Stormwater

Stormwater pollution affects water quality. PWSA draws water from the Allegheny River. Anything that enters a storm sewer is ultimately released, untreated, into the rivers and streams. In addition to the Allegheny River being used as the source of our drinking water, it is also used for swimming, boating, and fishing.

The PWSA system is made up of sanitary, dedicated stormwater, and combined sewers. All new development is required to have separate storm sewers. As an older city, only about 25 percent of the system has separate storm sewers.

Residents can help prevent stormwater pollution by doing the following:

Dispose of trash properly.

Don't litter. You can help reduce cost and keep our rivers clean by properly disposing of waste.

Consider where you wash your car.

If you're washing your car in the driveway, all the soap is running into the street and may enter the storm sewers and eventually end up in the river.

Properly dispose of pet waste.

If pet waste is not properly disposed of during rain events, the bacteria may enter the storm sewers and eventually end up in the river.

Use fertilizer sparingly.

During rain events, fertilizer runs down the street and may enter the storm sewers and eventually end up in the river. Don't fertilize before a rain storm.

Stop oil leaks immediately.

Leaking oil runs down the street and may enter the storm sewers and eventually end up in the river. Check for oil leaks regularly and dispose of oil properly.

Who Monitors and Ensures the Quality of Water?

PWSA continuously monitors your drinking water in accordance with Federal and State regulations.

On pages 6-10, the tables show our monitoring results for the period of January 1, 2019, to December 31, 2019. While we conducted more than 100,000 analyses for approximately 100 different chemical and microbial constituents last year, we only found detectable levels of the contaminants listed in the water quality tables. It should be noted that none of the test results exceeded federal or state maximum contaminant levels (MCLs).

Source Water Protection

PWSA's source water protection plan is approved by the Pennsylvania Department of Environmental Protection (PADEP). This report identifies the most likely sources of pollution affecting the Allegheny River.

These include accidental release of contaminants from industrial processes; cumulative impact of discharge from power plants; cumulative release of petroleum products from pipeline ruptures; stormwater runoff from lands adjacent to the river and Combined Sewer Overflows (CSOs). A summary of the Source Water Assessment is available on the PADEP website at dep.state.pa.us.

PWSA realizes the importance of protecting our source water and is actively involved with organizations that aid the Authority in accomplishing this goal. PWSA is a member of River Alert Information Network (RAIN), which is an early-warning spill detection monitoring network along the Allegheny, Monongahela, and their tributaries. For more information please visit their site at rainmatters.org. PWSA is also a member of the Ohio River Valley Water Sanitation Commission (ORSANCO) and is enrolled in their organic detection program. For more information please visit their site at orsanco.org.

Should You Be Concerned About Lead?

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead found in drinking water is primarily from materials and components associated with water service lines and plumbing inside private property.

PWSA recently tested 168 pre-selected sites in its service area that have lead service lines or plumbing (Tier 1 sites). EPA has established an action level for lead of 15 parts per billion (ppb). This means that water providers must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring, public education, and lead service line replacement. An action level exceedance is not a violation. The 90th percentile results from the latest round of testing were 10.0 ppb, which is below the action level. According to EPA, there is no safe level of lead. Another set of tests will be completed by June 30, 2020. PWSA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components in your home. More information on lead in drinking water can be found at lead.pgh2o.com.

Steps you can take to reduce exposure to lead in drinking water

- **Run your water to flush out lead.** If you haven't used your water for several hours, run your cold tap for at least one minute before cooking or drinking. Homes with longer lead water service lines may require flushing for a longer period of time.
- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap. Do not use water from the hot water tap to make baby formula. Lead dissolves more easily in hot water.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** The The NSF Water Fact Kit includes specific information about filtering lead in drinking water at: nsf.org. Coupons for NSF-certified filters can be found at lead.pgh2o.com/resources/lead-filters-and-other-products.
- **Identify if your plumbing fixtures contain lead.** There are lead check swabs that can detect lead on plumbing surfaces, such as solder and pipes. These swabs can be purchased at plumbing and home improvement stores. Consider having lead-containing pipes and fixtures replaced, or use the precautions listed above.

Identify if your plumbing fixtures contain lead

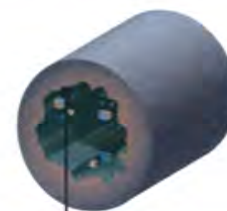
Consider having lead-containing pipes and fixtures replaced, and contact us at 412.255.8987 for information about coordinating removal of the PWSA-owned portion of the service line. We offer free private lead service line replacements for customers who are at or below 300 percent of the Federal Poverty Level. Funds for this program are available from a settlement of an enforcement action between PWSA and the PADEP. Customers can contact Dollar Energy Fund at 866.762.2348 to apply.

PWSA offers residential water customers a free test for lead. You can request a kit at pgh2o.com/leadform or call 412.255.8987. You may also contact private labs for testing. More information on testing can be found at our website at lead.pgh2o.com.

Orthophosphate and Lead Service Line Replacements

PWSA started applying the corrosion control additive orthophosphate to the drinking water in April 2019. Orthophosphate is a food-grade additive that forms a protective layer inside of lead service lines, creating a barrier between the lead pipes and the water flowing through them. It is approved by the Environmental Protection Agency (EPA) and used in water systems across the world. PWSA's water quality team completed extensive monitoring throughout the water distribution system to track orthophosphate's effectiveness and ensure consistent water quality during this treatment upgrade. We are pleased to see lower lead levels in our drinking water samples during the December 2019 round of testing.

While orthophosphate works throughout the distribution system to reduce lead levels, PWSA continues to replace lead lines free of charge. To date, over 7000 lead lines have been replaced and thousands of free lead test kits and filters have been distributed.



Lack of corrosion control allows lead to leach from pipes into water.



A protective layer of **Orthophosphate** forms to prevent pipe corrosion.

Orthophosphate has created a protective barrier in lead pipes to reduce lead levels in drinking water.

What Does PWSA Test for?

In general, the sources of all drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source or raw water include:

- **Microbial contaminants** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants** such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides** which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, can come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants** which can be naturally-occurring or the result of oil and gas production and mining activities.

In order to assure that tap water is safe to drink, the EPA and PADEP regulate the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and PADEP regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

PWSA tests for contaminants that may be present in the source water prior to treatment. Results of the tests enables PWSA to adjust the treatment process in order to maximize the reduction and removal of contaminants. Tests are also conducted during the treatment process and on the finished water. Additional samples for testing are collected on a regular basis from our storage facilities, various points in the distribution network, and customers' taps.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1.800.426.4791.

Long Term Surface Water Enhancement Treatment Rule Round 2 (LT2)

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.



Special Information for Immuno-Compromised Individuals

Some people may be more vulnerable to contaminants in drinking water than others.

Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. Environmental Protection Agency (EPA) and Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1.800.426.4791.

TABLE 1: Detected Sample Results

A small amount of water was purchased from Pennsylvania American Water (PAW).

CHEMICAL CONTAMINANTS: WATER TREATMENT PLANT									
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination	
Calcium	-	-	25	18-30	ppm	2019	-	-	
Fluoride	2*	4	0.77	-	ppm	2019	N	Water additive which promotes strong teeth	
Nitrate	10	10	0.66	0.53-0.79	ppm	2019	N	Runoff from fertilizer use; Leaching from septic tank sewage; Erosion of natural deposits	
Barium	2	2	0.034	-	ppm	5/30/19	N	-	
Orthophosphate	-	-	0.017	0-0.06	ppm	2019	N	-	
Nickel	-	-	0.0021	-	ppm	5/30/19	N	-	
PAW	Nitrate	10	10	0.95	-	ppm	2019	N	Runoff from fertilizer use; Leaching from septic tank sewage; Erosion of natural deposits
	Fluoride	2*	4	0.62	-	ppm	2019	-	Water additive which promotes strong teeth

*EPA's MCL for fluoride is 4 ppm. However, Pennsylvania has set a lower MCL to better protect human health.

Unregulated Contaminant Monitoring Rule 4 (UCMR4)

FR IX.1.b

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. Any unregulated contaminants detected are reported in the following list. For additional information and data visit: epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule, or call the Safe Drinking Water Hotline at (800) 426-4791.

The Pittsburgh Water and Sewer Authority detects for:

CHEMICAL CONTAMINANTS: UCMR4 ALLEGHENY RIVER								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Bromide	-	-	36.2	25.6-46	ppb	2019	N/A	-
Total Organic Carbon	-	-	2.55	2.34-2.89	ppm	2019	N/A	Naturally present in the environment

CHEMICAL CONTAMINANTS: UCMR4 DISTRIBUTION								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
HAA5	-	-	27.03	14.8-44.57	ppb	2019	-	-
HAA6 Br	-	-	8.43	4.59-12.9	ppb	2019	-	-
HAA 9	-	-	34.54	22.48-49.66	ppb	2019	-	-

Chemical Contaminants

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CHEMICAL CONTAMINANTS: DISTRIBUTION SYSTEM								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Free Chlorine	4	MRDLG-4	1.10	0.76-1.10	ppm	2019	N	Water additive used to control microbes
Calcium	-	-	24	15-41	ppm	2019	N	-
HAA5	60	N/A	22	12-39	ppb	2019	N	By-product of drinking water disinfection
TTHM	80	N/A	55	17-115	ppb	2019	N	By-product of drinking water chlorination
Orthophosphate	-	-	1.72	0.62-2.31	ppm	2019	N	-

ENTRY POINT DISINFECTANT RESIDUAL								
Contaminant	Minimum Disinfectant Residual	Lowest Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination	
Chlorine	0.20	0.73	0.73-1.20	ppm	2019	N	Water additive used to control microbes	
PAW* Chlorine	0.20	1.40	1.40-2.47	ppm	2019	N	Water additive used to control microbes	

*A small amount of water was purchased from Pennsylvania American Water (PAW).

LEAD AND COPPER							
Contaminant	Action Level (AL)	MCLG	90th Percentile Value	Units	# of Sites Above AL of Total Sites	Violation Y/N	Sources of Contamination
Lead (Jan-Jun 2019)	15	0	17.49	ppb	20 out of 177	N	Corrosion of household plumbing; Erosion of natural deposits
Copper (Jan-Jun 2019)	1.3	1.3	0.086	ppm	0 out of 177	N	Corrosion of household plumbing; Erosion of natural deposits; Leaching from wood preservatives
Lead (Jul-Dec 2019)	15	0	10	ppb	6 out of 169	N	Corrosion of household plumbing; Erosion of natural deposits
Copper (Jul-Dec 2019)	1.3	1.3	0.135	ppm	0 out of 169	N	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives

Microbial Contaminants Tables

FR IX.1.b

MICROBIAL: LT2 ALLEGHENY RIVER								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Cryptosporidium	-	-	0.190	-	Oocysts/L	2017	N/A	Naturally present in the environment

MICROBIAL (RELATED TO ASSESSMENTS/CORRECTIVE ACTIONS REGARDING TO POSITIVE RESULTS)					
Contaminants	TT	MCLG	Assessments/ Corrective Actions	Violation Y/N	Sources of Contamination
Total Coliform Bacteria	Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement	N/A	See detailed description under "Detected Contaminants Health Effects Language and Corrective Actions" section	N	Naturally present in the environment

MICROBIAL (RELATED TO E. COLI)					
Contaminants	MCL	MCLG	Positive Sample(s)	Violation Y/N	Sources of Contamination
<i>E. coli</i>	Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i>	0	0	N	Human and animal fecal waste
Contaminants	TT	MCLG	Assessments/ Corrective Actions	Violation Y/N	Sources of Contamination
<i>E. coli</i>	Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement	N/A	See description under "Detected Contaminants Health Effects Language and Corrective Actions" section	N	Human and animal fecal waste

Contaminants Tables

A small amount of water was purchased from Pennsylvania American Water (PAW).

TURBIDITY							
Contaminant		MCL	MCLG	Level Detected	Sample Date	Violation Y/N	Source of Contamination
Turbidity		TT= 1 NTU for a single measurement	0	0.430	2/25/19	N	Soil runoff
		TT= at least 95% of monthly samples \leq 0.3 NTU		N/A	N/A	N	
PAW	Turbidity	TT= 1 NTU for a single measurement	0	0.12	2019	N	Soil runoff
		TT= at least 95% of monthly samples \leq 0.3 NTU		100%	N/A	N	

TOTAL ORGANIC CARBON (TOC)						
Contaminant		Range of % Removal Required	Range of percent removal achieved	Number of quarters out of compliance	Violation Y/N	Sources of Contamination
TOC		35%	45%-47%	0	N	Naturally present in the environment
PAW	TOC	25%-35%	18%-30%	0	N	Naturally present in the environment

A Source Water Assessment of PWSA's intake water (located on the Allegheny River) was completed in 2010 by the PADEP. The Assessment has found that our source water is potentially most susceptible to road deicing materials, accidental spills along railroad tracks, and leaks from submerged pipelines and storage tanks. Overall, the Allegheny River Watershed has a moderate risk of significant contamination. Summary reports are available on the PADEP website at: depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4492 and then selecting "Pittsburgh Water and Sewer Authority.pdf" file in the list or by writing to the PADEP at 400 Waterfront Dr., Pittsburgh, PA 15222. Complete reports were distributed to municipalities, water supplier, local planning agencies and PADEP regional Office, Records management Unit at 412.442.4217.

Other Violations

PWSA received a violation for failing to take two sets of water quality parameter distribution samples from 25 sites every 6 months. PWSA collected 2 samples from 24 of the 25 distribution sites from June 1, 2019 to December 31, 2019, but collected only one sample from one of the sites.

Abbreviations & Definitions

(ND) Non-Detect

Laboratory analysis indicates that the contaminant is not present at a detectable level.

(ppm or mg/L) Parts Per Million or Milligrams Per Liter

One part per million corresponds to one minute in two years or a single penny in \$10,000.

(ppb or µg/L) Parts Per Billion or Micrograms Per Liter

One part per billion corresponds to one minute in 2000 years or a single penny in \$10,000,000.

(Mrem/year) Millirems Per Year

A measure of radiation absorbed by the body.

(pCi/L) Picocuries Per Liter

A measure of radioactivity.

(NTU) Nephelometric Turbidity Unit

Measurement of the clarity of water. Turbidity in excess of 5 NTU becomes just barely noticeable to the average person.

(AL) Action Level

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

(TT) Treatment Technique

A required process intended to reduce the level of a contaminant in drinking water.

(N/A) Non-Applicable

Does not apply.

(MCLG) Maximum Contaminant Level Goal

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(MCL) Maximum Contaminant Level

The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.

(MRDLG) Maximum Residual Disinfectant Level Goal

The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(MRDL) Maximum Residual Disinfectant Level

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(MinRDL) Minimum Residual Disinfectant Level

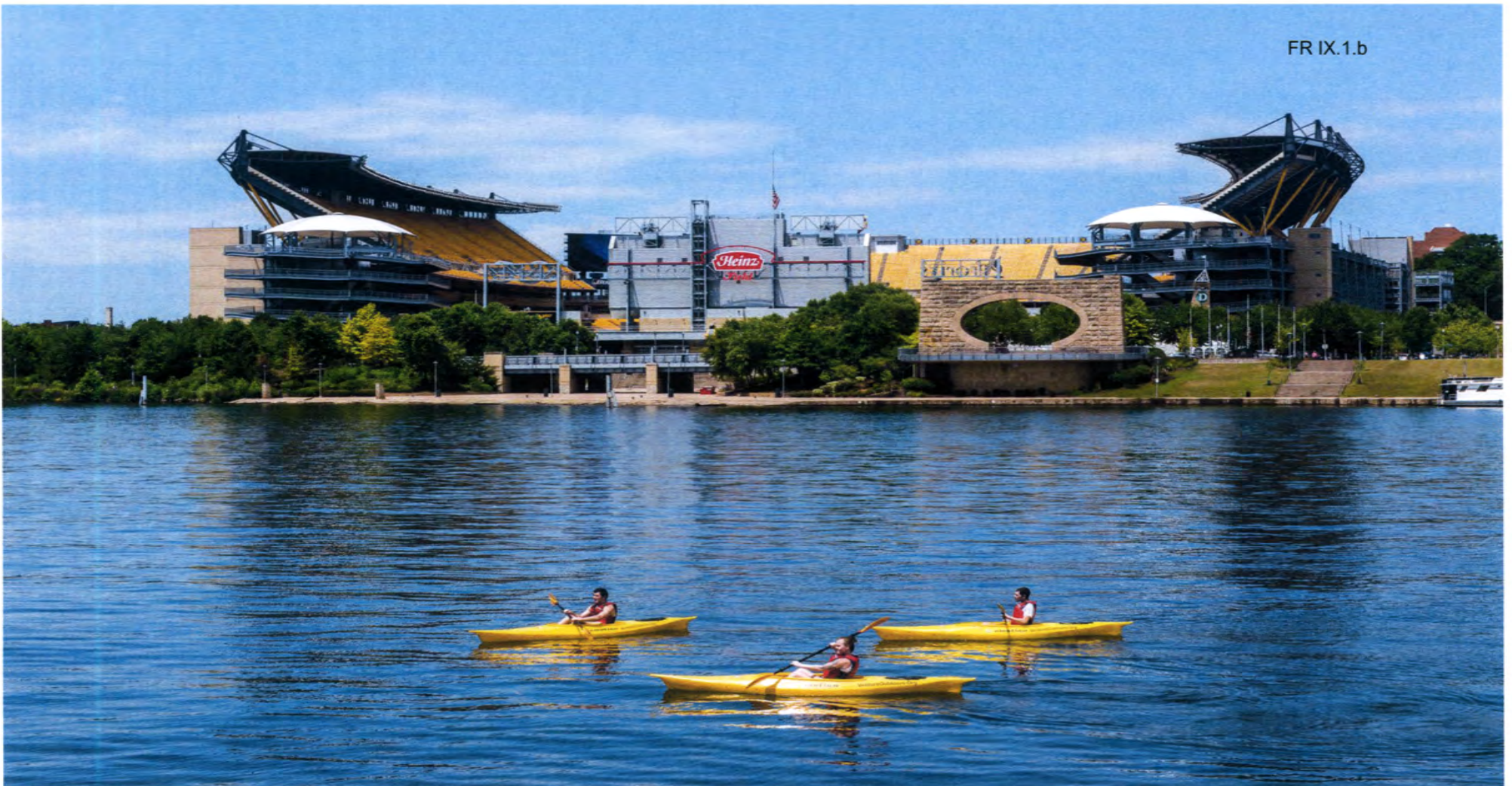
The minimum level of residual disinfectant required at the entry point to the distribution system.

Level 1 Assessment

A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment

A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.



What Do the Results Mean?

We are proud that your drinking water meets or surpasses all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected but are below the recommended minimum contaminant level (MCL) and therefore meet the regulatory requirements.

Stay Informed

Update your contact information and stay informed. It's important that your contact information is up to date so that we can notify you about planned construction, water emergencies, extended water outages, and provide other safety information. PWSA encourages all customers to provide updated contact information by going to our website at pgh2o.com/pay or by calling PWSA Customer Service at 412.255.2423 (press 5). This information ensures that we are able to make direct contact in the event of an emergency.

IX. QUALITY OF SERVICE

IX.2. Indicate whether the company is in compliance with 52 Pa. Code, § 65.6(a) regarding normal operating pressure standards, and with 52 Pa. Code, § 65.6(d) regarding pressure surveys at regular intervals.

- a. Provide details on any water pressure problems, lasting longer than 5 days, which had occurred since the last rate proceeding in any part of the water transmission and distribution system.
- b. Describe any action taken on a temporary basis, and the long term solutions developed to address any water pressure problems.

RESPONSE:

PWSA provides water service in compliance with 52 Pa. Code, § 65.6(a) over more than 95% of its service territory, during normal operating periods. The design of PWSA's system is such that some areas (less than 5%) experience higher or lower pressures routinely, outside of those provided in 52 Pa. Code, § 65.6(a). During non-normal operating periods, such as when there is a main break or a facility is out of service, PWSA may not be able to meet 52 Pa. Code, § 65.6(a) in larger portions of the system. PWSA has developed a pressure and flow monitoring program to address these issues.

- a. PWSA installed a total of 61 continuous recording pressure monitors throughout the system. The first 24 continuous recording pressure monitors were operational by July 8, 2018, and the remaining 37 pressure monitors were operational by January 21, 2021. This monitoring network ensures that there is at least one or more continuous recording pressure monitors in each separate pressure zone throughout the PWSA distribution system
- b. PWSA continues to work with the PA-DEP to review data from the pressure sensors in the distribution system. Analysis of the data being gathered will assist PWSA with developing the long-term plan to address the local pressure problems systematically and individually.

IX. QUALITY OF SERVICE

IX.3. Provide support to demonstrate that water or wastewater service is being furnished on a continuous basis by supplying a summary of the company's records of each service interruption greater than 24 hours since the last rate proceeding.

RESPONSE:

PWSA records the time of interruption and restoration for service. All of this information is being compiled within an Access Database. A copy of this data has been attached for reference.

IX. QUALITY OF SERVICE

IX.4. Provide a discussion of the company's policy, or provide a copy of the policy if in written form, on tracking and responding to customer complaints.

- a. Provide a summary report demonstrating the company's compliance with 52 Pa. Code, § 65.3 regarding the full and prompt investigation of service or facility complaints and the recordkeeping requirements of such complaints.

RESPONSE:

When a PWSA representative is notified that a customer is unsatisfied with their service or with the information provided to them, the representative will request the customer's authorization to initiate an Inquiry regarding the matter and will respond to that Inquiry within three business days. The matter is then escalated to a PWSA Senior Representative who contacts the customer and attempts to resolve the customer's Inquiry during that contact by providing additional information or taking additional action. If the customer is still not satisfied, the Inquiry becomes a Dispute. In the Dispute process, the customer's information is forwarded to the PWSA Compliance group to investigate, using reasonable methods under the given circumstances. Within thirty days, a member of the Compliance group will contact the customer to review the full Dispute investigation, supporting documentation, and all information available for the customer to make an informed judgement. At that time, the customer is offered a copy of the Utility Report, which details the account history and investigation. The Utility Report also provides the contact information for the Pennsylvania Public Utility Commission, should the customer wish to appeal the matter further. If the customer indicates that they are satisfied with PWSA's response, or the customer does not respond to the findings within fifteen days, the matter is considered resolved. PWSA tracks overall Compliance metrics related to disputes and complaints using Excel Spreadsheets. Attached, please find a copy of the summary spreadsheet that contains all of the disputes and complaints received and responded to in 2020 and 2021, year to date. Note, PWSA tracks disputes, informal complaints and formal complaints in a more detailed manner through separate Excel spreadsheets. Every complaint that the Compliance Department receives is thoroughly investigated and a full utility report is generated, detailing the facts surrounding the investigation and PWSA's position, and is communicated to the customer. Everything sent to the customer related to the complaint is saved on PWSA's network, by address, satisfying the PUC's record keeping regulatory requirements.

- a. Please see attached the Compliance metrics spreadsheet for 2020. This summary is used for tracking compliance metrics. Reporting and monitoring customer complaints in compliance with Pa. Code, § 65.3 have been addressed in the PWSA Compliance Plan.

IX. QUALITY OF SERVICE

IX.5. Indicate whether the company is in compliance with 52 Pa. Code, § 65.4(b) regarding complete and current mapping of the entire distribution or collection system.

RESPONSE:

PWSA continues to develop its GIS system for its entire distribution and collection systems infrastructure. The base systems are currently mapped in GIS, but accuracy of attribution for all of those mapped assets is something we are continuing to improve. The water and sewer systems are mapped from the available historical maps that are on file; however, the material and date installed data is not yet complete, with the extraction and inclusion of this data being actively worked on at this time. PWSA has completed the process of electronically scanning and referencing all of the available historical paper maps and plans for existing facilities.

IX. QUALITY OF SERVICE

IX.6. Provide a summary report demonstrating the company's efforts in water conservation, since the last rate proceeding, pursuant to 52 Pa. Code, § 65.20.

RESPONSE:

Plans for conservation activities are included in the Compliance Plan submission.

IX. QUALITY OF SERVICE

IX.7. Provide a discussion of the company's policy regarding meter requirements, replacements and testing. State if the company's procedures are in compliance with 52 Pa. Code, § 65.8(b).

a. Provide meter test records as required in 52 Pa. Code, § 65.8(c) for the 50 meters most recently removed from service.

b. Provide a discussion of the company's policy and history of compliance with 52 Pa. Code, § 65.9 regarding adjustment of bills for meter error within the last year.

RESPONSE:

In Section 509.6 of PWSA's prior tariff, currently The Pittsburgh Water and Sewer Authority Rules and Regulations, PWSA does provide meter tests at a customer's request. However, the Authority will only perform a meter test at no charge if the meter passes testing.

PWSA implemented a meter replacement program to comply with these provisions, which was included in its Compliance Plan filing.

a. PWSA maintains records containing meter testing information.

b. With respect to 52 Pa. Code § 65.9(a), PWSA's recent 12 months practice has been to credit disputed usage for meters with test results in excess of 106% accuracy. With respect to 52 Pa. Code § 65.9(b), PWSA does not assess any charges outside of the cost of the meter test for slow meters. With respect to 52 Pa. Code § 65.9(c), PWSA does not assess any charges for non-registering meters. PWSA has developed a plan for compliance with 52 Pa. Code § 65.9 and has included additional information in the Compliance Plan.

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.1. Provide a comparative balance sheet for the historic test year-end and the preceding year-end.

RESPONSE:

Please see 53.52.c.2.

X. BALANCE SHEET

X.2. Provide a detail of other physical property, investments in affiliated companies and other investments.

RESPONSE:

PWSA is currently in compliance with 52 Pa. Code, § 65.16 System of Accounts. PWSA has mapped the current Chart of Accounts to provide reports and other required financial information in conformity with the most recent Uniform System of Accounts for Class A Water Utilities.

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.3. Provide the amounts and purpose of special cash accounts as of the historic test year-end.

RESPONSE:

PWSA does not have any special cash accounts.

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.4. Describe the nature and amounts of notes receivable, accounts receivable from associated companies, and any other receivables, other than customers' accounts, greater than 15% of the total. Limit the explanation to variances greater than \$10,000.

RESPONSE:

PWSA does not have any notes receivable or accounts receivable from associated companies. Other receivables account for 10.04% of total receivables balance with the rest attributable to billed and unbilled water, wastewater, and wastewater treatment charges from customers.

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.5. Provide the amount of accumulated reserve for uncollectible accounts, method and rate of accrual, amounts accrued and amounts written-off in each of the last 3 years.

RESPONSE:

PWSA maintains a reserve for uncollectible accounts. This reserve, based on an analytical review of outstanding accounts and historical collection data, is recognized coincident with recognition of revenue. PWSA has rights to utilize collection agencies, service terminations, liens, and real property sales to protect its interests, limit further losses, and motivate payments from delinquent customers. Due to this leverage, PWSA's current policy is not to write off bad debts. The table below shows the amounts accrued over the last three years.

	Per Books 12/31/2018	Per Books 12/31/2019	Unaudited 12/31/2020
Water & Sewer Conveyance	\$19,746,025	\$21,114,602	\$21,087,438
Sewer Treatment	10,609,311	11,341,158	11,333,582
Total	\$30,355,336	\$32,455,760	\$32,421,020

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.6. Provide a list of prepayments and give an explanation of special prepayments.

RESPONSE:

Please see the table below.

Prepaid Expense	Amount	Paid	Cost Period
Commonwealth of Pennsylvania - PaPUC	561,810.12	Sep 2020	6 months of 2021
Cogsdale Licensing	283,608.53	Dec 2020	2021
Microsoft Licensing	141,666.91	Dec 2020	11 months of 2021
CWM Environmental	98,006.67	Dec 2020	1 month of 2021
E-Builder Licenses	78,633.35	Jul 2020	5 months of 2021
Kubra Prepaid Postage	76,000.00	Nov 2020	2021
Document Management Licensing	47,511.06	Aug 2020	6 months of 2021
Microsoft 365 Licensing	40,723.36	Aug 2020	2021 and 2022
Sensus USA	34,476.78	Mar 2020	3 months of 2021
ARCGIS Licensing	31,513.42	Aug 2020	8 months of 2021
Barracuda E-mail Licensing	23,995.53	Dec 2020	11 months of 2021
CADD Drawing Licensing	23,348.00	Dec 2020	2021
Pitney Bowes Prepaid Postage	18,305.05	Dec 2019	2021
Sprymobile Licensing	17,149.81	Aug 2020	3 months of 2021
VMWARE Licensing	16,875.04	Dec 2020	9 months of 2021
US Water Alliance	16,000.00	Nov 2020	2021
Sprybackflow Licensing	14,691.95	Dec 2020	10 months of 2021
Sir Speedy Prepaid Postage	14,368.80	Dec 2020	2021
WAMS Licensing	13,320.89	May 2020	5 months of 2021
ARCGIS Software	13,089.04	Aug 2020	9 months of 2021
Web Hosting	11,854.45	Jun 2020	4 months of 2021
Tech Connect SCADA Support	11,216.51	May 2020	3 months of 2021
PFAS Notification Management	9,863.01	May 2020	4 months of 2021
Innovyze Software	8,146.05	Mar 2020	4 months of 2021
American Water Works Association	5,846.80	Apr 2020	5 months of 2021

X. BALANCE SHEET

X.7. Break down and explain in detail any significant items, greater than 15% of the total, in the current assets account listed on the balance sheet. Limit the explanation to variances greater than \$10,000.

RESPONSE:

Cash and Cash Equivalents **2019: \$64,680,000**

The Authority's cash and cash equivalents are considered to be cash on hand, demand deposits, and all highly liquid investments, both restricted and unrestricted, with maturity of three months or less at date of purchase.

Accounts Receivable: Water and Wastewater Treatment **2019: \$24,408,000**

Accounts receivables consist of monies owed to PWSA for services provided. Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings. The Authority recognizes unbilled accounts receivable for water service provided prior to year-end that is billed during the following year. Accounts receivable, both billed and unbilled, are divided by water (which includes wastewater conveyance) and wastewater treatment. Accounts receivable are presented net of a reserve for uncollectible amounts.

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.8. Explain in detail, including the amount and purpose, the deferred asset accounts that currently operate to affect or will at a later date affect the operating account supplying:

- a. Origin of these accounts.
- b. Probable changes to this account in the near future.
- c. Amortization of these accounts currently charged to operations or to be charged in the near future.

RESPONSE:

As explained below, PWSA maintains various swap agreements that represent deferred outflows and/or inflows.

- a. During December 2017, the Authority issued \$165,390 First Lien Revenue Refunding Bonds composed of Series A (159,795) and Series B (taxable) (\$5,595). The proceeds of the bonds were used to fund the costs of the refunding of all or a portion of the Authority's outstanding Series of 1998B, 2008A, 2008D-1, and 2013B water and sewer system revenue bonds.

The 2017 A and B Bonds were issued at a bond premium of \$23,374, which is being amortized as an adjustment to interest expense over the life of the bonds.

The 2017 A Bonds at December 31, 2020 and 2019 have carrying amounts of \$129,610 and \$142,605, respectively. The 2017 B Bonds were paid off during 2018.

During December 2017, the Authority issued \$218,805 Series C First Lien Revenue Refunding Bonds, the proceeds of which were used to fund the costs of refunding the Authority's outstanding Series 2008 B-1, B-2, and D-2 water and sewer system revenue bonds. The Bonds bear interest at the LIBOR index rate. The 2017 C Bonds were remarketed to convert the cash flows of the Authority's outstanding fixed payer swap portfolio from 70% 1-month LIBOR to the Weekly SIFMA Index (plus a third payment leg that includes a fixed rate component of the Authority paying 0.118%) between the Overlay Swap's effective date of December 1, 2020 and termination date of December 1, 2023.

The 2017 C Bonds at December 31, 2019 have a carrying amount of \$218,805.

- b. The Water and Sewer System First Lien Revenue Refunding Bonds Series C of 2017 were issued with a mandatory tender date of December 1, 2023. A mandatory tender

X. BALANCE SHEET

requires that the Authority purchase the bonds on the tender date with proceeds from a remarketing, which could be from another public offering or a private bank loan. The outcome of this transaction could impact this account in the near future. However, there is no way to determine what the impact will be until after the transaction is completed.

- c. During the years ended December 31, 2019 and 2018, the Authority paid \$8,243 and \$10,564, respectively, fixed and received \$4,464 and \$4,430, respectively, variable related to their outstanding swap agreements.

Current period changes in fair value for the interest rate swaps that are accounted for as hedges are recorded on the statements of net position as an adjustment to deferred outflows. Additionally, current period changes in fair value for the interest rate swap accounted for as an investment is recorded on the statements of revenues, expenses, and changes in net position as a component of investment income.

Through the use of derivative instruments such as interest rate swaps, the Authority is exposed to a variety of risks, including credit risk, interest rate risk, termination risk, basis risk, and rollover risk. A detailed description, valuation, and amortization, and associated risks can be found in PWSA's 2019 Audit report (FR VII.15).

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.9. Explain the nature of accounts payable to associated companies. Provide a breakdown by category.

RESPONSE:

PWSA has no associated companies.

X. BALANCE SHEET

X.10. Provide breakdown and explanation of other deferred credits as to their origin and disposition policy, for example, amortization.

RESPONSE:

Deferred Charge on Refunding

The Authority has recorded a deferred charge on refunding, which is shown as a deferred outflow of resources on the statements of net position.

Balance at 12/31/2018	Additions	Amortization	Balance at 12/31/2019
\$ 102,534,000	\$ 4,686	\$ 8,208	\$ 99,012,000

Interest Rate Swaps

The aggregate change in fair value during the year for hedging derivatives is reported on the statement of net position as a deferred outflow and swap borrowing and the investment derivative is considered an ineffective hedging derivative, whereby the change in fair value will be reported as a change in fair value of swap on the statement of revenues, expenses and changes in net position. A detailed description, valuation, and amortization, and associated risks can be found in PWSA's 2019 Audit report (FR VII.15).

X. BALANCE SHEET

X.11. Provide an explanation and method of funding of any reserves, other than depreciation and bad debt appearing on historic balance sheet.

RESPONSE:

Operating Reserve Fund

2019 Audit: \$18,712,000

PWSA is required by the 2017 Trust Indenture to maintain and fully fund an operating reserve. Per the indenture, monies in the Operating Reserve Fund can be used by PWSA to pay for the Current Expenses of the Authority. To the extent the Debt Service Fund is insufficient to make the required interest in principals on Senior Debt, monies in the operating reserve fund can be used. PWSA is required to maintain one sixth (1/6th) of the Current Expenses reflected in the most recent annual audited financial statements of the Authority. PWSA funds this reserve using cash generated from operations and has included a deposit in the FPPTY revenue requirement

Pittsburgh Water and Sewer Authority's Base Rate Filing

X. BALANCE SHEET

X.12. Provide an analysis of unappropriated retained earnings for the historic test year and 2 preceding years.

RESPONSE:

PWSA does not have unappropriated retained earnings. Any revenues collected in excess of system costs are deposited into cash account for payment of future operating and non-operating costs.

X. BALANCE SHEET

X.13. Describe the purpose of any advances made by the company to its parent corporation and describe all terms and conditions associated with such advances, including an estimate of future advances or repayments that are expected to occur.

RESPONSE:

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

XI. OTHER DATA

XI.1. Provide the company's monthly balance sheets and income statements for each month of the historic and future test year.

RESPONSE:

Please see schedules attached.

Pittsburgh Water & Sewer Authority
Monthly Income Statements - HTY (2020)

Monthly Profit / Loss	Per Books 1/31/2020	Per Books 2/28/2020	Per Books 3/31/2020	Per Books 4/30/2020	Per Books 5/31/2020	Per Books 6/30/2020	Per Books 7/31/2020	Per Books 8/31/2020	Per Books 9/30/2020	Per Books 10/31/2020	Per Books 11/30/2020	Per Books 12/31/2020
REVENUES												
Utility Revenue	\$ (19,053,818)	\$ (18,260,912)	\$ (19,331,384)	\$ (18,790,144)	\$ (17,701,116)	\$ (16,749,010)	\$ (21,100,642)	\$ (23,348,111)	\$ (22,069,098)	\$ (17,947,072)	\$ (19,440,308)	\$ (20,783,070)
Fee Revenue	(200,886)	(888,853)	(635,420)	(17,976)	(1,786,518)	(602,074)	(215,862)	(482,072)	(80,588)	(737,394)	(497,167)	(245,726)
Misc Revenue	(49,019)	(348,609)	(61,145)	(19,053)	(9,041)	(15,627)	(110,065)	(52,344)	(25,684)	(217,065)	(12,350)	(112,610)
Interest Income (NonTrust)	-	-	-	-	-	-	-	-	-	-	-	-
Interest Income (Trust)	(35,079)	(42,800)	(39,976)	(31,166)	(16,384)	(12,003)	(6,804)	(5,896)	(4,503)	(2,806)	(2,321)	(1,779)
Other Income	(985,053)	(486,303)	(851,812)	(1,310,776)	(619,742)	(98,590)	(297,777)	(824,080)	-	(841,539)	-	(761,360)
Gain/Loss on Asset Disposal	-	-	-	-	-	-	-	-	-	-	-	-
Revenues Total	\$ (20,323,856)	\$ (20,027,476)	\$ (20,919,736)	\$ (20,169,116)	\$ (20,132,802)	\$ (17,477,304)	\$ (21,731,150)	\$ (24,712,503)	\$ (22,179,873)	\$ (19,745,876)	\$ (19,952,146)	\$ (21,904,545)
EXPENSES												
Salaries & Benefits												
Salaries Expense	\$ 1,791,602	\$ 1,876,777	\$ 1,831,142	\$ 1,896,700	\$ 1,805,349	\$ 1,899,642	\$ 2,822,407	\$ 1,832,308	\$ 1,831,936	\$ 1,855,266	\$ 1,906,835	\$ 3,561,198
Other Employee Expenses	552,446	518,580	544,840	542,342	550,542	576,101	622,393	552,228	576,358	581,609	556,307	693,844
Salaries & Benefits Total	2,344,048	2,395,357	2,375,982	2,439,042	2,355,891	2,475,744	3,444,800	2,384,537	2,408,294	2,436,875	2,463,142	4,255,042
Direct Operating Expenses												
Chemical Costs	345,699	274,742	383,148	446,676	286,107	345,063	189,214	413,890	322,355	340,638	353,953	361,968
Equipment Costs	194,407	1,441	116,153	33,227	75,533	63,833	67,581	92,676	92,371	88,918	53,651	(42,053)
Material Costs	36,659	47,307	55,007	5,237	16,050	48,652	40,400	36,624	44,059	38,916	14,838	71,320
Operating Contracts	6,588,064	5,289,211	7,893,257	7,135,130	7,068,407	7,660,921	8,486,118	8,604,618	8,848,995	7,439,222	8,006,440	12,755,525
Repairs and Maintenance	184,104	204,634	332,585	196,847	141,544	321,605	560,843	1,286,944	1,902,352	101,521	977,608	3,278,909
Misc Direct Operating Costs	66,154	73,469	37,399	48,971	39,661	53,214	49,209	88,202	71,801	13,639	7,188	(163,858)
Inventory Exp - Castings	470	29,373	1,517	(7,276)	1,425	31,819	12,205	5,255	88,499	14,217	8,273	2,262
Inventory Exp - Clarifier	-	-	-	-	-	-	-	-	-	-	-	-
Inventory Exp - Equipment	6,821	2,283	2,469	1,399	13,567	9,589	2,873	5,229	1,583	17,275	1,127	885
Inventory Exp - Hardware	34,861	26,244	9,679	10,421	41,899	14,200	45,043	12,418	26,124	77,973	13,248	14,252
Inventory Exp - Heavy Equip	-	-	-	-	-	-	-	-	-	556	-	-
Inventory Exp - Misc	4,866	3,109	1,004	2,260	10,302	2,237	4,434	2,811	2,204	22,005	711	1,924
Inventory Exp - Parts	12,251	10,933	4,556	4,952	13,144	39,652	10,086	4,256	39,349	17,511	10,000	6,380
Inventory Exp - Pipe	46,218	21,576	46,776	15,991	40,138	55,489	37,859	29,288	111,700	57,056	23,060	56,701
Inventory Exp - Valves	6,322	3,814	13,915	1,946	13,620	6,994	2,420	385	8,403	30,042	5,404	2,764
Direct Operating Expenses Total	7,526,893	5,988,137	8,897,466	7,895,782	7,761,398	8,653,268	9,508,284	10,582,597	11,559,796	8,259,488	9,475,500	16,346,979
General & Administrative												
Admin Fees	91,127	110,089	81,163	88,449	63,423	70,784	66,161	66,461	77,114	119,612	32,647	757,437
Freight and Postage	6,003	6,848	7,836	863	102,264	2,174	2,469	2,835	118,538	6,188	79,057	179,877
Leases and Rent	224,729	108,931	90,054	93,366	85,252	89,758	88,052	88,049	109,241	95,456	92,203	80,028
Professional Services	2,110,973	1,107,719	1,320,660	1,313,714	1,058,108	1,565,722	855,074	1,367,716	2,243,332	963,474	1,095,601	2,481,884
Supplies	80,414	91,266	88,932	45,052	44,121	37,697	46,923	56,190	45,834	68,212	41,119	408,761
Travel and Training	4,352	28,415	5,468	1,692	1,228	(2,030)	347	3,000	2,843	2,311	21,271	4,631
Utility Expense	92,430	821,971	481,812	399,662	426,958	390,206	331,489	421,072	330,389	368,749	379,747	339,379
Admin Misc	48,660	12,420	34,873	185,138	45,002	19,858	259,948	(2,338)	23,931	30,470	28,515	13,164,092
General & Administrative Total	2,658,687	2,287,658	2,110,798	2,127,934	1,826,356	2,174,169	1,650,463	2,002,985	2,951,223	1,654,471	1,770,159	17,416,089
Other Expenses												
Other Expenses - City	-	-	-	-	-	-	-	-	-	-	-	4,289,265
Other Expenses - Non-City	76,427	79,225	34,857	39,184	26,738	47,058	37,300	41,163	39,635	36,218	11,826	(83,714)
Depreciation Expense	1,804,407	1,804,406	1,804,365	1,804,365	1,804,250	1,804,178	1,804,178	1,804,158	1,804,157	1,804,106	1,804,051	1,811,723
Interest Expense	3,168,316	3,102,313	3,197,852	3,088,215	3,076,415	3,135,775	3,123,281	3,088,764	3,154,103	3,073,231	3,069,918	3,184,398
Other Expenses Total	5,049,150	4,985,943	5,037,074	4,931,763	4,907,403	4,987,011	4,964,760	4,934,084	4,997,894	4,913,555	4,885,796	9,201,672
Expenses Total	\$ 17,578,779	\$ 15,657,095	\$ 18,421,320	\$ 17,394,522	\$ 16,851,048	\$ 18,290,191	\$ 19,568,307	\$ 19,904,203	\$ 21,917,207	\$ 17,264,389	\$ 18,594,596	\$ 47,219,783
(Profit) / Loss	\$ (2,745,077)	\$ (4,370,381)	\$ (2,498,416)	\$ (2,774,594)	\$ (3,281,754)	\$ 812,887	\$ (2,162,843)	\$ (4,808,300)	\$ (262,666)	\$ (2,481,487)	\$ (1,357,550)	\$ 25,315,238

Pittsburgh Water & Sewer Authority
Monthly Income Statements - FTY (2021)

Monthly Profit / Loss	Per Books 1/31/2021
REVENUES	
Utility Revenue	\$ (18,341,477)
Fee Revenue	(72,576)
Misc Revenue	(78,812)
Interest Income (NonTrust)	-
Interest Income (Trust)	-
Other Income	-
Gain/Loss on Asset Disposal	-
Revenues Total	<u>\$ (18,492,865)</u>
EXPENSES	
Salaries & Benefits	
Salaries Expense	\$ 1,952,323
Other Employee Expenses	596,520
Salaries & Benefits Total	2,548,843
Direct Operating Expenses	
Chemicals Costs	301,038
Equipment Costs	55,932
Material Costs	39,415
Operating Contracts	6,570,430
Repairs and Maintenance	212,403
Misc Direct Operating Costs	4,866
Inventory Exp - Castings	844
Inventory Exp - Clarifier	-
Inventory Exp - Equipment	1,675
Inventory Exp - Hardware	22,903
Inventory Exp - Heavy Equip	-
Inventory Exp - Misc	1,500
Inventory Exp - Parts	7,891
Inventory Exp - Pipe	23,716
Inventory Exp - Valves	4,091
Direct Operating Expenses Total	7,246,703
General & Administrative	
Admin Fees	62,796
Freight and Postage	21,728
Leases and Rent	154,714
Professional Services	1,573,336
Supplies	53,622
Travel and Training	8,490
Utility Expense	566,581
Admin Misc	311,976
General & Administrative Total	2,753,243
Other Expenses	
Other Expenses - City	-
Other Expenses - Non City	13,837
Depreciation Expense	-
Interest Expense	125,779
Other Expenses Total	139,616
Expenses Total	<u>\$ 12,688,405</u>
(Profit) / Loss	\$ (5,804,460)

Pittsburgh Water & Sewer Authority
Monthly Balance Sheets - HTY (2020)

	Per Books 1/31/2020	Per Books 2/28/2020	Per Books 3/31/2020	Per Books 4/30/2020	Per Books 5/31/2020	Per Books 6/30/2020	Per Books 7/31/2020	Per Books 8/31/2020	Per Books 9/30/2020	Per Books 10/31/2020	Per Books 11/30/2020	Per Books 12/31/2020
ASSETS												
Current Assets												
Cash	\$ 66,658,777	\$ 42,362,717	\$ 37,539,206	\$ 40,167,011	\$ 41,691,905	\$ 43,054,967	\$ 38,467,199	\$ 12,031,715	\$ 19,898,138	\$ 17,663,897	\$ 48,475,640	\$ 60,209,204
Short-Term Investments	-	-	-	-	-	-	-	-	-	-	-	-
Accounts Receivable	23,845,153	23,490,668	23,225,764	25,085,252	26,113,845	24,252,065	24,659,659	26,928,906	26,319,624	22,916,317	22,785,651	22,487,576
Inventory	1,662,609	1,736,870	2,020,991	2,008,859	1,996,640	2,071,264	2,109,261	2,186,153	2,102,542	1,938,531	1,928,996	2,075,156
Other Assets	4,535,993	2,895,836	2,894,726	2,890,983	2,889,663	2,864,082	2,861,634	2,861,634	2,856,720	2,856,720	2,852,914	13,026,981
Current Assets Total	96,702,533	70,486,091	65,680,686	70,152,105	72,692,053	72,242,379	68,097,753	44,008,408	51,177,025	45,375,466	76,043,200	97,798,917
Trusteed Funds												
Trusteed Funds	39,361,764	66,396,677	50,989,432	50,953,057	50,896,670	50,868,356	50,888,880	78,141,934	39,217,225	39,229,177	39,217,777	59,770,979
Trusteed Funds Total	39,361,764	66,396,677	50,989,432	50,953,057	50,896,670	50,868,356	50,888,880	78,141,934	39,217,225	39,229,177	39,217,777	59,770,979
Long-Term Assets												
Construction In Progress	143,437,708	150,974,389	164,364,447	170,372,438	175,977,820	180,614,902	192,192,243	202,330,895	217,018,797	229,331,494	243,706,686	159,063,602
Utility Assets	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	998,895,442	1,089,953,784
Accum Depr - Utility Assets	(310,676,311)	(312,425,246)	(314,174,139)	(315,923,033)	(317,671,812)	(319,420,519)	(321,169,227)	(322,917,914)	(324,666,600)	(326,415,235)	(328,163,815)	(328,011,528)
Non-Utility Assets	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	12,180,991	11,977,409
Accum Depr - Non-Utility Assets	(6,912,446)	(6,967,917)	(7,023,388)	(7,078,859)	(7,134,330)	(7,189,801)	(7,245,272)	(7,300,743)	(7,356,214)	(7,411,685)	(7,467,156)	(7,318,985)
Bond Issue Costs	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)
Long-Term Assets Total	836,923,897	842,656,172	854,241,865	858,445,492	862,246,624	865,079,528	874,852,690	883,187,184	896,070,929	906,579,521	919,150,662	925,662,794
Assets Total	\$ 972,988,194	\$ 979,538,940	\$ 970,911,983	\$ 979,550,654	\$ 985,835,346	\$ 988,190,262	\$ 993,839,323	\$ 1,005,337,525	\$ 986,465,179	\$ 991,184,163	\$ 1,034,411,639	\$ 1,083,232,691
LIABILITIES & EQUITY												
Current Liabilities												
Current Maturities of Long-Term Debt	\$ (26,653,544)	\$ (26,442,170)	\$ (26,235,323)	\$ (25,915,392)	\$ (25,608,495)	\$ (25,303,416)	\$ (24,998,398)	\$ (24,693,412)	\$ (24,389,508)	\$ (24,085,869)	\$ (23,783,095)	\$ (27,890,482)
Accounts Payable	(5,860,621)	(5,551,565)	(5,271,271)	(6,628,862)	(4,836,716)	(5,413,207)	(5,314,484)	(5,120,457)	(7,715,754)	(4,860,701)	(5,203,035)	(4,013,963)
Accrued Payroll	(898,672)	(706,213)	(697,444)	(678,998)	(584,480)	(273,163)	(867,572)	(661,892)	(1,098,687)	(587,569)	(755,017)	(1,091,924)
AP From Trusteed Funds	(12,231,273)	(14,844,417)	(1,804,763)	(4,417,907)	(7,031,051)	(9,644,194)	(12,257,338)	(14,870,482)	(1,849,847)	(4,420,053)	(6,990,259)	(9,797,976)
AP Retainage	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Liabilities	(40,328,271)	(38,789,870)	(38,814,204)	(37,465,196)	(38,257,170)	(38,409,202)	(38,132,696)	(40,587,136)	(41,270,598)	(39,407,570)	(40,360,433)	(56,726,531)
Current Liabilities Total	(85,972,382)	(86,334,235)	(72,823,005)	(75,106,355)	(76,317,912)	(79,043,182)	(81,570,488)	(85,933,379)	(76,324,394)	(73,361,762)	(77,091,839)	(99,520,876)
Long-Term Liabilities												
Long-Term Debt	(876,552,918)	(878,370,833)	(880,756,670)	(884,337,398)	(886,128,778)	(886,570,702)	(887,529,170)	(889,855,981)	(880,328,252)	(885,528,360)	(923,668,214)	(975,400,389)
Other LT Liabilities	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,181,506)	(6,156,584)
Long-Term Liabilities Total	(882,734,424)	(884,552,339)	(886,938,176)	(890,518,903)	(892,310,284)	(892,752,208)	(893,710,675)	(896,037,486)	(886,509,758)	(891,709,866)	(929,849,720)	(981,556,972)
Equity												
Contributed Capital	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)
Net investment in capital assets	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286	4,661,286
Equity Total	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)	(615,714)
Net (Profit) or Loss	(2,745,077)	(7,115,458)	(9,613,874)	(12,388,468)	(15,670,222)	(14,857,335)	(17,020,178)	(21,828,478)	(22,091,145)	(24,572,631)	(25,930,181)	(614,943)
Liabilities & Equity Total	\$ (972,067,597)	\$ (978,617,746)	\$ (969,990,770)	\$ (978,629,441)	\$ (984,914,132)	\$ (987,268,439)	\$ (992,917,055)	\$ (1,004,415,057)	\$ (985,541,010)	\$ (990,259,973)	\$ (1,033,487,454)	\$ (1,083,308,505)

**Pittsburgh Water & Sewer Authority
Monthly Balance Sheets - FTY (2021)**

	Per Books 1/31/2021
ASSETS	
Current Assets	
Cash	\$ 59,902,965
Short-Term Investments	-
Accounts Receivable	26,549,697
Inventory	2,145,289
Other Assets	13,025,635
Current Assets Total	101,623,586
Trusteed Funds	
Trusteed Funds	59,893,539
Trusteed Funds Total	59,893,539
Long-Term Assets	
Construction In Progress	163,960,513
Utility Assets	1,089,953,784
Accum Depr - Utility Assets	(328,011,528)
Non-Utility Assets	11,977,409
Accum Depr - Non Utility Assets	(7,318,985)
Bond Issue Costs	(1,488)
Long-Term Assets Total	930,559,705
Assets Total	<u>\$ 1,092,076,831</u>
LIABILITIES & EQUITY	
Current Liabilities	
Current Maturities of Long-Term Debt	\$ (27,589,285)
Accounts Payable	(5,063,845)
Accrued Payroll	(1,531,451)
AP From Trusteed Funds	(9,797,976)
AP Retainage	-
Other Current Liabilities	(55,133,391)
Current Liabilities Total	(99,115,947)
Long-Term Liabilities	
Long-Term Debt	(978,844,997)
Other LT Liabilities	(6,156,584)
Long-Term Liabilities Total	(985,001,581)
Equity	
Contributed Capital	(5,277,000)
Net investment in capital assets	4,046,343
Equity Total	(1,230,657)
Net (Profit) or Loss	(5,804,460)
Liabilities & Equity Total	<u>\$ (1,091,152,645)</u>

XI. OTHER DATA

XI.2. Supply a copy of internal and independent audit reports of the historic test year and prior calendar year, noting any exceptions and recommendations and disposition thereof.

RESPONSE:

Please refer to FR VII.15 for the December 31, 2019 and 2018 audited financial statements.

XI. OTHER DATA

XI.3. Provide all monthly or quarterly, or both, budget variance reports to management, or the board of directors, or both, submitted during the past year. Please provide the most recent detailed budget variance report which the company compiled, and update as additional reports are issued.

RESPONSE:

Please see attached.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of January 31, 2020					PGH ₂ O			
	FY 2019		FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget	
Receipts								
<u>User Charge & Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 12,153,920	\$ 12,596,391	3.6%	\$ 171,182,397	\$ 173,841,419	\$ 174,797,265	\$ (955,847)	
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 363,460	\$ 249,909	-31.2%	\$ 5,868,943	\$ 4,769,306	\$ 5,242,920	\$ (473,615)	
ALCOSAN Collections	6,004,660	3,873,889	-35.5%	73,522,941	74,079,806	76,286,841	(2,207,036)	
Subtotal: Other Operating Receipts	\$ 6,368,120	\$ 4,123,798	-35.2%	\$ 79,391,884	\$ 78,849,111	\$ 81,529,762	\$ (2,680,650)	
Total: Receipts	\$ 18,522,039	\$ 16,720,189	-9.7%	\$ 250,574,281	\$ 252,690,530	\$ 256,327,027	\$ (3,636,497)	
Revenue Requirements								
<u>Operating Expenses</u>								
Executive Director's Office	366,757	160,627	-56.2%	3,479,233	2,577,089	2,504,143	72,946	
Customer Service	576,989	760,435	31.8%	7,457,579	6,524,866	7,156,543	(631,677)	
Management Information Systems	124,565	146,426	17.6%	2,301,283	3,157,166	3,216,255	(59,089)	
Finance	135,381	1,116,758	724.9%	3,186,898	11,794,166	12,081,298	(287,132)	
Procurement	32,369	-	-100.0%	370,556	-	-	-	
Human Resources	326,154	51,941	-84.1%	951,558	1,090,329	1,150,036	(59,707)	
Legal	84,310	454,846	439.5%	3,616,831	4,813,779	4,751,354	62,425	
Warehouse	34,906	22,555	-35.4%	663,281	548,104	572,896	(24,792)	
External Affairs	86,969	119,883	37.8%	1,080,407	1,280,928	1,335,051	(54,123)	
Engineering & Construction	395,357	1,054,630	166.8%	8,824,994	29,301,615	31,081,077	(1,779,463)	
Environmental Compliance	65,874	34,329	-47.9%	1,491,438	2,527,697	2,739,522	(211,825)	
General Administration	1,934	1,950	0.8%	24,939	1,950	-	1,950	
Water Quality	134,630	166,584	23.7%	2,254,974	2,086,691	2,158,960	(72,269)	
Water Treatment Plant	1,377,403	1,122,216	-18.5%	17,099,660	21,188,157	21,962,891	(774,735)	
Water Distribution	1,796,651	1,416,022	-21.2%	25,251,612	14,749,169	14,477,335	271,834	
Sewer Operations	1,003,915	329,871	-67.1%	11,487,340	4,731,580	4,868,514	(136,934)	
Direct Operating Expenses	\$ 6,544,167	\$ 6,959,074	6.3%	\$ 89,542,582	\$ 106,373,285	\$ 110,055,875	\$ (3,682,590)	
ALCOSAN Expenses	7,733,639	7,752,770	0.2%	71,397,509	76,267,491	77,049,709	(782,218)	
Co-Op Agreement Op. Expenses - Water	-	-	n.a.	2,300,237	-	-	-	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-	
Non-City Water Subsidy	186,758	-	-100.0%	1,404,861	-	-	-	
In-Direct Operating Expenses	\$ 7,920,397	\$ 7,752,770	-2.1%	\$ 77,402,844	\$ 76,267,491	\$ 77,049,709	\$ (782,218)	
Subtotal: Operating Expenses	\$ 14,464,564	\$ 14,711,844	1.7%	\$ 166,945,426	\$ 182,640,776	\$ 187,105,584	\$ (4,464,808)	
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 896,237	\$ 751,286	-16.2%	\$ 59,279,766	\$ 66,758,371	\$ 66,547,366	\$ 211,004	
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 209,249	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -	
Total: Revenue Requirements	\$ 15,570,049	\$ 15,463,130	-0.7%	\$ 228,736,175	\$ 249,399,147	\$ 253,652,950	\$ (4,253,804)	
Revenue Surplus / (Deficit)	\$ 2,951,990	\$ 1,257,060		\$ 21,838,106	\$ 3,291,383	\$ 2,674,077	\$ 617,306	
Financial Metrics*					FY 2019	FY 2020	FY 2020	
					<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>	
Senior Debt Service Coverage					1.97	1.54	1.38	
Minimum Requirement					1.25	1.25	1.25	
Total Debt Service Coverage					1.51	1.21	1.12	
Minimum Requirement					1.10	1.10	1.10	
Unrestricted Days Cash without ALCOSAN Expense					234.36	143.61	138.65	
Unrestricted Days Cash with ALCOSAN Expense					136.50	83.64	79.79	
Unrestricted Days Cash including the Operating Reserve Fund					173.24	121.41	117.80	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of February 29, 2020		PGH ₂ O					
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget
Receipts							
<u>User Charge & Wholesale Receipts</u>							
Subtotal: User Charge & Wholesale Receipts	\$ 23,175,773	\$ 25,537,390	10.2%	\$ 171,182,397	\$ 172,131,254	\$ 174,797,265	\$ (2,666,012)
<u>Other Operating Receipts</u>							
Other Misc. and Fee Operating Receipts	\$ 431,461	\$ 1,487,374	244.7%	\$ 5,868,943	\$ 5,744,808	\$ 5,242,920	\$ 501,888
ALCOSAN Collections	11,233,959	9,571,584	-14.8%	73,522,941	73,662,444	76,286,841	(2,624,397)
Subtotal: Other Operating Receipts	\$ 11,665,420	\$ 11,058,958	-5.2%	\$ 79,391,884	\$ 79,407,252	\$ 81,529,762	\$ (2,122,509)
Total: Receipts	\$ 34,841,193	\$ 36,596,349	5.0%	\$ 250,574,281	\$ 251,538,506	\$ 256,327,027	\$ (4,788,521)
Revenue Requirements							
<u>Operating Expenses</u>							
Executive Director's Office	749,690	272,511	-63.7%	3,479,233	2,477,751	2,504,143	(26,392)
Customer Service	1,182,438	1,280,989	8.3%	7,457,579	6,552,023	7,156,543	(604,519)
Management Information Systems	242,684	286,261	18.0%	2,301,283	3,022,001	3,216,255	(194,254)
Finance	239,606	1,654,620	590.6%	3,186,898	11,798,665	12,081,298	(282,633)
Procurement	57,174	-	-100.0%	370,556	-	-	-
Human Resources	363,517	95,583	-73.7%	951,558	1,057,830	1,150,036	(92,206)
Legal	310,850	789,248	153.9%	3,616,831	4,755,256	4,751,354	3,902
Warehouse	66,506	52,767	-20.7%	663,281	529,962	572,896	(42,934)
External Affairs	145,730	215,420	47.8%	1,080,407	1,285,118	1,335,051	(49,933)
Engineering & Construction	745,041	2,040,247	173.8%	8,824,994	27,812,480	31,081,077	(3,268,593)
Environmental Compliance	79,119	111,169	40.5%	1,491,438	2,375,496	2,739,522	(364,025)
General Administration	3,584	4,823	34.5%	24,939	4,823	-	4,823
Water Quality	273,465	353,119	29.1%	2,254,974	2,038,588	2,158,960	(120,372)
Water Treatment Plant	2,643,310	2,760,593	4.4%	17,099,660	21,244,846	21,962,891	(718,045)
Water Distribution	3,699,731	2,397,514	-35.2%	25,251,612	14,606,959	14,477,335	129,624
Sewer Operations	2,371,040	637,290	-73.1%	11,487,340	4,678,899	4,868,514	(189,615)
Direct Operating Expenses	\$ 13,173,485	\$ 12,952,153	-1.7%	\$ 89,542,582	\$ 104,240,697	\$ 110,055,875	\$ (5,815,178)
ALCOSAN Expenses	12,377,236	12,419,932	0.3%	71,397,509	75,983,040	77,049,709	(1,066,669)
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-
Non-City Water Subsidy	447,164	-	-100.0%	1,404,861	-	-	-
In-Direct Operating Expenses	\$ 16,831,408	\$ 12,419,932	-26.2%	\$ 77,402,844	\$ 75,983,040	\$ 77,049,709	\$ (1,066,669)
Subtotal: Operating Expenses	\$ 30,004,893	\$ 25,372,085	-15.4%	\$ 166,945,426	\$ 180,223,736	\$ 187,105,584	\$ (6,881,848)
<u>Debt Service</u>							
Subtotal: Debt Service	\$ 23,864,660	\$ 28,261,349	18.4%	\$ 59,279,766	\$ 65,700,788	\$ 66,547,366	\$ (846,578)
<u>Transfers to Reserves</u>							
Subtotal: Transfers to Reserves	\$ 418,497	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -
Total: Revenue Requirements	\$ 54,288,051	\$ 53,633,434	-1.2%	\$ 228,736,175	\$ 245,924,524	\$ 253,652,950	\$ (7,728,426)
Revenue Surplus / (Deficit)	\$ (19,446,858)	\$ (17,037,085)		\$ 21,838,106	\$ 5,613,982	\$ 2,674,077	\$ 2,939,905
Financial Metrics*				FY 2019	FY 2020	FY 2020	
				Actual	Forecast	Budget	
Senior Debt Service Coverage				1.97	1.57	1.38	
Minimum Requirement				1.25	1.25	1.25	
Total Debt Service Coverage				1.51	1.23	1.12	
Minimum Requirement				1.10	1.10	1.10	
Unrestricted Days Cash without ALCOSAN Expense				239.15	157.52	138.65	
Unrestricted Days Cash with ALCOSAN Expense				138.33	91.11	79.79	
Unrestricted Days Cash including the Operating Reserve Fund				175.56	129.38	117.80	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of March 31, 2020		PGH ₂ O						
	FY 2019		FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth		Actual	Forecast	Budget	Forecast - Budget
Receipts								
<u>User Charge & Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 36,106,584	\$ 39,996,919	10.8%	\$	171,182,397	\$ 172,377,375	\$ 174,797,265	\$ (2,419,890)
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 877,771	\$ 2,181,297	148.5%	\$	5,868,943	\$ 6,174,615	\$ 5,242,920	\$ 931,694
ALCOSAN Collections	16,019,901	14,677,847	-8.4%	\$	73,522,941	72,486,246	76,286,841	(3,800,595)
Subtotal: Other Operating Receipts	\$ 16,897,672	\$ 16,859,144	-0.2%	\$	79,391,884	\$ 78,660,861	\$ 81,529,762	\$ (2,868,901)
Total: Receipts	\$ 53,004,256	\$ 56,856,062	7.3%	\$	250,574,281	\$ 251,038,236	\$ 256,327,027	\$ (5,288,791)
Revenue Requirements								
<u>Operating Expenses</u>								
Executive Director's Office	1,101,706	453,341	-58.9%		3,479,233	2,579,132	2,504,143	74,990
Customer Service	1,775,352	1,821,583	2.6%		7,457,579	6,601,090	7,156,543	(555,453)
Management Information Systems	446,246	431,035	-3.4%		2,301,283	2,945,199	3,216,255	(271,056)
Finance	367,997	2,335,049	534.5%		3,186,898	11,921,528	12,081,298	(159,770)
Procurement	83,102	-	-100.0%		370,556	-	-	-
Human Resources	426,946	136,280	-68.1%		951,558	1,000,755	1,150,036	(149,281)
Legal	984,931	958,054	-2.7%		3,616,831	4,537,395	4,751,354	(213,959)
Warehouse	347,088	82,895	-76.1%		663,281	508,200	572,896	(64,695)
External Affairs	211,232	304,235	44.0%		1,080,407	1,263,458	1,335,051	(71,593)
Engineering & Construction	1,099,944	4,653,101	323.0%		8,824,994	28,254,345	31,081,077	(2,826,732)
Environmental Compliance	314,942	145,131	-53.9%		1,491,438	2,176,676	2,739,522	(562,846)
General Administration	7,058	8,086	14.6%		24,939	8,086	-	8,086
Water Quality	435,497	461,899	6.1%		2,254,974	1,948,094	2,158,960	(210,865)
Water Treatment Plant	4,050,052	4,222,449	4.3%		17,099,660	21,167,919	21,962,891	(794,972)
Water Distribution	5,509,950	3,461,124	-37.2%		25,251,612	14,629,440	14,477,335	152,105
Sewer Operations	3,003,996	931,695	-69.0%		11,487,340	4,533,613	4,868,514	(334,901)
Direct Operating Expenses	\$ 20,166,039	\$ 20,405,955	1.2%	\$	89,542,582	\$ 104,074,932	\$ 110,055,875	\$ (5,980,943)
ALCOSAN Expenses	18,586,628	18,364,823	-1.2%		71,397,509	75,442,088	77,049,709	(1,607,621)
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.		2,300,237	-	-	-
Co-Op Agreement Op. Expenses - Sewer	-	-	-		2,300,237	-	-	-
Non-City Water Subsidy	709,823	-	-100.0%		1,404,861	-	-	-
In-Direct Operating Expenses	\$ 23,303,459	\$ 18,364,823	-21.2%	\$	77,402,844	\$ 75,442,088	\$ 77,049,709	\$ (1,607,621)
Subtotal: Operating Expenses	\$ 43,469,498	\$ 38,770,778	-10.8%	\$	166,945,426	\$ 179,517,021	\$ 187,105,584	\$ (7,588,564)
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 25,208,122	\$ 29,077,192	15.3%	\$	59,279,766	\$ 65,971,350	\$ 66,547,366	\$ (576,016)
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 627,746	\$ -	-100.0%	\$	2,510,983	\$ -	\$ -	\$ -
Total: Revenue Requirements	\$ 69,305,366	\$ 67,847,970	-2.1%	\$	228,736,175	\$ 245,488,371	\$ 253,652,950	\$ (8,164,580)
Revenue Surplus / (Deficit)	\$ (16,301,110)	\$ (10,991,908)		\$	21,838,106	\$ 5,549,865	\$ 2,674,077	\$ 2,875,788
<u>Financial Metrics*</u>					<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2020</u>	
					<u>Actual</u>	<u>Forecast</u>	<u>Budget</u>	
Senior Debt Service Coverage					1.97	1.57	1.38	
<i>Minimum Requirement</i>					<i>1.25</i>	<i>1.25</i>	<i>1.25</i>	
Total Debt Service Coverage					1.51	1.24	1.12	
<i>Minimum Requirement</i>					<i>1.10</i>	<i>1.10</i>	<i>1.10</i>	
<i>Unrestricted Days Cash without ALCOSAN Expense</i>					<i>239.54</i>	<i>156.03</i>	<i>138.65</i>	
<i>Unrestricted Days Cash with ALCOSAN Expense</i>					<i>138.87</i>	<i>90.46</i>	<i>79.79</i>	
<i>Unrestricted Days Cash including the Operating Reserve Fund</i>					<i>176.25</i>	<i>128.89</i>	<i>117.80</i>	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of April 30, 2020		PGH ₂ O					
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget
Receipts							
<u>User Charge & Wholesale Receipts</u>							
Subtotal: User Charge & Wholesale Receipts	\$ 50,047,316	\$ 51,738,096	3.4%	\$ 171,182,397	\$ 154,056,860	\$ 174,797,265	\$ (20,740,405)
<u>Other Operating Receipts</u>							
Other Misc. and Fee Operating Receipts	\$ 1,443,297	\$ 2,218,030	53.7%	\$ 5,868,943	\$ 5,590,839	\$ 5,242,920	\$ 347,918
ALCOSAN Collections	22,463,376	19,919,531	-11.3%	73,522,941	64,181,174	76,286,841	(12,105,668)
Subtotal: Other Operating Receipts	\$ 23,906,673	\$ 22,137,561	-7.4%	\$ 79,391,884	\$ 69,772,013	\$ 81,529,762	\$ (11,757,749)
Total: Receipts	\$ 73,953,990	\$ 73,875,657	-0.1%	\$ 250,574,281	\$ 223,828,873	\$ 256,327,027	\$ (32,498,154)
Revenue Requirements							
<u>Operating Expenses</u>							
Executive Director's Office	1,253,941	577,743	-53.9%	3,479,233	2,458,097	2,504,143	(46,045)
Customer Service	2,287,230	2,628,186	14.9%	7,457,579	6,712,550	7,156,543	(443,993)
Management Information Systems	548,889	583,709	6.3%	2,301,283	2,613,540	3,216,255	(602,715)
Finance	468,379	2,681,021	472.4%	3,186,898	9,996,097	12,081,298	(2,085,201)
Procurement	110,054	-	-100.0%	370,556	-	-	-
Human Resources	475,626	215,427	-54.7%	951,558	804,061	1,150,036	(345,975)
Legal	1,052,639	1,371,839	30.3%	3,616,831	4,561,878	4,751,354	(189,476)
Warehouse	141,828	116,747	-17.7%	663,281	409,383	572,896	(163,513)
External Affairs	266,879	362,577	35.9%	1,080,407	993,321	1,335,051	(341,730)
Engineering & Construction	1,381,628	6,415,672	364.4%	8,824,994	25,590,203	31,081,077	(5,490,874)
Environmental Compliance	474,004	291,195	-38.6%	1,491,438	1,619,855	2,739,522	(1,119,667)
General Administration	9,781	8,701	-11.0%	24,939	8,701	-	8,701
Water Quality	592,444	639,429	7.9%	2,254,974	1,942,733	2,158,960	(216,227)
Water Treatment Plant	5,569,220	5,809,208	4.3%	17,099,660	18,784,080	21,962,891	(3,178,811)
Water Distribution	8,114,959	4,376,476	-46.1%	25,251,612	13,102,727	14,477,335	(1,374,609)
Sewer Operations	3,998,359	1,171,342	-70.7%	11,487,340	3,789,085	4,868,514	(1,079,429)
Direct Operating Expenses	\$ 26,745,861	\$ 27,249,273	1.9%	\$ 89,542,582	\$ 93,386,312	\$ 110,055,875	\$ (16,669,564)
ALCOSAN Expenses	25,461,346	25,424,366	-0.1%	71,397,509	71,623,048	77,049,709	(5,426,661)
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-
Non-City Water Subsidy	893,350	-	-100.0%	1,404,861	-	-	-
In-Direct Operating Expenses	\$ 30,361,704	\$ 25,424,366	-16.3%	\$ 77,402,844	\$ 71,623,048	\$ 77,049,709	\$ (5,426,661)
Subtotal: Operating Expenses	\$ 57,107,565	\$ 52,673,639	-7.8%	\$ 166,945,426	\$ 165,009,360	\$ 187,105,584	\$ (22,096,225)
<u>Debt Service</u>							
Subtotal: Debt Service	\$ 26,130,685	\$ 29,614,374	13.3%	\$ 59,279,766	\$ 65,860,072	\$ 66,547,366	\$ (687,294)
<u>Transfers to Reserves</u>							
Subtotal: Transfers to Reserves	\$ 836,994	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -
Total: Revenue Requirements	\$ 84,075,244	\$ 82,288,013	-2.1%	\$ 228,736,175	\$ 230,869,432	\$ 253,652,950	\$ (22,783,518)
Revenue Surplus / (Deficit)	\$ (10,121,255)	\$ (8,412,355)		\$ 21,838,106	\$ (7,040,559)	\$ 2,674,077	\$ (9,714,636)
Financial Metrics*				FY 2019	FY 2020	FY 2020	
				Actual	Forecast	Budget	
Senior Debt Service Coverage				1.97	1.36	1.38	
Minimum Requirement				1.25	1.25	1.25	
Total Debt Service Coverage				1.51	1.10	1.12	
Minimum Requirement				1.10	1.10	1.10	
Unrestricted Days Cash without ALCOSAN Expense				266.95	125.89	138.65	
Unrestricted Days Cash with ALCOSAN Expense				151.08	71.25	79.79	
Unrestricted Days Cash including the Operating Reserve Fund				191.75	113.05	117.80	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of May 31, 2020		PGH ₂ O					
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget
Receipts							
User Charge & Wholesale Receipts							
Subtotal: User Charge & Wholesale Receipts	\$ 64,639,986	\$ 63,392,233	-1.9%	\$ 171,182,397	\$ 155,139,450	\$ 174,797,265	\$ (19,657,815)
Other Operating Receipts							
Other Misc. and Fee Operating Receipts	\$ 2,037,756	\$ 4,013,597	97.0%	\$ 5,868,943	\$ 6,797,896	\$ 5,242,920	\$ 1,554,976
ALCOSAN Collections	29,075,847	25,007,479	-14.0%	73,522,941	65,051,016	76,286,841	(11,235,825)
Subtotal: Other Operating Receipts	\$ 31,113,603	\$ 29,021,076	-6.7%	\$ 79,391,884	\$ 71,848,912	\$ 81,529,762	\$ (9,680,850)
Total: Receipts	\$ 95,753,589	\$ 92,413,309	-3.5%	\$ 250,574,281	\$ 226,988,363	\$ 256,327,027	\$ (29,338,665)
Revenue Requirements							
Operating Expenses							
Executive Director's Office	1,379,557	676,381	-51.0%	3,479,233	2,455,804	2,504,143	(48,339)
Customer Service	2,759,615	3,139,654	13.8%	7,457,579	6,748,388	7,156,543	(408,155)
Management Information Systems	704,711	732,285	3.9%	2,301,283	2,537,468	3,216,255	(678,787)
Finance	836,783	3,123,731	273.3%	3,186,898	9,922,742	12,081,298	(2,158,556)
Procurement	135,315	-	-100.0%	370,556	-	-	-
Human Resources	522,209	259,520	-50.3%	951,558	791,199	1,150,036	(358,837)
Legal	1,324,524	1,872,633	41.4%	3,616,831	4,666,218	4,751,354	(85,136)
Warehouse	183,200	144,877	-20.9%	663,281	405,936	572,896	(166,960)
External Affairs	372,166	457,789	23.0%	1,080,407	1,010,245	1,335,051	(324,806)
Engineering & Construction	2,037,854	8,375,874	311.0%	8,824,994	24,887,352	31,081,077	(6,193,726)
Environmental Compliance	527,451	340,860	-35.4%	1,491,438	1,481,199	2,739,522	(1,258,322)
General Administration	11,951	10,096	-15.5%	24,939	10,096	-	10,096
Water Quality	673,616	791,277	17.5%	2,254,974	1,937,522	2,158,960	(221,438)
Water Treatment Plant	6,633,202	7,119,143	7.3%	17,099,660	18,345,432	21,962,891	(3,617,459)
Water Distribution	9,502,188	5,322,996	-44.0%	25,251,612	13,064,619	14,477,335	(1,412,716)
Sewer Operations	4,838,451	1,453,660	-70.0%	11,487,340	3,735,832	4,868,514	(1,132,683)
Direct Operating Expenses	\$ 32,442,793	\$ 33,820,775	4.2%	\$ 89,542,582	\$ 92,000,050	\$ 110,055,875	\$ (18,055,825)
ALCOSAN Expenses	29,969,823	30,531,764	1.9%	71,397,509	72,252,869	77,049,709	(4,796,840)
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-
Non-City Water Subsidy	930,504	-	-100.0%	1,404,861	-	-	-
In-Direct Operating Expenses	\$ 34,907,335	\$ 30,531,764	-12.5%	\$ 77,402,844	\$ 72,252,869	\$ 77,049,709	\$ (4,796,840)
Subtotal: Operating Expenses	\$ 67,350,128	\$ 64,352,539	-4.5%	\$ 166,945,426	\$ 164,252,919	\$ 187,105,584	\$ (22,852,665)
Debt Service							
Subtotal: Debt Service	\$ 27,070,707	\$ 30,123,814	11.3%	\$ 59,279,766	\$ 65,721,053	\$ 66,547,366	\$ (826,313)
Transfers to Reserves							
Subtotal: Transfers to Reserves	\$ 1,046,243	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -
Total: Revenue Requirements	\$ 95,467,078	\$ 94,476,353	-1.0%	\$ 228,736,175	\$ 229,973,972	\$ 253,652,950	\$ (23,678,978)
Revenue Surplus / (Deficit)	\$ 286,511	\$ (2,063,043)		\$ 21,838,106	\$ (2,985,610)	\$ 2,674,077	\$ (5,659,687)
Financial Metrics*				FY 2019	FY 2020	FY 2020	
				Actual	Forecast	Budget	
Senior Debt Service Coverage				1.97	1.44	1.38	
Minimum Requirement				1.25	1.25	1.25	
Total Debt Service Coverage				1.51	1.17	1.12	
Minimum Requirement				1.10	1.10	1.10	
Unrestricted Days Cash without ALCOSAN Expense				270.97	142.26	138.65	
Unrestricted Days Cash with ALCOSAN Expense				151.78	79.68	79.79	
Unrestricted Days Cash including the Operating Reserve Fund				192.63	121.68	117.80	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of June 30, 2020		PGH ₂ O					
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget
Receipts							
<u>User Charge & Wholesale Receipts</u>							
Subtotal: User Charge & Wholesale Receipts	\$ 76,364,887	\$ 76,286,452	-0.1%	\$ 171,182,397	\$ 156,716,696	\$ 174,797,265	\$ (18,080,570)
<u>Other Operating Receipts</u>							
Other Misc. and Fee Operating Receipts	\$ 2,465,172	\$ 4,630,192	87.8%	\$ 5,868,943	\$ 6,918,363	\$ 5,242,920	\$ 1,675,442
ALCOSAN Collections	33,456,484	30,748,357	-8.1%	73,522,941	65,560,979	76,286,841	(10,725,862)
Subtotal: Other Operating Receipts	\$ 35,921,657	\$ 35,378,549	-1.5%	\$ 79,391,884	\$ 72,479,342	\$ 81,529,762	\$ (9,050,420)
Total: Receipts	\$ 112,286,543	\$ 111,665,001	-0.6%	\$ 250,574,281	\$ 229,196,038	\$ 256,327,027	\$ (27,130,989)
Revenue Requirements							
<u>Operating Expenses</u>							
Executive Director's Office	1,561,768	820,387	-47.5%	3,479,233	2,502,111	2,504,143	(2,032)
Customer Service	3,314,018	3,758,851	13.4%	7,457,579	6,874,284	7,156,543	(282,259)
Management Information Systems	831,231	892,828	7.4%	2,301,283	2,509,553	3,216,255	(706,702)
Finance	1,093,252	3,927,237	259.2%	3,186,898	10,223,500	12,081,298	(1,857,798)
Procurement	161,671	-	-100.0%	370,556	-	-	-
Human Resources	572,242	352,020	-38.5%	951,558	820,292	1,150,036	(329,743)
Legal	1,578,034	2,184,083	38.4%	3,616,831	4,584,791	4,751,354	(166,563)
Warehouse	223,370	177,955	-20.3%	663,281	408,590	572,896	(164,306)
External Affairs	460,037	536,529	16.6%	1,080,407	1,015,486	1,335,051	(319,565)
Engineering & Construction	2,611,345	10,456,301	300.4%	8,824,994	24,228,288	31,081,077	(6,852,790)
Environmental Compliance	658,411	398,340	-39.5%	1,491,438	1,337,087	2,739,522	(1,402,434)
General Administration	12,961	10,976	-15.3%	24,939	10,976	-	10,976
Water Quality	808,687	940,276	16.3%	2,254,974	1,916,956	2,158,960	(242,004)
Water Treatment Plant	8,078,604	8,662,489	7.2%	17,099,660	18,244,718	21,962,891	(3,718,174)
Water Distribution	11,543,246	6,338,437	-45.1%	25,251,612	13,064,754	14,477,335	(1,412,582)
Sewer Operations	6,009,831	1,694,943	-71.8%	11,487,340	3,669,375	4,868,514	(1,199,140)
Direct Operating Expenses	\$ 39,518,708	\$ 41,151,652	4.1%	\$ 89,542,582	\$ 91,410,760	\$ 110,055,875	\$ (18,645,115)
ALCOSAN Expenses	36,155,330	36,434,089	0.8%	71,397,509	72,492,423	77,049,709	(4,557,286)
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-
Non-City Water Subsidy	1,013,344	-	-100.0%	1,404,861	-	-	-
In-Direct Operating Expenses	\$ 41,175,682	\$ 36,434,089	-11.5%	\$ 77,402,844	\$ 72,492,423	\$ 77,049,709	\$ (4,557,286)
Subtotal: Operating Expenses	\$ 80,694,390	\$ 77,585,741	-3.9%	\$ 166,945,426	\$ 163,903,183	\$ 187,105,584	\$ (23,202,401)
<u>Debt Service</u>							
Subtotal: Debt Service	\$ 28,232,904	\$ 30,698,991	8.7%	\$ 59,279,766	\$ 65,647,772	\$ 66,547,366	\$ (899,594)
<u>Transfers to Reserves</u>							
Subtotal: Transfers to Reserves	\$ 1,255,492	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -
Total: Revenue Requirements	\$ 110,182,785	\$ 108,284,732	-1.7%	\$ 228,736,175	\$ 229,550,954	\$ 253,652,950	\$ (24,101,996)
Revenue Surplus / (Deficit)	\$ 2,103,758	\$ 3,380,269		\$ 21,838,106	\$ (354,917)	\$ 2,674,077	\$ (3,028,994)
Financial Metrics*				FY 2019	FY 2020	FY 2020	
				Actual	Forecast	Budget	
Senior Debt Service Coverage				1.97	1.49	1.38	
Minimum Requirement				1.25	1.25	1.25	
Total Debt Service Coverage				1.51	1.21	1.12	
Minimum Requirement				1.10	1.10	1.10	
Unrestricted Days Cash without ALCOSAN Expense				272.72	158.76	138.65	
Unrestricted Days Cash with ALCOSAN Expense				152.10	88.54	79.79	
Unrestricted Days Cash including the Operating Reserve Fund				193.04	130.63	117.80	

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020

The Pittsburgh Water and Sewer Authority													
2020 Cash Flow Projection (Cash Basis)													
<i>As of June 30, 2020</i>													
	Actual						Forecast						
Receipts	January	February	March	April	May	June	July	August	September	October	November	December	Total
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 11,704,447	\$ 13,742,391	\$ 15,044,738	\$ 13,312,890	\$ 13,312,890	\$ 13,312,890	\$ 156,716,696
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,444,059	5,464,511	6,933,071	5,927,915	5,115,152	5,927,915	65,560,979
DSIC	4	3	(2,642)	(296)	8	(1,106)	-	-	-	-	-	-	(4,030)
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	334,133	213,439	186,728	362,816	307,160	334,578	5,870,581
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	91,550	91,550	91,550	91,550	91,550	91,567	1,051,812
Total Receipts	\$ 16,720,189	19,876,159	20,259,714	17,019,595	18,537,652	19,251,691	17,574,189	19,511,890	22,256,086	19,695,170	18,826,751	19,666,950	\$ 229,196,038
Cash Disbursements													
Operating Expenses													
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	217,265	77,970	82,148	1,079,264	81,891	143,186	\$ 2,502,111
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	649,731	458,730	491,219	500,760	484,455	530,538	6,874,284
Management Information Systems	146,426	139,835	144,774	132,674	148,576	160,543	226,286	171,936	168,491	245,816	334,690	469,505	2,509,553
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	595,430	680,292	489,350	472,030	475,443	3,583,718	10,223,500
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	102,952	61,685	86,639	62,135	66,314	88,548	820,292
Legal	454,846	334,402	168,806	413,785	500,795	311,450	416,671	387,608	392,692	387,423	389,939	426,374	4,584,791
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	43,870	28,763	30,278	26,773	29,798	71,153	408,590
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	98,476	64,255	68,308	77,808	70,876	99,235	1,015,486
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	2,734,081	2,659,694	2,929,250	2,704,496	2,621,788	122,678	24,228,288
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	248,317	144,660	144,709	123,250	127,040	150,771	1,337,087
General Administration	1,950	2,872	3,264	615	1,395	880	-	-	-	-	-	-	10,976
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	194,820	169,488	146,759	142,888	148,175	174,550	1,916,956
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,805,960	1,501,480	1,543,519	1,489,493	1,511,787	1,729,990	18,244,718
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,317,158	928,419	1,011,489	985,405	1,033,877	1,449,969	13,064,754
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	365,419	303,867	315,476	286,012	320,044	383,613	3,669,375
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,437,696	4,709,271	6,192,294	7,523,724	4,907,801	6,267,547	72,492,423
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	15,474,131	12,348,119	14,092,623	16,107,278	12,603,917	15,691,374	\$ 163,903,184
Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	225,000	31,283,025	225,000	225,000	225,000	225,000	\$ 61,095,360
Bond Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	423,459	423,459	423,459	423,459	423,459	423,459	4,552,412
PennVest Debt Service	Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	648,459	31,706,485	648,459	648,459	648,459	\$ 65,647,772
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
Total Disbursements	\$ 15,463,130	38,170,304	14,214,537	14,440,043	12,188,340	13,808,380	16,122,590	44,054,603	14,741,082	16,755,737	13,252,376	16,339,833	\$ 229,550,954
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	1,451,599	(24,542,713)	7,515,005	2,939,433	5,574,375	3,327,117	
Annual Surplus/Deficit													\$ (354,914)
Capital Spending													
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	12,819,708	17,511,651	12,879,007	17,811,795	19,267,843	42,213,253	\$ 150,651,381
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	-	-	-	-	-	-	\$ 13,160,608
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	12,819,708	17,511,651	12,879,007	17,811,795	19,267,843	42,213,253	\$ 163,811,990
Capital Line of Credit													
Capital Line of Credit Limit						150,000,000	-	-	-	-	-	-	\$ -
Capital Draws						-	-	-	-	-	-	-	-
Outstanding Capital Draws						62,500,000	-	-	-	-	-	-	-
Remaining Capital Credit	\$ -	-	-	-	-	87,500,000	-	-	-	-	-	-	-

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of July 31, 2020		PGH ₂ O						
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference	
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget	
Receipts								
<u>User Charge & Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 94,701,641	\$ 91,291,452	-3.6%	\$ 171,182,397	\$ 156,825,722	\$ 174,797,265	\$ (17,971,544)	
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 2,844,677	\$ 4,956,115	74.2%	\$ 5,868,943	\$ 6,818,602	\$ 5,242,920	\$ 1,575,681	
ALCOSAN Collections	41,439,465	36,378,246	-12.2%	73,522,941	64,384,351	76,286,841	(11,902,491)	
Subtotal: Other Operating Receipts	\$ 44,284,142	\$ 41,334,361	-6.7%	\$ 79,391,884	\$ 71,202,953	\$ 81,529,762	\$ (10,326,809)	
Total: Receipts	\$ 138,985,784	\$ 132,625,814	-4.6%	\$ 250,574,281	\$ 228,028,674	\$ 256,327,027	\$ (28,298,353)	
Revenue Requirements								
<u>Operating Expenses</u>								
Executive Director's Office	1,741,424	944,270	-45.8%	3,479,233	2,408,729	2,504,143	(95,414)	
Customer Service	4,051,967	4,483,380	10.6%	7,457,579	6,949,082	7,156,543	(207,461)	
Management Information Systems	978,326	1,185,544	21.2%	2,301,283	2,575,984	3,216,255	(640,271)	
Finance	1,374,610	4,232,335	207.9%	3,186,898	9,933,167	12,081,298	(2,148,131)	
Procurement	196,589	-	-100.0%	370,556	-	-	-	
Human Resources	636,403	414,769	-34.8%	951,558	780,091	1,150,036	(369,945)	
Legal	2,108,367	2,739,756	29.9%	3,616,831	4,723,793	4,751,354	(27,561)	
Warehouse	248,812	222,455	-10.6%	663,281	409,220	572,896	(163,676)	
External Affairs	550,702	614,581	11.6%	1,080,407	995,063	1,335,051	(339,989)	
Engineering & Construction	3,312,317	13,649,860	312.1%	8,824,994	24,687,766	31,081,077	(6,393,312)	
Environmental Compliance	913,370	449,160	-50.8%	1,491,438	1,139,590	2,739,522	(1,599,932)	
General Administration	14,537	12,784	-12.1%	24,939	12,784	-	12,784	
Water Quality	1,036,525	1,105,779	6.7%	2,254,974	1,887,640	2,158,960	(271,320)	
Water Treatment Plant	9,412,132	9,972,340	6.0%	17,099,660	17,748,607	21,962,891	(4,214,284)	
Water Distribution	13,804,070	7,632,688	-44.7%	25,251,612	13,041,847	14,477,335	(1,435,488)	
Sewer Operations	7,020,800	2,016,301	-71.3%	11,487,340	3,625,314	4,868,514	(1,243,201)	
Direct Operating Expenses	\$ 47,400,952	\$ 49,676,003	4.8%	\$ 89,542,582	\$ 90,918,675	\$ 110,055,875	\$ (19,137,200)	
ALCOSAN Expenses	43,099,835	42,869,928	-0.5%	71,397,509	72,753,382	77,049,709	(4,296,327)	
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-	
Non-City Water Subsidy	1,069,654	-	-100.0%	1,404,861	-	-	-	
In-Direct Operating Expenses	\$ 48,176,497	\$ 42,869,928	-11.0%	\$ 77,402,844	\$ 72,753,382	\$ 77,049,709	\$ (4,296,327)	
Subtotal: Operating Expenses	\$ 95,577,449	\$ 92,545,931	-3.2%	\$ 166,945,426	\$ 163,672,057	\$ 187,105,584	\$ (23,433,527)	
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 34,392,671	\$ 31,338,008	-8.9%	\$ 59,279,766	\$ 62,261,088	\$ 66,547,366	\$ (4,286,279)	
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 1,464,740	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -	
Total: Revenue Requirements	\$ 131,434,860	\$ 123,883,939	-5.7%	\$ 228,736,175	\$ 225,933,145	\$ 253,652,950	\$ (27,719,805)	
Revenue Surplus / (Deficit)	\$ 7,550,924	\$ 8,741,874		\$ 21,838,106	\$ 2,095,529	\$ 2,674,077	\$ (578,547)	
Financial Metrics*				FY 2019	FY 2020	FY 2020		
				<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>		
Senior Debt Service Coverage				1.97	1.38	1.38		
<i>Minimum Requirement</i>				<i>1.25</i>	<i>1.25</i>	<i>1.25</i>		
Total Debt Service Coverage				1.51	1.13	1.12		
<i>Minimum Requirement</i>				<i>1.10</i>	<i>1.10</i>	<i>1.10</i>		
<i>Unrestricted Days Cash without ALCOSAN Expense</i>				274.20	226.12	138.65		
<i>Unrestricted Days Cash with ALCOSAN Expense</i>				152.31	125.61	79.79		
<i>Unrestricted Days Cash including the Operating Reserve Fund</i>				193.31	167.75	117.80		

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020

The Pittsburgh Water and Sewer Authority 2020 Cash Flow Projection (Cash Basis) As of July 31, 2020	Actual												Forecast				Total
	January	February	March	April	May	June	July	August	September	October	November	December					
	Receipts																
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 13,104,214	\$ 14,346,143	\$ 12,694,638	\$ 12,694,638	\$ 12,694,638	\$	156,825,722			
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,211,002	6,611,433	5,652,909	4,877,851	5,652,909		64,384,351			
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	-	-	-	-		(4,034)			
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	213,439	186,728	362,816	307,160	334,578		5,752,309			
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	91,550	91,550	91,550	91,550	91,567		1,070,327			
Total Receipts	\$ 16,720,189	19,876,159	20,259,714	17,019,595	18,537,652	19,251,691	20,960,813	18,620,205	21,235,854	18,801,912	17,971,199	18,773,692	\$	228,028,674			
Cash Disbursements																	
Operating Expenses																	
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	123,883	77,970	82,148	1,079,264	81,891	143,186	\$	2,408,729			
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	458,730	491,219	500,760	484,455	530,538		6,949,082			
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	171,936	168,491	245,816	334,690	469,505		2,575,984			
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	680,292	489,350	472,030	475,443	3,583,718		9,933,167			
Procurement	-	-	-	-	-	-	-	-	-	-	-	-		-			
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	61,685	86,639	62,135	66,314	88,548		780,091			
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	387,608	392,692	387,423	389,939	426,374		4,723,793			
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	28,763	30,278	26,773	29,798	71,153		409,220			
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	64,255	68,308	77,808	70,876	99,235		995,063			
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,659,694	2,929,250	2,704,496	2,621,788	122,678		24,687,766			
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	144,660	144,709	123,250	127,040	150,771		1,139,590			
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	-	-	-	-	-		12,784			
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	169,488	146,759	142,888	148,175	174,550		1,887,640			
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,501,480	1,543,519	1,489,493	1,511,787	1,729,990		17,748,607			
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	928,419	1,011,489	985,405	1,033,877	1,449,969		13,041,847			
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	303,867	315,476	286,012	320,044	383,613		3,625,314			
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,992,087	6,192,294	7,523,724	4,907,801	6,267,547		72,753,382			
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-		-			
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-		-			
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	14,960,190	12,630,934	14,092,623	16,107,278	12,603,917	15,691,374	\$	163,672,058			
Debt Service																	
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,623,079	325,000	325,000	325,000	325,000	\$	57,887,090			
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	400,000	400,000	400,000	400,000	400,000		4,373,998			
Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	639,017	28,023,079	725,000	725,000	725,000	725,000	\$	62,261,088			
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	\$	-			
Total Disbursements	\$ 15,463,130	38,170,304	14,214,537	14,440,043	12,188,340	13,808,380	15,599,207	40,654,014	14,817,623	16,832,278	13,328,917	16,416,374	\$	225,933,145			
Surplus / Deficit	1,257,060	(8,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	5,361,606	(22,033,809)	6,418,231	1,969,634	4,642,281	2,357,317					
Annual Surplus/Deficit													\$	2,095,532			
Capital Spending																	
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	6,125,890	7,258,630	8,356,891	8,763,201	16,712,530	\$	82,589,296			
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,589,600	4,169,853	4,356,100	3,786,004	2,863,105	\$	37,278,581			
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	11,577,341	10,715,490	11,428,483	12,712,991	12,549,205	19,575,635	\$	119,867,877			
Capital Line of Credit																	
Capital Line of Credit Limit	-	-	-	-	-	-	150,000,000	-	-	-	-	-		-			
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$	-			
Outstanding Capital Draws	-	-	-	-	-	-	62,500,000	-	-	-	-	-		-			
Remaining Capital Credit	\$ -	-	-	-	-	-	87,500,000	-	-	-	-	-		-			

The Pittsburgh Water and Sewer Authority
2019 & 2020 Financial Status Update (Cash Basis)
As of August 31, 2020



	FY 2019			FY 2020			FY 2019		FY 2020		FY 2020		2020 Difference	
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Actual	Forecast	Budget	Forecast - Budget				
Receipts														
User Charge & Wholesale Receipts														
Subtotal: User Charge & Wholesale Receipts	\$ 110,285,427	\$ 106,397,818	-3.5%	\$ 171,182,397	\$ 158,827,873	\$ 174,797,265	\$ 171,182,397	\$ 158,827,873	\$ 174,797,265	\$ (15,969,392)				
Other Operating Receipts														
Other Misc. and Fee Operating Receipts	\$ 3,114,670	\$ 5,490,531	76.3%	\$ 5,868,943	\$ 7,048,030	\$ 5,242,920	\$ 5,868,943	\$ 7,048,030	\$ 5,242,920	\$ 1,805,109				
ALCOSAN Collections	48,212,868	42,361,862	-12.1%	73,522,941	65,156,964	76,286,841	73,522,941	65,156,964	76,286,841	(11,129,878)				
Subtotal: Other Operating Receipts	\$ 51,327,537	\$ 47,852,393	-6.8%	\$ 79,391,884	\$ 72,204,993	\$ 81,529,762	\$ 79,391,884	\$ 72,204,993	\$ 81,529,762	\$ (9,324,768)				
Total: Receipts	\$ 161,612,964	\$ 154,250,211	-4.6%	\$ 250,574,281	\$ 231,032,867	\$ 256,327,027	\$ 250,574,281	\$ 231,032,867	\$ 256,327,027	\$ (25,294,161)				
Revenue Requirements														
Operating Expenses														
Executive Director's Office	2,029,520	1,036,516	-48.9%	3,479,233	2,423,004	2,504,143	3,479,233	2,423,004	2,504,143	(81,138)				
Customer Service	4,770,252	4,941,169	3.6%	7,457,579	6,948,141	7,156,543	7,457,579	6,948,141	7,156,543	(208,402)				
Management Information Systems	1,170,413	1,354,374	15.7%	2,301,283	2,572,877	3,216,255	2,301,283	2,572,877	3,216,255	(643,378)				
Finance	2,131,552	4,953,864	132.4%	3,186,898	9,974,404	12,081,298	3,186,898	9,974,404	12,081,298	(2,106,894)				
Procurement	221,598	-	-100.0%	370,556	-	-	370,556	-	-	-				
Human Resources	726,336	475,137	-34.6%	951,558	778,774	1,150,036	951,558	778,774	1,150,036	(371,262)				
Legal	2,363,984	2,995,425	26.7%	3,616,831	4,591,854	4,751,354	3,616,831	4,591,854	4,751,354	(159,500)				
Warehouse	273,075	248,579	-9.0%	663,281	406,581	572,896	663,281	406,581	572,896	(166,315)				
External Affairs	611,628	692,038	13.1%	1,080,407	1,008,265	1,335,051	1,080,407	1,008,265	1,335,051	(326,786)				
Engineering & Construction	3,840,483	16,287,539	324.1%	8,824,994	24,665,750	31,081,077	8,824,994	24,665,750	31,081,077	(6,415,327)				
Environmental Compliance	1,047,959	510,651	-51.3%	1,491,438	1,056,421	2,739,522	1,491,438	1,056,421	2,739,522	(1,683,100)				
General Administration	17,552	13,551	-22.8%	24,939	13,551	-	24,939	13,551	-	13,551				
Water Quality	1,484,648	1,332,229	-10.3%	2,254,974	1,944,601	2,158,960	2,254,974	1,944,601	2,158,960	(214,358)				
Water Treatment Plant	10,513,272	11,640,876	10.7%	17,099,660	17,915,664	21,962,891	17,099,660	17,915,664	21,962,891	(4,047,228)				
Water Distribution	16,895,681	8,681,011	-48.6%	25,251,612	13,161,751	14,477,335	25,251,612	13,161,751	14,477,335	(1,315,585)				
Sewer Operations	8,197,947	2,201,375	-73.1%	11,487,340	3,506,520	4,868,514	11,487,340	3,506,520	4,868,514	(1,361,994)				
Direct Operating Expenses	\$ 56,295,901	\$ 57,364,332	1.9%	\$ 89,542,582	\$ 90,968,157	\$ 110,055,875	\$ 89,542,582	\$ 90,968,157	\$ 110,055,875	\$ (19,087,718)				
ALCOSAN Expenses	47,817,838	47,745,782	-0.2%	71,397,509	72,814,166	77,049,709	71,397,509	72,814,166	77,049,709	(4,235,543)				
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	2,300,237	-	-	-				
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	2,300,237	-	-	-				
Non-City Water Subsidy	1,105,855	-	-100.0%	1,404,861	-	-	1,404,861	-	-	-				
In-Direct Operating Expenses	\$ 52,930,701	\$ 47,745,782	-9.8%	\$ 77,402,844	\$ 72,814,166	\$ 77,049,709	\$ 77,402,844	\$ 72,814,166	\$ 77,049,709	\$ (4,235,543)				
Subtotal: Operating Expenses	\$ 109,226,602	\$ 105,110,114	-3.8%	\$ 166,945,426	\$ 163,782,323	\$ 187,105,584	\$ 166,945,426	\$ 163,782,323	\$ 187,105,584	\$ (23,323,261)				
Debt Service														
Subtotal: Debt Service	\$ 57,048,544	\$ 59,178,360	3.7%	\$ 59,279,766	\$ 62,078,360	\$ 66,547,366	\$ 59,279,766	\$ 62,078,360	\$ 66,547,366	\$ (4,469,006)				
Transfers to Reserves														
Subtotal: Transfers to Reserves	\$ 1,673,989	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ 2,510,983	\$ -	\$ -	\$ -				
Total: Revenue Requirements	\$ 167,949,135	\$ 164,288,475	-2.2%	\$ 228,736,175	\$ 225,860,683	\$ 253,652,950	\$ 228,736,175	\$ 225,860,683	\$ 253,652,950	\$ (27,792,267)				
Revenue Surplus / (Deficit)	\$ (6,336,170)	\$ (10,038,264)		\$ 21,838,106	\$ 5,172,183	\$ 2,674,077	\$ 21,838,106	\$ 5,172,183	\$ 2,674,077	\$ 2,498,106				
Financial Metrics*				FY 2019	FY 2020	FY 2020								
				Actual	Forecast	Budget								
Senior Debt Service Coverage				1.97	1.41	1.38								
<i>Minimum Requirement</i>				<i>1.25</i>	<i>1.25</i>	<i>1.25</i>								
Total Debt Service Coverage				1.51	1.15	1.12								
<i>Minimum Requirement</i>				<i>1.10</i>	<i>1.10</i>	<i>1.10</i>								
Unrestricted Days Cash without ALCOSAN Expense				274.05	238.54	138.65								
Unrestricted Days Cash with ALCOSAN Expense				152.21	132.49	79.79								
Unrestricted Days Cash including the Operating Reserve Fund				193.18	174.61	117.80								

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020													
The Pittsburgh Water and Sewer Authority													
2020 Cash Flow Projection (Cash Basis)													
As of August 31, 2020													
	Actual								Forecast				Total
	January	February	March	April	May	June	July	August	September	October	November	December	
Receipts													
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 15,106,365	\$ 14,346,143	\$ 12,694,638	\$ 12,694,638	\$ 12,694,638	\$ 158,827,873
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,983,615	6,611,433	5,652,909	4,877,851	5,652,909	65,156,964
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	-	-	-	-	(4,034)
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	482,072	186,728	362,816	307,160	334,578	6,020,943
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	52,344	91,550	91,550	91,550	91,567	1,031,121
Total Receipts	\$ 16,720,189	\$ 19,876,159	\$ 20,259,714	\$ 17,019,595	\$ 18,537,652	\$ 19,251,691	\$ 20,960,813	\$ 21,624,397	\$ 21,235,854	\$ 18,801,912	\$ 17,971,199	\$ 18,773,692	\$ 231,032,867
Cash Disbursements													
Operating Expenses													
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	123,883	92,246	82,148	1,079,264	81,891	143,186	\$ 2,423,004
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	457,789	491,219	500,760	484,455	530,538	6,948,141
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	168,830	168,491	245,816	334,690	469,505	2,572,877
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	721,529	489,350	472,030	475,443	3,583,718	9,974,404
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	60,368	86,639	62,135	66,314	88,548	778,774
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	255,669	392,692	387,423	389,939	426,374	4,591,854
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	26,124	30,278	26,773	29,798	71,153	406,581
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	77,457	68,308	77,808	70,876	99,235	1,008,265
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,637,679	2,929,250	2,704,496	2,621,788	122,678	24,665,750
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	61,491	144,709	123,250	127,040	150,771	1,056,421
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	766	-	-	-	-	13,551
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	226,450	146,759	142,888	148,175	174,550	1,944,601
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,668,536	1,543,519	1,489,493	1,511,787	1,729,990	17,915,664
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	1,048,322	1,011,489	985,405	1,033,877	1,449,969	13,161,751
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	185,074	315,476	286,012	320,044	383,613	3,506,520
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,875,854	6,369,311	7,523,724	4,907,801	6,267,547	72,814,166
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total	\$ 14,711,844	\$ 10,660,241	\$ 13,398,693	\$ 13,902,861	\$ 11,678,900	\$ 13,233,202	\$ 14,960,190	\$ 12,564,183	\$ 14,269,659	\$ 16,107,278	\$ 12,603,917	\$ 15,691,374	\$ 163,782,324
Debt Service													
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,475,246	325,000	325,000	325,000	325,000	\$ 57,739,256
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	365,106	400,000	400,000	400,000	400,000	4,339,104
Sub Total	\$ 751,286	\$ 27,510,063	\$ 815,844	\$ 537,181	\$ 509,440	\$ 575,178	\$ 639,017	\$ 27,840,352	\$ 725,000	\$ 725,000	\$ 725,000	\$ 725,000	\$ 62,078,360
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
Total Disbursements	\$ 15,463,130	\$ 38,170,304	\$ 14,214,537	\$ 14,440,043	\$ 12,188,340	\$ 13,808,380	\$ 15,599,207	\$ 40,404,535	\$ 14,994,659	\$ 16,832,278	\$ 13,328,917	\$ 16,416,374	\$ 225,860,683
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	5,361,606	(18,780,138)	6,241,215	1,969,634	4,642,281	2,357,317	
Annual Surplus/Deficit													\$ 5,172,186
Capital Spending													
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	5,375,227	7,258,630	8,356,891	8,763,201	16,712,530	\$ 81,838,633
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,712,498	4,169,853	4,356,100	3,786,004	2,863,105	\$ 37,401,478
Total	\$ 4,103,433	\$ 7,531,181	\$ 13,423,562	\$ 6,008,091	\$ 5,605,382	\$ 4,637,082	\$ 11,577,341	\$ 10,087,724	\$ 11,428,483	\$ 12,712,991	\$ 12,549,205	\$ 19,575,635	\$ 119,240,111
Capital Line of Credit													
Capital Line of Credit Limit	-	-	-	-	-	-	-	150,000,000	-	-	-	-	-
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Capital Draws	-	-	-	-	-	-	-	62,500,000	-	-	-	-	-
Remaining Capital Credit	\$ -	-	-	-	-	-	-	87,500,000	-	-	-	-	-

The Pittsburgh Water and Sewer Authority
2019 & 2020 Financial Status Update (Cash Basis)
As of September 30, 2020



	FY 2019			FY 2020			FY 2020						
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	2020 Difference		Forecast - Budget				
Receipts													
<u>User Charge & Wholesale Receipts</u>													
Subtotal: User Charge & Wholesale Receipts	\$	125,202,875	\$	121,975,795	-2.6%	\$	171,182,397	\$	160,059,709	\$	174,797,265	\$	(14,737,557)
<u>Other Operating Receipts</u>													
Other Misc. and Fee Operating Receipts	\$	3,276,819	\$	5,596,656	70.8%	\$	5,868,943	\$	6,875,877	\$	5,242,920	\$	1,632,956
ALCOSAN Collections		53,918,178		49,479,336	-8.2%		73,522,941		65,663,004		76,286,841		(10,623,837)
Subtotal: Other Operating Receipts	\$	57,194,996	\$	55,075,992	-3.7%	\$	79,391,884	\$	72,538,881	\$	81,529,762	\$	(8,990,881)
Total: Receipts	\$	182,397,871	\$	177,051,787	-2.9%	\$	250,574,281	\$	232,598,590	\$	256,327,027	\$	(23,728,438)
Revenue Requirements													
<u>Operating Expenses</u>													
Executive Director's Office		2,544,691		2,279,002	-10.4%		3,479,233		2,583,342		2,504,143		79,199
Customer Service		5,412,207		5,621,420	3.9%		7,457,579		7,137,173		7,156,543		(19,370)
Management Information Systems		1,330,496		1,517,805	14.1%		2,301,283		2,567,817		3,216,255		(648,438)
Finance		2,388,084		5,501,721	130.4%		3,186,898		11,032,911		12,081,298		(1,048,387)
Procurement		246,280		-	-100.0%		370,556		-		-		-
Human Resources		783,211		523,694	-33.1%		951,558		740,691		1,150,036		(409,344)
Legal		2,831,400		3,310,563	16.9%		3,616,831		4,514,300		4,751,354		(237,054)
Warehouse		297,405		279,196	-6.1%		663,281		406,919		572,896		(165,976)
External Affairs		740,504		751,512	1.5%		1,080,407		999,431		1,335,051		(335,621)
Engineering & Construction		4,612,736		20,008,031	333.8%		8,824,994		25,456,992		31,081,077		(5,624,085)
Environmental Compliance		1,150,502		562,880	-51.1%		1,491,438		963,941		2,739,522		(1,775,581)
General Administration		19,544		14,875	-23.9%		24,939		14,875		-		14,875
Water Quality		1,707,667		1,497,785	-12.3%		2,254,974		1,963,398		2,158,960		(195,562)
Water Treatment Plant		11,960,704		13,100,281	9.5%		17,099,660		17,831,550		21,962,891		(4,131,342)
Water Distribution		19,103,902		9,812,409	-48.6%		25,251,612		13,281,660		14,477,335		(1,195,675)
Sewer Operations		9,236,235		2,568,618	-72.2%		11,487,340		3,558,287		4,868,514		(1,310,227)
Direct Operating Expenses	\$	64,365,567	\$	67,349,791	4.6%	\$	89,542,582	\$	93,053,288	\$	110,055,875	\$	(17,002,588)
ALCOSAN Expenses		54,067,663		54,061,595	0.0%		71,397,509		72,645,344		77,049,709		(4,404,365)
Co-Op Agreement Op. Expenses - Water		4,007,008		-	n.a.		2,300,237		-		-		-
Co-Op Agreement Op. Expenses - Sewer		-		-	-		2,300,237		-		-		-
Non-City Water Subsidy		1,194,940		-	-100.0%		1,404,861		-		-		-
In-Direct Operating Expenses	\$	59,269,611	\$	54,061,595	-8.8%	\$	77,402,844	\$	72,645,344	\$	77,049,709	\$	(4,404,365)
Subtotal: Operating Expenses	\$	123,635,178	\$	121,411,386	-1.8%	\$	166,945,426	\$	165,698,631	\$	187,105,584	\$	(21,406,953)
<u>Debt Service</u>													
Subtotal: Debt Service	\$	57,877,834	\$	59,835,466	3.4%	\$	59,279,766	\$	62,010,466	\$	66,547,366	\$	(4,536,901)
<u>Transfers to Reserves</u>													
Subtotal: Transfers to Reserves	\$	1,883,237	\$	-	-100.0%	\$	2,510,983	\$	-	\$	-	\$	-
Total: Revenue Requirements	\$	183,396,249	\$	181,246,851	-1.2%	\$	228,736,175	\$	227,709,097	\$	253,652,950	\$	(25,943,853)
Revenue Surplus / (Deficit)	\$	(998,378)	\$	(4,195,064)		\$	21,838,106	\$	4,889,493	\$	2,674,077	\$	2,215,416
Financial Metrics*						FY 2019	FY 2020	FY 2020					
						<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>					
Senior Debt Service Coverage						1.97	1.40	1.38					
<i>Minimum Requirement</i>						<i>1.25</i>	<i>1.25</i>	<i>1.25</i>					
Total Debt Service Coverage						1.51	1.15	1.12					
<i>Minimum Requirement</i>						<i>1.10</i>	<i>1.10</i>	<i>1.10</i>					
Unrestricted Days Cash without ALCOSAN Expense						267.91	232.27	138.65					
Unrestricted Days Cash with ALCOSAN Expense						150.45	130.44	79.79					
Unrestricted Days Cash including the Operating Reserve Fund						190.95	172.07	117.80					

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020													
The Pittsburgh Water and Sewer Authority													
2020 Cash Flow Projection (Cash Basis)													
As of September 30, 2020													
Receipts	Actual										Forecast		Total
	January	February	March	April	May	June	July	August	September	October	November	December	
Receipts													
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 15,106,365	\$ 15,577,978	\$ 12,694,638	\$ 12,694,638	\$ 12,694,638	\$ 160,059,709
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,983,615	7,117,474	5,652,909	4,877,851	5,652,909	65,663,004
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	(148)	-	-	-	(4,182)
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	482,072	80,588	362,816	307,160	334,578	5,914,803
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	52,344	25,684	91,550	91,550	91,567	965,255
Total Receipts	\$ 16,720,189	\$ 19,876,159	\$ 20,259,714	\$ 17,019,595	\$ 18,537,652	\$ 19,251,691	\$ 20,960,813	\$ 21,624,397	\$ 22,801,577	\$ 18,801,912	\$ 17,971,199	\$ 18,773,692	\$ 232,598,590
Cash Disbursements													
Operating Expenses													
Executive Director's Office	\$ 160,627	111,885	180,830	124,403	98,657	144,006	123,883	92,246	1,242,485	79,264	81,891	143,186	\$ 2,583,342
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	457,789	680,251	500,760	484,455	530,538	7,137,173
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	168,830	163,431	245,816	334,690	469,505	2,567,817
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	721,529	547,857	472,030	475,443	4,583,718	11,032,911
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	60,368	48,557	62,135	66,314	88,548	740,691
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	255,669	315,138	387,423	389,939	426,374	4,514,300
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	26,124	30,617	26,773	29,798	71,153	406,919
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	77,457	59,474	77,808	70,876	99,235	999,431
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,637,679	3,720,492	2,704,496	2,621,788	122,678	25,456,992
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	61,491	52,229	123,250	127,040	150,771	963,941
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	766	1,324	-	-	-	14,875
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	226,450	165,556	142,888	148,175	174,550	1,963,398
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,668,536	1,459,405	1,489,493	1,511,787	1,729,990	17,831,550
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	1,048,322	1,131,399	985,405	1,033,877	1,449,969	13,281,660
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	185,074	367,243	286,012	320,044	383,613	3,558,287
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,875,854	6,315,812	7,408,401	4,907,801	6,267,547	72,645,344
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	14,960,190	12,564,183	16,301,271	14,991,954	12,603,917	16,691,374	\$ 165,698,632
Debt Service													
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,475,246	297,525	325,000	325,000	325,000	\$ 57,711,781
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	365,106	359,580	400,000	400,000	400,000	4,298,684
Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	639,017	27,840,352	657,105	725,000	725,000	725,000	\$ 62,010,466
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
Total Disbursements	\$ 15,463,130	\$ 38,170,304	\$ 14,214,537	\$ 14,440,043	\$ 12,188,340	\$ 13,808,380	\$ 15,599,207	\$ 40,404,535	\$ 16,958,376	\$ 15,716,954	\$ 13,328,917	\$ 17,416,374	\$ 227,709,097
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,445,312	5,361,606	(18,780,138)	5,843,200	3,084,958	4,642,281	1,357,317	
Annual Surplus/Deficit													\$ 4,889,496
Capital Spending													
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	5,375,227	7,258,630	8,356,891	8,763,201	16,712,530	\$ 81,838,633
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,712,498	4,169,853	4,356,100	3,786,004	2,863,105	\$ 37,401,478
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	11,577,341	10,087,724	11,428,483	12,712,991	12,549,205	19,575,635	\$ 119,240,111
Capital Line of Credit													
Capital Line of Credit Limit	-	-	-	-	-	-	-	-	150,000,000	-	-	-	\$ -
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	-
Outstanding Capital Draws	-	-	-	-	-	-	-	-	72,500,000	-	-	-	-
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	77,500,000	-	-	-	-

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of October 31, 2020		PGH ₂ O						
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference	
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget	
Receipts								
<u>User Charge & Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 142,619,902	\$ 136,448,697	-4.3%	\$ 171,182,397	\$ 161,837,972	\$ 174,797,265	\$ (12,959,293)	
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 3,478,277	\$ 6,551,172	88.3%	\$ 5,868,943	\$ 7,376,027	\$ 5,242,920	\$ 2,133,106	
ALCOSAN Collections	61,442,848	56,190,173	-8.5%	73,522,941	66,720,933	76,286,841	(9,565,908)	
Subtotal: Other Operating Receipts	\$ 64,921,125	\$ 62,741,345	-3.4%	\$ 79,391,884	\$ 74,096,960	\$ 81,529,762	\$ (7,432,802)	
Total: Receipts	\$ 207,541,028	\$ 199,190,042	-4.0%	\$ 250,574,281	\$ 235,934,932	\$ 256,327,027	\$ (20,392,095)	
Revenue Requirements								
<u>Operating Expenses</u>								
Executive Director's Office	3,274,145	2,397,090	-26.8%	3,479,233	2,622,167	2,504,143	118,024	
Customer Service	5,877,582	6,084,629	3.5%	7,457,579	7,099,622	7,156,543	(56,921)	
Management Information Systems	1,474,119	1,666,679	13.1%	2,301,283	2,470,874	3,216,255	(745,381)	
Finance	2,630,768	6,085,753	131.3%	3,186,898	11,144,913	12,081,298	(936,385)	
Procurement	286,285	-	-100.0%	370,556	-	-	-	
Human Resources	824,175	575,978	-30.1%	951,558	730,840	1,150,036	(419,196)	
Legal	3,141,822	3,590,525	14.3%	3,616,831	4,406,838	4,751,354	(344,516)	
Warehouse	335,479	316,566	-5.6%	663,281	417,516	572,896	(155,379)	
External Affairs	831,463	825,280	-0.7%	1,080,407	995,391	1,335,051	(339,660)	
Engineering & Construction	5,082,873	22,152,984	335.8%	8,824,994	24,897,449	31,081,077	(6,183,628)	
Environmental Compliance	1,228,365	624,912	-49.1%	1,491,438	902,723	2,739,522	(1,836,799)	
General Administration	21,286	16,522	-22.4%	24,939	16,522	-	16,522	
Water Quality	1,885,495	1,617,401	-14.2%	2,254,974	1,940,126	2,158,960	(218,834)	
Water Treatment Plant	13,426,184	14,518,356	8.1%	17,099,660	17,760,132	21,962,891	(4,202,759)	
Water Distribution	21,911,622	10,893,429	-50.3%	25,251,612	13,377,275	14,477,335	(1,100,060)	
Sewer Operations	10,708,430	2,853,099	-73.4%	11,487,340	3,556,756	4,868,514	(1,311,758)	
Direct Operating Expenses	\$ 72,940,094	\$ 74,219,202	1.8%	\$ 89,542,582	\$ 92,339,145	\$ 110,055,875	\$ (17,716,730)	
ALCOSAN Expenses	61,485,988	61,469,995	0.0%	71,397,509	73,269,640	77,049,709	(3,780,069)	
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-	
Non-City Water Subsidy	1,232,807	-	-100.0%	1,404,861	-	-	-	
In-Direct Operating Expenses	\$ 66,725,803	\$ 61,469,995	-7.9%	\$ 77,402,844	\$ 73,269,640	\$ 77,049,709	\$ (3,780,069)	
Subtotal: Operating Expenses	\$ 139,665,897	\$ 135,689,198	-2.8%	\$ 166,945,426	\$ 165,608,785	\$ 187,105,584	\$ (21,496,799)	
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 58,310,683	\$ 60,481,745	3.7%	\$ 59,279,766	\$ 61,931,745	\$ 66,547,366	\$ (4,615,621)	
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 2,092,486	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -	
Total: Revenue Requirements	\$ 200,069,065	\$ 196,170,943	-1.9%	\$ 228,736,175	\$ 227,540,531	\$ 253,652,950	\$ (26,112,420)	
Revenue Surplus / (Deficit)	\$ 7,471,963	\$ 3,019,098		\$ 21,838,106	\$ 8,394,401	\$ 2,674,077	\$ 5,720,324	
Financial Metrics*				FY 2019	FY 2020	FY 2020		
				<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>		
Senior Debt Service Coverage				1.97	1.47	1.38		
<i>Minimum Requirement</i>				<i>1.25</i>	<i>1.25</i>	<i>1.25</i>		
Total Debt Service Coverage				1.51	1.21	1.12		
<i>Minimum Requirement</i>				<i>1.10</i>	<i>1.10</i>	<i>1.10</i>		
<i>Unrestricted Days Cash without ALCOSAN Expense</i>				<i>269.98</i>	<i>247.18</i>	<i>138.65</i>		
<i>Unrestricted Days Cash with ALCOSAN Expense</i>				<i>150.53</i>	<i>137.82</i>	<i>79.79</i>		
<i>Unrestricted Days Cash including the Operating Reserve Fund</i>				<i>191.05</i>	<i>179.48</i>	<i>117.80</i>		

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020														
The Pittsburgh Water and Sewer Authority														
2020 Cash Flow Projection (Cash Basis)														
As of October 31, 2020														
	Actual											Forecast		Total
	January	February	March	April	May	June	July	August	September	October	November	December		
Receipts														
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 15,106,365	\$ 15,577,978	\$ 14,472,901	\$ 12,694,638	\$ 12,694,638	\$ 161,837,972	
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,983,615	7,117,474	6,710,837	4,877,851	5,652,909	66,720,933	
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	(148)	57	-	-	(4,125)	
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	482,072	80,588	737,394	307,160	334,578	6,289,381	
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	52,344	25,684	217,065	91,550	91,567	1,090,770	
Total Receipts	\$ 16,720,189	\$ 19,876,159	\$ 20,259,714	\$ 17,019,595	\$ 18,537,652	\$ 19,251,691	\$ 20,960,813	\$ 21,624,397	\$ 22,801,577	\$ 22,138,254	\$ 17,971,199	\$ 18,773,692	\$ 235,934,932	
Cash Disbursements														
Operating Expenses														
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	123,883	92,246	1,242,485	118,088	81,891	143,186	\$ 2,622,167	
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	457,789	680,251	463,210	484,455	530,538	7,099,622	
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	168,830	163,431	148,874	334,690	469,505	2,470,874	
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	721,529	547,857	584,032	475,443	4,583,718	11,144,913	
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-	
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	60,368	48,557	52,283	66,314	88,548	730,840	
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	255,669	315,138	279,962	389,939	426,374	4,406,838	
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	26,124	30,617	37,370	29,798	71,153	417,516	
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	77,457	59,474	73,768	70,876	99,235	995,391	
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,637,679	3,720,492	2,144,953	2,621,788	122,678	24,897,449	
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	61,491	52,229	62,031	127,040	150,771	902,723	
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	766	1,324	1,648	-	-	16,522	
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	226,450	165,556	119,616	148,175	174,550	1,940,126	
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,668,536	1,459,405	1,418,075	1,511,787	1,729,990	17,760,132	
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	1,048,322	1,131,399	1,081,020	1,033,877	1,449,969	13,377,275	
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	185,074	367,243	284,481	320,044	383,613	3,556,756	
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,875,854	6,315,812	7,408,401	5,532,097	6,267,547	73,269,640	
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-	
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	14,960,190	12,564,183	16,301,271	14,277,812	13,228,213	16,691,374	\$ 165,608,786	
Debt Service														
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,475,246	297,525	280,572	325,000	325,000	\$ 57,667,353	
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	365,106	359,580	365,708	400,000	400,000	4,264,393	
Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	639,017	27,840,352	657,105	646,280	725,000	725,000	\$ 61,931,745	
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-	
Total Disbursements	\$ 15,463,130	\$ 38,170,304	\$ 14,214,537	\$ 14,440,043	\$ 12,188,340	\$ 13,808,380	\$ 15,599,207	\$ 40,404,535	\$ 16,958,376	\$ 14,924,092	\$ 13,953,213	\$ 17,416,374	\$ 227,540,531	
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	5,361,606	(18,780,138)	5,843,200	7,214,162	4,017,985	1,357,317		
Annual Surplus/Deficit													\$ 8,394,404	
Capital Spending														
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	5,375,227	7,258,630	8,356,891	8,763,201	16,712,530	\$ 81,838,633	
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,712,498	4,169,853	4,356,100	3,786,004	2,863,105	\$ 37,401,478	
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	11,577,341	10,087,724	11,428,483	12,712,991	12,549,205	19,575,635	\$ 119,240,111	
Capital Line of Credit														
Capital Line of Credit Limit										150,000,000	-	-	\$ -	
Capital Draws										-	-	-	-	
Outstanding Capital Draws										72,500,000	-	-	-	
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	-	77,500,000	-	-	-	

The Pittsburgh Water and Sewer Authority 2019 & 2020 Financial Status Update (Cash Basis) As of November 30, 2020		PGH ₂ O						
	FY 2019	FY 2020		FY 2019	FY 2020	FY 2020	2020 Difference	
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget	
Receipts								
<u>User Charge & Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 154,626,378	\$ 150,732,325	-2.5%	\$ 171,182,397	\$ 163,426,963	\$ 174,797,265	\$ (11,370,303)	
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 5,386,592	\$ 7,061,016	31.1%	\$ 5,868,943	\$ 7,487,162	\$ 5,242,920	\$ 2,244,241	
ALCOSAN Collections	66,469,893	61,532,611	-7.4%	73,522,941	67,185,520	76,286,841	(9,101,321)	
Subtotal: Other Operating Receipts	\$ 71,856,486	\$ 68,593,628	-4.5%	\$ 79,391,884	\$ 74,672,682	\$ 81,529,762	\$ (6,857,080)	
Total: Receipts	\$ 226,482,863	\$ 219,325,953	-3.2%	\$ 250,574,281	\$ 238,099,644	\$ 256,327,027	\$ (18,227,383)	
Revenue Requirements								
<u>Operating Expenses</u>								
Executive Director's Office	3,412,258	2,515,816	-26.3%	3,479,233	2,659,003	2,504,143	154,860	
Customer Service	6,483,581	6,691,120	3.2%	7,457,579	7,221,658	7,156,543	65,115	
Management Information Systems	1,664,286	1,834,774	10.2%	2,301,283	2,304,279	3,216,255	(911,976)	
Finance	2,863,368	6,583,918	129.9%	3,186,898	11,167,636	12,081,298	(913,662)	
Procurement	323,420	-	-100.0%	370,556	-	-	-	
Human Resources	888,572	630,300	-29.1%	951,558	718,848	1,150,036	(431,188)	
Legal	3,391,209	3,854,766	13.7%	3,616,831	4,281,141	4,751,354	(470,213)	
Warehouse	552,266	351,513	-36.4%	663,281	422,666	572,896	(150,230)	
External Affairs	909,306	892,219	-1.9%	1,080,407	991,454	1,335,051	(343,597)	
Engineering & Construction	5,570,438	25,267,583	353.6%	8,824,994	27,190,260	31,081,077	(3,890,817)	
Environmental Compliance	1,386,225	695,058	-49.9%	1,491,438	845,829	2,739,522	(1,893,693)	
General Administration	23,649	17,611	-25.5%	24,939	17,611	-	17,611	
Water Quality	2,047,533	1,729,114	-15.6%	2,254,974	1,903,663	2,158,960	(255,296)	
Water Treatment Plant	15,149,208	15,895,631	4.9%	17,099,660	17,625,620	21,962,891	(4,337,271)	
Water Distribution	24,311,411	11,750,862	-51.7%	25,251,612	13,200,831	14,477,335	(1,276,505)	
Sewer Operations	11,567,722	3,094,344	-73.3%	11,487,340	3,477,957	4,868,514	(1,390,558)	
Direct Operating Expenses	\$ 80,544,454	\$ 81,804,629	1.6%	\$ 89,542,582	\$ 94,028,455	\$ 110,055,875	\$ (16,027,420)	
ALCOSAN Expenses	66,402,361	66,730,283	0.5%	71,397,509	73,188,108	77,049,709	(3,861,601)	
Co-Op Agreement Op. Expenses - Water	4,007,008	-	n.a.	2,300,237	-	-	-	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-	
Non-City Water Subsidy	1,329,896	-	-100.0%	1,404,861	-	-	-	
In-Direct Operating Expenses	\$ 71,739,265	\$ 66,730,283	-7.0%	\$ 77,402,844	\$ 73,188,108	\$ 77,049,709	\$ (3,861,601)	
Subtotal: Operating Expenses	\$ 152,283,719	\$ 148,534,911	-2.5%	\$ 166,945,426	\$ 167,216,563	\$ 187,105,584	\$ (19,889,021)	
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 58,697,812	\$ 61,057,952	4.0%	\$ 59,279,766	\$ 61,782,952	\$ 66,547,366	\$ (4,764,414)	
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 2,301,734	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -	
Total: Revenue Requirements	\$ 213,283,266	\$ 209,592,863	-1.7%	\$ 228,736,175	\$ 228,999,515	\$ 253,652,950	\$ (24,653,435)	
Revenue Surplus / (Deficit)	\$ 13,199,597	\$ 9,733,090		\$ 21,838,106	\$ 9,100,129	\$ 2,674,077	\$ 6,426,052	
Financial Metrics*				FY 2019	FY 2020	FY 2020		
				<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>		
Senior Debt Service Coverage				1.97	1.48	1.38		
Minimum Requirement				1.25	1.25	1.25		
Total Debt Service Coverage				1.51	1.22	1.12		
Minimum Requirement				1.10	1.10	1.10		
Unrestricted Days Cash without ALCOSAN Expense				265.13	247.71	138.65		
Unrestricted Days Cash with ALCOSAN Expense				149.09	139.29	79.79		
Unrestricted Days Cash including the Operating Reserve Fund				189.22	180.55	117.80		

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2020

The Pittsburgh Water and Sewer Authority														
2020 Cash Flow Projection (Cash Basis)														
As of November 30, 2020														
	Actual												Forecast	Total
	January	February	March	April	May	June	July	August	September	October	November	December		
Receipts														
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 15,106,365	\$ 15,577,978	\$ 14,472,901	\$ 14,283,628	\$ 12,694,638	\$ 163,426,963	
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,983,615	7,117,474	6,710,837	5,342,438	5,652,909	67,185,520	
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	(148)	57	328	-	(3,797)	
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	482,072	80,588	737,394	497,167	334,578	6,479,389	
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	52,344	25,684	217,065	12,350	91,567	1,011,570	
Total Receipts	\$ 16,720,189	\$ 19,876,159	\$ 20,259,714	\$ 17,019,595	\$ 18,537,652	\$ 19,251,691	\$ 20,960,813	\$ 21,624,397	\$ 22,801,577	\$ 22,138,254	\$ 20,135,911	\$ 18,773,692	\$ 238,099,644	
Cash Disbursements														
Operating Expenses														
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	123,883	92,246	1,242,485	118,088	118,727	143,186	\$ 2,659,003	
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	457,789	680,251	463,210	606,491	530,538	7,221,658	
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	168,830	163,431	148,874	168,096	469,505	2,304,279	
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	721,529	547,857	584,032	498,165	4,583,718	11,167,636	
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-	
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	60,368	48,557	52,283	54,322	88,548	718,848	
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	255,669	315,138	279,962	264,242	426,374	4,281,141	
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	26,124	30,617	37,370	34,947	71,153	422,666	
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	77,457	59,474	73,768	66,938	99,235	991,454	
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,637,679	3,720,492	2,144,953	3,114,599	1,922,678	27,190,260	
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	61,491	52,229	62,031	70,146	150,771	845,829	
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	766	1,324	1,648	1,089	-	17,611	
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	226,450	165,556	119,616	111,712	174,550	1,903,663	
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,668,536	1,459,405	1,418,075	1,377,275	1,729,990	17,625,620	
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	1,048,322	1,131,399	1,081,020	857,433	1,449,969	13,200,831	
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	185,074	367,243	284,481	241,245	383,613	3,477,957	
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,875,854	6,315,812	7,408,401	5,260,288	6,457,825	73,188,108	
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-	
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	14,960,190	12,564,183	16,301,271	14,277,812	12,845,714	18,681,652	\$ 167,216,564	
Debt Service														
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,475,246	297,525	260,960	229,633	325,000	\$ 57,552,374	
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	365,106	359,580	365,708	366,185	400,000	4,230,577	
Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	639,017	27,840,352	657,105	626,668	595,818	725,000	\$ 61,782,952	
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-	
Total Disbursements	\$ 15,463,130	38,170,304	14,214,537	14,440,043	12,188,340	13,808,380	15,599,207	40,404,535	16,958,376	14,904,481	13,441,532	19,406,652	\$ 228,999,515	
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	5,361,606	(18,780,138)	5,843,200	7,233,774	6,694,380	(632,960)		
Annual Surplus/Deficit													\$ 9,100,132	
Capital Spending														
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	5,375,227	7,258,630	8,356,891	8,763,201	16,712,530	\$ 81,838,633	
PENNVEST Spending	\$ 1,743,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,712,498	4,169,853	4,356,100	3,786,004	2,863,105	\$ 37,401,478	
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	11,577,341	10,087,724	11,428,483	12,712,991	12,549,205	19,575,635	\$ 119,240,111	
Capital Line of Credit														
Capital Line of Credit Limit											150,000,000	-	\$ -	
Capital Draws											-	-	-	
Outstanding Capital Draws											107,000,000	-	-	
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	-	-	43,000,000	-	-	

The Pittsburgh Water and Sewer Authority
2019 & 2020 Financial Status Update (Cash Basis)
As of December 31, 2020



	FY 2019			FY 2020			FY 2020			2020 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Actual	Budget	Actual - Budget			
Receipts										
<u>User Charge & Wholesale Receipts</u>										
Subtotal: User Charge & Wholesale Receipts	\$ 171,182,397	\$ 165,192,700	-3.5%	\$ 171,182,397	\$ 165,192,700	\$ 174,797,265	\$ (9,604,566)			
<u>Other Operating Receipts</u>										
Other Misc. and Fee Operating Receipts	\$ 5,868,943	\$ 7,361,091	25.4%	\$ 5,868,943	\$ 7,361,091	\$ 5,242,920	\$ 2,118,170			
ALCOSAN Collections	73,522,941	68,226,853	-7.2%	73,522,941	68,226,853	76,286,841	(8,059,988)			
Subtotal: Other Operating Receipts	\$ 79,391,884	\$ 75,587,944	-4.8%	\$ 79,391,884	\$ 75,587,944	\$ 81,529,762	\$ (5,941,818)			
Total: Receipts	\$ 250,574,281	\$ 240,780,644	-3.9%	\$ 250,574,281	\$ 240,780,644	\$ 256,327,027	\$ (15,546,384)			
Revenue Requirements										
<u>Operating Expenses</u>										
Executive Director's Office	3,479,233	2,652,942	-23.7%	3,479,233	2,652,942	2,504,143	148,800			
Customer Service	7,457,579	7,069,743	-5.2%	7,457,579	7,069,743	7,156,543	(86,799)			
Management Information Systems	2,301,283	2,589,691	12.5%	2,301,283	2,589,691	3,216,255	(626,564)			
Finance	3,186,898	12,870,730	303.9%	3,186,898	12,870,730	12,081,298	789,432			
Procurement	370,556	-	-100.0%	370,556	-	-	-			
Human Resources	951,558	707,475	-25.7%	951,558	707,475	1,150,036	(442,561)			
Legal	3,616,831	4,295,018	18.8%	3,616,831	4,295,018	4,751,354	(456,336)			
Warehouse	663,281	400,607	-39.6%	663,281	400,607	572,896	(172,288)			
External Affairs	1,080,407	1,049,867	-2.8%	1,080,407	1,049,867	1,335,051	(285,184)			
Engineering & Construction	8,824,994	26,087,632	195.6%	8,824,994	26,087,632	31,081,077	(4,993,445)			
Environmental Compliance	1,491,438	1,403,532	-5.9%	1,491,438	1,403,532	2,739,522	(1,335,989)			
General Administration	24,939	18,435	-26.1%	24,939	18,435	-	18,435			
Water Quality	2,254,974	1,740,900	-22.8%	2,254,974	1,740,900	2,158,960	(418,060)			
Water Treatment Plant	17,099,660	17,132,272	0.2%	17,099,660	17,132,272	21,962,891	(4,830,619)			
Water Distribution	25,251,612	13,061,180	-48.3%	25,251,612	13,061,180	14,477,335	(1,416,155)			
Sewer Operations	11,487,340	3,459,048	-69.9%	11,487,340	3,459,048	4,868,514	(1,409,466)			
Direct Operating Expenses	\$ 89,542,582	\$ 94,539,074	5.6%	\$ 89,542,582	\$ 94,539,074	\$ 110,055,875	\$ (15,516,801)			
ALCOSAN Expenses	71,397,509	73,188,108	2.5%	71,397,509	73,188,108	77,049,709	(3,861,601)			
Co-Op Agreement Op. Expenses - Water	4,600,473	-	n.a.	2,300,237	-	-	-			
Co-Op Agreement Op. Expenses - Sewer	-	-	-	2,300,237	-	-	-			
Non-City Water Subsidy	1,404,861	-	-100.0%	1,404,861	-	-	-			
In-Direct Operating Expenses	\$ 77,402,844	\$ 73,188,108	-5.4%	\$ 77,402,844	\$ 73,188,108	\$ 77,049,709	\$ (3,861,601)			
Subtotal: Operating Expenses	\$ 166,945,426	\$ 167,727,183	0.5%	\$ 166,945,426	\$ 167,727,183	\$ 187,105,584	\$ (19,378,402)			
<u>Debt Service</u>										
Subtotal: Debt Service	\$ 59,279,766	\$ 61,640,999	4.0%	\$ 59,279,766	\$ 61,640,999	\$ 66,547,366	\$ (4,906,367)			
<u>Transfers to Reserves</u>										
Subtotal: Transfers to Reserves	\$ 2,510,983	\$ -	-100.0%	\$ 2,510,983	\$ -	\$ -	\$ -			
Total: Revenue Requirements	\$ 228,736,175	\$ 229,368,182	0.3%	\$ 228,736,175	\$ 229,368,182	\$ 253,652,950	\$ (24,284,769)			
Revenue Surplus / (Deficit)	\$ 21,838,106	\$ 11,412,462		\$ 21,838,106	\$ 11,412,462	\$ 2,674,077	\$ 8,738,385			
Financial Metrics*				FY 2019	FY 2020	FY 2020				
				<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>				
Senior Debt Service Coverage				1.97	1.52	1.38				
<i>Minimum Requirement</i>				<i>1.25</i>	<i>1.25</i>	<i>1.25</i>				
Total Debt Service Coverage				1.51	1.25	1.12				
<i>Minimum Requirement</i>				<i>1.10</i>	<i>1.10</i>	<i>1.10</i>				
<i>Unrestricted Days Cash without ALCOSAN Expense</i>				263.70	256.39	138.65				
<i>Unrestricted Days Cash with ALCOSAN Expense</i>				148.63	144.51	79.79				
<i>Unrestricted Days Cash including the Operating Reserve Fund</i>				188.64	185.64	117.80				

*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

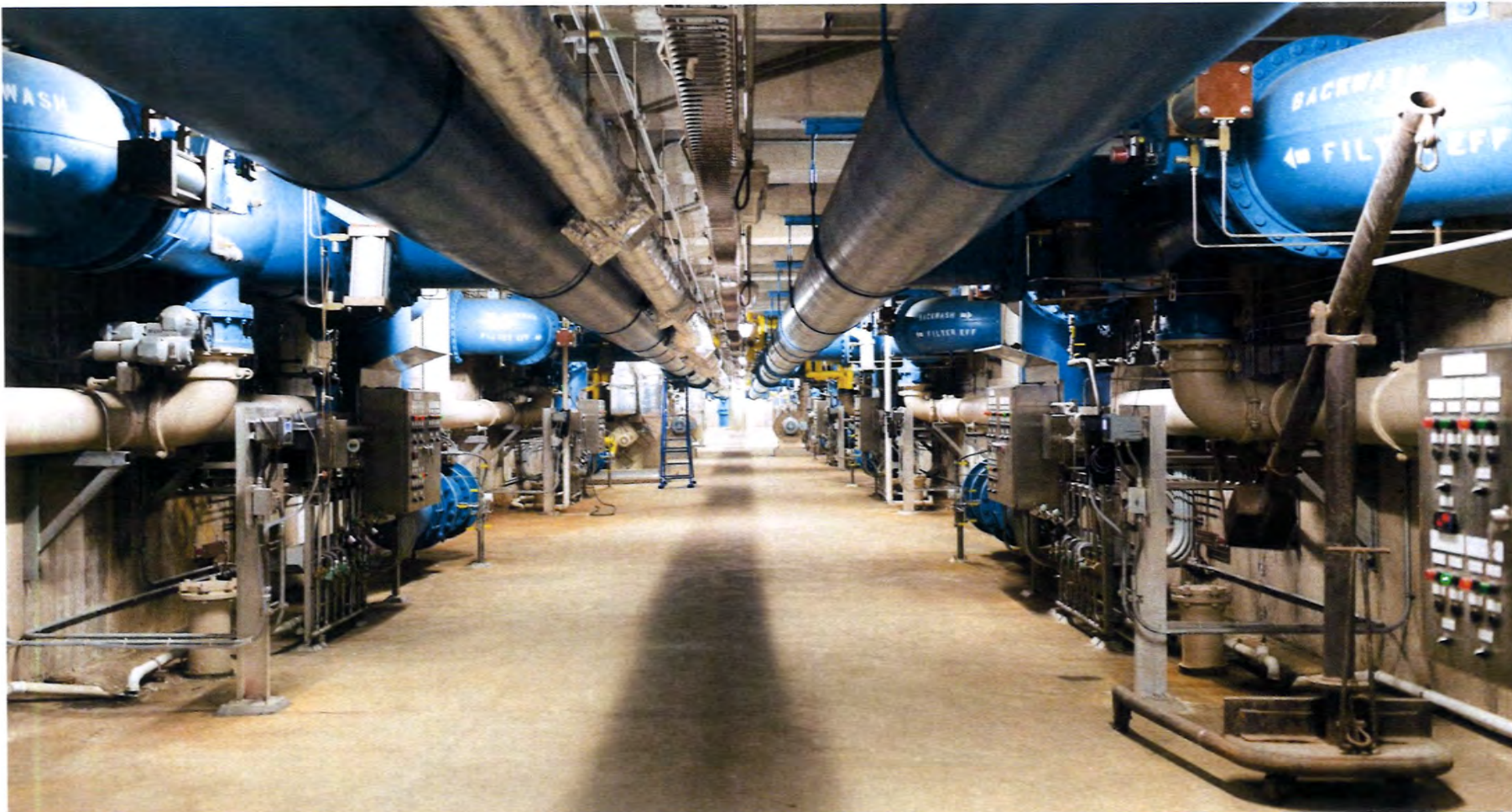
2020													
The Pittsburgh Water and Sewer Authority													
2020 Cash Flow Projection (Cash Basis)													
As of December 31, 2020													
	Actual												Total
Receipts	January	February	March	April	May	June	July	August	September	October	November	December	Total
Water and Conveyance	\$ 12,596,391	\$ 12,940,999	\$ 14,459,528	\$ 11,741,178	\$ 11,654,137	\$ 12,894,219	\$ 15,005,000	\$ 15,106,365	\$ 15,577,978	\$ 14,472,901	\$ 14,283,628	\$ 14,460,375	\$ 165,192,700
ALCOSAN	3,873,889	5,697,695	5,106,263	5,241,684	5,087,947	5,740,878	5,629,890	5,983,615	7,117,474	6,710,837	5,342,438	6,694,242	68,226,853
DSIC	4	3	(2,642)	(296)	8	(1,106)	(5)	-	(148)	57	328	(314)	(4,111)
Fees	200,886	888,853	635,420	17,976	1,786,518	602,074	215,862	482,072	80,588	737,394	497,167	245,726	6,390,536
Misc. Other	49,019	348,609	61,145	19,053	9,041	15,627	110,065	52,344	25,684	217,065	12,350	54,662	974,665
Total Receipts	\$ 16,720,189	19,876,159	20,259,714	17,019,595	18,537,652	19,251,691	20,960,813	21,624,397	22,801,577	22,138,254	20,135,911	21,454,691	\$ 240,780,644
Cash Disbursements													
Operating Expenses													
Executive Director's Office	\$ 160,627	111,883	180,830	124,403	98,637	144,006	123,883	92,246	1,242,485	118,088	118,727	137,126	\$ 2,652,942
Customer Service	760,435	520,554	540,594	806,603	511,468	619,197	724,529	457,789	680,251	463,210	606,491	378,623	7,069,743
Management Information Systems	146,426	139,835	144,774	152,674	148,576	160,543	292,716	168,830	163,431	148,874	168,096	754,917	2,589,691
Finance	1,116,758	537,863	680,429	345,972	442,710	803,506	305,098	721,529	547,857	584,032	498,165	6,286,811	12,870,730
Procurement	-	-	-	-	-	-	-	-	-	-	-	-	-
Human Resources	51,941	43,642	40,697	79,147	44,093	92,500	62,750	60,368	48,557	52,283	54,322	77,175	707,475
Legal	454,846	334,402	168,806	413,785	500,795	311,450	555,673	255,669	315,138	279,962	264,242	440,251	4,295,018
Warehouse	22,555	30,212	30,128	33,852	28,130	33,079	44,500	26,124	30,617	37,370	34,947	49,094	400,607
External Affairs	119,883	95,537	88,814	58,342	95,212	78,739	78,052	59,474	73,768	66,938	66,938	157,648	1,049,867
Engineering & Construction	1,054,630	985,617	2,612,854	1,762,571	1,960,202	2,080,427	3,193,559	2,637,679	3,720,492	2,144,953	3,114,599	820,049	26,087,632
Environmental Compliance	34,329	76,839	33,963	146,064	49,665	57,480	50,820	61,491	52,229	62,031	70,146	708,475	1,403,532
General Administration	1,950	2,872	3,264	615	1,395	880	1,808	766	1,324	1,648	1,089	824	18,435
Water Quality	166,584	186,536	108,779	177,531	151,847	148,999	165,503	226,450	165,556	119,616	111,712	11,787	1,740,900
Water Treatment Plant	1,122,216	1,638,377	1,461,856	1,586,760	1,309,935	1,543,346	1,309,850	1,668,536	1,459,405	1,418,075	1,377,275	1,236,641	17,132,272
Water Distribution	1,416,022	981,491	1,063,610	915,352	946,519	1,015,442	1,294,251	1,048,322	1,131,399	1,081,020	857,433	1,310,318	13,061,180
Sewer Operations	329,871	307,419	294,404	239,647	282,319	241,283	321,358	185,074	367,243	284,481	241,245	364,704	3,459,048
ALCOSAN	7,752,770	4,667,162	5,944,891	7,059,544	5,107,398	5,902,325	6,435,840	4,875,854	6,315,812	7,408,401	5,260,288	6,457,825	73,188,108
Non-City Water Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-
City Co-Op Payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total	\$ 14,711,844	10,660,241	13,398,693	13,902,861	11,678,900	13,233,202	14,960,190	12,564,183	16,301,271	14,277,812	12,845,714	19,192,271	\$ 167,727,184
Debt Service													
Bond Debt Service	\$ 334,210	27,247,577	555,223	165,254	145,842	239,229	276,676	27,475,246	297,525	260,960	229,633	213,927	\$ 57,441,302
PennVest Debt Service	417,076	262,486	260,621	371,927	363,598	335,949	362,341	365,106	359,580	365,708	366,185	369,120	4,199,698
Sub Total	\$ 751,286	27,510,063	815,844	537,181	509,440	575,178	639,017	27,840,352	657,105	626,668	595,818	583,047	\$ 61,640,999
Transfer to Restricted Funds	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
Total Disbursements	\$ 15,463,130	38,170,304	14,214,537	14,440,043	12,188,340	13,808,380	15,599,207	40,404,535	16,958,376	14,904,481	13,441,532	19,775,319	\$ 229,368,182
Surplus / Deficit	1,257,060	(18,294,145)	6,045,177	2,579,553	6,349,312	5,443,312	5,361,606	(18,780,138)	5,843,200	7,233,774	6,694,380	1,679,372	
Annual Surplus/Deficit													\$ 11,412,465
Capital Spending													
Capital Spending (Non PENNVEST)	\$ 2,357,911	4,473,708	8,709,898	3,792,403	5,251,504	3,562,700	7,224,030	5,375,227	7,258,630	8,356,891	8,763,201	16,712,530	\$ 81,838,633
PENNVEST Spending	\$ 1,745,522	3,057,473	4,713,664	2,215,688	353,878	1,074,382	4,353,310	4,712,498	4,169,853	4,356,100	3,786,004	2,863,105	\$ 37,401,478
Total	\$ 4,103,433	7,531,181	13,423,562	6,008,091	5,605,382	4,637,082	11,577,341	10,087,724	11,428,483	12,712,991	12,549,205	19,575,635	\$ 119,240,111
Capital Line of Credit													
Capital Line of Credit Limit												150,000,000	
Capital Draws													
Outstanding Capital Draws												26,665,369	
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	-	-	-	123,334,631	

XI. OTHER DATA

XI.4. Provide a copy of the company's most recent operating and capital budgets.

RESPONSE:

Please see attached.



The Pittsburgh Water and Sewer Authority

2021 – 2025 Capital Improvement Plan

Approved on September 25, 2020



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William Bennett, Senior Manager, Field Operations

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Edward Barca, Director of Finance

John Potanko, Program Manager – Capital Projects

WATER TREATMENT PLANT

George Watson, Acting Senior Group Manager, Production

Jefferey Turko, Senior Manager, Production

SUPPORT SERVICES

Jason Felser, Director of Information Technology

Kelly Morgano, Senior Manager, Human Resources

Rebecca Zito, Acting Senior Manager of Public Affairs

Faith Wydra, Senior Manager, Water Quality

Nicole Dickun, Senior Manager, Procurement

Lee Haller, Deputy Chief, Program Management



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Introduction

The Pittsburgh Water and Sewer Authority (“**the Authority**” or “**the PWSA**”) is a body corporate and politic organized and existing under the Act pursuant to Resolution No. 36 of the Council of the City of Pittsburgh (the “**City**”), duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 16, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority’s Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on December 11, 1989, to include, among authorized projects, low head dams and facilities for generating surplus electric power. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on May 9, 2008, to extend the term of existence of the Authority to May 21, 2045. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on March 19, 2020, to extend the term of existence of the Authority to March 13, 2070 and to include stormwater systems.

Under its Articles of Incorporation, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, low head dams, facilities for generating surplus power, and stormwater systems.

The System provides water to approximately 81,000 customers or 84% of the total population in the geographic boundaries of the City. The Authority provides wastewater collection and transmission service to almost the entire City, estimated at 306,000 residents. The System does not include wastewater treatment facilities; such facilities are the responsibility of Allegheny County Sanitary Authority (“**ALCOSAN**”), a separate and distinct legal entity.

The Authority operates and maintains a 117 million gallon per day (MGD) rapid sand type water treatment plant, a 26 MGD microfiltration plant, approximately 964 miles of water mains, over 32,000 valves and fire hydrants, 1 raw water pump station, 10 finished water pump stations, 4 in-ground reservoirs, 10 storage tanks, approximately 1,220 miles of sanitary, storm and combined sewers, 29,000 manholes, 30,000 catch basins and inlets, 38 combined sewer overflow outfalls, 185 storm outfalls, and four wastewater pump stations.

Pennsylvania Public Utility Commission Oversight of the Authority

On December 21, 2017, the Pennsylvania legislature enacted Act 65 of 2017 (“**Act 65**”), placing the Authority under the jurisdiction of the Pennsylvania Public Utility Commission (“**PUC**”) pursuant to the Pennsylvania Public Utility Code (the “**Public Utility Code**”). Act 65 applies most of the provisions of the Public Utility Code to the Authority in the same manner as a “public utility,” resulting in regulation of the Authority’s rate making, its operating effectiveness, debt issuances and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Act 65 includes provisions that allow the Authority to impose, charge or collect rates or charges as necessary to permit the Authority to comply with its covenants with the holders of any bonds or other financial obligations of the Authority, and prohibits the PUC from requiring the Authority to take any action that would cause the interest on the Authority’s financial obligations to be includible in gross income of the holders of such obligations for federal income tax purposes.

Capital Improvement Program

Overview

The PWSA’s Capital Improvement Program focuses on sustaining cost-effective operations, while optimizing the system’s asset performance and life expectancy. The 2021-2025 Capital Improvement Program invests in programs which consider risk and consequence of asset failure and levels of service benefits.

Development and Approval Process

The PWSA’s CIP process begins each year in May when project nominations are solicited from the entire organization. At the completion of the nomination period, the Finance Department screens and evaluates the nominated projects to determine the projects that should be included in the CIP. Further planning efforts consist of the preparation of a Project Sheet, which provides more detailed information on a project’s potential scope options, risks, schedule, and the cost

estimate. This process lasts several months and culminates with the presentation of the updated CIP to PWSA's Board of Directors. Projects that are not selected for execution at any stage will be re-assessed during the next year's CIP development process.

Capital Project Prioritization

Due to funding limitations and the need to renew/replacing a significant amount of aging infrastructure, the following criteria are used to evaluate and prioritize capital projects:

- Capacity – Meets community health needs and growth, as needed
- Level of Service – Improvement to customer service
- Operations and Maintenance Efficiency – Potential for operating cost savings
- Regulatory Compliance – Regulatory compliance schedule and potential fines for non-compliance
- Regional Cooperation/Stewardship – Coordination with external stakeholders and local communities
- Reliability/Operational Flexibility – Location, age, and condition of infrastructure and risk if action is not taken
- Safety - Potential health and safety risks to personnel and the public if action is not taken
- Sustainability – Energy efficiency and “green” approach to improving water quality

Funding Sources

The PWSA Capital Improvement Program is funded through several primary sources to which specific programs and projects are allocated. These funding sources include, but are not limited to, Debt, Distribution System Improvement Charge (“DSIC”), cost shares with other utilities, and federal and state funding programs.

Capital Improvement Plan Organization

The CIP is organized into six project classes (types):

- Water Treatment Plant
- Water Pumping and Storage
- Water Distribution
- Wastewater System
- Stormwater
- Other

Each project class is then made up of individual projects. Projects are defined based upon current information, which range from annual allowances for asset renewal and/or replacement activities, to major, multiple phase facility renewal projects.

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Project Information

The following information is provided for each project:

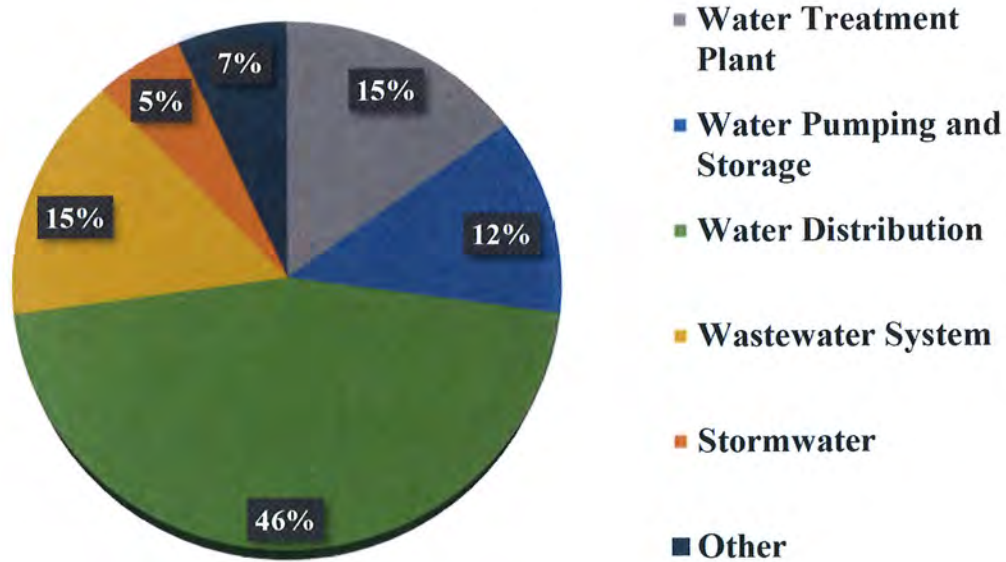
- **Alternatives to the Recommended Action** – Lists the alternatives that were considered or evaluated.
- **Cash Flow Summary** – Estimated five-year cash flow for the project.
- **Funding Source(s)** – Proposed funding source(s) for the project.
- **Impact on Operations** – Describes the anticipated impact to the PWSA’s operations when the project is completed.
- **Phase** – Phase in the project life-cycle (i.e. assessment/design/construction).
- **Priority** – Criteria utilized to prioritize the project.
- **Project Class** – Type of project.
- **Project Description** - A basic understanding of the project’s intent and scope of work.
- **Project Justification** - A detailed explanation to why the project is needed.
- **Project Name** – Descriptive name assigned to the project.
- **Project Number** – Unique number(s) assigned to track the project from inception to completion. This number is established once a project is approved.
- **Risk(s)** - Outlines the risk(s) to the PWSA if the project is delayed or is not selected.
- **Ward** – Project location(s) based within the City of Pittsburgh.

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Historical and Forecasted Capital Expenditures

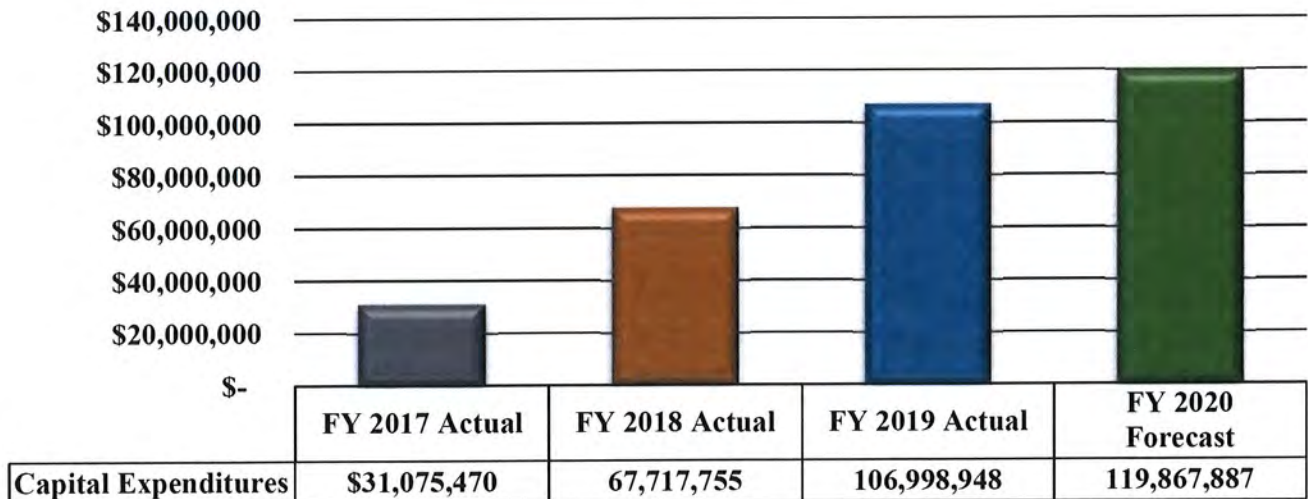
The figures below illustrate the historical capital expenditures by project class for FY 2017 – FY 2019 as well as the historical and forecasted capital expenditures for FY 2017 – FY 2020.

Figure 1. Historical Capital Expenditures by Project Class: FY 2017 – FY 2019



	FY 2017 - Actual	FY 2018 - Actual	FY 2019 - Actual	Total
Water Treatment Plant	\$ 8,156,719	7,275,878	15,665,185	\$ 31,097,782
Water Pumping and Storage	3,562,479	11,732,850	9,667,165	24,962,494
Water Distribution	11,113,101	27,185,518	55,588,889	93,887,508
Wastewater System	6,768,668	9,225,987	15,152,656	31,147,310
Stormwater	953,003	3,156,175	6,901,255	11,010,434
Other	521,500	9,141,347	4,023,798	13,686,645
Total	\$ 31,075,471	\$ 67,717,755	106,998,948	\$ 205,792,173

Figure 2. Historical and Forecasted Capital Expenditures: FY 2017 – FY 2020



2021-2025 Capital Improvement Program

The figures below illustrate the proposed breakdown of the project classes, funding sources, and yearly cash flows for the 2021 to 2025 CIP.

Figure 3. Proposed Yearly Capital Cash Flow by Project Class

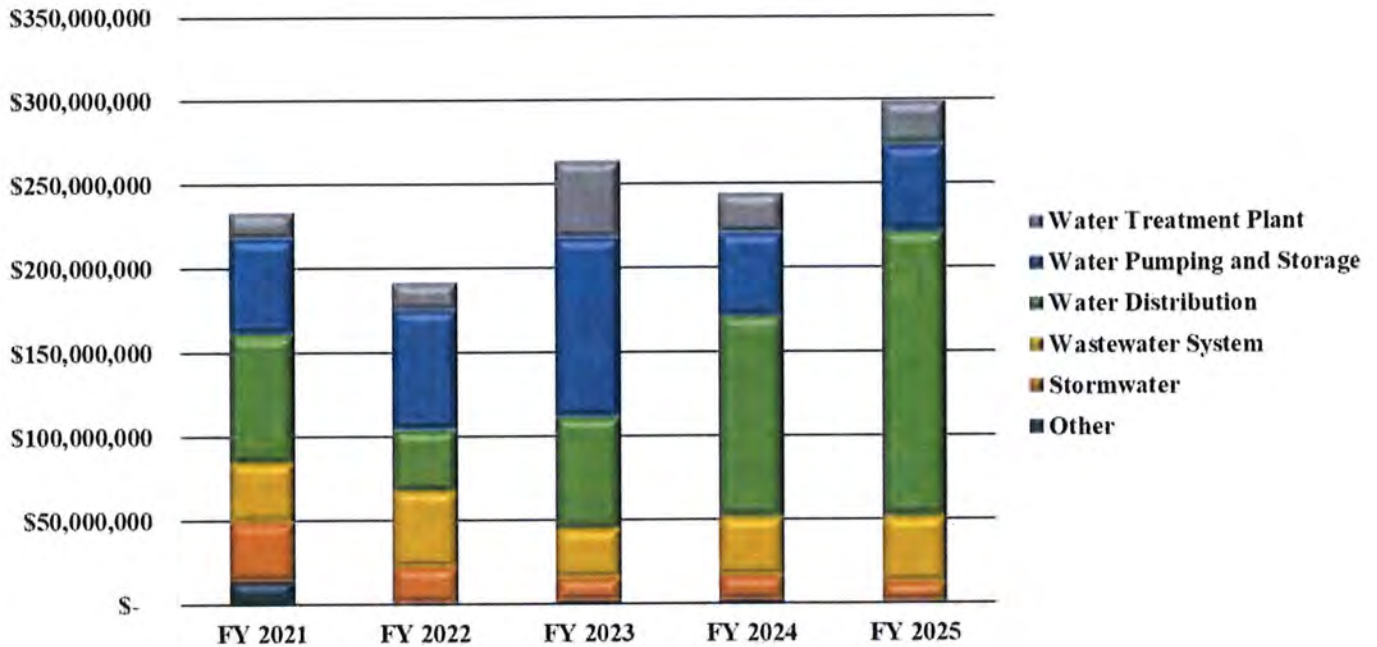


Figure 4. Capital Requirements

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Water Treatment Plant	\$ 15,112,066	16,422,149	45,559,717	23,358,443	26,105,966	\$ 126,558,340
Water Pumping and Storage	56,863,770	70,939,529	106,366,346	49,645,737	51,176,787	334,992,169
Water Distribution	76,245,552	36,345,826	66,150,837	119,049,668	169,246,024	467,037,906
Wastewater System	35,741,675	45,109,155	29,580,401	34,664,259	38,980,692	184,076,182
Stormwater	34,696,272	21,721,607	13,237,377	14,764,949	11,479,750	95,899,955
Other	14,670,000	1,100,000	2,500,000	2,500,000	1,500,000	22,270,000
Total Capital Requirements	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553

Figure 5. Funding Sources

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Debt (Revenue Bonds)	\$ 169,262,753	173,670,904	249,823,825	233,482,080	287,988,242	\$ 1,114,227,804
Debt (Project Fund)	17,219,270	7,466,387	3,069,877	-	-	27,755,534
DSIC - Water	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,253
DSIC - Sewer	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,254
PENNVEST	37,038,708	-	-	-	-	37,038,708
Total Funding Sources	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553



2021-2025 Project Summary



Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Water Treatment Plant							
11	Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements	\$ 3,343,250	1,655,000	3,853,059	3,853,059	3,353,059	\$ 16,057,427
12	Aspinwall Utility Water Improvements - Electrical	210,000	-	-	-	-	210,000
13	Aspinwall Utility Water Improvements - General/Mechanical	1,068,750	-	-	-	-	1,068,750
14	Aspinwall Water Treatment Plant Electrical and Backup Power Improvements	2,337,500	4,250,000	13,732,500	5,482,500	-	25,802,500
15	Aspinwall Water Treatment Plant Raw Water Intakes	1,228,500	1,228,500	9,850,500	9,850,500	2,457,000	24,615,000
16	Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance	308,659	-	-	-	-	308,659
17	Clearwell Emergency Response Project	1,986,316	8,406,316	16,606,316	-	-	26,998,948
18	Corrosion Control Chemical Storage & Feed Systems	600,404	-	-	-	-	600,404
19	Emergency Clarifier Repairs - Clarifiers No. 1, 2 & 4	258,662	-	-	-	-	258,662
20	Hydraulic Valve Replacement Program	-	-	199,334	1,618,744	1,431,922	3,250,000
21	Instrumentation Upgrade	1,040,000	-	-	-	-	1,040,000
22	Lime Slurry System Improvements	1,412,017	882,333	-	-	-	2,294,350
23	Ross Pump Station	1,318,008	-	1,318,008	2,553,640	18,863,985	24,053,641
Total: Water Treatment Plant		\$15,112,066	\$16,422,149	\$45,559,717	\$23,358,443	\$26,105,966	\$126,558,340
Project Class: Water Pumping and Storage							
25	2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4	\$11,000,000	11,552,785	6,025,215	-	-	\$ 28,578,000
26	Aspinwall Pump Station Improvements	2,135,526	8,490,526	18,090,526	-	-	28,716,578
27	Aspinwall Pump Station to Lanpher Reservoir Rising Main	5,000,000	16,661,613	34,338,387	-	-	56,000,000
28	Bruecken Pump Station Improvements	1,668,553	6,182,033	16,600,073	-	-	24,450,659
29	Chlorine Booster Station Improvements	2,698,491	3,523,793	3,261,896	-	-	9,484,180
30	Clearwell Improvements	200,000	200,000	1,502,024	29,842,950	25,264,517	57,009,491
31	Disinfection By-Products Mitigation	1,455,000	-	1,155,000	-	-	2,610,000
32	Garfield Tank Improvements	-	-	465,517	1,792,241	1,792,241	4,049,999
33	Herron Hill Pump Station Improvements	-	-	1,259,770	4,850,115	4,850,115	10,960,000
34	Herron Hill Reservoir Improvements	2,751,211	-	-	-	-	2,751,211
35	Herron Hill Tank Pump Station Improvements	-	-	127,586	491,207	491,207	1,110,000
36	Highland No. 2 Reservoir Improvements	17,893,400	8,946,700	-	-	-	26,840,100
37	Highland Reservoir Pump Station and Rising Main	10,000,000	10,670,664	12,926,750	-	-	33,597,414
38	Howard Pump Station Improvements	-	-	-	2,143,678	8,253,161	10,396,839
39	Inline Pump Station (Coral and Pacific) Improvements	-	-	68,966	265,517	265,517	600,000
40	Lanpher Reservoir Improvements	1,000,000	3,879,693	7,879,693	-	-	12,759,386
41	Lincoln Pump Station Improvements	171,489	660,233	-	-	-	831,722
42	Lincoln Pump Station: Bypass Pump Station Project	890,100	-	-	-	-	890,100
43	Lincoln Tank Improvements	-	-	482,184	1,856,408	1,856,408	4,195,000
44	Mission Pump Station Improvements	-	-	1,938,506	7,463,247	7,463,247	16,865,000
45	Saline Pump Station Improvements	-	171,489	-	-	-	171,489
46	Spring Hill Tank Improvements	-	-	244,253	940,374	940,374	2,125,001
Total: Water Pumping and Storage		\$56,863,770	70,939,529	106,366,346	49,645,737	51,176,787	\$334,992,169

Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Water Distribution							
48	Bus Rapid Transit (BRT) Water Distribution	\$ 9,200,000	2,300,000	-	-	-	\$ 11,500,000
49	District Metering	-	-	3,190,000	3,280,000	3,380,000	9,850,000
50	District Water and Pressure Meters	485,135	-	1,455,404	-	-	1,940,539
51	Duck Hollow	-	-	3,000,270	-	-	3,000,270
52	Herron Hill - Squirrel Hill Boundary Adjustments	-	-	-	-	830,000	830,000
53	Highland Park MFP Improvements Project	225,000	1,732,500	-	-	-	1,957,500
54	Intermediate Main Replacement Program	-	-	2,847,356	12,768,391	22,965,287	38,581,035
55	Intermediate Meters	75,000	80,000	82,000	85,000	87,000	409,000
56	Large Diameter Water Main Replacement	5,500,000	-	2,248,276	11,366,207	21,966,552	41,081,035
57	Large Meter Replacement	1,512,919	1,709,414	1,546,031	1,585,000	587,000	6,940,364
58	Lead Service Identification Program	1,500,000	1,500,000	2,558,667	-	-	5,558,667
59	Lead Service Line Replacement	3,111,200	-	-	-	-	3,111,200
60	Low Pressure Area Remediation	1,029,259	1,093,445	170,654	-	-	2,293,358
61	North Side Boundary Adjustments	-	-	-	-	1,200,000	1,200,000
62	Private Lead Service Line Reimbursement Program	500,000	375,000	375,000	375,000	135,287	1,760,287
63	Regulator Valve and Vault Replacement	2,000,000	1,000,000	3,000,000	4,500,000	3,000,000	13,500,000
64	Small Diameter Water Main Replacement	45,838,708	19,950,643	38,645,977	75,436,736	103,691,564	283,563,628
65	Small Meter Replacement	1,357,684	1,796,385	1,721,106	1,650,000	500,000	7,025,175
66	South Side Slopes Boundary Adjustments	-	-	-	-	1,200,000	1,200,000
67	Unmetered and Flat Rate Properties	1,548,564	1,744,689	527,947	-	-	3,821,199
68	Valve Replacement	1,498,333	1,300,000	2,942,149	6,123,334	7,823,333	19,687,149
69	Water Relay	863,750	1,763,750	1,840,000	1,880,000	1,880,000	8,227,500
Total: Water Distribution		\$ 76,245,552	36,345,826	66,150,837	119,049,668	169,246,024	\$ 467,037,906
Project Class: Wastewater System							
71	31st Ward Sewer System	\$ 2,904,302	348,961	450,000	150,000	2,360,776	\$ 6,214,039
72	Browns Hill Road Sewer Pump Station Replacement	-	-	187,700	1,030,967	281,333	1,500,000
73	Large Diameter Sewer Rehabilitation	2,211,492	6,391,140	3,517,000	4,437,190	4,692,667	21,249,489
74	M-29 Outfall Improvements	3,473,539	-	-	-	-	3,473,539
75	Maytide Storm and Sanitary Sewer System Improvements	2,000,000	1,500,000	1,096,798	-	-	4,596,798
76	Queenston Sewer Improvements	1,601,450	185,600	-	-	-	1,787,050
77	Sewer Reconstruction	970,175	999,979	1,841,144	1,880,000	1,880,000	7,571,297
78	Sewers Under Structures	3,081,151	11,080,611	5,642,667	5,440,122	8,713,821	33,958,372
79	Small Diameter Sewer Rehabilitation	19,499,567	24,602,865	16,845,092	21,725,979	21,052,095	103,725,599
Total: Wastewater System		\$ 35,741,675	45,109,155	29,580,401	34,664,259	38,980,692	\$ 184,076,182

Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Stormwater							
81	Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements	\$ 685,000	1,000,000	350,000	-	-	\$ 2,035,000
82	Catch Basin and Inlet Replacement	8,137,621	1,987,720	8,317,500	9,964,949	10,479,750	38,887,540
83	Fleury Way Stormwater Infrastructure Improvements	730,141	-	-	-	-	730,141
84	Four Mile Run Stormwater Infrastructure Improvements	7,000,000	12,800,000	-	-	-	19,800,000
85	Lawn and Ophelia	600,000	-	-	-	-	600,000
86	Martin Luther King Field Stormwater Infrastructure Improvements	2,008,966	1,339,310	-	-	-	3,348,276
87	Maryland Avenue Stormwater Infrastructure Improvements	2,610,000	330,000	-	-	-	2,940,000
88	Nobles Lane Stormsystems Improvements	343,322	-	-	-	-	343,322
89	Saw Mill Run MS4 Compliance Projects	-	-	1,000,000	2,500,000	-	3,500,000
90	Saw Mill Run PWSA & PennDOT Watershed Improvements	-	200,000	500,000	300,000	-	1,000,000
91	Southside Flats Sewer Separation	-	335,365	3,069,877	-	-	3,405,242
92	Southside Stormwater Infrastructure Improvements	2,156,746	2,156,746	-	-	-	4,313,492
93	Thomas and McPherson Stormwater Infrastructure Improvements	4,319,899	1,387,466	-	-	-	5,707,365
94	Tide Gate Installations	-	-	-	2,000,000	1,000,000	3,000,000
95	Volunteer's Field Stormwater Infrastructure Improvements	1,000,000	-	-	-	-	1,000,000
96	Wightman Park Stormwater Infrastructure Improvements	1,750,000	-	-	-	-	1,750,000
97	Winchester Drive at Grovemount Stormsystem Improvements	554,577	-	-	-	-	554,577
98	Woodland Road Stormwater Infrastructure Improvements	1,550,000	185,000	-	-	-	1,735,000
99	Woods Run Stream Removal Stormwater Infrastructure Improvements	1,250,000	-	-	-	-	1,250,000
Total: Stormwater		\$ 34,696,272	21,721,607	13,237,377	14,764,949	11,479,750	\$ 95,899,955
Project Class: Other							
101	Park Maintenance / Upgrades	\$ 700,000	1,000,000	1,000,000	1,000,000	1,000,000	\$ 4,700,000
102	Property Acquisition / Facility Upgrades	700,000	-	1,000,000	1,000,000	-	2,700,000
103	Reconstruction of the Facade at the Central Warehouse	70,000	-	-	-	-	70,000
104	Roof Replacment Brilliant Yard Warehouse	160,000	-	-	-	-	160,000
105	Roof Replacement Herron Hill Pump Station	90,000	-	-	-	-	90,000
106	Surface Restoration (Capital Only)	12,500,000	-	-	-	-	12,500,000
107	Utility Cost Shares	450,000	100,000	500,000	500,000	500,000	2,050,000
Total: Other		\$ 14,670,000	1,100,000	2,500,000	2,500,000	1,500,000	\$ 22,270,000



Water Treatment Plant

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Water Treatment Plant

Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements

PROJECT NUMBER: 2017-322-101-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Improvements to pretreatment chemical and clarification systems to provide improved water treatment capabilities. This project is the parent project for all of the clarification and pre-treatment related projects.
PROJECT JUSTIFICATION: Chemical treatment systems are critical to producing safe drinking water. The storage and pumping component of the systems have reached the end of their useful life and need to be replaced.
RISK(S): Inefficient operation of chemical systems results in increased operating costs, including chemical consumption, labor, solids generation and disposal, and wear on equipment.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Debt (Revenue Bonds)
Total	\$19,333,383	3,343,250	1,655,000	3,853,059	3,853,059	3,353,059	\$16,057,427	

Water Treatment Plant

Aspinwall Utility Water Improvements - Electrical

PROJECT NUMBER: 2017-322-101-5
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Electrical work related to installation of heaters and SCADA.
PROJECT JUSTIFICATION: Electrical systems at the Water Treatment Plant have reached the end of their useful life and need to be replaced.
RISK(S): Failure of critical electrical systems at the Water Treatment Plant.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$210,000	210,000	0	0	0	0	\$210,000	

Water Treatment Plant

Aspinwall Utility Water Improvements - General/Mechanical

PROJECT NUMBER: 2017-322-101-4

WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Pipe demolition, pipe and appurtenance installation for the Water Treatment Plant's potable and non-potable water line system.
PROJECT JUSTIFICATION: Water piping throughout the Water Treatment Plant has come to the end of it's service life. Failure of this piping would result in interruptions in the ability to feed treatment chemicals.
RISK(S): Potable and non-potable water piping throughout the plant has come to the end of it's service life. This piping system is critical to the operations at the Water Treatment Plant.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,068,750	1,068,750	0	0	0	0	\$1,068,750	

Water Treatment Plant

Aspinwall Water Treatment Plant Electrical and Backup Power Improvements

PROJECT NUMBER: 2017-322-100-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Improvements to electrical systems at the Water Treatment Plant, including provisions for stand-by or backup power systems, upgrades to existing electrical distribution system, replacement of motor control centers, and associated panels, conduit, wiring, and systems.
PROJECT JUSTIFICATION: Electrical systems at the Water Treatment Plant have generally met the end of their useful lives and spare/replacement parts are unavailable.
RISK(S): Electrical power is critical to maintain pumping and treatment of water. Failure of these systems will result in the inability to produce water to meet demand and/or quality requirements.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$26,561,635	2,337,500	4,250,000	13,732,500	5,482,500	0	\$25,802,500	

Water Treatment Plant

Aspinwall Water Treatment Plant Raw Water Intakes

PROJECT NUMBER: 2018-322-100-0

WARD: Systemwide

PHASE: Design
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Project will include condition assessment, renewing or replacing the existing West and East Raw Water Intake Gate House buildings and associated systems, including gates, screens, and associated mechanical equipment as well as the addition of SCADA. Influent piping through the Ross Pump Station will also be addressed.
PROJECT JUSTIFICATION: The West Gate is 90% closed and inoperable. Both gate houses are in need of rehabilitation or replacement. The West Gatehouse is 100 years old, and the East Gate is almost 90 years old.
RISK(S): Both gates have reach the end of their useful life and need replaced. Failure of the East Gate would cause a disruption to the supply of water.
IMPACT ON OPERATIONS: Modernization of systems will require less time spent in operations and maintenance of these facilities.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$24,847,854	1,228,500	1,228,500	9,850,500	9,850,500	2,457,000	\$24,615,000	

Water Treatment Plant

Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety
PROJECT DESCRIPTION: Install new fencing, lighting, and surveillance around the Water Treatment Plant.
PROJECT JUSTIFICATION: The fencing and security infrastructure around the Water Treatment Plant is in need of upgrades.
RISK(S): Increases the likelihood of security issues.
IMPACT ON OPERATIONS: Increased security around the Water Treatment Plant.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay the implementation of the security upgrades.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$308,659	308,659	0	0	0	0	\$308,659	

Water Treatment Plant

Clearwell Emergency Response Project

PROJECT NUMBER: 2017-323-100-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Long-term bypass of the existing 108 year old clearwell (finished water structure) including the construction of pump wetwells at the Aspinwall and Bruecken Pump Stations, modifications to the clearwell inlet and outlet gate house, and the construction of a bypass line around the clearwell to the outlet gate house.
PROJECT JUSTIFICATION: The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. The clearwell has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands and providing sufficient contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. In order to replace the clearwell, a long-term bypass is required in order to provide adequate suction pressure for the pump stations.
RISK(S): Failure of the Clearwell would cause a disruption to the supply of water.
IMPACT ON OPERATIONS: Ability to meet system reliability and water quality regulations.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$28,132,103	1,986,316	8,406,316	16,606,316	0	0	\$26,998,948	

Water Treatment Plant

Corrosion Control Chemical Storage & Feed Systems

PROJECT NUMBER: 2017-322-107-0
WARD: Systemwide

PHASE: Construction
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Installation of three phosphoric acid storage and feed systems located at Aspinwall Pump Station, Bruecken Pump Station, and the Membrane Filtration Plant to provide corrosion control in the distribution system.
PROJECT JUSTIFICATION: Required in order to lower lead levels in water.
RISK(S): The existing corrosion control system was not adequate to maintain lead levels below the PA DEP action limit.
IMPACT ON OPERATIONS: In order to prevent algae growth in the open Highland No. 1 Reservoir, treatment must occur at three major locations with 6 injection points. This requires additional maintenance of treatment facilities at satellite locations.
ALTERNATIVES TO THE RECOMMENDED ACTION: Abandon Membrane Filtration Plant and the Highland No. 1 Reservoir and add orthophosphate at the Water Treatment Plant or use another less effective corrosion control method.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$9,346,377	600,404	0	0	0	0	\$600,404	

Water Treatment Plant

Emergency Clarifier Repairs - Clarifiers No. 1, 2 & 4

PROJECT NUMBER: 2017-322-101-6
WARD: Systemwide

PHASE: Construction
PRIORITY: Water Quality, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Replacement of mechanical equipment in Clarifier basin #2, concrete repairs in basins #2 and #4, replacement of sluice gate stem and actuator in basin #1.
PROJECT JUSTIFICATION: Having two clarifier basins inoperable at the same time would likely result in inadequate turbidity removal which is a critical treatment process.
RISK(S): The clarifier basins have come to the end of their useful life and are nearly inoperable. Failure of these basins would negatively impact the treatment of water.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy of equipment.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$778,082	258,662	0	0	0	0	\$258,662	

Water Treatment Plant

Hydraulic Valve Replacement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project is retrofitting the various hydraulic valve actuators primarily in the filters to electric valve actuators.
PROJECT JUSTIFICATION: The intent is to improve operational control while modernizing the facility to better align with industry standard practices.
RISK(S): None.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$3,250,000	0	0	199,334	1,618,744	1,431,922	\$3,250,000	

Water Treatment Plant

Instrumentation Upgrade

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE:
Not Started

PRIORITY:
Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency

PROJECT DESCRIPTION:
This project standardizes the key instrumentation at the remote sites. This project provides a methodical approach to replacement. It includes a study to document all equipment by tag number, location, condition, make and model number. The study would include recommendations for standardization by device type (pressure sensor, flowmeter, etc.) along with replacement costs for work done by a contractor. This project does not include any upgrades to water quality analyzers (turbidimeters, DO, Conductivity, or the like).

PROJECT JUSTIFICATION:
At present, devices were added under various projects with no standardization. This has resulted in increased maintenance cost as each brand requires different spare parts, different training, and in most cases different tools for maintenance purposes. Most of the equipment is beyond useful life and due for replacement.

RISK(S):
Failure to upgrade systems will cause loss of signal and possible loss of control of systems.

IMPACT ON OPERATIONS:
Increased system reliability and improved system management.

ALTERNATIVES TO THE RECOMMENDED ACTION:
There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Project Fund)
Total	\$1,040,000	1,040,000	0	0	0	0	\$1,040,000	

Water Treatment Plant

Lime Slurry System Improvements

PROJECT NUMBER: 2017-322-101-7

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Lime slurry system capacity expansion improvements to include demolition, installation of additional tanks, chemical feed equipment, minor revisions to the existing lime slurry system, and SCADA communications equipment and SCADA interface.
PROJECT JUSTIFICATION: Adequate lime storage is mandated by PADEP. New system will be more efficient/require less labor to operate and maintain.
RISK(S): The extra storage for liquid lime is critical to the reliable operation of the Water Treatment Plant.
IMPACT ON OPERATIONS: Adequate storage, increased reliability and efficiency, less housekeeping labor (for spillage).
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,294,350	1,412,017	882,333	0	0	0	\$2,294,350	

Water Treatment Plant

Ross Pump Station

PROJECT NUMBER: 2018-323-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, meters, SCADA, electrical equipment, HVAC, auxiliary systems, as well as the rehabilitation of the building architectural and energy management systems.
PROJECT JUSTIFICATION: Pump station is in need of rehabilitation. Pumps and ancillary systems are beyond their design life.
RISK(S): Exposes the Authority to higher capital costs to address emergency failures.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, life expectancy, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$24,266,869	1,318,008	0	1,318,008	2,553,640	18,863,985	\$24,053,641	



Water Pumping and Storage



Water Pumping and Storage

2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4

PROJECT NUMBER: 2019-325-103-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Condition assessment and rehabilitation or replacement of Rising Mains 3 and 4. Replacement or rehabilitation depending upon existing condition of rising mains.
PROJECT JUSTIFICATION: Rising Mains 3 and 4 feed the Highland 2 Pump Station. The capacity of these rising mains may need to be increased to accommodate additional flow during the bypass of the clearwell. These mains will need to accommodate demand from both Highland No. 1 and Highland No. 2 reservoirs during the bypass of the clearwell as well as to supply a redundant feed to the Highland No. 1 reservoir.
RISK(S): The consequences of failure for larger mains are much greater than for smaller distribution mains. Consequences typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Debt (Revenue Bonds)
Total	\$28,929,495	11,000,000	11,552,785	6,025,215	0	0	\$28,578,000	

Water Pumping and Storage

Aspinwall Pump Station Improvements

PROJECT NUMBER: 2017-323-104-0

WARD: Systemwide

PHASE:

Design

PRIORITY:

Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service

PROJECT DESCRIPTION:

Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems at the Bruecken and Aspinwall Pump Stations or replacement with a single high service pump station at the Water Treatment Plant.

PROJECT JUSTIFICATION:

The pump Station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, and allow the pumps to operate over a wide range of flow, allow the pumps to operate while the clearwell is being replaced. Alternately, a new high service pump station to replace the existing pump stations is also being investigated.

RISK(S):

Exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.

IMPACT ON OPERATIONS:

Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.

ALTERNATIVES TO THE RECOMMENDED ACTION:

There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$28,720,269	2,135,526	8,490,526	18,090,526	0	0	\$28,716,578	

Water Pumping and Storage

Aspinwall Pump Station to Lanpher Reservoir Rising Main

PROJECT NUMBER: 2018-323-100-0
WARD: Systemwide

PHASE: Design
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Construction of a new, redundant rising main from Aspinwall Pump Station to Lanpher Reservoir.
PROJECT JUSTIFICATION: The existing 60" rising main that supplies the Lanpher Reservoir is a 150 year old riveted steel pipe, has several tap connections to critical and bulk customers, and has experienced recent pipe failures. The new proposed rising main would serve as a primary supply source for the Lanpher Reservoir during the Clearwell Replacement Project and a redundant supply line in case of a failure or planned cleaning and rehabilitation of the existing 60" supply main.
RISK(S): Failure of the rising main could impact up to half of the Authority's customers.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing 60-inch supply main and construction of a parallel main in sections that cannot currently be isolated to clean, inspect, or rehabilitate.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$58,107,771	5,000,000	16,661,613	34,338,387	0	0	\$56,000,000	

Water Pumping and Storage

Bruecken Pump Station Improvements

PROJECT NUMBER: 2017-323-106-0
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems.
PROJECT JUSTIFICATION: The pump station was constructed in 1931. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, allow the pumps to operate more efficiently over a wide range of flow demands, and will reduce the required size of the new clearwell.
RISK(S): Exposes the Authority to higher capital costs to address emergency facility failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$24,456,425	1,668,553	6,182,033	16,600,073	0	0	\$24,450,659	

Water Pumping and Storage

Chlorine Booster Station Improvements

PROJECT NUMBER: 2019-323-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability
PROJECT DESCRIPTION: Replacement of existing chlorine injection facilities at reservoirs and tanks for chlorine residual.
PROJECT JUSTIFICATION: The Authority boosts chlorine residual at a majority of its storage facilities. Recent changes to PA DEP regulations require an increase in minimum chlorine residual levels in the distribution system. All chlorine booster facilities need to be upgraded in order to meet these requirements.
RISK(S): Exposes the Authority's customers to poor water quality.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$9,732,913	2,698,491	3,523,793	3,261,896	0	0	\$9,484,180	

Water Pumping and Storage

Clearwell Improvements

PROJECT NUMBER: Unidentified

WARD: Systemwide

PHASE:
Not Started

PRIORITY:
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:
Replacement of the existing 108 year old clearwell (finished water structure) with multi-celled clearwell to allow for maintenance.

PROJECT JUSTIFICATION:
The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. It has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands, and providing sufficient retention contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. Considering the age and condition of the clearwell, it is the water system's weakest link as there are no practical means to deliver water by bypassing the clearwell, while maintaining the required volume, quality, and contact time.

RISK(S):
Failure of the Clearwell would cause a disruption to the supply of water.

IMPACT ON OPERATIONS:
Ability to meet system reliability and water quality regulations.

ALTERNATIVES TO THE RECOMMENDED ACTION:
There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Debt (Revenue Bonds)
Total	\$57,009,491	200,000	200,000	1,502,024	29,842,950	25,264,517	\$57,009,491	

Water Pumping and Storage

Disinfection By-Products Mitigation

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of existing trihalomethane (THM) removal systems at Allentown tanks, Squirrel Hill Tank, and Brashears Tanks.
PROJECT JUSTIFICATION: Repair of the existing system is exceeding the value of the system. When the system fails, water is sprayed outside the tank facility leading to customer complaints.
RISK(S): Delaying the replacement of the existing systems will result in increased downtime of the existing systems for repairs. This will lead to possible regulatory violations for exceeding THM levels.
IMPACT ON OPERATIONS: Decrease in yearly maintenance for the existing system.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to make costly repairs to existing DBP mitigation equipment. Failure of existing equipment has resulted in loss of water and numerous customer complaints as well as possible failure to meet DEP regulations.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,610,000	1,455,000	0	1,155,000	0	0	\$2,610,000	

Water Pumping and Storage

Garfield Tank Improvements

PROJECT NUMBER: Unidentified

WARD: 9

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Rehabilitation or replacement of the existing tank. Increase of tank capacity may be necessary.
PROJECT JUSTIFICATION: The Garfield Elevated Storage Tank was constructed in 1959 and last rehabilitated in 1992. The existing tank does not have sufficient capacity to meet PA DEP's requirements for sizing, which states that a tank must have sufficient capacity to meet average day demand plus fire flow demand. This project will provide adequate storage through system redundancy to meet the pressure district's demand and fire flow conditions.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Do nothing and risk a failure of the tank. Postpone replacement or full rehabilitation until a later date through short-term rehabilitation.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,049,999	0	0	465,517	1,792,241	1,792,241	\$4,049,999	

Water Pumping and Storage

Herron Hill Pump Station Improvements

PROJECT NUMBER: Unidentified

WARD: 14

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in the late 1890's. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$10,960,000	0	0	1,259,770	4,850,115	4,850,115	\$10,960,000	

Water Pumping and Storage

Herron Hill Reservoir Improvements

PROJECT NUMBER: 2019-323-100-0
WARD: 5

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
PROJECT JUSTIFICATION: The existing cover has reached the end of its useful life and must be replaced. Existing chlorine feed systems are beyond their useful life and must be replaced.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$4,739,281	2,751,211	0	0	0	0	\$2,751,211	

Water Pumping and Storage

Herron Hill Tank Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$1,110,000	0	0	127,586	491,207	491,207	\$1,110,000	

Water Pumping and Storage

Highland No. 2 Reservoir Improvements

PROJECT NUMBER: 2019-323-102-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system and an upgrade of the reservoir outlet structure.
PROJECT JUSTIFICATION: The Highland No. 2 Reservoir will be used as a temporary clearwell while the new clearwell is being constructed. Existing chlorine feed facilities must be upgraded to meet PA DEP regulatory requirements for distribution chlorine residual. Existing reservoir outlet structure must be upgraded to accommodate new Highland Reservoir Pump Station.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$27,252,938	17,893,400	8,946,700	0	0	0	\$26,840,100	

Water Pumping and Storage

Highland Reservoir Pump Station and Rising Main

PROJECT NUMBER: 2017-323-101-0

WARD: Systemwide

PHASE:

Design

PRIORITY:

Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Level of Service

PROJECT DESCRIPTION:

Construction of a new finished water pump station and transmission main to supply water to the Highland No. 1 Service Area from Highland No. 2 Reservoir.

PROJECT JUSTIFICATION:

All compliant water supply for the Highland No. 1 Service Area currently flows through the Highland No. 1 Reservoir and the Membrane Filtration Plant. There is no other source water supply for the Highland No. 1 Service Area. In addition to providing alternate supply, this project is to temporarily provide finished water that meets the chlorine disinfection rules to the Highland No. 1 Service Area during the Clearwell Replacement Project. Additionally, this new facility could also be designed to service the Garfield pressure district, thus eliminating the rehabilitation of the Highland Pump Station.

RISK(S):

Failure of the two rising mains (No. 1 or No. 2), Membrane Filtration Plant, or Bruecken Pump Station would result in the loss of compliant water supply to approximately 40% of the Authority's customer base.

IMPACT ON OPERATIONS:

Increased operation and maintenance labor and expenses. Increased operating flexibility in the future.

ALTERNATIVES TO THE RECOMMENDED ACTION:

Construction of a new clearwell at the site of the existing west sedimentation basin. However, a previous study still recommended the addition of these assets as part of the Clearwell Replacement project.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$36,056,903	10,000,000	10,670,664	12,926,750	0	0	\$33,597,414	

Water Pumping and Storage

Howard Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 21, 24, 25, 26, 27

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed between 1900 and 1904. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for the staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$10,396,839	0	0	0	2,143,678	8,253,161	\$10,396,839	

Water Pumping and Storage

Inline Pump Station (Coral and Pacific) Improvements

PROJECT NUMBER: Unidentified

WARD: 8

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$600,000	0	0	68,966	265,517	265,517	\$600,000	

Water Pumping and Storage

Lanpher Reservoir Improvements

PROJECT NUMBER: 2017-323-105-0

WARD: 25

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
PROJECT JUSTIFICATION: The existing cover failed and had to be replaced on an emergency basis as part of the PA DEP October 2017 Administrative Order. Existing chlorine feed systems are beyond their useful life and must be replaced.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$16,859,005	1,000,000	3,879,693	7,879,693	0	0	\$12,759,386	

Water Pumping and Storage

Lincoln Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, and auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in 1952. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

	<u>CASH FLOW SUMMARY</u>							<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$831,772	171,489	660,233	0	0	0	\$831,722	

Water Pumping and Storage

Lincoln Pump Station: Bypass Pump Station Project

PROJECT NUMBER: 2020-323-100-0
WARD: 12

PHASE: Design
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Construction of a temporary bypass pump station that will be used at the Lincoln Pump Station and Saline pump station. This pump station will allow for the existign pump station to be taken off line completely for rehabilitation.
PROJECT JUSTIFICATION: Repair of existing pump station while trying to keep it online increases the cost and construction time. This is a cost effective way to provide temporary pumping.
RISK(S): Delaying the construction of this pump station will delay the renewal of existing pump stations that are in need of upgrades.
IMPACT ON OPERATIONS: Decrease in yearly maintenance for the existing system.
ALTERNATIVES TO THE RECOMMENDED ACTION: Attempt to rehabilitate/repair existing pump stations while they are in service.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$890,100	890,100	0	0	0	0	\$890,100	

Water Pumping and Storage

Lincoln Tank Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Rehabilitation or replacement of the existing tank.
PROJECT JUSTIFICATION: Constructed in 1939, this tank is nearing the end of its useful life. The last inspection, which was performed in 2018, noted deficiencies that need to be addressed to ensure water quality standards are met.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure.
IMPACT ON OPERATIONS: Increased flexibility and reliability and system compliance.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing tank, which may be a larger investment than replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,195,000	0	0	482,184	1,856,408	1,856,408	\$4,195,000	

Water Pumping and Storage

Mission Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 16, 17, 18, 20

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The Mission Pump Station is the only pumping station located south of the Monongahela River and was originally constructed between 1910 and 1912. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$16,865,000	0	0	1,938,506	7,463,247	7,463,247	\$16,865,000	

Water Pumping and Storage

Saline Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 14 & 15

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in 1935. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$171,489	0	171,489	0	0	0	\$171,489	

Water Pumping and Storage

Spring Hill Tank Improvements

PROJECT NUMBER: Unidentified
WARD: 24 & 26

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Perform a comprehensive inspection of the existing storage tanks and rehabilitation or replacement of the existing tanks.
PROJECT JUSTIFICATION: Constructed in 1929 of riveted steel, the coatings and structure of these tanks need to be rehabilitated due to corrosion.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure. Additionally, it exposes the Authority's staff and contractors to safety issues.
IMPACT ON OPERATIONS: Increased flexibility and reliability and system compliance.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing tank, which may be a larger investment than replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,125,001	0	0	244,253	940,374	940,374	\$2,125,001	



Water Distribution



Water Distribution System

Bus Rapid Transit (BRT) Water Distribution

PROJECT NUMBER: 2020-325-102-0
WARD: 1 & 4

PHASE: Design
PRIORITY: Regional Cooperation/ Stewardship and Level of Service
PROJECT DESCRIPTION: The City of Pittsburgh is making roadway improvements on Fifth Ave and Forbes Ave from downtown through Oakland, with full depth reconstruction planned on Forbes from Crosstown Blvd to Craft Ave and on Fifth between Crosstown Blvd and the Birmingham Bridge. The City's work, in partnership with the Port Authority, will include signal pole upgrades, traffic redesign, sidewalk bumpouts, and new bus shelters. The full depth reconstruction portion of the project has the potential to affect existing 15-inch, 16-inch, 20-inch, and 6-inch mains that are 80-100+ years old. The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains. These mains should be replaced as part of this project. However, first a study should be completed to ensure proper size of these mains as they could be oversized.
PROJECT JUSTIFICATION: The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains.
RISK(S): Replacement of water mains along the Fifth and Forbes corridor reduces the risk of service outages due to breaks, reduces the potential for inadequate capacity for firefighting activities, and improves water quality.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay the replacement of the required watermains and risk damage to the water system resulting from the project.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$11,697,747	9,200,000	2,300,000	0	0	0	\$11,500,000	

Water Distribution System

2023-2025 District Metering

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of system flow meters to track the flow of water and compare to area consumption to determine where leaks are the greatest.
PROJECT JUSTIFICATION: The district metering is intended to gather additional information on areas with suspected leakage and then prioritize areas for rehabilitation and replacement.
RISK(S): Failure to track water loss will result in loss of revenue.
IMPACT ON OPERATIONS: Decreased water loss.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$9,850,000	0	0	3,190,000	3,280,000	3,380,000	\$9,850,000	
2023 District Metering		0	0	3,190,000	0	0	\$3,190,000	Debt (Revenue Bonds)
2024 District Metering		0	0	0	3,280,000	0	\$3,280,000	
2025 District Metering		0	0	0	0	3,380,000	\$3,380,000	

Water Distribution System

District Water and Pressure Meters

PROJECT NUMBER: 2017-325-114-0

WARD: Systemwide

PHASE: Construction
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of water meters and pressure monitors in the distribution system to determine water usage and loss, and pressure loss.
PROJECT JUSTIFICATION: This project will help determine areas of water loss in the water system. This information can then be used to develop an action plan to mitigate water loss.
RISK(S): Customers may experience temporary service outages as a result of the work on this project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	DSIC - Water
Total	\$2,004,204	485,135	0	1,455,404	0	0	\$1,940,539	

Water Distribution System

Duck Hollow

PROJECT NUMBER: Unidentified
WARD: 14

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Either repair the existing failed 16" main or abandon and provide interconnections with the Squirrel Hill system.
PROJECT JUSTIFICATION: The Duck Hollow 16" main failed as a result of a landslide in 2018. The main will need to either be abandoned and replaced with emergency interconnections or replaced. Rehabilitation of the failed slope may be required.
RISK(S): Existing failed 16" main does not provide any backup water supply leading to a loss of resiliency.
IMPACT ON OPERATIONS: Increased system reliability and improved sytem management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,000,270	0	0	3,000,270	0	0	\$3,000,270	

Water Distribution System

Herron Hill - Squirrel Hill Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve adjustments to move the boundary between the Herron Hill Reservoir and Squirrel Hill pressure districts.
PROJECT JUSTIFICATION: Herron Hill and Squirrel Hill operate on similar hydraulic gradients. There are areas where these two systems intertwine, which has led to long dead end lines as well as frequent opening and altering of dividing pressure valves. Moving the boundary of the two zones to incorporate more of the Herron Hill system into the Squirrel Hill system will alleviate these issues as well as alleviate demand on the Herron Hill Reservoir.
RISK(S): Existing long dead ends can cause water quality issues.
IMPACT ON OPERATIONS: Decreased leakage between pressure districts.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$830,000	0	0	0	0	830,000	\$830,000	

Water Distribution System

Highland Park MFP Improvements Project

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Rehabilitation of the backwash recovery system; repairs to deteriorated areas of the reinforced concrete metal floor deck slab that comprises the second floor of the MFP building; repair of the deteriorated concrete floor and containment wall of the acid room; replacement of the pipe insulation in the pump room; and, repainting walls, ceiling, exposed structural steel framing, ferrous metal and pipe insulation on the first floor of the MFP building.
PROJECT JUSTIFICATION: Repair of the backwash water recovery system will reclaim up to 400,000 GPD of waste discharge to the public sanitary sewer system. Repairs to the composite floor deck and concrete floor in the acid room are required to preclude potential loss of structural integrity if not mitigated. Replacement of damaged or removed pipe insulation is required to mitigate pipe sweating and dripping onto equipment and walkways below.
RISK(S): Delaying the rehab of the backwash recovery system sends unnecessary wastewater flow to the public sewer system, stressing downstream sewer capacity.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Project Fund)
Total	\$1,957,500	225,000	1,732,500	0	0	0	\$1,957,500	

Water Distribution System

2023-2025 Intermediate Main Replacement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Strategic replacement of water mains to improve system reliability as well as improve water pressure, maintain water quality, and minimize disturbance to the community. Program will focus on 16" to 36" diameter mains.
PROJECT JUSTIFICATION: By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving overall replacement cost. Additionally, projects will be coordinated with other utilities to minimize disturbance to the community and street surface restoration costs. Water quality will also improve by removing tuberculated mains.
RISK(S): Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability, decrease in non-revenue water due to leaks.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$38,581,035	0	0	2,847,356	12,768,391	22,965,287	\$38,581,035	
2023 Intermediate Main Replacement		0	0	2,847,356	9,836,322	9,836,322	\$22,520,000	Debt (Revenue Bonds)
2024 Intermediate Main Replacement		0	0	0	2,932,069	10,128,966	\$13,061,035	
2025 Intermediate Main Replacement		0	0	0	0	3,000,000	\$3,000,000	

Water Distribution System

2021-2025 Intermediate Meters

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of customer meters size 1.5" to 2".
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue or violate regulatory requirements.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$409,000	75,000	80,000	82,000	85,000	87,000	\$409,000	
2021 Intermediate Meters		75,000	0	0	0	0	\$75,000	Debt (Revenue Bonds)
2022 Intermediate Meters		0	80,000	0	0	0	\$80,000	
2023 Intermediate Meters		0	0	82,000	0	0	\$82,000	
2024 Intermediate Meters		0	0	0	85,000	0	\$85,000	
2025 Intermediate Meters		0	0	0	0	87,000	\$87,000	

Water Distribution System

2020, 2023-2025 Large Diameter Water Main Replacement

PROJECT NUMBER: 2020-424-103-0 ,Unidentified

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Strategic replacement or rehabilitation of large diameter water mains (16" and larger) and appurtenances to improve system reliability and hydraulics, including internal and external inspections.
PROJECT JUSTIFICATION: The Authority's water system has approximately 122 miles of large diameter water mains. Maintaining a proactive approach to replacing large mains will ensure that large mains are replaced before the end of their useful life.
RISK(S): The consequences of failure for larger mains are much greater than for smaller distribution mains, which typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$41,082,455	5,500,000	0	2,248,276	11,366,207	21,966,552	\$41,081,035	
2020 Large Diameter Main Replacement – Four Mile Run	5,500,000	0	0	0	0	0	\$5,500,000	Debt (Revenue Bonds)
2023 Large Diameter Main Replacement	0	0	2,248,276	8,655,862	8,655,862	\$19,560,000		
2024 Large Diameter Main Replacement	0	0	0	2,710,345	10,434,828	\$13,145,173		
2025 Large Diameter Main Replacement	0	0	0	0	2,875,862	\$2,875,862		

Water Distribution System

2020-2025 Large Meter Replacement

PROJECT NUMBER: 2020-325-101-0, Unidentified

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Annual replacement of water meters larger than 1".
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$7,061,587	1,512,919	1,709,414	1,546,031	1,585,000	587,000	\$6,940,364	
2020 Large Meter Replacement		335,235	0	0	0	0	\$335,235	DSIC - Water
2021 Large Meter Replacement		1,177,684	639,207	0	0	0	\$1,816,891	
2022 Large Meter Replacement		0	1,070,207	683,052	0	0	\$1,753,259	
2023 Large Meter Replacement		0	0	862,979	500,000	0	\$1,362,979	
2024 Large Meter Replacement		0	0	0	1,085,000	250,000	\$1,335,000	
2025 Large Meter Replacement		0	0	0	0	337,000	\$337,000	

Water Distribution System

2020-2021 Lead Service Identification Program

PROJECT NUMBER: 2020-325-100-0, Unidentified
WARD: Systemwide

PHASE: Non Construction / Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Locating lead service lines allows the Authority to identify both individual service lines to replace and waterlines that have a particularly high amount of lead service lines that can be replaced to facilitate the lead service line replacements.
PROJECT JUSTIFICATION: Understanding where the lead service lines are within the water system will allow the Authority to more efficiently replace all lead service lines.
RISK(S): Failure to identify all lead service lines could slow the rate in which they are replaced.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$5,858,328	1,500,000	1,500,000	2,558,667	0	0	\$5,558,667	
2020 Lead Service Identification Program		1,500,000	0	0	0	0	\$1,500,000	Debt (Revenue Bonds)
2022 Lead Service Identification Program		0	1,500,000	2,558,667	0	0	\$4,058,667	

Water Distribution System

Lead Service Line Replacement

PROJECT NUMBER: 2018-325-100-0/1/2/3/4/5
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Replacement of 7% of lead service lines per year.
PROJECT JUSTIFICATION: Due to the exceedance of the action levels from compliance tests for lead and copper, the PA DEP required the Authority to perform additional distribution system water quality monitoring, and the optimization of corrosion control treatment, public education, and lead service line replacement.
RISK(S): Failure to comply will result in regulatory fines and poses a public health risk.
IMPACT ON OPERATIONS: Reduction in service line failure due to replacing with new infrastructure, reducing demands on operations repair crews.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$29,931,717	3,111,200	0	0	0	0	\$3,111,200	

Water Distribution System

Low Pressure Area Remediation

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE:
Not Started

PRIORITY:
Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:
Fix chronically low pressure areas by either extending neighboring higher pressure districts into the area, booster pump stations, or household booster pumps.

PROJECT JUSTIFICATION:
This project is in response to the low pressure monitors required by the October 2017 Administrative Order.

RISK(S):
Customers may experience temporary service outages as a result of the work on this project.

IMPACT ON OPERATIONS:
Increased system reliability and improved system management.

ALTERNATIVES TO THE RECOMMENDED ACTION:
There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,393,358	1,029,259	1,093,445	170,654	0	0	\$2,293,358	

Water Distribution System

North Side Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 21, 22, 23, 24, 25, 26, 27

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve installation to move some low pressure areas from the McNaugher Pressure District to the Brashears Pressure District.
PROJECT JUSTIFICATION: Areas within the McNaugher Pressure District that are near the Brashears Pressure District could have increased pressure by moving the pressure zone boundary through main improvements and valve adjustments.
RISK(S): Existing services are near or below minimum standards (20 psi).
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$1,200,000	0	0	0	0	1,200,000	\$1,200,000	

Water Distribution System

2021-2025 Private Lead Service Line Reimbursement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Reimbursement of private line lead service line costs.
PROJECT JUSTIFICATION: Replacing both private and public lead service lines is required to eliminate lead in the water system.
RISK(S): Failure to replace private lead service lines poses a public health risk.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$1,760,287	500,000	375,000	375,000	375,000	135,287	\$1,760,287	
2021 Private Lead Service Line Reimbursement		500,000	0	0	0	0	\$500,000	Debt (Revenue Bonds)
2022 Private Lead Service Line Reimbursement		0	375,000	0	0	0	\$375,000	
2023 Private Lead Service Line Reimbursement		0	0	375,000	0	0	\$375,000	
2024 Private Lead Service Line Reimbursement		0	0	0	375,000	0	\$375,000	
2025 Private Lead Service Line Reimbursement		0	0	0	0	135,287	\$135,287	

Water Distribution System

2021-2025 Regulator Valve and Vault Replacement

PROJECT NUMBER: Unidentified

WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of pressure zone interconnection vaults including new pressure regulators, flow meters, pressure transmitters, and SCADA communications.
PROJECT JUSTIFICATION: Existing regulator stations are in need of replacement. This will also aid in identification of non-revenue water.
RISK(S): Failure to fix could result in catastrophic failure of the vault.
IMPACT ON OPERATIONS: Decreased leakage will result in decrease of pumping energy.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$13,500,000	2,000,000	1,000,000	3,000,000	4,500,000	3,000,000	\$13,500,000	
2021 Regulator Valve and Vault Replacement		2,000,000	0	0	0	0	\$2,000,000	Debt (Revenue Bonds)
2022 Regulator Valve and Vault Replacement		0	1,000,000	0	0	0	\$1,000,000	
2023 Regulator Valve and Vault Replacement		0	0	3,000,000	0	0	\$3,000,000	
2024 Regulator Valve and Vault Replacement		0	0	0	4,500,000	0	\$4,500,000	
2025 Regulator Valve and Vault Replacement		0	0	0	0	3,000,000	\$3,000,000	

Water Distribution System

2019-2025 Small Diameter Water Main Replacement

PROJECT NUMBER: 2019-325-101-0, 2019-325-102-0/1/2, 2020-325-106-0/1/2,
Unidentified

WARD: Systemwide

PHASE: Construction / Design / Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Strategic replacement of water mains to improve system reliability as well as improve water pressure, maintain water quality, and minimize disturbance to the community. Program will initially focus on replacing existing 4" and 6" unlined cast iron mains and mains with a history of frequent breaks.
PROJECT JUSTIFICATION: By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving overall replacement cost. Additionally, projects will be coordinated with other utilities to minimize disturbance to the community and street surface restoration costs. Water quality will also improve by removing tuberculated mains.
RISK(S): Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$287,163,430	45,838,708	19,950,643	38,645,977	75,436,736	103,691,564	\$283,563,628	
2019 Small Main Replacement	11,918,082	0	0	0	0	0	\$11,918,082	PENNVEST
2020 Small Main Replacement	25,120,626	0	0	0	0	0	\$25,120,626	
2021 Small Main Replacement	7,300,000	10,950,643	0	0	0	0	\$18,250,643	Debt (Revenue Bonds)
2022 Small Main Replacement	1,500,000	6,000,000	11,500,000	0	0	0	\$19,000,000	
2023 Small Main Replacement	0	3,000,000	14,000,000	21,000,000	0	0	\$38,000,000	
2024 Small Main Replacement	0	0	13,145,977	40,489,609	60,734,414	0	\$114,370,000	
2025 Small Main Replacement	0	0	0	13,947,127	42,957,150	0	\$56,904,277	

Water Distribution System

2020-2025 Small Meter Replacement

PROJECT NUMBER: 2020-325-107-0

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Annual replacement of water meters 1" or less.
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue or violate regulatory requirements.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$7,321,915	1,357,684	1,796,385	1,721,106	1,650,000	500,000	\$7,025,175	
2020 Small Meter Replacement		255,000	0	0	0	0	\$255,000	DSIC - Water
2021 Small Meter Replacement		1,102,684	639,207	0	0	0	\$1,741,891	
2022 Small Meter Replacement		0	1,157,178	683,052	0	0	\$1,840,230	
2023 Small Meter Replacement		0	0	1,038,054	650,000	0	\$1,688,054	
2024 Small Meter Replacement		0	0	0	1,000,000	250,000	\$1,250,000	
2025 Small Meter Replacement		0	0	0	0	250,000	\$255,000	

Water Distribution System

South Side Slopes Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 16, 17

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve adjustments to move the boundary between the Highland No. 2 and Allentown Pressure Districts.
PROJECT JUSTIFICATION: Areas within the Highland No. 2 pressure district that are near the Allentown pressure district could have increased pressure by moving the pressure zone boundary through main improvements and valve adjustments.
RISK(S): Existing services are near or below minimum standards (20 psi).
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,200,000	0	0	0	0	1,200,000	\$1,200,000	

Water Distribution System

2020-2021 Unmetered and Flat Rate Properties

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Metering unmetered and flat rate properties as required by regulations.
PROJECT JUSTIFICATION: Required per the PUC regulations. The impact of not installing meters is the loss of revenue and lack of ability to accurately estimate water loss in the system.
RISK(S): Failure to comply with PUC regulations and the potential of lost revenue.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$4,307,553	1,548,564	1,744,689	527,947	0	0	\$3,821,199	
2020 Unmetered and Flat Rate Properties		1,441,278	879,992	0	0	0	\$2,321,200	DSIC - Water
2021 Unmetered and Flat Rate Properties		107,286	864,767	527,947	0	0	\$1,500,000	

Water Distribution System

2020-2025 Valve Replacement

PROJECT NUMBER: 2020-325-104-0, Unidentified
WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of defective or non-operational valves on transmission and distribution mains throughout the water distribution system, excluding valves replaced during waterline relays.
PROJECT JUSTIFICATION: Increasing the number of operable valves in the system will reduce the number of valves that would need to be closed during emergency conditions, and therefore the number of customers that may be impacted.
RISK(S): A larger number of customers may be subject to service outages.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all repairs. This would require an increase in operation expenses for both personnel and equipment.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$21,204,425	1,498,333	1,300,000	2,942,149	6,123,334	7,823,333	\$19,687,149	
2020 Valve Replacement		998,333	0	0	0	0	\$998,333	Debt (Revenue Bonds)
2021 Valve Replacement		500,000	300,000	0	0	0	\$800,000	
2022 Valve Replacement		0	1,000,000	708,816	0	0	\$1,500,000	
2023 Valve Replacement		0	0	2,233,333	1,116,667	0	\$3,350,000	
2024 Valve Replacement		0	0	0	5,006,667	2,503,333	\$7,510,000	DISC – Water / Debt (Revenue Bonds)
2025 Valve Replacement		0	0	0	0	5,320,000	\$5,320,000	

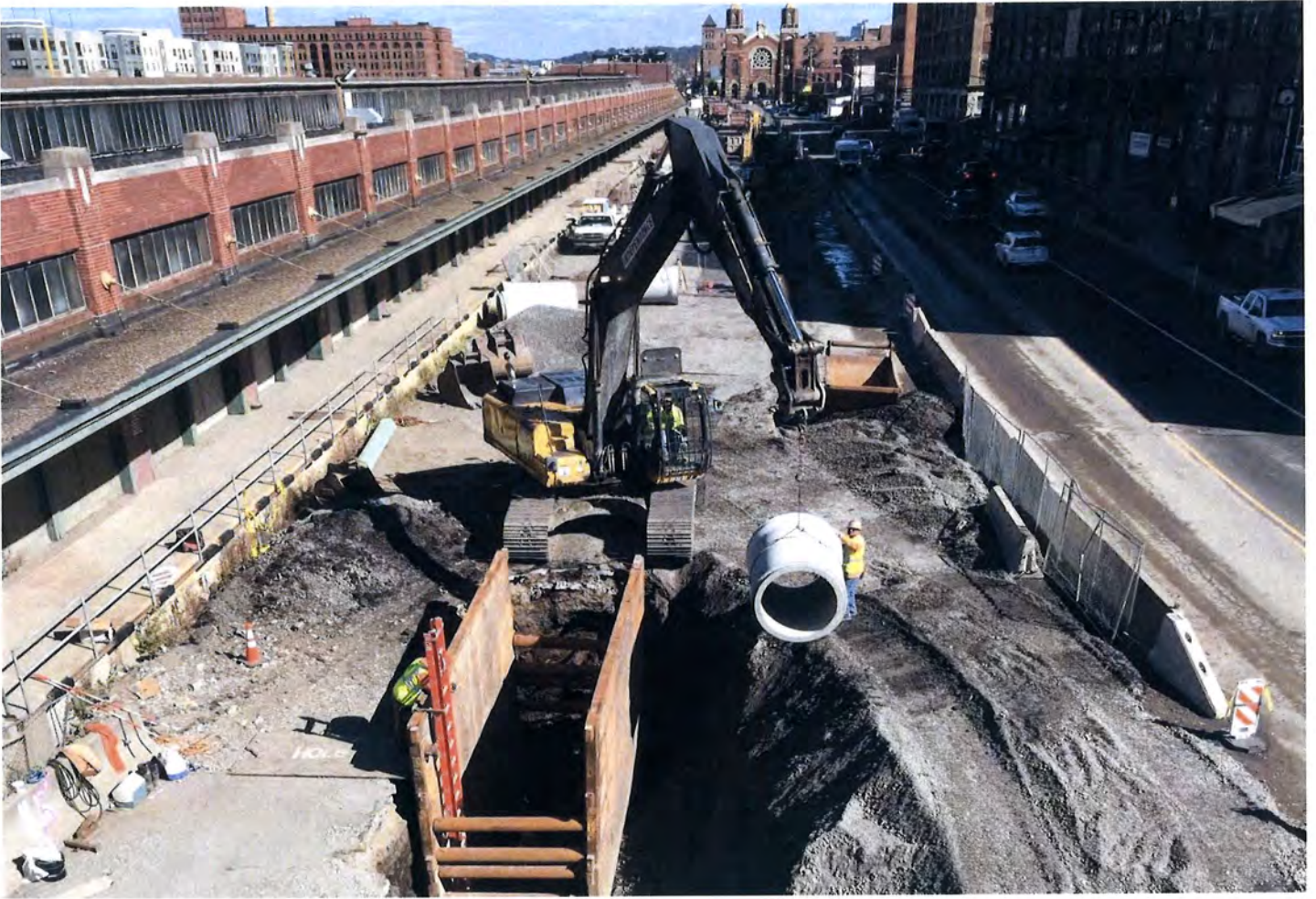
Water Distribution System

2021-2025 Water Relay

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of existing water mains, valves, fittings, service connections, and hydrants due to emergency situations.
PROJECT JUSTIFICATION: The existing water distribution system is aging and updates are required to address failures that could be significant public safety hazards.
RISK(S): Customers will be subject to service outages or inadequate pressure for firefighting activities until break is addressed.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all upgrades. This would require an increase in operations expenses for both personnel and equipment.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$8,227,500	863,750	1,763,750	1,840,000	1,880,000	1,880,000	\$8,227,500	
2021 Water Relay		863,750	863,750	0	0	0	\$1,727,500	Debt (Revenue Bonds)
2022 Water Relay		0	900,000	900,000	0	0	\$1,800,000	
2023 Water Relay		0	0	940,000	940,000	0	\$1,880,000	
2024 Water Relay		0	0	0	940,000	940,000	\$1,880,000	
2025 Water Relay		0	0	0	0	940,000	\$940,000	



Wastewater System

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Wastewater System

31st Ward Sewer System

PROJECT NUMBER: 2017-424-100-0

WARD: 31

PHASE: Construction
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Regional Cooperation/ Stewardship, Level of Service
PROJECT DESCRIPTION: Evaluation to identify and locate the source(s) of the infiltration and inflow (I/I), removal of public I/I sources, and rehabilitation/replacement of the Rogers Street and Mifflin Road Pump Station and force main.
PROJECT JUSTIFICATION: Both sewage pump stations and the force main that convey flow to the Streets Run Sanitary Trunk Sewer were constructed in the late 1940's and are reaching the end of their useful life. Additionally, past studies suggest this sewershed may be significantly impacted by high levels of infiltration/inflow.
RISK(S): Increased combined sewer overflows and pump station system failures.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Abandonment of the existing pump stations and installation of a new gravity main to convey flows to the West Mifflin Sanitary Authority.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds) / DSIC - Sewer</u>
Total	\$8,047,680	2,904,302	348,961	450,000	150,000	2,360,776	\$6,214,039	

Wastewater System

Browns Hill Road Sewer Pump Station Replacement

PROJECT NUMBER: Unidentified
WARD: 15

PHASE:
Not Started

PRIORITY:
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:
Construction of a replacement 160 GPM sanitary sewer pump station, including standby power, safer ingress and egress for routine maintenance, a water supply for equipment wash down and odor control facilities, if required. Additionally, perform a condition assessment of the 4" force main (approx. 790 l.f.) constructed in 2007, but was not utilized and confirm sanitary sewer separation occurred. Additional sewer separation may need to occur prior to modifying the existing diversion chamber.

PROJECT JUSTIFICATION:
The existing sanitary sewer pump station has reached the end of its useful life. The replacement station will provide increased operating efficiency and resiliency and improved safety conditions for staff.

RISK(S):
If the station is not replaced, pump or wet well failures could occur, which would result in sanitary sewer overflows. Sanitary sewer overflows could result in fines and notice of violations from regulating agencies.

IMPACT ON OPERATIONS:
Increased operating flexibility and reliability.

ALTERNATIVES TO THE RECOMMENDED ACTION:
Delay the construction and risk pump or wet well failures.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,500,000	0	0	187,700	1,030,967	281,333	\$1,500,000	

Wastewater System

2020-2025 Large Diameter Sewer Rehabilitation

PROJECT NUMBER: 2020-424-101-0, Unidentified

WARD: Systemwide

PHASE: Design / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Proactive, trenchless rehabilitation of 36" diameter or greater sewer mains to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.
PROJECT JUSTIFICATION: Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.
RISK(S): If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$21,249,489	2,211,492	6,391,140	3,517,000	4,437,190	4,692,667	\$21,249,489	
2020 Large Diameter Sewer Rehabilitation		1,187,158	2,443,473	0	0	0	\$3,630,632	Debt (Revenue Bonds)
2021 Large Diameter Sewer Rehabilitation		1,024,333	3,105,667	0	0	0	\$4,130,000	
2022 Large Diameter Sewer Rehabilitation		0	842,000	2,430,000	0	0	\$3,272,000	
2023 Large Diameter Sewer Rehabilitation		0	0	1,087,000	3,293,000	0	\$4,380,000	
2024 Large Diameter Sewer Rehabilitation		0	0	0	1,144,190	3,495,810	\$4,640,000	
2025 Large Diameter Sewer Rehabilitation		0	0	0	0	1,196,857	\$1,196,857	

Wastewater System

M-29 Outfall Improvements

PROJECT NUMBER: 2018-424-103-0
WARD: 15

PHASE: Design
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Modifying diversion chamber, rehabilitating culvert, constructing an endwall, and installing flapgate associated with the M-29 outfall structure.
PROJECT JUSTIFICATION: The M-29 outfall structure is critical infrastructure that has been in jeopardy of failing for several years due to significant structural defects in the existing culvert.
RISK(S): The M-29 outfall structure could fail prior to completion of the project.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,614,643	3,473,539	0	0	0	0	\$3,473,539	

Wastewater System

Maytide Storm and Sanitary Sewer System Improvements

PROJECT NUMBER: 2017-424-109-0

WARD: 29

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Reconstruction of storm infrastructure from Merritt Avenue to the storm interceptor on Ravilla Avenue and the realignment of the 10" sanitary sewer on Maytide (Sanderson to Valline).
PROJECT JUSTIFICATION: Localized property and street flooding has been well-documented for several years at this location and the undeveloped right-of-way of Sanderson has significantly deteriorated. Additionally, an inspection of the 10" sanitary sewer on Maytide Street revealed structural and construction defects.
RISK(S): Continual degradation to a steep slope could result in property damage and an increased cost to stabilize. Customers may be subject to basement backups, or overflows may occur due to collapsed pipes.
IMPACT ON OPERATIONS: Increased operating reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds) / DSIC - Sewer</u>
Total	\$5,235,035	2,000,000	1,500,000	1,096,798	0	0	\$4,596,798	

Wastewater System

Queenston Sewer Improvements

PROJECT NUMBER: 2019-424-103-2

WARD: 32

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Removal of a combined sewer diversion chamber and installation of new sewer infrastructure, which will result in the separation of the sewershed.
PROJECT JUSTIFICATION: The existing sewer infrastructure (both storm and sanitary) have significant structural defects, which are located under a large structure in a paper street over 40 feet deep. Additionally, several customers experience sewer backups that are connected to the combined sewer in a mostly separated area.
RISK(S): Customers may be subject to basement backups or overflows may occur due to collapsed pipes.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Reroute the infrastructure (laterals and catch basins) connected to the failed mains; however, this may result in additional basement backups for the customers and may not be feasible due to the existing depth of the existing infrastructure.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,927,040	1,601,450	185,600	0	0	0	\$1,787,050	

Wastewater System

2019 -2025 Sewer Reconstruction

PROJECT NUMBER: 2019-424-102-0, 2020-424-102-0, Unidentified

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Reconstruction of existing sewers, manholes, catch basins, and inlets due to emergency situations or pipe failures.
PROJECT JUSTIFICATION: The existing sewer system is aging and immediate repairs are required to address failures that could be significant public safety hazards.
RISK(S): Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all repairs. This would result in an increase to labor, equipment, and related operating expenses.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$10,308,170	970,175	999,979	1,841,144	1,880,000	1,880,000	\$7,571,297	
2019 Sewer Reconstruction	51,290	0	0	0	0	0	\$51,290	Debt (Revenue Bonds)
2020 Sewer Reconstruction	918,244	0	0	0	0	0	\$918,244	
2022 Sewer Reconstruction	0	999,979	750,021	0	0	0	\$1,750,000	
2023 Sewer Reconstruction	0	0	0	1,091,123	805,080	0	\$1,896,203	DSIC - Sewer
2024 Sewer Reconstruction	0	0	0	0	1,074,920	805,080	\$1,880,000	Debt (Revenue Bonds)
2025 Sewer Reconstruction	0	0	0	0	0	1,074,920	\$1,074,920	

Wastewater System

2018-2025 Sewers Under Structures

PROJECT NUMBER: 2017-424-110-0, 2020-424-104-0, 2020-424-104-1,
Unidentified

WARD: Systemwide

PHASE: Design / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Rehabilitation, relocation, and abandonment, if applicable, of existing sewer infrastructure located under or adjacent to buildings, bridges, or railroads or located on steep slopes.
PROJECT JUSTIFICATION: In recent years, there has been an increasing rate of failure of this asset type due to limited accessibility and pipe age. By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.
RISK(S): Failure of this asset type could result in significant property/structure damage, increased replacement cost, and increased service outages or bypass pumping.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$34,379,243	3,081,151	11,080,611	5,642,667	5,440,122	8,713,821	\$33,958,372	
2018 Sewers Under Structures	1,833,151	3,333,405	519,444	0	0	\$5,686,000	Debt (Revenue Bonds)	
2020 Sewers Under Structures	1,248,000	7,555,635	4,159,365	0	0	\$12,963,000	DSIC – Sewer/ Debt (Revenue Bonds)	
2022 Sewers Under Structures	0	191,571	766,286	4,445,408	2,431,333	\$7,834,598		
2023 Sewers Under Structures	0	0	197,571	790,286	5,250,488	\$6,238,345		
2024 Sewers Under Structures	0	0	0	204,429	817,714	\$1,022,143	Debt (Revenue Bonds)	
2025 Sewers Under Structures	0	0	0	0	214,286	\$214,286		

Wastewater System

2019-2025 Small Diameter Sewer Rehabilitation

PROJECT NUMBER: 2019-424-100-0 / 2019-424-108-0 / 2020-424-100-0/1/2,
2020-424-106-0/1/2, Unidentified

WARD: Systemwide

PHASE: Design/Construction/Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Proactive, trenchless rehabilitation of sewer mains (36" diameter and less) to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.
PROJECT JUSTIFICATION: Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.
RISK(S): If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$105,187,934	19,499,567	24,602,865	16,845,092	21,725,979	21,052,095	\$103,725,599	
2019 Small Diameter Rehabilitation		482,961	0	0	0	0	\$482,961	Debt (Revenue Bonds)
2020 Small Diameter Rehabilitation		11,493,705	2,916,832	0	0	0	\$14,410,538	
2021 Small Diameter Rehabilitation		6,582,901	12,081,232	0	0	0	\$18,664,133	
2022 Small Diameter Rehabilitation		940,000	8,150,000	2,750,000	0	0	\$11,840,000	
2023 Small Diameter Rehabilitation		0	1,454,800	12,554,292	6,990,908	0	\$21,000,000	
2024 Small Diameter Rehabilitation		0	0	1,540,800	13,133,472	7,325,728	\$22,000,000	
2025 Small Diameter Rehabilitation		0	0	0	1,601,600	13,726,367	\$15,327,967	

**\$941,800 ALCOSAN GROW grant funding secured.



Stormwater



Stormwater System

Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements

PROJECT NUMBER: 2020-GI-100-0

WARD: 1 & 4

PHASE: Design
PRIORITY: Safety, Regional Cooperation/Stewardship, Reliability/Operational Flexibility
PROJECT DESCRIPTION: A cost share with the City of Pittsburgh's Department of Mobility and Infrastructure on the redesign of Forbes Avenue and Fifth Avenue to accommodate bus rapid transit from downtown to Birmingham Bridge. This project will include the installation of permeable paving, underground storage, and bioretention plantings and is tributary to the M-05 and M-19 outfall.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,255,882	685,000	1,000,000	350,000	0	0	\$2,035,000	

Stormwater System

2020-2025 Catch Basin and Inlet Replacement

PROJECT NUMBER: 2020-424-105-0/1, Unidentified

WARD: Systemwide

PHASE: Procurement / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Strategic replacement of catch basins and storm inlets throughout the system to replace failed units, stormwater control reliability, and minimize disturbance to the community.
PROJECT JUSTIFICATION: By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.
RISK(S): Overland and street flooding could occur due to a defective or undersized catch basin or storm inlet, creating a public health and safety hazard during wet weather events.
IMPACT ON OPERATIONS: Increased operating reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$38,887,540	8,137,621	1,987,720	8,317,500	9,964,949	10,479,750	\$38,887,540	
2020 Catch Basin and Inlet Replacement		8,121,621	914,643	0	0	0	\$9,036,264	Debt (Revenue Bonds)
2021 Catch Basin and Inlet Replacement		16,000	1,000,000	200,000	0	0	\$1,216,000	
2022 Catch Basin and Inlet Replacement		0	73,077	8,044,423	962,500	0	\$9,080,000	
2023 Catch Basin and Inlet Replacement		0	0	73,077	8,141,923	985,000	\$9,200,000	
2024 Catch Basin and Inlet Replacement		0	0	0	860,526	8,634,224	\$9,494,750	
2025 Catch Basin and Inlet Replacement		0	0	0	0	860,526	\$860,526	

Stormwater System

Fleury Way Stormwater Infrastructure Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Construction of storm sewer infrastructure to address persistent and severe street flooding and roadway damage. Project will include installing approximately 500 ft of 18" storm sewers and 4 new catch basins as well as inverting the crown of the road and adding proper curbing for optimal drainage.
PROJECT JUSTIFICATION: After field assessment and review, the stormwater group ranked this issue as a "high priority" because of the severity of road degradation and persistent street flooding caused by lack of stormwater infrastructure and improper road design. This issue is located in the A-42 Green First sewershed. This project is also a good opportunity to coordinate and share costs with DOMI.
RISK(S): Poor level of service and safety risks.
IMPACT ON OPERATIONS: 4 additional inlets operations will need to add to the cleaning schedule.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$730,141	730,141	0	0	0	0	\$730,141	

**\$123,000 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Four Mile Run Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-102-0

WARD: 15

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Sewer separation, stream restoration, stream daylighting, bioretention, and underground storage to remove the existing stream base and wet weather flow currently discharging into the combined sewer located in M-29.
PROJECT JUSTIFICATION: This project will separate wet weather flow being directly discharged into the Authority's combined sewer system.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$25,400,720	7,000,000	12,800,000	0	0	0	\$19,800,000	

Stormwater System

Lawn and Ophelia

PROJECT NUMBER: 2017-424-104-0

WARD: 4

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Project is located in the South Oakland neighborhood in the City of Pittsburgh and is tributary to the M-19B outfall. This project is intended to be a community gathering space combined with stormwater management features.
PROJECT JUSTIFICATION: It is anticipated that 1.9 impervious acres from neighboring roads and roofs can be managed.
RISK(S): Customer within the service area of this project may experience stormwater related issues prior to the completion of this project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$768,341	600,000	0	0	0	0	\$600,000	

**\$313,900 ALCOSAN GROW grant funding secured.

Stormwater System

Martin Luther King Field Stormwater Infrastructure Improvements

PROJECT NUMBER: 2019-GI-104-0

WARD: 4 & 5

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Installation of regenerative bio-swale and underground detention facilities to capture and detain impervious acres from the adjacent streets and upstream separate storm sewers, which currently discharging into the combined sewer located in M-19.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved sytem management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,654,970	2,008,966	1,339,310	0	0	0	\$3,348,276	

**\$855,270 ALCOSAN GROW grant funding secured.

Stormwater System

Maryland Avenue Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-101-0

WARD: 7

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Permeable paver based GSI project to manage approximately 5.3 acres of impervious acres for 1.5" runoff event.
PROJECT JUSTIFICATION: The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
RISK(S): Continued flooding risk unmitigated, which has contributed to frequent reports of basement backups in this area of the PWSA system.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Implementing stormwater management projects at less cost-effective locations.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$4,454,383	2,610,000	330,000	0	0	0	\$2,940,000	

Stormwater System

Nobles Lane Stormsystems Improvements

PROJECT NUMBER: Unidentified
WARD: 29

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Construction of strategically placed basins and storm sewers to reduce or eliminate overland flooding from roadway onto private property.
PROJECT JUSTIFICATION: After field assessment and review, the stormwater group ranked this issue as a "high priority" because of flooding severity and its location in the Saw Mill Run sewershed. This project seeks to install new catch basins and a new storm sewer to help appropriately manage runoff. This area of the Carrick neighborhood does not have any stormwater infrastructure.
RISK(S): Poor level of service.
IMPACT ON OPERATIONS: The proposed basins will include green filters to add water quality benefits to Saw Mill Run. These will need to be routinely cleaned via the green infrastructure maintenance contractor and will be a minimal impact to this particular operations budget.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$343,322	343,322	0	0	0	0	\$343,322	

**\$65,551 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Saw Mill Run MS4 Compliance Projects

PROJECT NUMBER: Unidentified
WARD: 32 & 29

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Identifying and completing projects related to MS4 compliance.
PROJECT JUSTIFICATION: This project is necessary to become compliant with MS4 regulatory requirements.
RISK(S): The timeline to complete the MS4 compliance projects could take longer than expected.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$3,500,000	0	0	1,000,000	2,500,000	0	\$3,500,000	

Stormwater System

Saw Mill Run PWSA & PennDOT Watershed Improvements

PROJECT NUMBER: Unidentified
WARD: 32

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Implementation of stormwater treatment and reconnection of streams to vegetated floodplains to help mitigate stormwater peak flows and reduce sediment and other pollutant loads. This project will demonstrate the effectiveness of green infrastructure in reducing pollutants, controlling CSO/SSOs, and restoring the health of the aquatic ecosystems in the Saw Mill Run watershed to comply with regulatory obligations.
PROJECT JUSTIFICATION: This project will help to comply with regulatory obligations by reducing pollutants and controlling CSO/SSO's.
RISK(S): It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,000,000	0	200,000	500,000	300,000	0	\$1,000,000	

**Future cost share agreement will be negotiated with PennDOT.

Stormwater System

Southside Flats Sewer Separation

PROJECT NUMBER: Unidentified
WARD: 16 & 17

PHASE: Not Started
PRIORITY: Safety, Regional Cooperation/Stewardship, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Separation of 17 acres of combined sewer through the construction of stormdrain along Wharton Street to 18th Street.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Community members are concerned about disruptions during construction and potential rooftop disconnect costs.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,405,242	0	335,365	3,069,877	0	0	\$3,405,242	

Stormwater System

Southside Stormwater Infrastructure Improvements

PROJECT NUMBER: 2019-GI-100-0

WARD: 16 & 17

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: The Southside Green / Stormwater project is located in the M-16 sewershed, which discharges approximately 103MG of combined sewer overflows (CSOs) in typical year as it is defined in the current system model. Additionally, there are 15 known surface streams/seeps within the park that appear to connect into the combined sewer system. The project will focus on stormwater management source control opportunities within Southside Park. The project will look at separating the stormwater runoff from the park and road right-of-way areas. It will connect through a new storm sewer discharge to be built under South 21st Street to the Monongahela. The project will detain and slowly return the stormwater runoff to the combined sewer system.
PROJECT JUSTIFICATION: This project will help with complying with the Consent Order Agreement by reducing CSO's.
RISK(S): It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$4,970,325	2,156,746	2,156,746	0	0	0	\$4,313,492	

**\$1,489,900 ALCOSAN GROW grant funding secured.

Stormwater System

Thomas and McPherson Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-106-0
WARD: 7

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Installation of roadside bioretention features to capture and detain impervious road runoff in the North Point Breeze neighborhood of the City of Pittsburgh, which is tributary to the A-42 combined sewer outfall.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,671,222	4,319,899	1,387,466	0	0	0	\$5,707,365	

**\$1,517,800 ALCOSAN GROW grant funding secured.

Stormwater System

Tide Gate Installations

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of tide gates at 44 combined sewer overflow diversion chamber locations to assist in preventing river water intrusion.
PROJECT JUSTIFICATION: Will prevent the intrusion of sewage into river water during heavy wet weather events.
RISK(S): The length of time to install the tide gates could result in sewage overflowing into river water prior to the completion of the project.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$3,000,000	0	0	0	2,000,000	1,000,000	\$3,000,000	

Stormwater System

Volunteer's Field Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-104-0

WARD: 29

PHASE:

Construction

PRIORITY:

Safety, Regulatory Compliance, Regional Cooperation/Stewardship

PROJECT DESCRIPTION:

Project is located in the Carrick neighborhood of the City of Pittsburgh and is tributary to Saw Mill Run. Installation of green infrastructure within the Park to reduce sediment and other pollutant loads.

PROJECT JUSTIFICATION:

Required for compliance with the MS4 permit and EPA TMDL requirements. Project will also detain stormwater to reduce downstream flooding in Saw Mill Run.

RISK(S):

It may be difficult to comply with certain regulatory obligations prior to the completion of the project.

IMPACT ON OPERATIONS:

Increased operating flexibility and reliability.

ALTERNATIVES TO THE RECOMMENDED ACTION:

There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,641,976	1,000,000	0	0	0	0	\$1,000,000	

Stormwater System

Wightman Park Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-105-0

WARD: 14

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Project is located in the Squirrel Hill neighborhood of the City of Pittsburgh and is tributary to the M-29 outfall. Stormwater management within the park itself as well as the necessary piping or inlet work to direct up to 3.25 impervious acres from the adjacent streets into the park. The Wightman Park project along with future street bioswale projects are expected to increase the impervious acres captured as well as alleviate reported sewer basement backups in the neighborhood around Wightman Park.
PROJECT JUSTIFICATION: 2.24 million gallons of stormwater runoff will be managed through this project in a typical year, producing downstream CSO reduction. The project will also improve the performance of adjacent, downstream sewers through peak flow reduction.
RISK(S): Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay construction which will increase the risk of sewer basement backups.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,521,825	1,750,000	0	0	0	0	\$1,750,000	

**\$368,300 ALCOSAN GROW grant funding secured.

Stormwater System

Winchester Drive at Grovemount Stormsystem Improvements

PROJECT NUMBER: Unidentified
WARD: 20

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Construction of storm system and roadway improvements to address right of way flooding and damage (hillside erosion and road undercutting) caused by stormwater.
PROJECT JUSTIFICATION: After field assessment and review, the stormwater group ranked this issue as a "high priority" because of the severity of safety issues caused by lack of inlets and curbing as well as a failing outlet structure. Due to improper basin placement as well as poor road design the intersection at Winchester Drive and Grovemount Road is being undercut by overland stormwater runoff, causing the road to start to fail and collapse. This project seeks to install new catch basins and a new storm sewer as well as stabilize the existing outfall to help appropriately manage runoff.
RISK(S): Poor level of service, safety risks.
IMPACT ON OPERATIONS: 10 new basins operations will have to add to the cleaning schedule.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$554,577	554,577	0	0	0	0	\$554,577	

**\$42,193 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Woodland Road Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-108-0

WARD: 14

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Bioretention based GSI project to manage approximately 7 acres of impervious acres for 1.5" runoff event. Project location is in A-22 sewershed on the campus of Chatham University adjacent to Woodland Road. Design activities include field investigations (site survey, geotech), development of design documents for construction and pre-construction flow monitoring.
PROJECT JUSTIFICATION: The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
RISK(S): Continued flooding risk unmitigated, which has contributed to frequent reports of basement backups in this area of the PWSA system.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Implementing stormwater management projects at less cost-effective locations.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,073,559	1,550,000	185,000	0	0	0	\$1,735,000	

Stormwater System

Woods Run Stream Removal Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-108-0

WARD: 26

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: This project will redirect an existing stream inflow location into a detain and slow release subsurface storage facility. The stream base and wet weather flow currently discharge directly into the 36" diameter the PWSA combined sewer on Mairdale Avenue.
PROJECT JUSTIFICATION: This project will separate wet weather flow being directly discharged into the PWSA's combined sewer system.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,619,086	1,250,000	0	0	0	0	\$1,250,000	

**\$1,224,300 ALCOSAN GROW grant funding secured.



Other



Other

2021-2025 Park Maintenance / Upgrades

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project will fund water and sewer infrastructure upgrades within City of Pittsburgh parks.
PROJECT JUSTIFICATION: The water and sewer infrastructure within City of Pittsburgh parks is in need of upgrades.
RISK(S): Deferred maintenance of water and sewer infrastructure could have negative impacts on the functionality of City of Pittsburgh parks.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY**FUNDING SOURCE(S)**

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,700,000	700,000	1,000,000	1,000,000	1,000,000	1,000,000	\$4,700,000	

Other

2021-2025 Property Acquisition / Facility Upgrades**PROJECT NUMBER:** Unidentified**WARD:** Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project will fund all future property/building acquisitions and facility upgrades.
PROJECT JUSTIFICATION: The current facilities of the Authority are in need of upgrades. In addition, new properties may be aquired to fill the need of increased staffing and equipment levels.
RISK(S): Deferred maintenance on current facilities and limited space will impact operations.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY**FUNDING SOURCE(S)**

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,700,000	700,000	0	1,000,000	1,000,000	0	\$2,700,000	

Other

Reconstruction of the Facade at the Central Warehouse

PROJECT NUMBER: Unidentified
WARD: 9

PHASE: Not Started
PRIORITY: Safety
PROJECT DESCRIPTION: Reconstruction of the facade at the Central Warehouse.
PROJECT JUSTIFICATION: The existing facade is failing and in danger of falling and causing injury to employees or pedestrians.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$70,000	70,000	0	0	0	0	\$70,000	

Other

Roof Replacment Brilliant Yard Warehouse**PROJECT NUMBER:** Unidentified**WARD:** 12

PHASE: Not Started
PRIORITY: Safety, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Roof replacment at Brilliant Yard warehouse.
PROJECT JUSTIFICATION: Existing roof leaking and causing structural damage.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY**FUNDING SOURCE(S)**

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$160,000	160,000	0	0	0	0	\$160,000	

Other

Roof Replacement Herron Hill Pump Station

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Replace existing roof and gutters at the Herron Hill Pump Station.
PROJECT JUSTIFICATION: Existing roof is leaking and causing structural damage to building.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$90,000	90,000	0	0	0	0	\$90,000	

Other

Surface Restoration (Capital Only)**PROJECT NUMBER:** 2020-325-105-0/1**WARD:** Systemwide**PHASE:**
Construction**PRIORITY:**
Safety, Operations and Maintenance Efficiency**PROJECT DESCRIPTION:**
Resurfacing of streets as a result of other capital projects.**PROJECT JUSTIFICATION:**
Adequately restoring street surface conditions is a requirement for all applicable capital projects.**RISK(S):**
Customers could experience temporary street closures as a result of street resurfacing work.**IMPACT ON OPERATIONS:**
Increased system reliability and improved system management.**ALTERNATIVES TO THE RECOMMENDED ACTION:**
There are no practical alternatives to the recommended action.**CASH FLOW SUMMARY****FUNDING SOURCE(S)**

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$14,328,141	12,500,000	0	0	0	0	\$12,500,000	

Other

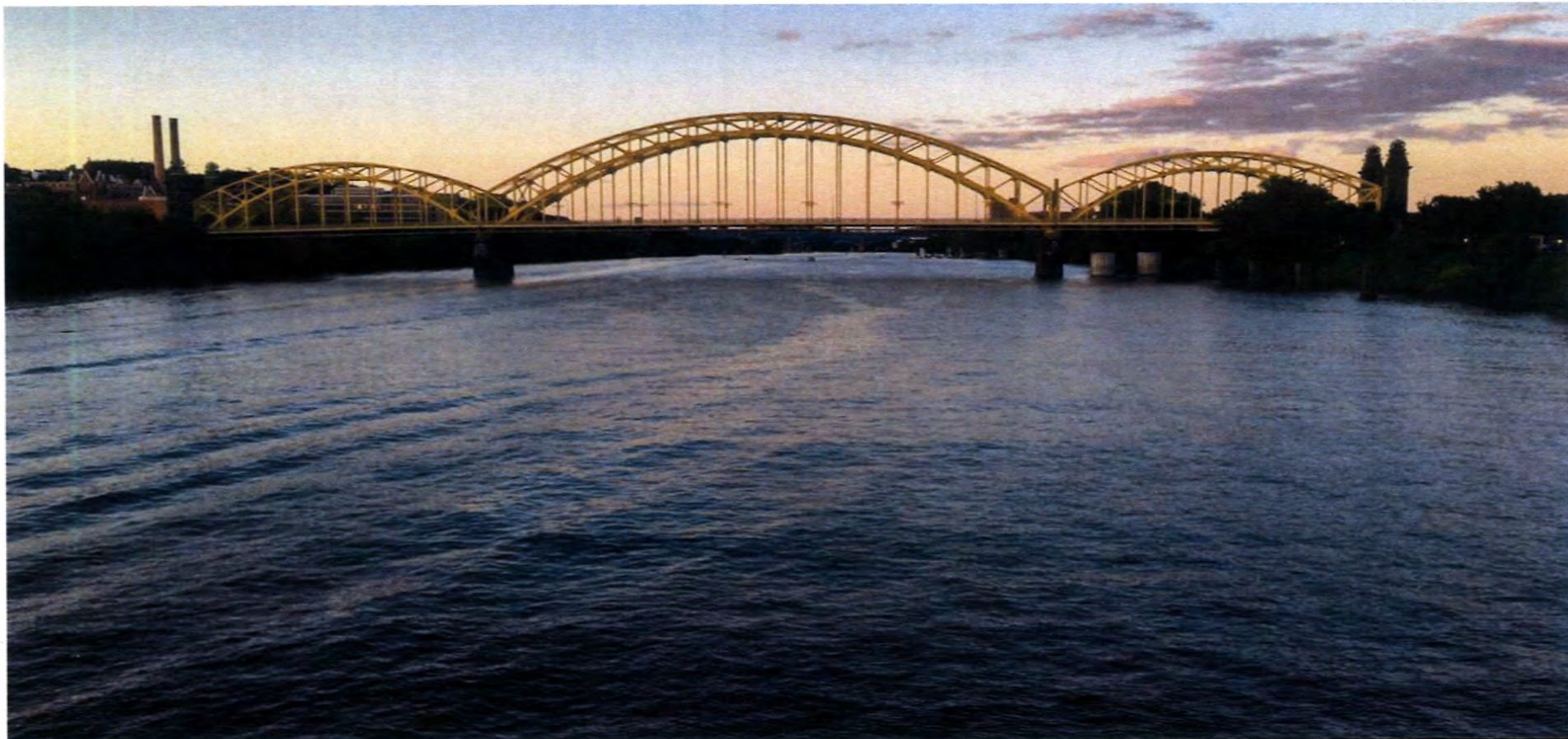
Utility Cost Shares

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regional Cooperation/ Stewardship
PROJECT DESCRIPTION: This project will fund future cost sharing projects.
PROJECT JUSTIFICATION: Cost sharing projects can provide a savings to the Authority.
RISK(S): Cost sharing projects have the potential to be delayed due to coordination issues.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Complete projects without cost sharing agreements.

CASH FLOW SUMMARYFUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,050,000	450,000	100,000	500,000	500,000	500,000	\$2,050,000	



The Pittsburgh Water and Sewer Authority

2021 Operating Budget

Approved on December 18, 2020



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William Bennett, Senior Manager, Field Operations

WATER TREATMENT PLANT

George Watson, Acting Senior Group Manager, Production



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Budget Summary

The Pittsburgh Water and Sewer Authority Operating Budget
Budget Summary

	2020	2021	
	<u>Estimate</u>	<u>Budget</u>	<u>Difference</u>
Revenues			
User & Wholesale Charges	\$ 161,837,972	\$ 174,072,530	\$ 12,234,558
ALCOSAN	66,720,933	75,849,912	9,128,979
Distribution System Improvement Charge	-	8,679,427	8,679,427
Other Miscellaneous and Fee Revenues	7,376,027	6,180,099	(1,195,928)
Total Revenues	\$ 235,934,932	\$ 264,781,968	\$ 28,847,036
Expenditures			
Customer Service	\$ 7,099,622	\$ 8,611,265	\$ 1,511,643
Engineering and Construction	24,897,449	32,309,411	7,411,962
Environmental Compliance	902,723	3,217,426	2,314,703
Chief Executive Officer	2,622,167	2,927,978	305,811
Finance	11,144,913	10,526,446	(618,467)
General Administration	16,522	-	(16,522)
Human Resources	730,840	942,691	211,851
Laboratory	1,940,126	2,272,776	332,650
Legal	4,406,838	6,207,316	1,800,478
Management Information Systems	2,470,874	4,524,257	2,053,383
Public Affairs	995,391	1,155,269	159,878
Sewer Operations	3,556,756	3,831,101	274,345
Warehouse	417,516	456,859	39,343
Water Operations	13,377,275	14,417,833	1,040,558
Water Treatment Plant	17,760,132	19,442,694	1,682,562
ALCOSAN Expenses	73,269,640	78,195,786	4,926,146
Debt Service	61,931,745	67,046,830	5,115,085
Distribution System Improvement Charge	-	8,679,427	8,679,427
Total Expenditures	\$ 227,540,529	\$ 264,765,365	\$ 37,224,836
Operating Result	\$ 8,394,403	\$ 16,603	\$ (8,377,800)
Senior Debt Service Coverage Ratio	1.47x	1.47x	
Total Debt Service Coverage Ratio	1.21x	1.18x	



2021 Operating Budget Summary

The Pittsburgh Water and Sewer Authority Operating Budget
2021 Operating Budget Summary

2021 Operating Budget																
GL #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse	Water Operations	Water Treatment Plant	Total
4001	Salary, Wages	\$ 800,323	3,269,802	3,370,550	595,544	1,427,590	521,287	443,327	666,840	1,258,659	344,701	1,224,180	296,307	6,342,374	3,239,704	\$ 24,001,187
4005	OT Premium Pay	-	197,614	47,568	-	-	-	48,646	-	8,213	5,647	120,408	7,066	397,044	174,253	1,006,458
4010	Shift Differential	-	-	-	-	-	-	-	-	-	-	19	-	9,516	-	9,534
4015	Senior Skill	-	-	-	-	-	-	-	-	-	-	1,007	-	5,972	803	7,781
4020	Pay Adjustments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4025	Bonns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4030	Holiday Pay	16,535	154,597	82,725	13,524	18,799	19,510	19,389	17,506	23,994	12,955	88,594	12,161	308,318	151,752	910,169
4035	Vacation Pay	41,338	169,383	82,725	15,616	21,932	19,510	28,566	32,993	41,926	12,955	16,215	-	529,042	249,321	1,360,062
4040	Other	-	-	-	-	-	-	-	-	-	-	-	-	-	35	2,463
4045	Sick Pay	-	-	-	-	-	-	-	-	-	-	-	-	25,455	1,742	27,197
4050	Personal Time Pay	28,346	98,807	118,599	10,411	16,919	17,097	17,773	13,974	20,367	8,304	10,134	-	248,008	123,715	782,651
4055	Comp Time Taken	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4060	Comp Time Earned	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4065	Jury Duty	97	345	555	-	-	-	-	-	-	94	225	-	944	362	2,623
4070	Military Leave	-	-	-	3,622	-	-	342	-	-	-	-	-	-	-	3,964
4075	Support Pay	-	28	-	-	-	-	-	-	-	-	2,745	-	25,630	5,773	34,176
4080	Retirement	-	4,330	827	700	-	-	68	551	332	332	1,088	-	10,686	5,996	26,915
4081	Paid Parental Leave	-	9,598	3,398	-	-	-	134	-	-	-	2,065	-	34,587	45,329	91,713
4085	Special	-	-	-	-	-	-	-	-	-	-	-	-	146,095	-	146,095
4090	Admin Leave	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4095	Sovereignty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
886,639	Total Wages & Salaries	886,639	3,904,503	3,706,946	639,427	1,485,239	577,404	558,245	731,864	1,353,358	584,988	1,564,189	342,970	8,083,671	3,997,041	28,416,486
4110	Fed Ins Contr Act Tx	54,972	2,42,079	229,831	39,644	92,085	36,419	34,611	45,376	83,908	36,269	96,980	21,264	501,188	247,817	1,762,442
4115	Medicare	12,856	56,615	55,751	9,272	21,536	8,517	8,095	10,612	19,624	8,482	22,681	4,973	117,213	57,957	412,184
4120	Fed Unemploy Tax	-	-	-	-	-	15,000	-	-	-	-	-	-	-	-	15,000
4125	State Unemploy Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4130	Workers Comp Insur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4135	Med Health Ins	85,415	693,506	514,678	47,255	112,559	32,227	90,180	49,677	82,818	56,448	321,909	37,528	1,650,969	748,101	4,521,269
44575	Med Health Ins Waiver	44,575	12,133	5,667	1,642	966	2,000	132	20,328	1,688	1,062	3,989	259	10,197	761	105,590
7,262	Short Term Disability	1,998	37,426	6,000	4,475	9,102	3,877	5,629	7,225	11,150	4,642	16,103	3,157	73,081	35,577	224,707
4150	Long Term Disability	1,995	17,736	3,600	4,353	4,961	4,314	3,525	2,172	1,895	1,046	10,596	1,909	48,978	26,263	133,547
4155	Life Ins <50k	263	6,138	6,608	1,090	2,532	997	920	1,302	2,239	980	2,563	554	12,453	5,767	46,139
4160	Accident/Death/Dismember	263	705	847	146	348	132	117	173	285	129	326	115	1,614	758	6,045
4165	Dental Ins	3,404	28,112	6,896	1,669	2,810	3,454	3,452	3,575	2,901	1,416	14,223	1,322	68,281	29,093	167,609
4170	Vision Insur	675	5,690	3,570	663	1,013	651	554	595	1,185	604	740	416	1,962	490	18,809
4174	Cust Serv Week	-	2,530	1,650	2,950	-	250	4,800	-	750	750	-	-	83,000	-	8,900
4175	Uniforms	5,000	-	3,600	8,000	1,200	250	-	-	-	-	49,500	3,000	-	55,779	207,389
4180	Tuition Reimburse	5,000	20,000	36,192	3,066	51,649	10,000	-	-	37,752	32,747	-	-	-	10,300	211,640
4185	Retirement Benefit	1,363	95	10,689	3,066	6,520	-	-	2,004	3,053	1,528	-	-	-	388	28,892
4195	Misc Benefits	(365)	(13,689)	(13,008)	(1,538)	(3,582)	(2,827)	-	(2,351)	(3,449)	(886)	-	-	(1,60)	-	(41,752)
4199	Payroll Upkud Except	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
222,614	Total Employee Benefits	222,614	1,109,184	870,572	124,126	303,700	115,261	152,015	140,688	245,783	145,218	539,551	74,498	2,565,777	1,219,052	7,828,039
1,109,253	TOTAL SALARIES & BENEFITS	1,109,253	5,013,687	4,577,518	763,553	1,788,939	692,666	710,260	872,552	1,599,142	730,206	2,103,740	417,469	10,649,448	5,216,093	36,244,525

The Pittsburgh Water and Sewer Authority Operating Budget
2021 Operating Budget Summary

2021 Operating Budget																
GL #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse	Water Operations	Water Treatment Plant	Total
5005	Alum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271,089
5010	Boiler-Chemicals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26,270
5015	Calcium Hypochlorite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,884
5020	Cat Flec TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	101,075
5025	Cautic Soda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271,080
5030	Chlorine Cylinders	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19,920
5035	Chlorine Rail Car	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40,080
5040	Citric Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045	Copper Sulphate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,700,000
5050	Ferrie Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	178,858
5065	Hydrofluosilic Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	523,278
5060	Lime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	251,551
5065	Potassium Permanganate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	229,800
5070	Powdered Active Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	883,201
5075	Soda Ash	-	-	-	-	-	-	-	-	-	-	-	-	-	-	416,110
5080	Sodium Hypochlorite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,440
5085	Sodium Carbonate Peroxyly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,963,636
Chemicals																
5120	Computer & Peripherals	-	10,000	1,440	-	-	-	13,000	-	761,721	-	2,000	-	-	289,851	1,080,012
5125	Computers,Networking	-	-	-	-	-	-	-	-	5,274,169	-	-	-	-	-	5,274,169
5140	Furniture, Fixture	1,000	-	1,000	-	-	500	500	-	2,500	-	1,000	1,000	-	29,000	37,500
5145	Grounds,Maint	-	-	-	-	-	-	399,700	-	-	-	2,000	1,500	-	35,000	399,700
5147	Lab Equip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5150	Machinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5160	Office Equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5190	Veihcels	-	-	-	-	750,000	-	-	-	-	-	-	-	-	-	750,000
Equipment																
5205	Asphalt Cold Patch	1,000	10,000	2,440	5,000	750,000	500	415,200	-	6,038,390	-	5,000	2,500	172,000	602,051	8,009,081
5210	Asphalt Cold-City	-	-	-	-	-	-	-	-	-	-	-	-	90,000	-	90,000
5215	Asphalt Hou-City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5220	Asphalt Hotmix	-	-	-	-	-	-	-	-	-	-	-	-	29,200	-	29,200
5225	Asphalt Patch Bit Sealer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5227	Brck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5230	Cement Bagged	-	-	-	-	-	-	-	-	-	-	1,800	-	1,800	-	3,600
5235	Gravel	-	-	-	-	-	-	-	-	-	-	1,400	-	3,675	-	5,075
5240	Iron Steel Brass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5245	Lumber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,752
5250	Sand	-	-	-	-	-	-	-	-	-	-	-	-	27,500	-	27,500
5255	Slag	-	-	-	-	-	-	-	-	-	-	-	-	7,000	-	7,000
5260	Stone	-	-	-	-	-	-	-	-	-	-	-	-	269,799	-	269,799
5265	Top Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Materials																
		-	-	-	-	-	-	-	-	-	-	3,120	-	4,680	-	7,800
		-	-	-	-	-	-	-	-	-	-	140,321	-	433,674	-	578,747

The Pittsburgh Water and Sewer Authority Operating Budget
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2021 Operating Budget																
GL #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse	Water Operations	Water Treatment Plant	Total
5305	Annual Sewer Contract	-	-	8,475,402	-	-	-	-	-	-	-	-	-	-	-	8,475,402
5310	Boiler Compressor Elevr	-	-	-	-	-	-	-	-	-	-	600,000	-	-	-	600,000
5315	CB Cleaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5316	CB Repairs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5328	Curb Box Repair	-	-	-	-	-	-	-	-	-	-	150,000	-	-	-	150,000
5330	Debris Removal	-	-	-	-	-	-	-	-	-	-	300,000	-	-	-	300,000
5335	Drag Bucket	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5340	Dumpster	-	-	-	-	-	-	-	-	-	-	12,000	4,800	-	12,000	46,800
5341	Vactor Debris Remove Cont	-	-	-	-	-	-	-	-	-	-	120,000	-	-	-	120,000
5342	Emergency WaterLine Repair	-	-	5,400,000	-	-	-	-	-	-	-	-	-	-	-	5,400,000
5345	Inspection	-	-	-	-	-	-	-	-	-	-	500	-	-	12,000	1,772,500
5347	Inspection Field	-	-	1,750,000	10,500	-	-	-	-	-	-	-	-	-	12,000	13,500
5350	Key Lock Serv	-	-	-	-	-	-	-	-	-	-	-	-	-	125,000	125,000
5355	Landscape (Grounds)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5360	Meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5370	Operating Contract Other	-	-	72,10,447	-	-	-	-	-	-	-	468,000	-	-	829,300	9,277,747
5375	Radon/leakdes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5380	Inr-Gov Proj Panther Hollow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5383	Sewage Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5385	Temporary Help	-	-	-	-	-	-	-	-	-	-	1,500	-	-	-	2,100
5390	Welding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5395	Water Reky DISC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5396	Water Reby DISC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contracts		-	-	22,835,850	10,500	-	-	-	-	-	-	1,202,000	4,800	1,239,400	990,300	26,282,850
5402	Annual Software Support	5,500	131,000	57,550	-	238,676	88,675	5,500	99,664	862,010	83,465	-	-	1,920	1,716,321	1,716,321
5405	Bldg Property Repairs	3,000	-	-	-	-	3,850	-	-	20,072	-	-	14,000	9,000	80,000	126,072
5408	Computer Hardware	-	-	-	-	-	-	1,000	-	84,979	-	-	-	-	33,000	121,829
5411	Computer Software Support	-	-	-	-	-	-	-	-	42,436	-	-	-	-	97,500	140,936
5413	Concrete Repairs	-	-	5,500,000	-	-	-	-	-	-	-	1,000	-	-	4,800	5,505,800
5415	Concrete Repairs	-	-	-	-	-	-	-	-	-	-	-	5,000	-	45,000	50,000
5417	Electrical Repairs	-	-	-	-	-	-	-	-	-	-	5,000	-	1,500	99,996	101,496
5420	Fence Repairs	-	-	-	-	-	-	-	-	-	-	100,000	-	4,500	156,180	145,680
5422	Fence Installation	-	-	-	-	-	-	-	-	-	-	-	-	40,000	35,300	85,300
5432	GIS Hardware Software	-	-	5,820	-	-	-	-	-	-	-	-	-	-	-	5,820
5432	Hardware Repairs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5457	Heavy Equip Repair	-	-	-	-	-	-	-	-	-	-	-	-	-	4,800	64,800
5459	HVAC Plumbing	-	-	-	-	-	-	-	-	-	-	-	5,000	3,000	100,000	108,000
5444	Hydrant A Section	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5445	Hydrant Misc Parts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5447	Hydrant Repair Parts	-	-	-	-	-	-	21,690	-	-	-	-	-	-	-	-
5452	Machinery Repairs	-	-	-	-	-	-	-	-	-	-	2,000	-	-	50,000	80,350
5457	Office Equip Repairs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5462	Plant Repairs	-	-	-	-	-	-	-	-	-	-	-	-	-	260,000	260,000
5467	Power Tool Repairs	-	-	-	-	-	-	-	-	-	-	4,000	-	4,200	-	8,200
5472	Road Repair Plant	-	-	-	-	-	-	-	-	-	-	-	-	12,000	12,000	
5475	Scanner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5482	Tool Repairs	-	-	-	-	-	-	-	-	-	-	2,500	-	-	500	6,000
5484	Hand Tool Repairs	-	-	-	-	-	-	-	-	-	-	2,000	-	808	6,308	
5486	Misc Tool Repairs	-	-	-	-	-	-	-	-	-	-	1,500	-	1,000	2,500	
5488	CC TV Repairs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5490	Vactor Repairs	-	-	-	-	-	-	-	-	-	-	18,000	-	-	-	18,000
5491	Vehicle Repairs	-	-	-	-	748,161	-	-	-	-	-	-	-	-	-	748,161
5496	Repair/Maint Other	-	1,000	-	-	-	-	10,000	-	-	-	-	-	-	82,200	98,200
Repairs & Maintenance		8,500	132,000	5,563,370	-	1,006,637	92,525	38,100	99,664	1,009,497	83,465	51,000	24,000	138,370	1,164,446	9,411,773

The Pittsburgh Water and Sewer Authority Operating Budget
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5570	Testing Misc	-	-	-	-	-	-	498,120	-	-	-	-	-	6,000	101,200	605,320
	Misc. Operating	-	-	-	-	-	-	498,120	-	-	-	-	-	6,000	101,200	605,320
6015	Casting Manhole/Chasin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60,000
6025	Casting Risers/Lids	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000
6035	Casting Sewer Inlet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34,000
6060	Casting Water Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,600
	Inventory - Castings	-	-	-	-	-	-	-	-	-	-	96,600	-	-	-	103,600
6115	Clarifier Part Elec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6120	Clarifier Part Screw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6125	Clarifier Part Sludge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Inventory - Clarifier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6200	Inventory-Equip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6220	Fire Extinguishers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
6245	Materials Handling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,000
6260	Safety Equipment	-	-	-	-	-	-	-	-	-	-	240	-	-	-	72,000
6280	Vacuum Chlorinators	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,400
	Inventory - Equipment	-	-	-	-	-	-	-	-	-	-	240	-	-	-	75,000
6300	Inventory-Hardware	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,600
6315	Fittings	-	-	-	-	-	-	-	-	-	-	20,000	-	-	-	120,000
6320	Hardware Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18,000
6325	Hose Fitting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6330	Keys & Locks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,400
6335	Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600
6340	Machinery Misc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000
6345	Meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,400
6350	Plumbing Inv Exp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,600
6355	Power Tool Inv Exp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24,000
6360	Tools Inv Exp	-	-	-	-	-	-	-	-	-	-	1,200	-	-	-	12,000
6365	Hand Tools Inv Exp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100,000
	Inventory - Hardware	-	-	-	-	-	-	-	-	-	-	1,200	-	-	-	110,200
6420	Backhoe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Inventory - Heavy Equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	307,000
6500	Inventory-Misc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6506	Batteries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
6515	Cleaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
6518	Concrete Accessories	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10,800
6520	Cooper Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6525	Filters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6526	Filters HVAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6530	First Aid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,200
6540	Lamps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6544	Lubricating Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,600
6548	Paint Oils Putty Glass	-	-	-	-	-	-	-	-	-	-	1,800	-	-	-	7,200
6552	Paper Products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6555	Pump Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,200
6565	Sewer Mats/Supplies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,000
6570	Testing Dyes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6580	Vehicle Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,200
6585	Welding Supplies-Inventory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Inventory - Miscellaneous	-	-	-	-	-	-	-	-	-	-	9,240	-	-	-	37,320
		-	-	-	-	-	-	-	-	-	-	9,240	-	-	-	62,760

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2021 Operating Budget																
GL #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse	Water Operations	Water Treatment Plant	Total
-	6645 Paras Other	-	-	-	-	-	-	-	-	-	-	-	-	36,000	18,000	54,000
-	6680 Yard	-	-	-	-	-	-	-	-	-	-	-	-	180,000	-	180,000
-	Inventory - Parts	-	-	-	-	-	-	-	-	-	-	-	-	216,000	18,000	234,000
-	6705 Pipe	-	-	-	-	-	-	-	-	-	-	60	-	7,300	240	7,500
-	6710 Pipe Ductile	-	-	-	-	-	-	-	-	-	-	-	-	540,000	-	540,000
-	6755 Pipe Plastic	-	-	-	-	-	-	-	-	-	-	-	-	7,300	600	7,800
-	6765 Pipe Service Line	-	-	-	-	-	-	-	-	-	-	-	-	12,000	1,200	13,200
-	Inventory - Pipe	-	-	-	-	-	-	-	-	-	-	60	-	566,400	2,040	568,500
-	6805 Valves <12In	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	6810 Valves >16In	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	6820 Valves GA	-	-	-	-	-	-	-	-	-	-	-	-	144,000	4,800	148,800
-	6825 Valves Misc	-	-	-	-	-	-	-	-	-	-	-	-	144,000	4,800	148,800
-	Inventory - Valves	-	-	-	-	-	-	-	-	-	-	-	-	144,000	4,800	148,800
-	INVENTORY TOTAL	-	-	-	-	-	-	-	-	-	-	127,340	1,500	1,449,320	872,400	1,665,400
1,118,753	DIRECT OPERATING TOTAL	5,155,687	32,979,177	779,053	3,545,776	785,691	1,661,680	972,216	813,671	8,647,029	450,269	13,129,718	480,269	14,093,211	13,129,718	87,761,333
-	7003 Bank Fees	-	-	-	-	300,000	-	-	-	900	-	-	-	-	-	300,900
-	7005 Certification Fees	-	-	13,670	7,680	10,000	-	5,000	80	900	-	-	-	-	-	37,330
-	7010 Membership Fees	31,025	-	18,224	18,400	3,635	600	3,150	700	4,241	62,129	-	-	-	-	142,124
-	7015 Permits	-	-	100,000	69,600	2,150,000	-	-	-	-	-	-	-	-	-	2,319,600
-	7020 Registration Fees	-	-	-	14,600	254,575	-	-	-	-	-	-	-	-	-	269,175
-	7030 Licenses	-	-	1,890	320	450	-	600	2,000	-	-	500	150	5,400	8,600	19,910
-	7035 Customer CC Fees	-	425,600	-	-	-	-	-	-	-	-	-	-	-	-	425,600
31,025	Total Fees	425,600	133,784	110,600	2,718,770	600	8,750	2,780	5,141	5,141	62,129	500	150	5,400	8,600	3,513,829
-	7105 Freight Hauling	-	-	-	300	-	3,000	4,950	120	-	-	-	1,200	1,200	19,000	29,770
-	7110 Freight Shipping	-	-	-	60	-	-	20	-	-	-	-	-	-	-	509,080
-	7115 Postage	-	-	-	360	-	3,000	4,970	120	-	-	-	1,200	1,200	19,000	558,850
-	Total Freight and Postage	-	-	-	920	-	6,950	9,940	240	-	-	-	2,400	2,400	38,000	95,369
-	7210 Copier/Fax Machine	-	1,920	-	6,400	-	-	3,449	-	900	-	30,000	-	52,992	125,676	230,437
-	7215 Equip Rental	-	-	-	-	912,000	-	-	-	-	-	-	-	-	-	912,000
-	7255 Office Rent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7260 Pagers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7265 Radial Lease(City)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	Total Leases & Rents	1,920	912,000	6,400	6,400	912,000	5,600	3,449	1,200	94,269	10,000	30,000	-	52,992	125,676	1,226,706
-	7305 Advertising	-	-	-	400	6,000	-	-	-	-	-	-	-	-	-	24,400
-	7306 Annual Report	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7307 Advertising - Marketing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7310 Annual Audit	-	-	-	-	54,000	-	-	-	-	-	-	-	-	-	54,000
-	7315 Billing Contract	-	833,799	-	-	-	-	-	-	-	-	-	-	-	-	833,799
-	7321 Coll Agency Sewage	-	-	525,833	69,500	660,000	-	-	-	151,458	205,000	-	-	-	35,000	1,836,791
190,000	7323 Consultants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190,000
-	7325 Consumer Confidence Rpt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7328 Contingencies	30,000	-	5,250	-	70,000	-	-	-	-	-	-	-	-	-	30,000
-	7335 Consulting Engineers	-	-	5,093,986	300	-	-	-	-	-	-	-	-	-	-	5,094,286
-	7345 Ins.Auto	-	-	-	-	45,784	-	-	-	-	-	-	-	-	-	45,784
-	7348 Ins.Commercial Prep	-	-	-	-	263,947	-	-	-	-	-	-	-	-	-	263,947
-	7353 Ins.Gen Liability	-	-	-	-	93,079	-	-	-	-	-	-	-	-	-	93,079
-	7359 Ins.Officers Director	-	-	-	-	430,000	-	-	-	-	-	-	-	-	-	430,000
-	7365 Ins.WorkersComp	-	-	-	-	40,000	-	-	-	-	-	-	-	-	-	40,000
-	7366 Ins.WorkersComp.City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7368 Internet Connection.Serv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7370 Legal	90,000	-	-	-	-	-	3,286,500	-	-	-	-	-	-	-	90,000
-	7371 Legal Self Ins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7373 Minority Women Bus Emer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7375 Meter Services	-	796,990	-	-	-	-	-	-	-	-	-	-	-	-	796,990
-	7382 Payroll Services	-	-	-	-	329,504	36,000	-	-	-	-	-	-	-	-	36,000
-	7383 Prof Service Other	1,450,000	302,200	470,000	2,212,493	68,285	107,300	388,333	972,000	467,092	25,820	125,000	-	131,080	1,898,060	8,876,882
-	7389 Trust Admin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68,285
-	7390 Water Levis	-	100,000	-	-	-	-	-	-	-	-	-	-	-	-	100,000
1,761,200	Total Professional Services	2,032,989	6,095,069	2,282,693	2,103,528	148,900	388,333	4,259,700	242,570	618,550	131,080	125,000	-	1,933,060	1,933,060	22,122,671

The Pittsburgh Water and Sewer Authority Operating Budget
2021 Operating Budget Summary

2021 Operating Budget																
Gl. #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse	Water Operations	Water Treatment Plant	Total
7405	Computer Software Supplies	-	-	-	-	-	-	-	-	72,000	-	-	-	-	-	72,000
7422	Fuel-Gases	-	-	-	-	-	-	13,200	-	-	-	-	-	-	70,000	383,200
7423	Fuel Kerosene	-	-	-	-	300,000	-	-	-	-	-	-	-	800	9,200	10,600
7424	Fuel Propane	-	-	-	-	-	-	-	-	-	-	-	-	800	600	2,000
7435	GIS Printer,Xerox	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7440	Grounds & Maint. Supp	-	-	-	-	-	-	600	-	-	-	-	3,040	120,000	200,000	364,040
7443	ICE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7445	Lab Chemicals	-	-	-	-	-	-	88,333	-	-	-	-	-	-	-	88,333
7447	Lab Supplies	-	-	-	-	-	-	102,000	-	-	-	-	-	-	-	102,000
7450	Office Supplies	1,500	4,000	2,000	1,320	19,400	500	360	1,200	2,100	1,500	3,600	1,200	9,600	25,000	73,280
7490	Welding Supplies	-	-	-	-	-	-	-	-	-	-	-	-	750	17,520	18,270
	Total Supplies	1,500	4,000	2,000	1,320	319,400	500	204,493	1,200	74,100	1,500	45,200	4,240	131,950	322,320	1,113,723
7505	TE-A:Fire	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7510	TE-A:Auto Rentals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7520	TE:Fuel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7540	TE:Lodging	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7545	TE:Meals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7550	TE:Mileage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7555	TE:Seminars/Conferences	6,000	-	-	-	-	-	-	2,000	-	-	-	-	1,000	-	7,000
7560	TE:Training	-	-	-	-	-	1,000	-	-	-	-	-	-	-	-	3,000
7575	TE:Travel Misc	9,500	3,000	3,000	2,000	1,000	-	1,000	10,000	2,000	10,000	1,000	1,000	1,000	2,000	46,500
7590	TE:Travel Purch Orders	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Travel & Entertainment	15,500	3,000	3,000	2,000	1,000	1,000	1,000	12,000	2,000	10,000	1,000	1,000	2,000	2,000	56,500
7605	Electric	-	-	-	-	-	-	-	-	-	-	-	-	-	4,267,200	4,267,200
7650	Natural Gas City	-	-	-	-	-	-	-	-	-	-	-	-	-	400,000	400,000
7675	Telemeter	-	-	-	-	-	-	-	-	-	-	-	-	-	114,120	114,120
7680	Cellular Phone	-	-	-	-	-	-	-	-	-	-	-	-	-	114,120	114,120
7681	Local Phones	-	-	-	-	-	-	-	162,565	-	-	-	-	-	-	162,565
7682	Long Distance	-	-	-	-	-	-	-	154,770	-	-	-	-	-	-	154,770
7683	Internet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Utilities	-	-	-	-	-	-	-	-	357,335	-	-	-	-	4,781,320	5,138,656
7705	Bad Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7710	Capital Asset Reclass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7711	DISC Asset Reclas	-	(250,950)	(6,903,619)	-	(2,000,000)	-	-	-	(5,274,169)	-	-	-	-	(879,000)	(15,307,717)
7712	Cash Discount Taken	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7715	Claims Deductibles	-	-	-	-	-	-	-	950,000	-	-	-	-	-	-	950,000
7720	Customer Refund CSM	-	550,000	-	-	-	-	-	-	-	-	-	-	-	-	550,000
7721	Customer Refund AP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7730	Fines/Penalties	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7735	Lease/Buy/Bk/Exp	-	-	-	35,000	-	-	-	-	-	-	-	-	-	-	-
7742	Education & Outreach	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7743	Employee Fund	-	-	-	-	-	-	-	-	-	20,000	-	-	-	-	20,000
7750	Inv. Adjustments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7760	Misc Gen. Admin Exp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7765	One Call	-	30,000	-	-	-	-	-	-	-	-	-	-	-	-	30,000
7770	Publication/Subscription	-	-	-	-	-	-	100	9,300	-	-	-	-	-	-	9,400
7787	3rd Pty L.W. Exp	-	-	-	-	5,500	3,000	-	-	-	-	-	-	-	-	8,500
7789	3rd Pty Sew Trt Exp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7799	Grants Awarded by PW-SA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Miscellaneous Admin	1,809,225	3,305,578	(6,903,619)	2,438,373	(1,994,500)	3,000	611,096	959,300	(5,274,169)	25,399	201,700	6,590	324,622	(879,000)	(15,699,419)
	TOTAL ADMINISTRATIVE	1,809,225	3,305,578	(6,903,619)	2,438,373	(1,994,500)	157,000	611,096	5,235,100	(4,122,773)	341,598	201,700	6,590	324,622	6,312,976	20,011,516

The Pittsburgh Water and Sewer Authority Operating Budget
2021 Operating Budget Summary

2021 Operating Budget															
GL #	GL Description	Chief Executive Officer	Customer Service	Engineering and Construction	Environmental Compliance	Finance	Human Resources	Laboratory	Legal	Management Information Systems	Public Affairs	Sewer Operations	Warehouse Operations	Water Treatment Plant	Total
8005	City Indirect Costs	-	-	-	-	2,678,000	-	-	-	-	-	-	-	-	2,678,000
8070	Sewer Direct	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8071	Sewer Indirect	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total City Subsidy		150,000			2,678,000									2,678,000
8180	Non-City Water Reimburse	-	-	-	-	242,472	-	-	-	-	-	-	-	-	242,472
	Total Non-City Subsidy		150,000			242,472									392,472
8225	Depr Non-Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8230	Depr Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Depreciation														
8305	Amort Debt Discount	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8320	Int Exp Cust Sec Deposit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8335	Int Exp LT Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8340	Int Exp Swap Fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8341	Int Exp Liquidity Fee	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8342	Int Exp Rev/Klg Fee	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8343	Rating Fee	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8345	Int Exp Swap Pmt Rept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8355	Int Exp PV Loans	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8360	Revolver Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Interest		150,000			2,920,472									3,070,472
	OTHER EXPENSES TOTAL	2,927,978	8,611,265	32,309,411	3,217,426	10,526,446	942,691	\$2,272,776	6,207,316	4,524,257	1,155,269	3,831,101	456,859	14,417,833	19,442,694
	GRAND TOTAL														110,843,321

Chief Executive Officer



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Chief Executive Officer

Position Summary		Expenditures			
Title	2021 FTE	2020 Budget	2021 Budget	Difference	
General Ledger					
Chief Executive Officer	1	\$ 727,647	\$ 800,323	\$ 72,677	
Deputy Executive Director	1	1,621	-	(1,621)	
Chief, Technology and Performance Improvement	1	2,026	-	(2,026)	
Senior Health & Safety Manager	1	24,316	16,535	(7,781)	
Senior Manager of Performance	1	60,790	41,338	(19,452)	
Executive Administration Supervisor	1	22,183	28,346	6,163	
		1,527	-	(1,527)	
		143	97	(46)	
		840,253	886,639	46,386	
Temporary, Part-Time, and Seasonal Allowances					
Safety Intern	0.5	52,096	54,972	2,876	
		-	12,856	12,856	
		75,832	83,415	7,583	
		28,076	44,575	16,499	
		4,741	7,262	2,521	
		2,068	1,998	(70)	
		1,426	1,995	569	
		188	263	76	
		3,095	3,404	309	
		644	675	30	
		125	-	(125)	
		-	5,000	5,000	
		-	5,000	5,000	
		-	1,563	1,563	
		(426)	(365)	61	
		167,865	222,614	54,749	
		-	1,000	1,000	
		-	1,000	1,000	
		-	5,500	5,500	
		-	3,000	3,000	
		-	8,500	8,500	
		4,625	31,025	26,400	
		4,625	31,025	26,400	
		-	1,200	1,200	
		60,000	190,000	130,000	
		39,500	30,000	(9,500)	
		-	90,000	90,000	
		1,362,000	1,450,000	88,000	
		1,461,500	1,761,200	299,700	
		-	1,500	1,500	
		-	1,500	1,500	
		3,800	-	(3,800)	
		2,000	6,000	4,000	
		4,100	9,500	5,400	
		9,900	15,500	5,600	
		20,000	-	(20,000)	
		20,000	-	(20,000)	
GRAND TOTAL		\$ 2,504,143	\$ 2,927,978	\$ 423,835	

Customer Service



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Customer Service

Position Summary	
Title	2021 FTE
Director of Customer Services	1
Quality Control Manager	1
Senior AMI & Billing Manager	1
Senior Customer Service Manager	1
Senior PUC Compliance Manager	1
AMI & Billing Manager	1
RNI Data Analyst	1
Dispatch Coordinator	1
Senior Training Coordinator	1
Senior PUC Compliance Coordinator	1
Senior Customer Service Coordinator	1
Senior Collections Coordinator	1
Senior Billing Coordinator	1
Senior Lead Help Coordinator	1
Senior Collections Manager	1
Engineering Technician II	1
PGH2o Cares Coordinator	1
Collections Analyst	1
Customer Service Coordinator	1
Lead Program Customer Assistance	4
Senior Billing Specialist	1
Compliance Analyst	3
Billing Analyst/Corporate Accounts	1
Clerical Specialist II - AMI	2
Clerical Specialist II	2
Account Clerk	4
Customer Service Representative 3	1
Engineering Technician I (A)	1
Engineering Tech I	1
Dispatcher	7
Customer Service Representative 2	2
Data Analyst	1
Administrative Assistant-Customer Service	1
Customer Service Administrative Assistant	1
Billing Specialist	1
Customer Service Representative 1	16
PGH2o Cares Analyst	3
Temporary, Part-Time, and Seasonal Allowances	
Customer Service Representative 1-PT (1500 Hours)	0.5
Customer Service Representative 1-PT (1500 Hours)	0.5
Customer Service Representative 1-PT (1500 Hours)	0.5
Customer Service Representative 1-PT (1500 Hours)	0.5
Customer Service Representative 1-PT (1500 Hours)	0.5
Total Full-Time Permanent Positions	73.5

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary,Wages	\$ 2,549,048	\$ 3,269,802	\$ 720,754
4005 OT Premium Pay	154,054	197,614	43,559
4025 Bonus	880	-	(880)
4030 Holiday Pay	98,512	154,597	56,085
4035 Vacation Pay	123,243	169,383	46,140
4050 Personal Time Pay	77,027	98,807	21,780
4065 Jury Duty	269	345	76
4075 Supper Pay	22	28	6
4080 Bereavement	3,376	4,330	955
4085 Special	7,483	9,598	2,116
Total Wages & Salaries	3,013,914	3,904,503	890,590
4110 Fed Ins Contr Act Tx	186,863	242,079	55,217
4115 Medicare	43,702	56,615	12,914
4135 Med Health Ins	533,466	693,506	160,040
4140 Med Hlth Ins Waiver	9,610	12,133	2,523
4145 Short Term Disability	20,531	37,426	16,895
4150 Long Term Disability	6,374	17,736	11,361
4155 Life Ins <50k	4,826	6,138	1,312
4160 Accident.Death.Dismember	611	793	182
4165 Dental Ins	21,625	28,112	6,487
4170 Vision Insur	4,498	5,690	1,191
4174 Cust Serv Week	2,550	2,550	-
4180 Tuition Reimburse	20,000	20,000	-
4185 Retirement Benefit	-	95	95
4195 Misc Benefits	(2)	(13,689)	(13,687)
4199 Payroll Upload Except	(19)	-	19
Total Employee Benefits	854,634	1,109,184	254,549
5120 Computer & Peripherals	10,000	10,000	-
5140 Furniture.Fixture	25,000	-	(25,000)
Total Equipment	35,000	10,000	(25,000)
5402 Annual Software Support	-	131,000	131,000
5496 Repair.Maint Other	-	1,000	1,000
Total Repairs & Maintenance	-	132,000	132,000
7035 Customer CC Fees	367,400	425,600	58,200
Total Fees	367,400	425,600	58,200
7115 Postage	250,000	509,000	259,000
Total Freight and Postage	250,000	509,000	259,000
7215 Equip Rental	-	1,920	1,920
Total Leases & Rents	-	1,920	1,920
7315 Billing Contract	600,000	833,799	233,799
7323 Consultants	24,000	-	(24,000)
7375 Meter Services	800,000	796,990	(3,010)
7383 Prof Service.Other	655,300	302,200	(353,100)
7390 Water Liens	-	100,000	100,000
Total Professional Services	2,079,300	2,032,989	(46,311)
7450 Office Supplies	6,000	4,000	(2,000)
Total Supplies	6,000	4,000	(2,000)
7505 TE.Airfare	1,800	-	(1,800)
7540 TE.Lodging	1,800	-	(1,800)
7550 TE.Mileage	960	-	(960)
7555 TE.SeminarsConferences	3,400	-	(3,400)
7560 TE.Training	15,000	-	(15,000)
7575 TE.Travel Misc	240	3,000	2,760
Total Travel & Entertainment	23,200	3,000	(20,200)
7710 Capital Asset Reclass	(158,880)	(250,930)	(92,050)
7720 Customer Refund.CSM	-	550,000	550,000
7721 Customer Refund. AP	480,000	-	(480,000)
7765 One Call	30,000	30,000	-
Total Miscellaneous Admin	351,120	329,070	(22,050)
8180 Non.City Water Reimburse	175,975	150,000	(25,975)
Total Non-City Subsidy	175,975	150,000	(25,975)
GRAND TOTAL	\$ 7,156,543	\$ 8,611,265	\$ 1,454,723

Engineering and Construction



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Engineering and Construction

Position Summary		Expenditures		
Title	2021 FTE	2020 Budget	2021 Budget	Difference
		General Ledger		
Director of Engineering and Construction	1	\$ 4,063,833	\$ 3,370,550	\$ (693,284)
Deputy Director of Engineering	1	57,375	47,568	(9,807)
Senior Group Manager, Water Programs	1	130,028	82,725	(47,303)
Senior Group Manager, Stormwater	1	4035 Vacation Pay 111,453	82,725	(28,728)
Senior Group Manager, Wastewater	1	4050 Personal Time Pay 74,302	118,599	44,297
Senior Manager, Construction	1	4065 Jury Duty 322	555	233
Senior Project Manager	3	4080 Bereavement 1,486	827	(659)
Project Manager - Construction	1	4081 Paid Parental Leave 3,300	3,398	98
Project Manager	7	Total Wages & Salaries 4,442,099	3,706,946	(735,153)
Sustainability Manager	1	4110 Fed Ins Contr Act Tx 155,410	229,831	74,420
Associate Project Manager	11	4115 Medicare 34,410	53,751	19,340
Senior Engineering Technician	1	4135 Med Health Ins 577,178	514,678	(62,501)
Engineer III	2	4140 Med Hlth Ins Waiver 2,843	5,667	2,824
Inspector III	2	4145 Short Term Disability 14,890	6,000	(8,890)
Engineering Technician III	1	4150 Long Term Disability (381)	3,600	3,981
Engineer II	1	4155 Life Ins <50k 5,798	6,608	810
Inspector II	1	4160 Accident.Death.Dismember 1,032	847	(184)
Field Liaison	2	4165 Dental Ins 11,949	6,896	(5,053)
Engineering Technician II	1	4170 Vision Insur 3,380	3,570	190
Administrative Assistant	1	4174 Cust Serv Week 1,650	1,650	-
		4175 Uniforms 3,600	3,600	-
		4180 Tuition Reimburse 51,136	36,192	(14,944)
		4185 Retirement Benefit -	10,689	10,689
		4195 Misc Benefits (19,303)	(13,008)	6,295
		Total Employee Benefits 843,593	870,572	26,979
		5120 Computer & Peripherals -	1,440	1,440
		5140 Furniture.Fixture 1,875	1,000	(875)
		Total Equipment 1,875	2,440	565
		5305 Annual Sewer Contract 4,325,000	8,475,402	4,150,402
		5342 Energy WaterLine Repair 3,066,917	5,400,000	2,333,083
		5347 Inspection.Field 1,484,917	1,750,000	265,083
		5370 Operating.Contract.Other 6,942,100	7,210,447	268,347
		Operating Contracts 15,818,933	22,835,850	7,016,917
		5402 Annual Software Support 229,825	57,550	(172,275)
		5413 Concrete Repairs 7,274,000	5,500,000	(1,774,000)
		5427 GIS Hardware.Software 5,700	5,820	120
		Total Repairs & Maintenance 7,509,525	5,563,370	(1,946,155)
		7005 Certification Fees 10,915	13,670	2,755
		7010 Membership Fees 18,444	18,224	(220)
		7015 Permits -	100,000	100,000
		7030 Licenses -	1,890	1,890
		Total Fees 29,359	133,784	104,425
		7323 Consultants 50,000	525,833	475,833
		7332 Consulting Engineers 50,000	5,250	(44,750)
		7335 Misc Serv.NonCapital 4,821,574	5,093,986	272,411
		7383 Prof Service.Other 210,000	470,000	260,000
		Total Professional Services 5,131,574	6,095,069	963,494
		7450 Office Supplies 6,300	2,000	(4,300)
		Total Supplies 6,300	2,000	(4,300)
		7505 TE.Airfare 2,950	-	(2,950)
		7510 TE.Auto Rentals 250	-	(250)
		7520 TE.Fuel 1,100	-	(1,100)
		7540 TE.Lodging 11,750	-	(11,750)
		7545 TE.Meals 4,200	-	(4,200)
		7550 TE.Mileage 350	-	(350)
		7555 TE.SeminarsConferences 9,520	-	(9,520)
		7560 TE.Training 3,900	-	(3,900)
		7575 TE.Travel Misc 200	3,000	2,800
		Total Travel & Entertainment 34,220	3,000	(31,220)
		7710 Capital Asset Reclass (2,736,985)	(6,903,619)	(4,166,634)
		Total Miscellaneous Admin (2,736,985)	(6,903,619)	(4,166,634)
		GRAND TOTAL \$ 31,080,494	\$ 32,309,411	\$ 1,228,918

Environmental Compliance



The Pittsburgh Water and Sewer Authority Operating Budget
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Environmental Compliance

Position Summary		Expenditures			
Title	2021 FTE	2020 Budget		2021 Budget	Difference
Director of Water Quality	1	General Ledger			
Senior Manager, Water Quality	1	4001 Salary, Wages	\$ 468,175	\$ 595,544	\$ 127,369
Water Quality Data Manager	1	4030 Holiday Pay	12,724	13,534	811
Environmental Compliance Coordinator	1	4035 Vacation Pay	15,904	15,616	(288)
Scientist 2	2	4050 Personal Time Pay	12,724	10,411	(2,313)
Scientist 1	1	4070 Military Leave	3,181	3,622	441
Office Manager	1	4080 Bereavement	1,069	700	(369)
<u>Temporary, Part-Time, and Seasonal Allowances</u>	-	Total Wages & Salaries	513,776	639,427	125,650
Total Full-Time Permanent Positions	8	4110 Fed Ins Contr Act Tx	25,854	39,644	13,790
		4115 Medicare	6,250	9,272	3,022
		4135 Med Health Ins	71,518	47,255	(24,263)
		4140 Med Hlth Ins Waiver	463	1,642	1,179
		4145 Short Term Disability	3,027	4,475	1,448
		4150 Long Term Disability	1,819	4,353	2,534
		4155 Life Ins <50k	603	1,090	487
		4160 Accident.Death.Dismember	121	146	25
		4165 Dental Ins	2,499	1,669	(831)
		4170 Vision Insur	495	663	168
		4174 Cust Serv Week	250	2,950	2,700
		4175 Uniforms	1,920	1,260	(660)
		4180 Tuition Reimburse	23,000	8,000	(15,000)
		4185 Retirement Benefit	-	3,066	3,066
		4195 Misc Benefits	(1,309)	(1,358)	(49)
		Total Employee Benefits	136,510	124,126	(12,384)
		5140 Furniture.Fixture	1,000	-	(1,000)
		5145 Grounds.Maint	45,000	-	(45,000)
		5150 Machinery	-	5,000	5,000
		Total Equipment	46,000	5,000	(41,000)
		5347 Inspection.Field	-	10,500	10,500
		Operating Contracts	-	10,500	10,500
		5402 Annual Software Support	200,000	-	(200,000)
		Total Repairs & Maintenance	200,000	-	(200,000)
		7005 Certification Fees	350	7,680	7,330
		7010 Membership Fees	24,550	18,400	(6,150)
		7015 Permits	86,475	69,600	(16,875)
		7020 Registration Fees	250	14,600	14,350
		7030 Licenses	-	320	320
		Total Fees	111,625	110,600	(1,025)
		7110 Freight.Shipping	410	300	(110)
		7115 Postage	60	60	-
		Total Freight and Postage	470	360	(110)
		7215 Equip Rental	1,000	6,400	5,400
		Total Leases & Rents	1,000	6,400	5,400
		7305 Advertising	-	400	400
		7323 Consultants	195,840	69,500	(126,340)
		7335 Misc Serv.NonCapital	16,800	300	(16,500)
		7383 Prof Service.Other	1,478,500	2,212,493	733,993
		Total Professional Services	1,691,140	2,282,693	591,553
		7450 Office Supplies	1,800	1,320	(480)
		Total Supplies	1,800	1,320	(480)
		7505 TE.Airfare	1,500	-	(1,500)
		7540 TE.Lodging	2,500	-	(2,500)
		7545 TE.Meals	500	-	(500)
		7555 TE.SeminarsConferences	500	-	(500)
		7560 TE.Training	1,200	-	(1,200)
		7575 TE.Travel Misc	1,000	2,000	1,000
		Total Travel & Entertainment	7,200	2,000	(5,200)
		7742 Education & Outreach	30,000	35,000	5,000
		Total Miscellaneous Admin	30,000	35,000	5,000
		GRAND TOTAL	\$ 2,739,522	\$ 3,217,426	\$ 477,904

Finance



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Finance

Position Summary

Title	2021 FTE
Director of Finance	1
Senior Manager, Program Controls	1
Senior Manager, Procurement	1
Senior Finance Manager/Controller	1
Program Manager - Capital Projects	1
Procurement Manager	1
Senior Contract Specialist	1
Manager, Facilities	1
Project Systems Coordinator	1
Senior Accounting Specialist	1
Document Management Specialist	1
Contract Specialist	1
Senior Project Systems Specialist	1
Accounting Specialist	1
Project Systems Specialist	1
Fleet & Contract Administrator	1
Procurement Assistant	1
Document Management Associate	1

Temporary, Part-Time, and Seasonal Allowances

Total Full-Time Permanent Positions	18
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Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary/Wages	\$ 1,417,094	\$ 1,427,590	\$ 10,495
4030 Holiday Pay	33,459	18,799	(14,660)
4035 Vacation Pay	39,035	21,932	(17,103)
4050 Personal Time Pay	27,882	16,919	(10,963)
4055 Comp Time Taken	5,946	-	(5,946)
Total Wages & Salaries	1,523,417	1,485,239	(38,178)
4110 Fed Ins Contr Act Tx	82,452	92,085	9,633
4115 Medicare	16,090	21,536	5,446
4135 Med Health Ins	113,319	112,559	(760)
4140 Med Hlth Ins Waiver	-	966	966
4145 Short Term Disability	5,052	9,102	4,050
4150 Long Term Disability	2,562	4,961	2,399
4155 Life Ins <50k	1,446	2,532	1,086
4160 Accident,Death,Dismember	371	348	(23)
4165 Dental Ins	2,931	2,810	(121)
4170 Vision Insur	987	1,013	27
4174 Cust Serv Week	550	-	(550)
4175 Uniforms	1,200	1,200	-
4180 Tuition Reimburse	52,000	51,649	(351)
4185 Retirement Benefit	159	6,520	6,361
4195 Misc Benefits	(5,243)	(3,582)	1,661
Total Employee Benefits	273,876	303,700	29,824
5140 Furniture, Fixture	15,000	-	(15,000)
5160 Office Equipment	3,400	-	(3,400)
5190 Vehicles	-	750,000	750,000
Total Equipment	18,400	750,000	731,600
5402 Annual Software Support	258,324	258,676	352
5405 Bldg,Property Repairs	3,500	-	(3,500)
5491 Vehicle Repairs	660,000	748,161	88,161
Total Repairs & Maintenance	921,824	1,006,837	85,013
7003 Bank Fees	300,000	300,090	90
7005 Certification Fees	9,500	10,000	500
7010 Membership Fees	4,783	3,655	(1,128)
7015 Permits	-	2,150,000	2,150,000
7020 Registration Fees	-	254,575	254,575
7030 Licenses	2,707	450	(2,257)
Total Fees	316,990	2,718,770	2,401,780
7115 Postage	1,200	-	(1,200)
Total Freight and Postage	1,200	-	(1,200)
7255 Office Rent	871,896	912,000	40,104
Total Leases & Rents	871,896	912,000	40,104
7305 Advertising	72,000	6,000	(66,000)
7310 Annual Audit	49,500	54,000	4,500
7323 Consultants	1,406,678	660,000	(746,678)
7332 Consulting Engineers	-	70,000	70,000
7345 Ins.Auto	109,411	45,784	(63,627)
7348 Ins.Commercial Prop	233,828	263,947	30,119
7353 Ins.Gen Liability	22,502	22,929	427
7359 Ins.Officers,Director	76,019	93,079	17,060
7365 Ins.WorkersComp	409,284	450,000	40,716
7366 Ins.WorkersComp, City	32,000	40,000	8,000
7383 Prof Service,Other	974,645	329,504	(645,141)
7389 Trust Admin	53,685	68,285	14,600
Total Professional Services	3,439,551	2,103,528	(1,336,023)
7422 Fuel-Gasses	300,000	300,000	-
7450 Office Supplies	60,000	19,400	(40,600)
Total Supplies	360,000	319,400	(40,600)
7505 TE.Airfare	5,400	-	(5,400)
7510 TE.Auto Rentals	300	-	(300)
7540 TE.Lodging	8,375	-	(8,375)
7545 TE.Meals	1,680	-	(1,680)
7550 TE.Mileage	97	-	(97)
7555 TE.Seminars/Conferences	12,830	-	(12,830)
7560 TE.Training	1,000	-	(1,000)
7575 TE.Travel Misc	-	1,000	1,000
Total Travel & Entertainment	29,682	1,000	(28,682)
7710 Capital Asset Reclass	-	(2,000,000)	(2,000,000)
7770 Publication,Subscription	12,200	5,500	(6,700)
Total Miscellaneous Admin	12,200	(1,994,500)	(2,006,700)
8005 City Indirect Costs	4,015,531	2,678,000	(1,337,531)
Total City Subsidy	4,015,531	2,678,000	(1,337,531)
8180 Non-City Water Reimburse	296,732	242,472	(54,260)
Total Non-City Subsidy	296,732	242,472	(54,260)
GRAND TOTAL	\$ 12,081,298	\$ 10,526,446	\$ (1,554,852)

Human Resources



The Pittsburgh Water and Sewer Authority Operating Budget
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Human Resources

Position Summary		Expenditures			
Title	2021 FTE	2020 Budget	2021 Budget	Difference	
Director of Human Resources	1	\$ 504,262	\$ 521,287	\$ 17,025	
Senior Manager, Human Resources	1	4,692	-	(4,692)	
Human Resources Assistant Manager	1	15,727	19,510	3,783	
Senior Payroll Administrator	1	15,727	19,510	3,783	
Human Resources Specialist	1	12,582	17,097	4,515	
Payroll Specialist	1				
Human Resources Assistant	1				
Temporary, Part-Time, and Seasonal Allowances					
Total Full-Time Permanent Positions	7				
		General Ledger			
		4001 Salary.Wages	\$ 504,262	\$ 521,287	\$ 17,025
		4005 OT Premium Pay	4,692	-	(4,692)
		4030 Holiday Pay	15,727	19,510	3,783
		4035 Vacation Pay	15,727	19,510	3,783
		4050 Personal Time Pay	12,582	17,097	4,515
		Total Wages & Salaries	552,990	577,404	24,414
		4110 Fed Ins Contr Act Tx	22,285	36,419	14,134
		4115 Medicare	6,818	8,517	1,699
		4125 State Unemploy Tax	50,000	15,000	(35,000)
		4135 Med Health Ins	42,010	32,227	(9,784)
		4140 Med Hlth Ins Waiver	1,470	2,000	530
		4145 Short Term Disability	3,134	3,877	743
		4150 Long Term Disability	1,535	4,314	2,780
		4155 Life Ins <50k	1,287	997	(289)
		4160 Accident.Death.Dismember	177	132	(46)
		4165 Dental Ins	4,476	3,454	(1,022)
		4170 Vision Insur	1,057	651	(406)
		4174 Cust Serv Week	225	250	25
		4175 Uniforms	-	250	250
		4180 Tuition Reimburse	15,000	10,000	(5,000)
		4195 Misc Benefits	(3,942)	(2,827)	1,115
		Total Employee Benefits	145,532	115,261	(30,271)
		5125 Computers.Networking	22,000	-	(22,000)
		5140 Furniture.Fixture	1,200	500	(700)
		5160 Office Equipment	800	-	(800)
		Total Equipment	24,000	500	(23,500)
		5402 Annual Software Support	605	88,675	88,070
		5408 Computer Hardware	-	3,850	3,850
		5411 Computer Software Support	-	-	-
		Total Repairs & Maintenance	605	92,525	91,920
		5570 Testing Misc	5,000	-	(5,000)
		Misc. Operating	5,000	-	(5,000)
		7010 Membership Fees	1,200	600	(600)
		7020 Registration Fees	300	-	(300)
		Total Fees	1,500	600	(900)
		7110 Freight.Shipping	-	3,000	3,000
		7115 Postage	120	-	(120)
		Total Freight and Postage	120	3,000	2,880
		7215 Equip Rental	17,594	-	(17,594)
		Total Leases & Rents	17,594	-	(17,594)
		7305 Advertising	2,000	5,600	3,600
		7382 Payroll Services	194,537	36,000	(158,537)
		7383 Prof Service.Other	149,932	107,300	(42,632)
		Total Professional Services	346,469	148,900	(197,569)
		7450 Office Supplies	7,200	500	(6,700)
		Total Supplies	7,200	500	(6,700)
		7505 TE.Airfare	3,000	-	(3,000)
		7540 TE.Lodging	900	-	(900)
		7555 TE.SeminarsConferences	6,000	-	(6,000)
		7560 TE.Training	36,000	1,000	(35,000)
		7575 TE.Travel Misc	1,125	-	(1,125)
		Total Travel & Entertainment	47,025	1,000	(46,025)
		7770 Publication.Subscription	2,000	3,000	1,000
		Total Miscellaneous Admin	2,000	3,000	1,000
		GRAND TOTAL	\$ 1,150,036	\$ 942,691	\$ (207,345)

Laboratory



The Pittsburgh Water and Sewer Authority Operating Budget
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Laboratory

Position Summary

Title	2021 FTE
Lab Manager	1
Water Quality Supervisor	1
Chemist II - Yr. 7	1
Chemist II - Yr. 1	2
Chemist I	3
Temporary, Part-Time, and Seasonal Allowances	
	-
Total Full-Time Permanent Positions	8

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary.Wages	\$ 338,065	\$ 443,327	\$ 105,262
4005 OT Premium Pay	36,552	48,646	12,094
4030 Holiday Pay	15,045	19,389	4,344
4035 Vacation Pay	22,664	28,566	5,902
4050 Personal Time Pay	14,639	17,773	3,134
4070 Military Leave	338	342	4
4080 Bereavement	68	68	1
4081 Paid Parental Leave	133	-	(133)
4085 Special	133	134	1
Total Wages & Salaries	427,636	558,245	130,609
4110 Fed Ins Contr Act Tx	26,513	34,611	8,098
4115 Medicare	6,201	8,095	1,894
4135 Med Health Ins	81,982	90,180	8,198
4140 Med Hlth Ins Waiver	-	132	132
4145 Short Term Disability	4,607	5,629	1,022
4150 Long Term Disability	3,417	3,525	107
4155 Life Ins <50k	722	920	198
4160 Accident.Death.Dismember	91	117	26
4165 Dental Ins	2,671	3,452	780
4170 Vision Insur	440	554	114
4174 Cust Serv Week	200	-	(200)
4175 Uniforms	2,400	4,800	2,400
Total Employee Benefits	129,244	152,015	22,771
5120 Computer & Peripherals	-	15,000	15,000
5140 Furniture.Fixture	500	500	-
5147 Lab Equip	216,830	399,700	182,870
5150 Machinery	25,000	-	(25,000)
5160 Office Equipment	34,000	-	(34,000)
Total Equipment	276,330	415,200	138,870
5370 Operating Contract.Other	29,800	-	(29,800)
Operating Contracts	29,800	-	(29,800)
5402 Annual Software Support	14,000	5,500	(8,500)
5411 Computer Software Support	6,000	1,000	(5,000)
5452 Machinery Repairs	-	21,600	21,600
5496 Repair.Maint Other	-	10,000	10,000
Total Repairs & Maintenance	20,000	38,100	18,100
5570 Testing Misc	631,300	498,120	(133,180)
Misc. Operating	631,300	498,120	(133,180)
7005 Certification Fees	7,200	5,000	(2,200)
7010 Membership Fees	1,400	3,150	1,750
7030 Licenses	-	600	600
Total Fees	8,600	8,750	150
7110 Freight.Shipping	4,800	4,950	150
7115 Postage	120	20	(100)
Total Freight and Postage	4,920	4,970	50
7215 Equip Rental	-	3,449	3,449
Total Leases & Rents	-	3,449	3,449
7323 Consultants	14,000	-	(14,000)
7383 Prof Service.Other	500,004	388,333	(111,671)
Total Professional Services	514,004	388,333	(125,671)
7422 Fuel-Gasses	7,200	13,200	6,000
7440 Grounds & Maint Supp	-	600	600
7445 Lab Chemicals	12,000	88,333	76,333
7447 Lab Supplies	84,000	102,000	18,000
7450 Office Supplies	9,600	360	(9,240)
Total Supplies	112,800	204,493	91,693
7505 TE.Airfare	800	-	(800)
7540 TE.Lodging	1,700	-	(1,700)
7545 TE.Meals	525	-	(525)
7555 TE.SeminarsConferences	1,150	-	(1,150)
7560 TE.Training	150	-	(150)
7575 TE.Travel Misc	-	1,000	1,000
Total Travel & Entertainment	4,325	1,000	(3,325)
7770 Publication.Subscription	-	100	100
Total Miscellaneous Admin	-	100	100
GRAND TOTAL	\$ 2,158,960	\$ 2,272,776	\$ 113,816

Legal



The Pittsburgh Water and Sewer Authority Operating Budget
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Legal

Position Summary		Expenditures		
Title	2021 FTE	2020 Budget	2021 Budget	Difference
General Ledger				
Chief Corporate Counsel/Administration	1	\$ 525,219	\$ 666,840	\$ 141,622
Corporate Counsel - Environmental	1	23,025	17,506	(5,519)
Corporate Counsel	1	38,376	32,993	(5,383)
Risk Coordinator	1	15,350	13,974	(1,377)
Paralegal	2	768	551	(217)
Total Wages & Salaries		602,738	731,864	129,127
4110 Fed Ins Contr Act Tx		31,370	45,376	14,006
4115 Medicare		7,540	10,612	3,072
4135 Med Health Ins		45,161	49,677	4,516
4140 Med Hlth Ins Waiver		21,286	20,328	(958)
4145 Short Term Disability		4,912	7,225	2,314
4150 Long Term Disability		703	2,172	1,470
4155 Life Ins <50k		1,109	1,302	194
4160 Accident.Death.Dismember		146	173	26
4165 Dental Ins		3,250	3,575	325
4170 Vision Insur		492	595	103
4174 Cust Serv Week		175	-	(175)
4180 Tuition Reimburse		5,000	-	(5,000)
4185 Retirement Benefit		50	2,004	1,954
4195 Misc Benefits		(2,776)	(2,351)	425
Total Employee Benefits		118,416	140,688	22,271
5140 Furniture.Fixture		1,000	-	(1,000)
Total Equipment		1,000	-	(1,000)
5402 Annual Software Support		-	99,664	99,664
Total Repairs & Maintenance		-	99,664	99,664
7005 Certification Fees		-	80	80
7010 Membership Fees		-	700	700
7030 Licenses		3,200	2,000	(1,200)
Total Fees		3,200	2,780	(420)
7110 Freight.Shipping		-	120	120
Total Freight and Postage		-	120	120
7305 Advertising		-	1,200	1,200
7370 Legal		2,520,000	3,286,500	766,500
7383 Prof Service.Other		600,000	972,000	372,000
Total Professional Services		3,120,000	4,259,700	1,139,700
7450 Office Supplies		-	1,200	1,200
Total Supplies		-	1,200	1,200
7560 TE.Training		4,000	2,000	(2,000)
7575 TE.Travel Misc		2,000	10,000	8,000
Total Travel & Entertainment		6,000	12,000	6,000
7715 Claims.Deductibles		900,000	950,000	50,000
7770 Publication.Subscription		-	9,300	9,300
Total Miscellaneous Admin		900,000	959,300	59,300
GRAND TOTAL		\$ 4,751,354	\$ 6,207,316	\$ 1,455,962

Management Information Systems



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Management Information Systems

Position Summary	
Title	2021 FTE
Director of Information Technology	1
BI Analyst and Database Administrator	1
Manager, Information Technology	1
IT Project Manager	1
Network Systems Administrator	1
SQL BI Developer	1
Network Systems Administrator	1
GIS Project Coordinator	1
Senior GIS Analyst	3
GIS Analyst - SW	1
GIS Analyst	1
IT Helpdesk Technician II	2
GIS Specialist	1
IT Administrative Assistant	1
Temporary, Part-Time, and Seasonal Allowances	
-	
Total Full-Time Permanent Positions	17

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary/Wages	\$ 865,185	\$ 1,258,659	\$ 393,474
4005 OT Premium Pay	8,278	8,213	(65)
4030 Holiday Pay	21,763	23,994	2,232
4035 Vacation Pay	36,271	41,926	5,655
4050 Personal Time Pay	14,508	20,567	6,058
Total Wages & Salaries	946,004	1,353,358	407,354
4110 Fed Ins Contr Act Tx	46,652	83,908	37,256
4115 Medicare	13,717	19,624	5,907
4135 Med Health Ins	93,069	82,818	(10,251)
4140 Med Hlth Ins Waiver	716	1,688	972
4145 Short Term Disability	1,788	11,150	9,362
4150 Long Term Disability	1,685	1,895	210
4155 Life Ins <50k	1,550	2,239	689
4160 Accident.Death.Dismember	191	285	93
4165 Dental Ins	3,299	2,901	(398)
4170 Vision Insur	798	1,185	388
4174 Cust Serv Week	400	750	350
4180 Tuition Reimburse	16,800	37,752	20,952
4185 Retirement Benefit	-	3,038	3,038
4195 Misc Benefits	(4,329)	(3,449)	880
Total Employee Benefits	176,336	245,783	69,448
5120 Computer & Peripherals	272,921	761,721	488,800
5125 Computers.Networking	-	5,274,169	5,274,169
5140 Furniture.Fixture	7,427	2,500	(4,927)
Total Equipment	280,348	6,038,390	5,758,042
5402 Annual Software Support	542,320	862,010	319,690
5405 Bldg.Property Repairs	19,924	20,072	148
5408 Computer Hardware	67,738	84,979	17,241
5411 Computer Software Support	-	42,436	42,436
Total Repairs & Maintenance	629,982	1,009,497	379,515
7005 Certification Fees	-	900	900
7010 Membership Fees	3,244	4,241	997
Total Fees	3,244	5,141	1,897
7210 Copier.Fax Machine	90,649	93,369	2,720
7255 Office Rent	-	900	900
Total Leases & Rents	90,649	94,269	3,620
7323 Consultants	153,099	151,458	(1,641)
7383 Prof Service.Other	418,877	467,092	48,215
Total Professional Services	571,976	618,550	46,574
7405 Computer Software Supplies	15,000	72,000	57,000
7450 Office Supplies	1,560	2,100	540
Total Supplies	16,560	74,100	57,540
7560 TE.Training	63,972	-	(63,972)
7575 TE.Travel Misc	750	2,000	1,250
Total Travel & Entertainment	64,722	2,000	(62,722)
7680 Cellular Phone	223,656	162,565	(61,091)
7681 Local Phones	160,687	154,770	(5,917)
7682 Long Distance	990	-	(990)
7683 Internet	51,101	40,000	(11,101)
Total Utilities	436,434	357,336	(79,098)
7710 Capital Asset Reclass	-	(5,274,169)	(5,274,169)
Total Miscellaneous Admin	-	(5,274,169)	(5,274,169)
GRAND TOTAL	\$ 3,216,255	\$ 4,524,257	\$ 1,308,001

Public Affairs



The Pittsburgh Water and Sewer Authority Operating Budget
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Public Affairs

Position Summary	
Title	2021 FTE
Senior Manager, Public Affairs	1
Industry Relations Manager	1
Senior Public Affairs Coordinator	1
Internal Communications Coordinator	1
Construction Communications Project Manager	1
Development Coordinator	1
Public Affairs Associate	2
Education and Outreach Associate	1
<u>Temporary, Part-Time, and Seasonal Allowances</u>	
	-
Total Full-Time Permanent Positions	9

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary,Wages	\$ 604,129	\$ 544,701	\$ (59,428)
4005 OT Premium Pay	8,901	5,647	(3,254)
4030 Holiday Pay	22,548	12,955	(9,593)
4035 Vacation Pay	22,548	12,955	(9,593)
4050 Personal Time Pay	11,867	8,304	(3,563)
4065 Jury Duty	169	94	(74)
4080 Bereavement	593	332	(261)
Total Wages & Salaries	670,755	584,988	(85,767)
4110 Fed Ins Contr Act Tx	35,587	36,269	682
4115 Medicare	7,326	8,482	1,156
4135 Med Health Ins	71,562	56,448	(15,114)
4140 Med Hlth Ins Waiver	1,200	1,062	(138)
4145 Short Term Disability	4,105	4,642	537
4150 Long Term Disability	1,739	1,046	(693)
4155 Life Ins <50k	1,125	980	(145)
4160 Accident.Death.Dismember	146	129	(18)
4165 Dental Ins	2,026	1,416	(610)
4170 Vision Insur	717	604	(113)
4174 Cust Serv Week	275	750	475
4175 Uniforms	300	-	(300)
4180 Tuition Reimburse	23,900	32,747	8,847
4185 Retirement Benefit	301	1,528	1,227
4195 Misc Benefits	(1,210)	(886)	325
4199 Payroll Upload Except	824	-	(824)
Total Employee Benefits	149,921	145,218	(4,703)
5402 Annual Software Support	65,600	83,465	17,865
Total Repairs & Maintenance	65,600	83,465	17,865
7010 Membership Fees	31,275	62,129	30,854
Total Fees	31,275	62,129	30,854
7305 Advertising	8,000	10,000	2,000
7306 Annual Report	15,000	-	(15,000)
7323 Consultants	239,200	205,000	(34,200)
7325 Consumer Confidence Rpt	3,500	3,750	250
7335 Misc Serv.NonCapital	1,800	-	(1,800)
7383 Prof Service.Other	-	23,820	23,820
Total Professional Services	267,500	242,570	(24,930)
7450 Office Supplies	5,100	1,500	(3,600)
Total Supplies	5,100	1,500	(3,600)
7505 TE.Airfare	2,650	-	(2,650)
7520 TE.Fuel	1,400	-	(1,400)
7540 TE.Lodging	4,900	-	(4,900)
7545 TE.Meals	1,275	-	(1,275)
7555 TE.SeminarsConferences	8,900	-	(8,900)
7560 TE.Training	1,425	-	(1,425)
7575 TE.Travel Misc	500	10,000	9,500
Total Travel & Entertainment	21,050	10,000	(11,050)
7742 Education & Outreach	120,000	20,000	(100,000)
7770 Publication.Subscription	3,850	5,399	1,549
Total Miscellaneous Admin	123,850	25,399	(98,451)
GRAND TOTAL	\$ 1,335,051	\$ 1,155,269	\$ (179,782)

Sewer Operations



The Pittsburgh Water and Sewer Authority Operating Budget
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Sewer Operations

Position Summary	
Title	2021 FTE
Superintendent of Sewers	1
Sewer Plumbing Foreman	1
Sewer Foreman	1
T.V. Truck Specialist	6
Inspector II	3
Vactor Operator	4
Truck Driver	2
Laborer	7
Administrative Assistant	1
Temporary, Part-Time, and Seasonal Allowances	-
Total Full-Time Permanent Positions	26

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary.Wages	\$ 1,400,133	\$ 1,224,180	\$ (175,952)
4005 OT Premium Pay	162,376	120,408	(41,968)
4010 Shift Differential	20	19	(2)
4015 Semi Skill	1,205	1,007	(198)
4030 Holiday Pay	66,156	58,594	(7,562)
4035 Vacation Pay	109,881	98,541	(11,340)
4040 Other	3,139	2,328	(811)
4045 Sick Pay	662	1,742	1,080
4050 Personal Time Pay	55,258	49,999	(5,259)
4055 Comp Time Taken	3,521	-	(3,521)
4065 Jury Duty	108	225	117
4075 Supper Pay	2,885	2,745	(140)
4080 Bereavement	217	2,337	2,121
4085 Special	2,605	2,065	(541)
Total Wages & Salaries	1,808,166	1,564,189	(243,977)
4110 Fed Ins Contr Act Tx	112,106	96,980	(15,127)
4115 Medicare	26,218	22,681	(3,538)
4135 Med Health Ins	385,536	321,909	(63,627)
4140 Med Hlth Ins Waiver	3,576	3,989	413
4145 Short Term Disability	18,942	16,103	(2,839)
4150 Long Term Disability	2,200	10,596	8,396
4155 Life Ins <50k	3,013	2,563	(450)
4160 Accident.Death.Dismember	377	326	(51)
4165 Dental Ins	16,974	14,223	(2,750)
4170 Vision Insur	857	740	(117)
4174 Cust Serv Week	900	-	(900)
4175 Uniforms	55,500	49,500	(6,000)
4185 Retirement Benefit	365	-	(365)
4195 Misc Benefits	(56)	(58)	(2)
4199 Payroll Upload Except	2,081	-	(2,081)
Total Employee Benefits	628,589	539,551	(89,037)
5120 Computer & Peripherals	-	2,000	2,000
5140 Furniture.Fixture	1,000	1,000	-
5145 Grounds.Maint	4,000	2,000	(2,000)
5150 Machinery	16,000	-	(16,000)
Total Equipment	21,000	5,000	(16,000)
5205 Asphalt Cold Patch	15,613	-	(15,613)
5220 Asphalt Hotmix	12,600	-	(12,600)
5227 Brick	1,500	1,800	300
5230 Cement Bagged	900	1,400	500
5235 Gravel	6,000	-	(6,000)
5240 Iron Steel Brass	3,000	-	(3,000)
5245 Lumber	8,000	8,800	800
5250 Sand	6,000	-	(6,000)
5255 Slag	126,000	125,201	(799)
5265 Top Soil	2,000	3,120	1,120
Materials	181,613	140,321	(41,292)
5315 CB Cleaning	600,000	600,000	-
5330 Debris Removal	60,000	-	(60,000)
5340 Dumpster	6,000	12,000	6,000
5341 Vactor Debris Remove Cont	90,000	120,000	30,000
5347 Inspection.Field	24,000	-	(24,000)
5350 Key.Lock Serv	500	500	-
5355 Landscape (Grounds)	12,000	-	(12,000)
5370 Operating Contract.Other	558,000	468,000	(90,000)
5390 Welding	1,500	1,500	-
Operating Contracts	1,352,000	1,202,000	(150,000)

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Sewer Operations

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
5405 Bldg.Property Repairs	37,000	-	(37,000)
5413 Concrete Repairs	-	1,000	1,000
5420 Fence Repairs	2,000	5,000	3,000
5422 Fence Installation	-	10,000	10,000
5452 Machinery Repairs	1,000	2,000	1,000
5457 Office Equip Repairs	500	-	(500)
5467 Power Tool Repairs	1,000	4,000	3,000
5482 Tool Repairs	1,000	2,500	1,500
5484 Hand Tool Repairs	500	2,000	1,500
5486 Misc Tool Repairs	500	1,500	1,000
5488 CC TV Repairs	60,000	-	(60,000)
5490 Vactor Repairs	12,000	18,000	6,000
5496 Repair.Maint Other	-	5,000	5,000
Total Repairs & Maintenance	115,500	51,000	(64,500)
6015 Casting Manhole.CBasin	154,569	60,000	(94,569)
6025 Casting Risers.Lids	170,193	6,000	(164,193)
6035 Casting Sewer Inlet	6,234	24,000	17,766
6060 Casting Water Valve Box	-	6,600	6,600
6220 Fire Extinguishers	1,000	-	(1,000)
6245 Materials.Handling	500	-	(500)
6260 Safety Equipment	6,000	240	(5,760)
6315 Fittings	6,000	20,000	14,000
6325 Hose.Fitting	2,400	-	(2,400)
6335 Lights	1,500	-	(1,500)
6360 Tools Inv Exp	2,000	1,200	(800)
6500 Inventory-Misc	-	120	120
6506 Batteries	1,000	-	(1,000)
6515 Cleaning	750	120	(630)
6518 Concrete Accessories	500	-	(500)
6520 Copier Paper	750	-	(750)
6526 Filters HVAC	600	-	(600)
6530 FirstAid	750	-	(750)
6548 Paint Oils Putty Glass	-	1,800	1,800
6565 Sewer Mats.Supplies	-	1,200	1,200
6570 Testing Dyes	-	6,000	6,000
6645 Parts Other	5,000	-	(5,000)
6705 Pipe	-	60	60
6755 Pipe Plastic	5,000	-	(5,000)
6825 Valves Misc	60,000	-	(60,000)
INVENTORY TOTAL	424,746	127,340	(297,406)
7010 Membership Fees	5,000	-	(5,000)
7015 Permits	99,000	-	(99,000)
7030 Licenses	-	500	500
Total Fees	104,000	500	(103,500)
7215 Equip Rental	24,000	30,000	6,000
Total Leases & Rents	24,000	30,000	6,000
7383 Prof Service.Other	149,000	125,000	(24,000)
Total Professional Services	149,000	125,000	(24,000)
7423 Fuel Kerosene	-	600	600
7424 Fuel Propane	200	600	400
7440 Grounds & Maint Supp	39,000	40,400	1,400
7450 Office Supplies	1,500	3,600	2,100
Total Supplies	40,700	45,200	4,500
7505 TE.Airfare	500	-	(500)
7540 TE.Lodging	1,000	-	(1,000)
7545 TE.Meals	500	-	(500)
7550 TE.Mileage	5,200	-	(5,200)
7560 TE.Training	12,000	-	(12,000)
7575 TE.Travel Misc	-	1,000	1,000
Total Travel & Entertainment	19,200	1,000	(18,200)
GRAND TOTAL	\$ 4,868,514	\$ 3,831,101	\$ (1,037,413)

Warehouse



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Warehouse

Position Summary	
Title	2021 FTE
Senior Manager, Field Operations	1
Meter Repair Specialist	1
Inventory Control Specialist 3	1
Inventory Control Specialist 2	1
Inventory Control Specialist	2
Temporary, Part-Time, and Seasonal Allowances	-
Total Full-Time Permanent Positions	6

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary.Wages	\$ 311,527	\$ 296,307	\$ (15,220)
4005 OT Premium Pay	6,393	7,066	673
4030 Holiday Pay	10,655	12,161	1,506
4035 Vacation Pay	14,917	16,215	1,298
4050 Personal Time Pay	8,524	10,134	1,610
4080 Bereavement	1,144	1,088	(56)
Total Wages & Salaries	353,159	342,970	(10,188)
4110 Fed Ins Contr Act Tx	17,096	21,264	4,168
4115 Medicare	5,121	4,973	(148)
4135 Med Health Ins	45,920	37,528	(8,392)
4140 Med Hlth Ins Waiver	79	259	180
4145 Short Term Disability	3,243	3,157	(86)
4150 Long Term Disability	802	1,909	1,107
4155 Life Ins <50k	777	554	(223)
4160 Accident.Death.Dismember	169	115	(54)
4165 Dental Ins	1,766	1,322	(444)
4170 Vision Insur	288	416	128
4175 Uniforms	11,497	3,000	(8,497)
4180 Tuition Reimburse	6,454	-	(6,454)
Total Employee Benefits	93,212	74,498	(18,714)
5125 Computers.Networking	15,000	-	(15,000)
5140 Furniture.Fixture	1,400	1,000	(400)
5145 Grounds.Maint	2,100	1,500	(600)
Total Equipment	18,500	2,500	(16,000)
5340 Dumpster	6,000	4,800	(1,200)
Operating Contracts	6,000	4,800	(1,200)
5405 Bldg.Property Repairs	43,300	14,000	(29,300)
5415 Cranes Repairs	5,000	5,000	-
5417 Electrical Repairs	1,000	-	(1,000)
5439 HVAC.Plumbing	-	5,000	5,000
5496 Repair.Maint Other	3,000	-	(3,000)
Total Repairs & Maintenance	52,300	24,000	(28,300)
6220 Fire Extinguishers	1,200	500	(700)
6260 Safety Equipment	3,600	1,000	(2,600)
6500 Inventory-Misc	6,000	-	(6,000)
6515 Cleaning	2,400	-	(2,400)
6525 Filters	600	-	(600)
6530 FirstAid	2,400	-	(2,400)
INVENTORY TOTAL	16,200	1,500	(14,700)
7010 Membership Fees	500	-	(500)
7030 Licenses	125	150	25
Total Fees	625	150	(475)
7110 Freight.Shipping	2,400	1,200	(1,200)
Total Freight and Postage	2,400	1,200	(1,200)
7440 Grounds & Maint Supp	-	3,040	3,040
7450 Office Supplies	4,500	1,200	(3,300)
Total Supplies	4,500	4,240	(260)
7505 TE.Airfare	-	-	-
7520 TE.Fuel	-	-	-
7540 TE.Lodging	-	-	-
7545 TE.Meals	1,000	-	(1,000)
7575 TE.Travel Misc	-	1,000	1,000
Total Travel & Entertainment	1,000	1,000	-
7750 Inv.Adjustments	25,000	-	(25,000)
Total Miscellaneous Admin	25,000	-	(25,000)
GRAND TOTAL	\$ 572,896	\$ 456,859	\$ (116,037)

Water Operations



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Water Operations

Position Summary	
Title	2021 FTE
Chief of Operations	1
Director of Operations	1
Senior Manager, Field Operations	7
Superintendent	2
Water Repair Foreman - Licensed	3
Water Repair Foreman	6
Plumber	17
Heavy Equipment Operator - Licensed	1
Heavy Equipment Operator	8
Leak Detection Specialist	5
Utility Worker - Licensed	2
Valve & Hydrant Specialist - Licensed	1
Utility Worker	23
Valve & Hydrant Specialist	6
Equipment Repair Specialist	1
Valve & Hydrant Operator	5
Truck Driver - Special/Winch	3
General Laborer	1
Truck Driver	13
Administrative Assistant	1
Laborer	13
Field Service Technician III	4
Administrative Assistant	1
Field Service Technician II	1
<u>Temporary, Part-Time, and Seasonal Allowances</u>	
-	
Total Full-Time Permanent Positions	126

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary, Wages	\$ 6,248,149	\$ 6,342,374	\$ 94,225
4005 OT Premium Pay	536,676	397,044	(139,632)
4010 Shift Differential	10,006	9,516	(491)
4015 Semi Skill	6,498	5,972	(526)
4030 Holiday Pay	304,471	308,318	3,847
4035 Vacation Pay	538,952	529,042	(9,910)
4045 Sick Pay	32,499	25,455	(7,044)
4050 Personal Time Pay	243,503	248,008	4,505
4065 Jury Duty	1,025	944	(81)
4075 Supper Pay	26,090	25,630	(461)
4080 Bereavement	12,573	10,686	(1,887)
4085 Special	33,756	34,587	831
4090 Admin Leave	316	146,095	145,779
Total Wages & Salaries	7,994,514	8,083,671	89,156
4110 Fed Ins Contr Act Tx	495,660	501,188	5,528
4115 Medicare	115,920	117,213	1,293
4135 Med Health Ins	1,466,862	1,650,969	184,107
4140 Med Hlth Ins Waiver	8,825	10,197	1,372
4145 Short Term Disability	54,813	73,081	18,268
4150 Long Term Disability	22,467	48,978	26,511
4155 Life Ins <50k	12,596	12,453	(142)
4160 Accident, Death, Dismember	1,607	1,614	7
4165 Dental Ins	47,821	65,281	17,459
4170 Vision Insur	1,977	1,962	(15)
4174 Cust Serv Week	3,450	-	(3,450)
4175 Uniforms	80,000	83,000	3,000
4195 Misc Benefits	(182)	(160)	22
Total Employee Benefits	2,311,817	2,565,777	253,960
5140 Furniture, Fixture	6,000	1,000	(5,000)
5145 Grounds, Maint	75,000	21,000	(54,000)
5150 Machinery	514,000	155,000	(359,000)
Total Equipment	595,000	177,000	(418,000)
5205 Asphalt Cold Patch	145,723	90,000	(55,723)
5220 Asphalt Hotmix	-	29,200	29,200
5227 Brick	500	1,800	1,300
5230 Cement Bagged	3,150	3,675	525
5235 Gravel	10,000	-	(10,000)
5245 Lumber	20,000	27,500	7,500
5250 Sand	6,000	7,020	1,020
5255 Slag	252,000	269,799	17,799
5265 Top Soil	4,750	4,680	(70)
Materials	442,123	433,674	(8,449)
5328 Curb Box Repair	120,000	150,000	30,000
5330 Debris Removal	180,000	300,000	120,000
5340 Dumpster	7,200	18,000	10,800
5347 Inspection Field	30,000	-	(30,000)
5350 Key, Lock Serv	800	800	-
5355 Landscape (Grounds)	30,000	-	(30,000)
5370 Operating Contract, Other	454,800	770,000	315,200
5390 Welding	500	600	100
Operating Contracts	823,300	1,239,400	416,100
5402 Annual Software Support	-	1,920	1,920
5405 Bldg, Property Repairs	18,000	9,000	(9,000)
5417 Electrical Repairs	1,500	1,500	-
5420 Fence Repairs	4,000	4,500	500
5422 Fence Installation	30,000	40,000	10,000
5437 Heavy Equip Repair	20,000	60,000	40,000
5439 HVAC, Plumbing	3,000	3,000	-
5452 Machinery Repairs	3,000	6,750	3,750
5457 Office Equip Repairs	1,500	-	(1,500)
5467 Power Tool Repairs	4,000	4,200	200
5482 Tool Repairs	3,000	3,000	-
5484 Hand Tool Repairs	1,500	3,500	2,000
5486 Misc Tool Repairs	1,500	1,000	(500)
5496 Repair, Maint Other	61,608	-	(61,608)
5570 Testing Misc	18,000	6,000	(12,000)
Misc. Operating	18,000	6,000	(12,000)

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Water Operations

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
6025 Casting Risers.Lids	-	3,600	3,600
6060 Casting Water Valve Box	422,873	100,000	(322,873)
6220 Fire Extinguishers	2,000	-	(2,000)
6245 Materials.Handling	2,000	3,000	1,000
6260 Safety Equipment	72,000	72,000	-
6300 Inventory-Hardware	14,400	12,000	(2,400)
6315 Fittings	144,000	120,000	(24,000)
6320 Hardware Other	2,000	-	(2,000)
6325 Hose.Fitting	12,000	14,400	2,400
6335 Lights	400	600	200
6340 Machinery Misc	4,000	14,400	10,400
6345 Meters	-	9,600	9,600
6350 Plumbing Inv Exp	96,000	24,000	(72,000)
6355 Power Tool Inv Exp	10,000	12,000	2,000
6360 Tools Inv Exp	60,000	100,000	40,000
6365 Hand Tools Inv Exp	12,000	-	(12,000)
6420 Backhoe	2,500	-	(2,500)
6500 Inventory-Misc	-	12,000	12,000
6506 Batteries	1,400	120	(1,280)
6515 Cleaning	1,800	10,800	9,000
6518 Concrete Accessories	2,400	-	(2,400)
6520 Copier Paper	3,000	-	(3,000)
6526 Filters HVAC	1,200	-	(1,200)
6530 FirstAid	1,400	1,200	(200)
6544 Lubricating Oil	600	3,600	3,000
6548 Paint Oils Putty Glass	7,000	7,200	200
6552 Paper Products	2,400	-	(2,400)
6570 Testing Dyes	1,200	1,200	-
6580 Vehicle Oil	-	1,200	1,200
6585 Welding Supplies-Inventory	500	-	(500)
6645 Parts Other	72,000	36,000	(36,000)
6680 Yard	3,000	180,000	177,000
6705 Pipe	-	7,200	7,200
6710 Pipe Ductile	55,000	540,000	485,000
6755 Pipe Plastic	4,000	7,200	3,200
6765 Pipe Service Line	8,000	12,000	4,000
6805 Valves <12in	22,000	-	(22,000)
6810 Valves >16in	100,000	-	(100,000)
6825 Valves Misc	55,000	144,000	89,000
INVENTORY TOTAL	1,198,073	1,449,320	251,247
7005 Certification Fees	500	-	(500)
7010 Membership Fees	6,500	-	(6,500)
7015 Permits	540,000	-	(540,000)
7030 Licenses	3,000	5,400	2,400
Total Fees	550,000	5,400	(544,600)
7110 Freight.Shipping	1,200	1,200	-
Total Freight and Postage	1,200	1,200	-
7215 Equip Rental	30,000	52,992	22,992
Total Leases & Rents	30,000	52,992	22,992
7383 Prof Service.Other	276,000	131,080	(144,920)
Total Professional Services	276,000	131,080	(144,920)
7423 Fuel Kerosene	800	800	-
7424 Fuel Propane	800	800	-
7440 Grounds & Maint Supp	60,000	120,000	60,000
7450 Office Supplies	6,000	9,600	3,600
7490 Welding Supplies	700	750	50
Total Supplies	68,300	131,950	63,650
7505 TE.Airfare	2,000	-	(2,000)
7510 TE.Auto Rentals	1,000	-	(1,000)
7520 TE.Fuel	600	-	(600)
7540 TE.Lodging	4,000	-	(4,000)
7545 TE.Meals	600	-	(600)
7550 TE.Mileage	600	-	(600)
7555 TE.SeminarsConferences	600	1,000	400
7560 TE.Training	7,000	-	(7,000)
7575 TE.Travel Misc	-	1,000	1,000
Total Travel & Entertainment	16,400	2,000	(14,400)
GRAND TOTAL	\$ 14,477,335	\$ 14,417,833	\$ (59,502)

Water Treatment Plant



The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Water Treatment Plant

Position Summary	
Title	2021 FTE
Senior Manager, Projects	1
Acting Senior Group Manager, Production	1
Senior Manager, Production	1
Project Manager, Production	1
SCADA Technician	1
Operations Superintendent	1
Operations Startup/Commissions Technician	1
Plant Maintenance Foreman	2
Foreman	1
Water Production Administrator	1
Electrician	4
Plumber	3
Steamfitter	1
Plant Operator - Class A	4
Welder	1
Machinist	1
Stationary Engineer	6
Plant Operator	12
Painter	1
Equipment Repair Specialist	4
Truck Driver - Hazmat	1
Utility Worker	1
Laborer	8
Administrative Assistant	1
Temporary, Part-Time, and Seasonal Allowances	
Total Full-Time Permanent Positions	59

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
4001 Salary.Wages	\$ 2,989,056	\$ 3,239,704	\$ 250,648
4005 OT Premium Pay	232,751	174,253	(58,498)
4015 Semi Skill	933	803	(130)
4030 Holiday Pay	128,013	151,752	23,738
4035 Vacation Pay	186,201	249,321	63,120
4040 Other	47	35	(12)
4050 Personal Time Pay	104,738	123,715	18,977
4065 Jury Duty	-	362	362
4075 Supper Pay	3,491	5,773	2,282
4080 Bereavement	5,111	5,996	885
4085 Special	37,240	45,329	8,089
Total Wages & Salaries	3,687,580	3,997,041	309,461
4110 Fed Ins Contr Act Tx	222,630	247,817	25,187
4115 Medicare	47,470	57,957	10,487
4135 Med Health Ins	597,849	748,101	150,252
4140 Med Hth Ins Waiver	224	761	537
4145 Short Term Disability	25,476	35,577	10,101
4150 Long Term Disability	8,880	26,263	17,383
4155 Life Ins <50k	5,411	5,767	356
4160 Accident.Death.Dismember	703	758	55
4165 Dental Ins	23,477	29,093	5,616
4170 Vision Insur	404	490	86
4174 Cust Serv Week	1,325	-	(1,325)
4175 Uniforms	66,810	55,779	(11,031)
4180 Tuition Reimburse	10,000	10,300	300
4185 Retirement Benefit	-	388	388
4195 Misc Benefits	2,862	-	(2,862)
Total Employee Benefits	1,013,522	1,219,052	205,530
5005 Alum	177,912	271,089	93,177
5010 Boiler Chemicals	13,104	26,270	13,166
5015 Calcium Hypochlorite	12,940	25,884	12,944
5020 Cat Flocc TL	124,126	101,075	(23,051)
5025 Caustic Soda	249,600	271,080	21,480
5030 Chlorine Cylinders	-	19,920	19,920
5040 Citric Acid	39,245	40,080	835
5050 Ferric Chloride	1,845,000	1,700,000	(145,000)
5055 Hydrofluorosilicic Acid	165,132	178,858	13,726
5060 Lime	1,080,000	523,278	(556,722)
5065 Potassium Permanganate	480,480	251,551	(228,929)
5070 Powdered Active Carbon	1,000,200	229,800	(770,400)
5075 Soda Ash	979,200	883,201	(95,999)
5080 Sodium Hypochlorite	619,200	416,110	(203,090)
5085 Sodium Carbonate Peroxyhy	27,600	25,440	(2,160)
Chemicals	6,813,739	4,963,636	(1,850,103)
5120 Computer & Peripherals	68,113	289,851	221,738
5125 Computers.Networking	18,800	-	(18,800)
5140 Furniture,Fixture	47,000	29,000	(18,000)
5145 Grounds.Maint	8,600	35,000	26,400
5150 Machinery	270,300	248,200	(22,100)
5160 Office Equipment	-	-	-
Total Equipment	412,813	602,051	189,238
5205 Asphalt Cokl Patch	5,142	-	(5,142)
5230 Cement Bagged	312	-	(312)
5235 Gravel	5,314	-	(5,314)
5240 Iron Steel Brass	14,400	4,752	(9,648)
5265 Top Soil	5,666	-	(5,666)
Materials	30,833	4,752	(26,081)
5340 Dumpster	9,600	12,000	2,400
5341 Vactor Debris Remove Cont	22,000	-	(22,000)
5347 Inspection.Field	60,000	12,000	(48,000)
5350 Key.Lock Serv	-	12,000	12,000
5355 Landscape (Grounds)	120,000	125,000	5,000
5370 Operating Contract.Other	657,800	829,300	171,500
Operating Contracts	869,400	990,300	120,900

The Pittsburgh Water and Sewer Authority Operating Budget
Fiscal Year 2021

Water Treatment Plant

Expenditures	2020 Budget	2021 Budget	Difference
General Ledger			
5402 Annual Software Support	55,850	122,362	66,512
5405 Bldg. Property Repairs	1,997,668	80,000	(1,917,668)
5408 Computer Hardware	-	33,000	33,000
5411 Computer Software Support	-	97,500	97,500
5413 Concrete Repairs	60,000	4,800	(55,200)
5415 Cranes Repairs	60,000	45,000	(15,000)
5417 Electrical Repairs	60,000	99,996	39,996
5420 Fence Repairs	130,000	136,180	6,180
5422 Fence Installation	-	35,300	35,300
5437 Heavy Equip Repair	-	4,800	4,800
5439 HVAC Plumbing	60,000	100,000	40,000
5452 Machinery Repairs	60,000	50,000	(10,000)
5462 Plant Repairs	171,200	260,000	88,800
5472 Road Repair Plant	-	12,000	12,000
5482 Tool Repairs	-	500	500
5484 Hand Tool Repairs	2,400	808	(1,592)
5496 Repair Maint Other	42,800	82,200	39,400
Total Repairs & Maintenance	2,699,918	1,164,446	(1,535,472)
5570 Testing Misc	-	101,200	101,200
Misc. Operating	-	101,200	101,200
6260 Safety Equipment	27,000	2,400	(24,600)
6300 Inventory-Hardware	900	3,600	2,700
6315 Fittings	36,000	18,000	(18,000)
6325 Hose Fitting	-	1,200	1,200
6335 Lights	6,000	6,000	-
6350 Plumbing Inv Exp	12,000	6,000	(6,000)
6360 Tools Inv Exp	15,000	9,000	(6,000)
6500 Inventory-Misc	18,000	9,600	(8,400)
6515 Cleaning	12,000	1,200	(10,800)
6530 FirstAid	12,000	-	(12,000)
6544 Lubricating Oil	6,000	4,200	(1,800)
6548 Paint Oils Puty Glass	4,200	1,200	(3,000)
6645 Parts Other	9,000	18,000	9,000
6705 Pipe	-	240	240
6755 Pipe Plastic	-	600	600
6765 Pipe Service Line	-	1,200	1,200
6825 Valves Misc	2,400	4,800	2,400
INVENTORY TOTAL	160,500	87,240	(73,260)
7005 Certification Fees	8,000	-	(8,000)
7010 Membership Fees	21,036	-	(21,036)
7030 Licenses	8,600	8,600	-
Total Fees	37,636	8,600	(29,036)
7110 Freight Shipping	18,000	19,000	1,000
7115 Postage	200	-	(200)
Total Freight and Postage	18,200	19,000	800
7215 Equip Rental	60,000	125,676	65,676
Total Leases & Rents	60,000	125,676	65,676
7323 Consultants	-	35,000	35,000
7383 Prof Service Other	842,000	1,898,060	1,056,060
Total Professional Services	842,000	1,933,060	1,091,060
7422 Fuel-Gasses	120,000	70,000	(50,000)
7423 Fuel Kerosene	-	9,200	9,200
7424 Fuel Propane	12,000	600	(11,400)
7435 GIS Plotter Xerox	5,200	-	(5,200)
7440 Grounds & Maint Supp	48,000	200,000	152,000
7450 Office Supplies	5,400	25,000	19,600
7490 Wedding Supplies	-	17,520	17,520
Total Supplies	190,600	322,320	131,720
7505 TE Airfare	2,250	-	(2,250)
7520 TE Fuel	100	-	(100)
7540 TE Lodging	2,300	-	(2,300)
7545 TE Meals	650	-	(650)
7555 TE Seminars Conferences	2,250	-	(2,250)
7575 TE Travel Misc	400	2,000	1,600
Total Travel & Entertainment	7,950	2,000	(5,950)
7605 Electric	4,620,000	4,267,200	(352,800)
7650 Natural Gas City	425,000	400,000	(25,000)
7675 Telemeter	60,000	114,120	54,120
7680 Cellular Phone	13,200	-	(13,200)
Total Utilities	5,118,200	4,781,320	(336,880)
7710 Capital Asset Reclass	-	(879,000)	(879,000)
Total Miscellaneous Admin	-	(879,000)	(879,000)
GRAND TOTAL	\$ 21,962,891	\$ 19,442,694	\$ (2,520,197)



XI. OTHER DATA

XI.5. Provide a schedule that shows the percentage of unaccounted for water for the test year and 2 prior years. Describe how this amount was determined and explain any steps taken to reduce unaccounted for water. Provide a similar analysis of infiltration for wastewater utilities.

RESPONSE:

PWSA has had significant problems with high levels of unaccounted for water and with sewer infiltration. Estimates for unaccounted for water are in excess of 50%. PWSA has developed a plan to accurately meter production and pumping and storage locations as part of a comprehensive non-revenue water reduction plan. PWSA is also developing a plan to reduce inflow and infiltration. Additional details on the plan are included in the Compliance Plan.

XI. OTHER DATA

XI.6. Provide a corporate history (include the dates of original incorporation, subsequent mergers, or acquisitions, or both). Indicate all counties and cities and other governmental subdivisions to which service is provided, including service areas outside the state, and the total population in the area served.

RESPONSE:

Please see below.

PWSA Corporate History

The Authority is a body corporate and politic organized and existing under the Act pursuant to Resolution No. 36 of the Council of the City of Pittsburgh (the "City"), duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 16, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority's Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on December 11, 1989, to include, among authorized projects, low head dams and facilities for generating surplus electric power. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on May 9, 2008, to extend the term of existence of the Authority to May 21, 2045. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on March 19, 2020, to extend the term of existence of the Authority to March 19, 2070 and to include storm water systems.

Under its Articles of Incorporation, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, storm water systems, low head dams and facilities for generating surplus power.

The System provides water to approximately 81,000 customers or 84% of the total population in the geographic boundaries of the City. The Authority provides wastewater collection and transmission service to almost the entire City, estimated at 306,000 residents. The System does not include wastewater treatment facilities; such facilities are the responsibility of Allegheny County Sanitary Authority ("ALCOSAN"), a separate and distinct legal entity.

The Authority operates and maintains a 117 million gallon per day (MGD) rapid sand type water treatment plant, a 26 MGD microfiltration plant, approximately 964 miles of water mains, over 32,000 valves and fire hydrants, 1 raw water pump station, 10 finished water pump stations, 4 in-ground reservoirs, 10 storage tanks, approximately 1,220 miles of sanitary, storm and

Pittsburgh Water and Sewer Authority's Base Rate Filing

XI. OTHER DATA

combined sewers, 29,000 manholes, 30,000 catch basins and inlets, 38 combined sewer overflow outfalls, 185 storm outfalls, and four wastewater pump stations.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

VOLUME II

TESTIMONY

PITTSBURGH WATER AND SEWER AUTHORITY
RATE FILING

Docket Numbers:

R-2021-3024773 (Water)
R-2021-3024774 (Wastewater)
R-2021-3024779 (Stormwater)

April 13, 2021

**Pittsburgh Water and Sewer Authority
2021 Rate Filing**

**Docket Nos.
R-2021-3024772 (water)
R-2021-2034774 (wastewater)
R-2021-3024779 (stormwater)**

INDEX OF DIRECT TESTIMONY

Tab No.	Statement
1	Statement 1 – William J. Pickering
2	Statement 2 – Edward Barca
3	Statement 3 – Thomas F. Huestis
4	Statement 4 – Harold J. Smith
5	Statement 5 – Barry King
6	Statement 6 – Julie Q. Quigley
7	Statement 7 – Tony Igwe
8	Statement 8 – Keith Readling

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

WILLIAM J. PICKERING

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024733 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:

Overview of Filing

Description of PWSA and Process of Transition
Organizational Structure, Management Quality Updates
Accomplishments Since Last Rate Case

April 13, 2021

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TABLE OF EXHIBITS

WJP-1	Rate Case Tables
WJP-2	2019 Cooperation Agreement

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND CURRENT POSITION WITH PWSA.**

3 A. My name is William J. Pickering. My position with The Pittsburgh Water & Sewer
4 Authority (“PWSA” or “Authority”) is Chief Executive Officer.

5 **Q. HOW LONG HAVE YOU HELD THIS POSITION?**

6 A. I assumed the position of Executive Director for PWSA on June 1, 2020. On November
7 13, 2020, my title changed to Chief Executive Officer, through modifications made by
8 the Board to the Bylaws.

9 **Q. WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES?**

10 A. In my present position, my responsibilities include executing policy goals and objectives
11 established by the Board of Directors; preparing an annual business plan and budget;
12 developing, supervising and administering the PWSA’s staff and programs; directing the
13 operation of the water system; overseeing the operation of the sewer system and related
14 stormwater system; developing and implementing a capital improvement and
15 maintenance plan; directing water Customer Assistance Program efforts; and interacting
16 with customers, elected officials, consumer groups, governmental entities and the media.

17 **Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.**

18 A. Prior to joining PWSA in fall 2016, I was Manager of Communications and Government
19 Relations at DC Water. There, I managed the communications program and spearheaded
20 DC Water’s interactions with the federal, District and neighboring local governments. I
21 have also held several positions in the local and federal government. I have a Bachelor of
22 Science in Political Science from Santa Clara University and received my Certificate in
23 Public Management from George Washington University.

1 **Q. HAVE YOU EVER PROVIDED TESTIMONY BEFORE THIS COMMISSION?**

2 A. Yes. I submitted rebuttal testimony in PWSA’s 2020 rate case proceeding at Docket Nos.
 3 R-2020-3017951, R-2020-3017970 and P-2020-3019019. I also adopted the direct
 4 testimony of Robert A. Weimar, PWSA’s former Executive Director, in that rate
 5 proceeding.

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

7 A. The purpose of my testimony is to offer a high-level synopsis of this rate filing while
 8 introducing the other PWSA witnesses presenting testimony and explaining the scope of
 9 their testimony. I will also provide an overview about PWSA to include its continuing
 10 transition process to Commission jurisdiction and the current status of various projects
 11 and initiatives that have occurred since PWSA’s 2020 rate case filing.

12 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

13 A. Yes. I am sponsoring PWSA Exhibit WJP-1, which includes the Rate Case Tables; and
 14 PWSA Exhibit WJP-2, which is the 2019 Cooperation Agreement.

15 **Q. WHO ARE THE OTHER WITNESSES PROVIDING TESTIMONY ON BEHALF**
 16 **OF PWSA?**

17 A. The other witnesses providing testimony on behalf of PWSA are:

Witness	St. No.	Topics
Edward Barca	2	Support for Proposed Rate Increase, <i>Pro Forma</i> Financial Results, Development of Operating Budget & Capital Needs, Sources of Funding, Calculation of Revenue Requirements, Allocation of Water, Wastewater & Stormwater Costs, Proposed Rates and Charges
Tom Huestis	3	Support for Proposed Rate Increase, Financial Policies and Goals, Capital Markets Consideration, Peer Review of Financial Metrics

Witness	St. No.	Topics
Harold Smith	4	Allocation of Total System Revenue Requirements, Water Cost Allocation and Rate Design, Wastewater Cost Allocation and Rate Design, Stormwater Cost Allocation and Rate Design, Gradualism Adjustment, Two Year Phase In
Barry King	5	Capital Projects, Updates on Rate Case Commitments
Julie Quigley	6	Compliance Plan Stage 2, Customer Service and Collections Update, Impact of Rate Request on Future Affordability, Public Notice of Rate Filing (Including Stormwater Fee), Low Income Customer Assistance Program Enhancements, Stormwater Service, Customer Service Issues, Tariff Revisions (Including Fee Revisions & Line Extensions)
Tony Igwe	7	Stormwater Issues, Stormwater Plan, Proposed Stormwater Tariff, Compliance Plan Stage 2 Stormwater
Keith Readling	8	Stormwater Program Revenue Requirements, Identifying Impervious Area, Stormwater Fee Structure, Stormwater Fee Billing, Stormwater Credit Program

1 **Q. BEFORE DISCUSSING THE RATE INCREASE FILING, IS THERE**
 2 **ANYTHING YOU WANT TO HIGHLIGHT ABOUT PWSA’S**
 3 **ACCOMPLISHMENTS IN 2020?**

4 A. Yes. Later in my testimony, I discuss many other examples of positive strides that
 5 PWSA made in 2020, but I will highlight some of those accomplishments here. PWSA
 6 has continued to enhance the quality and effectiveness of customer service, provide
 7 responsible and responsive operations service, improve infrastructure reliability, and
 8 maintain regulatory compliance. Of particular note, lead levels fell into compliance with
 9 the Lead and Copper Rule in June 2020 and are the lowest lead levels PWSA has
 10 experienced in 20 years. The lower lead testing results demonstrate the effectiveness of
 11 adding orthophosphate to our drinking water treatment process beginning in April 2019.
 12 In addition, we continued to aggressively replace lead service lines with the goal of
 13 replacing all of them by 2026.

1 Another measure that I wish to highlight is PWSA’s increase in spending on
 2 critical water infrastructure improvements. In 2020, our capital investment was
 3 approximately \$122 million – an increase from 2019 – and our largest annual investment
 4 in history, despite construction delays due to the pandemic.

5 We are also proud of our customer assistance programs, which were established
 6 in 2018 and support our most vulnerable customers. Expansions of those programs went
 7 into effect on January 14, 2021.

8 In addition, PWSA secured a \$65,220,000 loan from the Pennsylvania
 9 Infrastructure Investment Authority (“PENNVEST”), which has a low-interest rate of one
 10 percent that allows us to reduce costs, and in the long-term, generate savings for our
 11 customers. Since 2019, we have saved ratepayers roughly \$80 million by using available
 12 federal and state funding programs over traditional bond financing.

13 PWSA has also completed a number of construction projects, designed to provide
 14 more reliable service to customers, meet stricter water quality standards and improve
 15 water quality and stormwater management. While PWSA has made significant
 16 achievements, we need to continue these efforts so that we are a utility of the future that
 17 delivers the highest possible quality of services to our customers.

18 **II. OVERVIEW OF NEED FOR RATE INCREASE AND UNIQUE PROPOSALS**
 19 **INCLUDED WITH THIS FILING**

20 **Q. PLEASE PROVIDE AN OVERVIEW OF THIS FILING.**

21 A. Consistent with the significant progress PWSA has made in recent years, the Authority
 22 remains focused on rebuilding and upgrading Pittsburgh’s water systems and is taking
 23 every reasonable step to operate efficiently and keep its costs down. Nonetheless, the
 24 Authority’s operating and capital expenses continue to increase. To operate our systems

1 at the required levels, PWSA requires a revenue increase of \$32.2 million, or 17.1
2 percent. PWSA's extensive Capital Improvement Plan ("CIP"), included with Mr.
3 Barca's testimony as PWSA Exhibit EB-5, which includes acceleration of the lead
4 service line replacement program and the refurbishment and replacement of a significant
5 portion of PWSA's water supply system, simply cannot be accomplished without
6 additional rate relief. Also, addressing regulatory compliance issues and responding to
7 unexpected situations that arise due to the age of the system are directly contributing to
8 increases in operating costs. As Mr. Barca explains in his testimony, the rate increase
9 that PWSA is seeking is the minimum amount that is needed to continue operations while
10 meeting the required financial metrics.

11 **Q. PLEASE EXPLAIN THE RATE CASE TABLES YOU ARE PRESENTING AS AN**
12 **EXHIBIT WITH THIS TESTIMONY.**

13 A. PWSA Exhibit WJP-1 includes the Rate Case Tables. Support for the figures in this
14 Exhibit is provided in the testimony of the following PWSA Witnesses: Edward Barca,
15 Harold Smith, and Keith Readling.

16 **Q. PLEASE EXPLAIN THE ORIGIN AND PURPOSE OF THE RATE CASE**
17 **TABLES.**

18 A. The Rate Case Tables were developed in collaboration with the parties in PWSA's prior
19 rate case as directed by the Administrative Law Judges ("ALJs"). Because the
20 Commission's existing template for this information was developed for traditionally
21 regulated utilities, the ALJs granted PWSA leave to develop Rate Case Tables consistent
22 with the cash flow method for calculating the revenue requirement. Pursuant to this
23 directive, PWSA developed an initial version of the Rate Case Tables and then worked
24 collaboratively with the parties to further adjust and refine the initial version. PWSA
25 received helpful feedback from the parties during this process and the final, agreed-to

1 version of the Rate Case Tables were shared with the ALJs on July 24, 2020. PWSA
 2 Exhibit WJP-1 presents PWSA’s proposals in this case using this template.

3 **Q. ARE THERE ANY SPECIFIC PROPOSALS INCLUDED WITH THIS FILING**
 4 **THAT YOU WOULD LIKE TO POINT OUT HERE?**

5 A. Yes. While PWSA’s financial needs are compelling in view of the importance of fully
 6 funding its CIP and enhancing the quality of its services, we are also cognizant of the
 7 financial challenges that many of our customers have faced, and are continuing to face,
 8 particularly as a result of the COVID-19 pandemic. For that reason, PWSA is proposing
 9 to phase-in the requested rate increase over two years. In this way, the Year 1 increase
 10 would be \$22 million, or 11.7%, and the Year 2 increase would be \$10.2 million, or
 11 5.4%.

12 As described in greater detail by Ms. Quigley, other rate mitigation measures
 13 included with our proposal are: (i) maintaining the current rate structure; (ii) structuring
 14 the newly proposed stormwater fee to apply both gradualism to the rates and to phase-in
 15 over the proposed two year period; and (iii) a new pilot program to incentivize customers
 16 to enroll in paperless billing and establish auto-pay. While PWSA is introducing a new
 17 stormwater fee for customers, the introduction of the fee benefits residential customers
 18 by providing for a more equitable rate structure since residential customers would no
 19 longer be carrying the full burden of stormwater costs that are driven by non-customers,
 20 like surface parking lots and other commercial entities, with large impervious surfaces.

21 PWSA is also proposing enhancements, as described by Ms. Quigley, in her direct
 22 testimony, to the customer assistance programs. The proposed modifications to the
 23 Winter Moratorium, Bill Discount and Hardship Grant are all designed to assist
 24 customers who may be facing their own financial challenges. Specific changes include:

1 (i) a proposed expansion of the Winter Moratorium to include senior citizens, regardless
 2 of income level; (ii) proposals to revise the Bill Discount so that the customers at or
 3 below 50% of the FPL qualify for a volumetric rate discount of 50% (as compared to the
 4 current discount of 20%) and to offer a 75% discount on the stormwater fee for customers
 5 who meet the general eligibility guidelines for this program; and (iii) a proposed increase
 6 in eligibility income for Hardship Grants from 150% to 300% of the FPL. PWSA will
 7 also continue the pilot arrearage forgiveness program agreed to in the most recent rate
 8 case settlement, which was approved by the Commission.¹

9 In summary, PWSA has taken numerous measures to moderate the impact of the
 10 requested rate increase on customers. While the Authority needs to make this request due
 11 to increases in operating expenses and to fund the numerous essential projects in the CIP
 12 that are key to enhancing the quality of utility services that PWSA provides, we have
 13 sought through these other proposals to balance our financial needs against the challenges
 14 faced by customers in paying higher rates.

15 **Q. WHAT INCREASED COSTS ARE DRIVING THE NEED FOR THIS RATE**
 16 **INCREASE?**

17 **A.** Due to the Commission's recognition in the last two base rate cases of PWSA's
 18 substantial capital needs, in approving rate increases proposed by settlements, the
 19 Authority has been able to avoid a financial crisis. However, the Authority has not been
 20 able to fully fund its CIP, so as to permit PWSA to enhance the quality of its water,
 21 wastewater and customer service. As explained by Mr. Barca in more detail, three
 22 primary cost categories are driving this request for rate relief. They include: (1) PWSA

¹ *Pa. PUC v. Pittsburgh Water and Sewer Authority* (water), Docket No. R-2020-3017951, and *Pa. PUC v. Pittsburgh Water and Sewer Authority* (wastewater), Docket No. R-2020-3017970 (Order entered December 3, 2020).

1 continues to need to increase operations to a level that is sufficient to maintain PWSA’s
 2 large system; 2) PWSA’s need to recover the cost of long term bonds issued to finance its
 3 increased CIP, which is largely driven by regulatory requirements; and 3) the COVID-19
 4 pandemic continues to put stress on the financial health of PWSA.

5 **Q. CAN YOU PROVIDE MORE DETAIL REGARDING THE ANTICIPATED**
 6 **INCREASED COSTS IN 2022 RELATED TO OPERATING EXPENSES AND**
 7 **PERSONNEL?**

8 A. As described more fully by Mr. Barca, the largest portion of the Operating Budget is for
 9 salary and associated benefits. Increases in operating expenses are due largely to
 10 PWSA’s efforts to fill its vacant positions so that it has the staff needed to support the
 11 operation of a very large system providing water, wastewater and stormwater services.
 12 Also, the annual costs that PWSA incurs to carry bad debt expense for collections related
 13 to pass-through charges of the Allegheny County Sanitary Authority (“ALCOSAN”)
 14 have increased and are expected to continue to increase due to the decrease in collected
 15 revenues resulting from the ongoing COVID-19 pandemic and the planned ALCOSAN
 16 rate increases.

17 **Q. CAN YOU PROVIDE MORE DETAIL ABOUT THE ENGINEERING AND**
 18 **CONSTRUCTION PROJECTS ANTICIPATED FOR 2022?**

19 A. While this will be covered more fully by the testimony of Mr. King, the key point is that
 20 PWSA is now well-positioned to significantly invest in the various engineering and
 21 construction projects necessary to modernize and update the water supply, water
 22 distribution and wastewater conveyance infrastructure. However, these projects are
 23 progressing and becoming more expensive as they move from the design to the
 24 construction phase. A major infrastructure project addresses the poor condition of the
 25 clearwell constructed in 1908 to store and disinfect filtered water prior to the introduction

1 of the water into PWSA’s distribution system. PWSA received approval in September
2 2019 from the Pennsylvania Department of Environmental Protection (“DEP”) to
3 implement a series of related key projects to construct a temporary bypass
4 chlorination/disinfection system, which will enable the clearwell to be shut down from
5 service so it can be replaced.² The scope of this project involves numerous, interrelated
6 components of PWSA’s overall infrastructure and completing these projects
7 expeditiously (with continuing oversight by DEP) will significantly reduce the risks of
8 water system failure.

9 The strategic replacement of water mains will improve reliability, improve water
10 pressure, maintain water quality, and minimize disturbances caused by breaks. As
11 PWSA replaces water mains, it also removes lead service lines attached to them pursuant
12 to its Lead Infrastructure Plan. This is a cost-effective way to maintain PWSA’s water
13 distribution system and proactively remove lead. From 2018-2021, PWSA’s Small-
14 Diameter Water Main Replacement Program (“SDWMRP”) focused on replacing
15 existing 4” and 6” diameter water mains that have a history of frequent breaks while also
16 replacing lead service lines in Level 4 and 5 lead priority areas. Since the most critical 4-
17 inch mains have been replaced, the planning effort for the 2022-2026 SDWMRP can
18 focus on a primary objective of removing lead service lines (with some reserved for
19 locations with a prevalence of breaks), ensuring that the money available for this program
20 is used as efficiently as it can be with respect to lead service line replacement (“LSLR”).

² See *In The Matter Of: Pittsburgh Water and Sewer Authority, Violations of the Pennsylvania Safe Drinking Water Act and the Rules and Regulations Promulgated Pursuant Thereto*, Consent Order and Agreement entered September 6, 2019.

1 The PWSA Water Reliability Plan, which includes a series of major pumping,
2 storage, and transmission infrastructure projects to facilitate the replacement of the
3 clearwell as well as upgrade major core infrastructure in the system, will begin
4 construction in the fourth quarter of 2021, with a majority of the construction projects in
5 progress in 2022. The construction contract for the Highland No. 2 Reservoir
6 Improvements Project, which will replace the liner and cover of the Highland No. 2
7 Reservoir, will be awarded in April 2021, with major construction activities starting in
8 March 2022 and concluding in the fourth quarter of 2022. The Rising Main 3
9 Rehabilitation and Reconstruction Project will intentionally be constructed at the same
10 time as the Highland No. 2 Reservoir line and cover work, to minimize the duration that
11 both of these vital infrastructures are necessarily off-line. Other Water Reliability
12 Projects scheduled to begin construction in 2022 and continue for at least two years
13 include the Rising Main 4 Rehabilitation and Reconstruction Project, the Aspinwall
14 Pump Station Improvements Project, the Bruecken Pump Station Improvement Project,
15 the Aspinwall Pump Station to Lanpher Reservoir Rising Main Project, the Clearwell
16 Bypass and Emergency Response Project, the Highland Reservoir Pump Station and
17 Rising Main Project, and the Aspinwall Water Treatment Plant Electrical and Backup
18 Power Improvements Project.

19 Overall, these projects will result in significant construction expenditures in
20 2022. To finance that additional construction, Mr. Barca explains that PWSA will need
21 to issue additional long term debt, which will increase its debt service by \$22.4 million;
22 including required debt service coverage, the total additional obligation that must be
23 recovered in rates is \$29.2 million in FY 2022.

1 **III. DESCRIPTION OF PWSA AND THE PROCESS OF TRANSITIONING TO**
 2 **COMMISSION JURISDICTION**

3 **Q. PLEASE DESCRIBE PWSA.**

4 A. Created by the City of Pittsburgh in 1984 pursuant to the Municipality Authorities Act,³
 5 PWSA operates the largest combined water and sewer authority in Pennsylvania
 6 producing an average of 70 million gallons of treated water daily and providing service to
 7 more than 300,000 residents as well as up to 520,000 people during working hours in
 8 total throughout the City of Pittsburgh and surrounding communities. PWSA’s
 9 employees have expertise in engineering, operations, maintenance, water quality,
 10 customer service, safety, green infrastructure and many other disciplines. PWSA is
 11 committed to continuing to enhance its operations to provide service in a safe, sustainable
 12 and customer-friendly manner at just and reasonable rates.

13 **Q. WHAT INFRASTRUCTURE DOES PWSA MANAGE?**

14 A. Currently, PWSA is responsible for the day-to-day management, operation, maintenance,
 15 and improvement of virtually the entire City water supply, distribution, and wastewater
 16 collection systems. Below is an overview of these systems.

- The **water** supply and distribution system consists of a 117 million gallon per day conventional flocculation, sedimentation and rapid sand process treatment plant which was placed in service in 1969, 964 miles of water mains plus more than 81,000 service lines, more than 25,900 line valves, more than 7,300 fire hydrants, one raw water pump station, ten finished water pump stations, one microfiltration plant, four reservoirs, and ten storage tanks. The total storage capacity of the reservoirs and tanks is approximately 455 million gallons. With consideration given to the pressure requirements of the distribution system, and storage capacities in each of the 15 pressure zones, the Authority stores enough finished water to provide (with water use restrictions) a 3 day uninterrupted supply to all customers should it temporarily be unable to treat additional water from the Allegheny River.

³ 52 Pa.C.S. §§ 5601-5632.

1 • The **wastewater** collection and conveyance system consists of approximately
 2 1,220 miles of sanitary, storm and combined sewer lines, 29,000 manholes,
 3 approximately 30,000 stormwater catch basins and inlets, 38 combined sewer
 4 overflow outfalls, 185 storm outfalls and four pump stations which are
 5 designed to carry both storm and sanitary flows. About 75% of the system is
 6 serviced by combined sewers (both wastewater and stormwater are collected
 7 in one pipe) and the remaining 25% are designed as separate sewage and
 8 stormwater piped systems. The average age of the sewer lines is between 60
 9 and 70 years old, with some portions reaching nearly 150 years in age. The
 10 wastewater collection and conveyance system discharges to a regional system
 11 that conveys sewer flows through trunk sewers to deliver to a wastewater
 12 treatment which services eighty-three cities, towns and boroughs in Allegheny
 13 County. The regional system is owned and operated by the Allegheny County
 14 Sanitary Authority (“ALCOSAN”)⁴ which maintains interceptors along the
 15 rivers to deliver sewage to its Woods Run Wastewater treatment plant prior to
 16 discharge in the Ohio River. Because the current combined sewer systems
 17 contribute to the Allegheny Region’s Combined Sewer Overflow volume,
 18 state and federal water quality regulations apply, including a regional Consent
 19 Decree involving ALCOSAN and the Pennsylvania Department of
 20 Environmental Protection mandating a \$2 billion Combined Sewer Overflow
 21 reduction program.⁵

22 **Q. HOW DOES STORMWATER FIT WITHIN THE WATER/WASTEWATER**
 23 **CONVEYANCE SYSTEM?**

24 A. Stormwater issues arise in two contexts: (1) the combined wastewater system Combined
 25 Sewer Overflows (“CSOs”); and, (2) the municipal separate storm sewer system (known
 26 as “MS4s”).⁶ The federal Environmental Protection Agency (“EPA”) develops and
 27 implements federal stormwater regulations to require compliance with water quality

⁴ ALCOSAN is a municipal authority (created by the City of Pittsburgh to comply with the Pennsylvania Clean Streams Law enacted in 1937) that serves as the regional sewage treatment facility. 35 Penn. Cons. Stat. §§ 691.1–691.1001. ALCOSAN provides wastewater treatment for 83 communities, including the City of Pittsburgh and maintains the facility pursuant to its National Pollutant Discharge Elimination System (“NPDES”) permit. PWSA does not own any sewage treatment facilities or provide consumers sewage treatment services. ALCOSAN is not regulated by the Commission.

⁵ ALCOSAN entered in to a modified consent decree agreement with the Department of Environmental Protection, which approved a comprehensive, \$2 billion, long-term plan to significantly reduce the overflow of diluted, untreated wastewater into the region’s rivers. Details of ALCOSAN’s Clean Water Plan are available at: <https://www.alcosan.org/our-plan/plan-documents>

⁶ MS4 refers to a conveyance that is owned by a public entity that discharges to waters, is designed or used to collect or convey stormwater, is not a combined sewer system and is not part of a sewage treatment plan.

1 standards, which are implemented by EPA and the DEP. Regarding the sewer system,
2 75% of the wastewater conveyance infrastructure is designed as a “combined” sewer
3 system to capture both wastewater and stormwater in one pipe network. In addition to
4 the combined system, one quarter of the current infrastructure managed by PWSA
5 includes separate sewer and stormwater systems, which require compliance with
6 stormwater management regulations (*i.e.*, MS4) and are subject to National Pollutant
7 Discharge Elimination System (“NPDES”) Permits issued by DEP pursuant to EPA
8 requirements.

9 **Q. PLEASE EXPLAIN HOW PWSA IS WORKING TO ADDRESS STORMWATER**
10 **ISSUES.**

11 A. As Mr. Igwe explains in his direct testimony, PWSA approaches stormwater management
12 throughout Pittsburgh in an effort to lower the volume of combined system overflows.
13 PWSA’s forthcoming stormwater master plan will look comprehensively at stormwater
14 issues and overlaps both categories of stormwater (*i.e.* addressing the combined system
15 and the separate stormwater system). It also outlines how Pittsburgh intends to use green
16 infrastructure solutions to manage stormwater.

17 The master planning effort will utilize innovative strategies including the
18 following: (i) Recommend an approach that prioritizes collaboration of interagency
19 partnerships and identifies opportunities to create a more equitable community through
20 better stormwater management and job creation through the expanded use of green
21 infrastructure; (ii) Address all applicable regulatory requirements and identify best
22 management practices that would incentivize and encourage private property owners to
23 be part of the solution; (iii) Provide performance recommendations to balance the use of
24 green and gray infrastructure, outline appropriate uses for green infrastructure to

1 accommodate Pittsburgh’s difficult terrain, and determine the level of stormwater
 2 protection across the City; (iv) Analyze other plans in place to recommend distinct
 3 outcomes that are beneficial to ratepayers and benefit the community through green
 4 infrastructure. In addition, the plan will assess PWSA’s stormwater programs in light of
 5 ALCOSAN’s recent consent order with EPA and the Department of Justice regarding
 6 combined sewer overflows. Since stormwater management is a regional responsibility, it
 7 is critical to consider the cost to ratepayers and act efficiently so that they are not paying
 8 twice for the same solution.

9 The primary goals of PWSA’s stormwater program are to reduce CSO volume;
 10 implement a stormwater asset management program; define a publicly accepted level of
 11 stormwater management capacity; achieve regulatory compliance; develop partnership
 12 with government and other agencies to access eligible funds for flood protection and
 13 water quality projects; and establish an affordable stormwater utility fee structure.

14 **Q. WHAT IS THE RELATIONSHIP BETWEEN PWSA AND THE CITY OF**
 15 **PITTSBURGH?**

16 A. The water/wastewater conveyance infrastructure operated by PWSA is currently owned
 17 by the City of Pittsburgh (“City”). PWSA first assumed responsibility for the system
 18 operation and maintenance from the City pursuant to an agreement effective January 1,
 19 1995 between the City and PWSA (the “1995 Cooperation Agreement”). Consistent with
 20 a Memorandum of Lease dated July 27, 1995, PWSA is on the path to becoming the
 21 official owner of the City’s assets and, on September 1, 2025, this transfer will be
 22 effectuated.

23 On December 20, 2019, PWSA filed a newly negotiated City Cooperation
 24 Agreement (“the 2019 Cooperation Agreement”) with the Commission, pursuant to 66

1 Pa. C.S. § 507, and requested that it be referred to the Office of Administrative Law
 2 Judge (“OALJ”) for a formal on-the-record proceeding.⁷ While that proceeding was
 3 pending before the OALJ, Governor Wolf signed into law Act 70 of 2020, which
 4 provides that the 2019 Cooperation Agreement has “the force and effect of law” until
 5 January 1, 2025, unless PWSA and the City mutually agree to an earlier termination
 6 date.⁸ Act 70 of 2020 further provides that the 2019 Cooperation Agreement, during its
 7 term, shall supersede any provision of the Public Utility Code, a Commission regulation,
 8 policy statement order and any regulatory proceeding pertaining to the issues covered by
 9 the 2019 Cooperation Agreement.⁹ As a result of Act 70, which made further review of
 10 the 2019 Cooperation Agreement unnecessary, the Commission entered a Final Order on
 11 October 14, 2020 marking the case closed.

12 **Q. WHAT IS THE OVERALL PURPOSE OF THE 2019 COOPERATION**
 13 **AGREEMENT?**

14 A. The 2019 Cooperation Agreement, which is attached as PWSA Exhibit WJP-2, provides
 15 that interactions between the City and PWSA will be conducted on a business-like,
 16 transactional basis. Specifically, it does the following: (i) reflects changes in the rights
 17 and obligations of the City and PWSA with respect to each other; (ii) reflects the division
 18 of services related to the system; (iii) provides for payments by the City and PWSA to the
 19 other based upon actual, verifiable, direct expenses, and in accordance with customary
 20 utility practices under the Public Utility Code; (iv) confirms that payments by PWSA to
 21 the City continue to be subordinate to all debt obligations of PWSA; (v) provides for

⁷ *Cooperation Agreement between the City of Pittsburgh and the Pittsburgh Water and Sewer Authority*,
 Docket No. U-2020-3015258.

⁸ Act of July 23, 2020, P.L. 677, No. 70.

⁹ Act 70 of 2020, Section 2802-G.

1 cooperation by the City and PWSA in their respective capital projects that may impact
 2 each other; (vi) provides for clarification of the responsibilities of PWSA with respect to
 3 City Parks larger than 50 acres and other City properties; (vii) confirms that the system
 4 will remain under public ownership; and (viii) sets forth certain other provisions relating
 5 to the roles and responsibilities of the City and PWSA with respect to the system.

6 **Q. WHAT DOES THE 2019 COOPERATION AGREEMENT PROVIDE FOR**
 7 **SERVICES BETWEEN THE CITY AND PWSA?**

8 A. The 2019 Cooperation Agreement provides that the City may render to PWSA the
 9 following services and goods: (i) participation of eligible PWSA employees in the City’s
 10 Pension Plan; (ii) fuel for PWSA vehicles; (iii) City permits and licenses relating to
 11 PWSA projects; (iv) vehicle fleet maintenance services; (v) 50% of street sweeping costs;
 12 and (vi) other goods and services as may be agreed upon by the parties. It further
 13 provides that PWSA may render the following services and goods to the City: (i)
 14 providing water through PWSA water mains to City properties; (ii) fire hydrant services;
 15 (iii) conveyance of sewage through PWSA sewer mains to ALCOSAN and payment of
 16 ALCOSAN charges; and (iv) payment of any subsidy to other water service providers.

17 **Q. PLEASE DESCRIBE SOME OF PWSA’S OBLIGATIONS UNDER THE 2019**
 18 **COOPERATION AGREEMENT.**

19 A. PWSA’s obligations under the 2019 Cooperation Agreement include: (i) responsibility
 20 for the operation, maintenance, repair and replacement of water mains in City Parks, and
 21 for existing and new service lines, which provide water service to City Parks larger than
 22 50 acres; (ii) responsibility for the operation, maintenance, repair and replacement of
 23 sanitary sewer and combined sewer mains in City Parks, and for existing and new sewer
 24 laterals within City Parks larger than 50 acres; and (iii) responsibility for the operation,
 25 maintenance, repair and replacement of water mains providing water service to City

1 properties, and the operation, maintenance, repair, and replacement of sanitary sewer and
2 combination sewer mains on City properties. The 2019 Cooperation Agreement also
3 addresses PWSA's obligations relating to service lines and sewer laterals on City
4 properties, and for the provision of water and sewage service to specific entities under
5 contracts with the City at phased-in charges. It further establishes a phase-in of PWSA
6 charges on City-owned metered properties for all water usage and fire hydrant usage.
7 The 2019 Cooperation Agreement also provides for the assessment of a City Payroll Tax
8 on PWSA, as well as taxes pursuant to the Pennsylvania Public Utility Realty Tax.¹⁰ The
9 Cooperation Agreement does not include phase-in charges for forthcoming stormwater
10 fees associated with City properties.

11 **Q. WHAT ISSUES ARE FACING PWSA AS IT OPERATES THE WATER AND**
12 **WASTEWATER CONVEYANCE SYSTEMS OF THE CITY OF PITTSBURGH?**

13 A. As the City's current water and sewer systems date back to the 1850s, PWSA continues
14 to face challenges caused by the dated infrastructure, the presence of lead in water service
15 lines, extreme storm events that impact stormwater and sewer systems, historical
16 contractual relationships, complex organizational and management structures and
17 numerous regulatory requirements and obligations.

18 **Q. HOW DID PWSA – A MUNICIPAL AUTHORITY – COME TO BE SUBJECT TO**
19 **THE COMMISSION'S JURISDICTION?**

20 A. In December 2017, Act 65 was passed which added Sections 3201-3209 to the Public
21 Utility Code subjecting PWSA to the Commission's jurisdiction. Shortly after passage of
22 Act 65, the Commission issued a Tentative Implementation Order to guide the process for

¹⁰ Article XI-A of the Tax Reform Code of 1971 (P.L. 6, No. 2, as amended).

1 PWSA’s transition to Commission jurisdiction.¹¹ After review of comments from
 2 interested stakeholders, the Commission entered its Final Implementation Order on
 3 March 15, 2018, which is the roadmap PWSA has been following to transition to
 4 Commission jurisdiction.¹²

5 **Q. PLEASE PROVIDE SOME BACKGROUND REGARDING PWSA’S 2021 RATE**
 6 **INCREASE AND THE FILING OF THIS BASE RATE CASE, WHICH WOULD**
 7 **RESULT IN AN INCREASE IN EARLY 2022.**

8 A. The Commission approved a Joint Petition for Settlement (“Settlement”) of that case,
 9 which was filed on September 30, 2020 by PWSA and the other parties in the 2020 base
 10 rate proceeding.¹³ Under that Settlement, PWSA agreed to an increase in annual
 11 revenues of \$19 million, inclusive of a 5% Distribution System Improvement Charge
 12 (“DSIC”). This increase was almost \$25 million less than PWSA had originally
 13 proposed. In addition, the Settlement terms included a withdrawal of the request for a
 14 multi-year rate plan and the implementation of COVID-19 consumer relief measures.
 15 PWSA agreed to these Settlement terms based upon its recognition of the financial
 16 challenges faced by many of its customers due to the COVID-19 pandemic.

17 However, as I explained earlier, PWSA’s operating expenses have continued to
 18 increase. Also, the Authority has substantial long term debt service obligations driven by
 19 an extensive CIP, which includes acceleration of the LSLR program and the

¹¹ *Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water and Sewer Authority*, Docket Numbers M-2018-2640802 (water) and M-2018-2640803 (wastewater), Tentative Implementation Order entered January 18, 2018.

¹² *Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water and Sewer Authority*, Docket Numbers M-2018-2640802 (water) and M-2018-2640803 (wastewater), Final Implementation Order entered March 15, 2018.

¹³ *Pa. PUC v. Pittsburgh Water and Sewer Authority (water)*, Docket No. R-2020-3017951, and *Pa. PUC v. Pittsburgh Water and Sewer Authority (wastewater)*, Docket No. R-2020-3017970 (Order entered December 3, 2020).

1 refurbishment and replacement of a significant portion of PWSA’s water supply system.
2 Without additional rate relief by early 2022, PWSA simply cannot accomplish these
3 important initiatives that are necessary for our customers, while also maintaining
4 compliance with regulatory requirements. Indeed, PWSA must have an increase of at
5 least \$22.4 million simply to cover additional debt service in FY 2022. The Authority
6 understands, however, that some customers may be facing financial challenges as well,
7 which is why PWSA has included specific proposals, such as a phase-in of the rate
8 increase and the expansion of its customer assistance programs.

9 Further, I note that in adopting the Termination Moratorium Order, which lifted
10 the termination moratorium on April 1, 2021, subject to various conditions, the
11 Commission recognized that the effect of the COVID-19 pandemic on Pennsylvania’s
12 unemployment numbers have declined significantly. The Commission observed that
13 “[t]his downward trajectory bodes well for Pennsylvania’s economy.”¹⁴

14 In addition, the Order noted that stimulus packages from the federal government
15 have countered a portion of the negative employment impacts, and also that the
16 Pennsylvania General Assembly passed legislation to appropriate funds allocated to
17 counties through a grant program. Further, the Order pointed to the American Rescue
18 Plan Act of 2021, passed by Congress on March 10, 2021, which contains “extended
19 unemployment compensation, stimulus checks, monthly payments for families with
20 children, and **assistance for low-income water and wastewater customers.**”¹⁵ Any
21 government assistance that PWSA’s low-income customers receive to pay their bills

¹⁴ Termination Moratorium Order at 2.

¹⁵ Termination Moratorium Order at 3 (emphasis added).

1 would moderate the impacts of the proposed rate increase, which is based on the
2 Authority's revenue requirements to provide water and wastewater service to all
3 customers. While PWSA does not expect to directly receive any of these funds, even if it
4 does, the timing and amount of such relief is unknown. As described more fully by Mr.
5 Barca, PWSA's financial needs cannot await the finalization of those details.

6 Finally, it is important to recognize the mandatory nature of many projects
7 included in PWSA's CIP due to the Consent Orders and Agreements ("COAs") issued by
8 DEP. These obligations are addressed in detail by Mr. King's testimony. As he notes,
9 for the 2019 COA alone, PWSA's total commitment for the construction projects is
10 approximately \$252.3 million. The 2019 COA is included with Mr. King's testimony as
11 PWSA Exhibit BK-1. If PWSA does not comply in a timely manner with any term or
12 provision of the 2019 COA, it will be required to pay a civil penalty of \$100.00 per day
13 for each violation and is also subject to the imposition of additional penalties. As Mr.
14 Barca explains, if PWSA is not permitted to raise its rates as proposed in this proceeding,
15 it will be unable to fulfill these obligations. The result is that PWSA would be subject to
16 the payment of these penalties, and since PWSA does not have shareholders, our
17 ratepayers would have to bear this burden.

18 **Q. DID THE COMMISSION CONDUCT A PROCEEDING REVIEWING PWSA'S**
19 **COMPLIANCE WITH COMMISSION REQUIREMENTS?**

20 A. Yes. Consistent with the statute and the Commission's direction in the Final
21 Implementation Order, PWSA filed a Petition for Approval of Its Compliance Plan and a
22 Petition for Approval of its Long-Term Infrastructure Implementation Plan on September

1 28, 2018.¹⁶ These proceedings were subsequently consolidated, upon motion by PWSA.
 2 The Commission later established a two-stage review process for PWSA’s Compliance
 3 Plan.¹⁷ PWSA then filed a Compliance Plan Supplement on February 1, 2019 and the
 4 matter proceeded to litigation. The parties filed a Joint Petition for Partial Settlement
 5 (“Partial Settlement”) on September 13, 2019, offering proposed resolutions of nearly
 6 75% of the identified issues. The Administrative Law Judges (“ALJs”) issued a
 7 Recommended Decision on October 29, 2019, finding that the Partial Settlement was in
 8 the public interest and recommended its approval without modification. The ALJs also
 9 addressed the litigated issues. The Commission issued an Order on March 26, 2020
 10 adopting the Recommended Decision, as modified.

11 **Q. IS THERE ANYTHING YOU WISH TO HIGHLIGHT ABOUT THE**
 12 **COMMISSION’S MARCH 26, 2020 ORDER?**

13 A. Yes. The Commission recognized that “PWSA’s transition to Commission jurisdiction is
 14 a vast and complex undertaking requiring prioritization and allocation of resources and
 15 the redevelopment of operations.”¹⁸ The Commission also found that “PWSA has
 16 presented a plan for compliance that...will adequately ensure and maintain the provision
 17 of adequate, efficient, safe, reliable and reasonable service.”¹⁹

¹⁶ *Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water and Sewer Authority*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), *Petition of The Pittsburgh Water And Sewer Authority For Approval Of Its Compliance Plan* filed September 28, 2018. *Petition of The Pittsburgh Water And Sewer Authority For Approval Of Its Long-Term Infrastructure Improvement Plan*, Docket Nos. P-2018-3005037 (water) and P-2018-3005039 (wastewater) filed September 28, 2018.

¹⁷ November 28, 2018 Secretarial Letter.

¹⁸ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater); and *Petition of Pittsburgh Water and Sewer Authority for Approval of its Long-Term Infrastructure Improvement Plan*, Docket Nos. P-2018-3005037 (water) and P-2018-3005039 (wastewater) (Order entered March 26, 2020) (“Stage 1 Compliance Plan Order”), at 23.

¹⁹ Stage 1 Compliance Plan Order at 23-24.

1 **Q. DID THE COMMISSION’S MARCH 26, 2020 ORDER APPROVE PWSA’S**
 2 **LTIIIP?**

3 A. No. The March 26, 2020 Order directed PWSA to file an Amended LTIIIP, which PWSA
 4 filed on April 27, 2020.²⁰ Upon review of PWSA’s Amended LTIIIP, the Commission
 5 found that it: (a) contains measures to ensure that the projected annual expenditures are
 6 cost-effective; (b) specifies the manner in which it accelerates or maintains an accelerated
 7 rate of infrastructure repair, improvement or replacement; (c) is sufficient to ensure and
 8 maintain adequate, efficient, safe, reliable and reasonable service; and (d) fulfills the
 9 requirements of the Commission’s regulations at 52 Pa. Code § 121.3(a). Therefore, the
 10 Commission approved PWSA’s Amended LTIIIP.²¹

11 **Q. HAS PWSA IMPLEMENTED THE DISTRIBUTION SYSTEM IMPROVEMENT**
 12 **CHARGE (“DSIC”)?**

13 A. Yes. PWSA has implemented the DSIC. As Mr. Barca explains, the DSIC is one of the
 14 three main sources of funding, along with debt (*i.e.* revenue bonds) and loans from
 15 PENNVEST. He notes that DSIC funding is being used as a source of internally
 16 generated funds (“PAYGO”) to fund capital projects.

17 **Q. WHAT IS THE CURRENT STATUS OF THE COMPLIANCE PLAN STAGE 1**
 18 **PROCEEDING?**

19 The Commission issued an Order on June 18, 2020 addressing a Petition for
 20 Reconsideration, Clarification and/or Amendment filed by PWSA and the Petition for
 21 Reconsideration and Clarification of Pittsburgh UNITED with respect to the March 26,
 22 2020 Order. By the June 18, 2020 Order, the Commission held in abeyance certain issues

²⁰ Stage 1 Compliance Plan Order at 129.

²¹ *Petition of Pittsburgh Water and Sewer Authority for Approval of its Amended Long-Term Infrastructure Improvement Plan for its Water Operations*, Docket No. P-2018-3005037 (Order entered August 27, 2020).

1 relating to LSLRs and directed PWSA to file a Compliance Proposal within the
2 Commission within 90 days, upon which other parties would have an opportunity to
3 comment.²² Thereafter, the Commission issued an Opinion and Order on February 4,
4 2021 resolving the remaining Stage 1 Compliance Plan issues that were not otherwise
5 deferred to Stage 2 of the Compliance Plan proceeding.²³

6 **Q. HAS PWSA COMPLIED WITH THE COMMISSION'S DIRECTIVES**
7 **REGARDING STAGE 1 ISSUES?**

8 A. Yes, as discussed more fully by Ms. Quigley, on March 26, 2021, PWSA filed
9 Supplemental Compliance Plan Regarding Line Extension. In compliance with the Stage
10 1 directives of the February 4, 2021 Order, PWSA filed on April 1, 2021: (1) Compliance
11 Plan (revised page 125); (2) Water Tariff Supplement No. 6; and, (3) Minor
12 Modifications to PWSA's LTIP pursuant to 52 Pa. Code § 121.5.

13 **Q. HAS PWSA CONTINUED TO KEEP THE COMMISSION UP-TO-DATE**
14 **REGARDING ITS COMPLIANCE PROGRESS?**

15 A. Yes. Pursuant to the Partial Settlement of the Compliance Plan Stage 1 proceeding,
16 PWSA agreed to file a quarterly compliance plan progress report which updates its status
17 on meeting the various commitments from the Partial Settlement.²⁴ PWSA filed its most
18 recent Quarterly Compliance Plan Progress Report on January 29, 2021. Also included
19 in this Compliance Plan Progress Report is an update regarding the settlement
20 commitments from PWSA's 2020 rate case proceeding.

²² *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 and M-2018-2640803 (Order entered June 18, 2020).

²³ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 and M-2018-2640803 (Order entered February 4, 2021).

²⁴ Joint Petition for Partial Settlement dated September 13, 2019 at Section III.ZZ.

1 **Q. DOES PWSA PLAN TO CONTINUE REPORTING ON COMMITMENTS IN**
2 **FUTURE COMPLIANCE PLAN QUARTERLY PROGRESS REPORTS?**

3 A. PWSA will continue to honor its commitment to provide Compliance Plan reports.
4 PWSA is willing to work with the parties in this proceeding to the extent there is a desire
5 for PWSA to report on items in future progress reports. For now, however, a better use
6 of PWSA’s resources is to continue to report on Compliance Plan items while working
7 through this and the other pending proceedings at the Commission.

8 **Q. WHAT IS THE STATUS OF THE COMMISSION’S STAGE 2 COMPLIANCE**
9 **PLAN PROCEEDING?**

10 A. In the February 4, 2021 Order in PWSA’s Stage 1 Compliance Plan proceeding, the
11 Commission found it “appropriate to provide direction regarding the commencement of
12 Stage 2 of the Compliance Plan proceeding.”²⁵ In doing so, the Commission reiterated
13 prior directives for PWSA to file its Stage 2 Compliance Plan within 60 days and set
14 forth a process for addressing this filing. PWSA obtained a short extension for filing its
15 Stage 2 Compliance Plan and on April 9, 2021 filed: (1) Stage 2 Compliance Plan:
16 Chapters 14 & 56, Discontinued Service to Leased Premises Act (“DSLPA”) and
17 Collections; and, (2) Stage 2 Compliance Plan: Stormwater. On the same date, PWSA
18 also filed: (1) Petition to Amend; and, (2) Motion to Hold in Abeyance setting forth its
19 proposals about how to proceed for each of the Stage 2 Compliance Plans. Ms. Quigley
20 discusses PWSA’s current view of the interplay of the Stage 2 Compliance Plan
21 proceeding regarding Chapters 14 & 56, DSLPA and Collections, while Mr. Igwe
22 discusses the interplay related to stormwater issues.

23

²⁵ February 4, 2021 Order at 62.

1 **IV. PWSA ORGANIZATIONAL STRUCTURE, MANAGEMENT QUALITY**
 2 **UPDATES**

3 **Q. PLEASE DESCRIBE THE GOVERNING BODY FOR PWSA.**

4 A. PWSA is governed by a nine-member Board of Directors (“Board”) whose members are
 5 appointed by the Mayor of the City and confirmed by City Council. Although previously
 6 the Board had seven members, it voted on March 26, 2020 to amend the Articles of
 7 Incorporation to expand to nine members. The Board is responsible for providing
 8 strategic direction and oversight to the PWSA management team, as well as adopting the
 9 Authority’s annual operating and capital budgets, approving contracts, and setting rates.
 10 Consistent with the recommendations made by a Blue Ribbon Panel on PWSA
 11 governance issues, new nominees to the Board of Directors are vetted and identified by
 12 an independent Board of Nominators prior to the Mayor submitting the nominees to City
 13 Council for approval. The purpose of the Board of Nominators, which is made up of
 14 independent community leaders, is to ensure that PWSA’s board includes individuals
 15 with relevant knowledge and expertise.

16 **Q. PLEASE DESCRIBE PWSA’S EXECUTIVE MANAGEMENT AND**
 17 **ORGANIZATIONAL STRUCTURE**

18 A. PWSA is operated through three operating divisions under the Chief Executive Officer:
 19 Administration, Engineering and Construction, and Operations. The Administration
 20 Division is responsible for the administrative and support functions of PWSA. This
 21 division’s major responsibilities include administration, customer service, finance,
 22 procurement, information technology, public affairs, legal, and human resources.

23 The Engineering and Construction Division works to safely and efficiently deliver
 24 an effective capital improvement program and to support operations with cost-effective
 25 technical solutions to water line breaks, sewer stoppages and collapsed pipes, combined

1 sewer overflows (“CSOs”) and stormwater flooding and basement backups. Also,
2 Engineering and Construction is responsible for managing PWSA’s response to all
3 regulatory consent orders for water supply, sewer collection, and stormwater
4 management related to Combined Sewer Overflows issued by the Pennsylvania
5 Department of Environmental Protection and the United States Environmental Protection
6 Agency. These include the Water Supply, CSO, Sanitary Sewer Overflow (“SSO”) and
7 municipal separate stormwater systems compliance requirements from State and Federal
8 environmental authorities. Engineering and Construction also prepares and assists in
9 reviewing of water and sewer tap-in applications, as well as addressing localized
10 combined sewer overflows and sewerage system backups.

11 The Operations Division operates and maintains the water treatment, water supply
12 and water distribution storage system, to ensure an adequate quantity of water to PWSA’s
13 customers while maintaining compliance with state and federal quality drinking water
14 regulations. The Operations Division also ensures conveyance of sewage and stormwater
15 to the ALCOSAN regional wastewater system and is responsible for maintaining all
16 sewerage collection infrastructure below grade. The Operations Division works
17 collaboratively with the City of Pittsburgh Department of Public Works and Department
18 of Mobility and Infrastructure to ensure roads remain safe for public travel at all times. It
19 is Operations’ responsibility to be aware of customer needs and address their concerns
20 (e.g., public service line leaks, water main leak repairs, catch basin cleaning, and sewer
21 line maintenance and repair). PWSA maintains sufficient inventory of materials, staff,
22 and equipment to respond promptly to a request regarding water and wastewater services.
23 Additionally, Operations strives to maintain a safe working environment while

1 establishing an effective and efficient operations division that will provide the highest
2 quality customer service at the lowest possible cost.

3 **Q. HOW DOES PWSA STAFF ITS OPERATIONS?**

4 A. PWSA has 345 employees as of March 15, 2021 with 11 more scheduled to start within
5 the next 2 months. The majority of Authority employees are represented by one of three
6 labor unions: The Pittsburgh Joint Collective Bargaining Committee (PJCBC) represents
7 blue-collar employees; The American Federation of State, County and Municipal
8 Employees (AFSCME) represents Local 2719 and Local 2037 employees; and
9 Management and professional staff are “at will” employees, with no Union
10 affiliation. PWSA has engaged the services of professional consultants to support
11 PWSA’s rapid growth in all staff categories and as necessary to meet its regulatory
12 compliance obligations. These embedded consultants assist with permitting, design, and
13 construction of facilities/infrastructure upgrades and replacements, and help to address
14 the limited Pittsburgh domiciled professionals. PWSA engages engineering consultants
15 to support all capital project implementation, including planning, design, and
16 construction under the supervision of PWSA Project Managers. PWSA also supplements
17 its core staff with a financial consulting services firm to support tariff and fee
18 analyses. Additional experts in finance, legal and administration engaged as required to
19 fulfill state, federal and local regulatory and administrative requirements. Mr. Barca
20 discusses more fully PWSA’s future plans to staff its administrative, engineering, and
21 field operations.

22

23

1 **V. PWSA’S ACCOMPLISHMENTS SINCE 2020 RATE CASE**

2 **A. Goals and Tracking**

3 **Q. YOU HAVE DISCUSSED THE SIGNIFICANT CHALLENGES FACING PWSA**
 4 **NOW AND IN THE FUTURE; WHAT IS PWSA DOING TO MEET THESE**
 5 **CHALLENGES?**

6 A. PWSA is focused on becoming a more professional and customer centric public utility
 7 that delivers “best in class” drinking water, wastewater collection and stormwater related
 8 services. In October 2018, PWSA released “Pittsburgh’s Water Future 2030 and
 9 Beyond,” which sets forth a 12-year plan for Pittsburgh’s water system. Included in this
 10 report is PWSA’s vision for rebuilding and upgrading the drinking water, stormwater and
 11 sewer systems. The report details PWSA’s goals including, inter alia, transparency,
 12 accountability, reliability, and affordability.²⁶ In 2019, PWSA issued an update to its
 13 website, which highlights some of PWSA’s key projects – from lead line replacements to
 14 innovative stormwater management solutions to customer assistance programs and
 15 community engagement initiatives – and its accomplishments to date.²⁷

16 During 2020, PWSA responded to the COVID-19 pandemic by prioritizing the
 17 health and safety of our workforce and our customers, while delivering the necessary
 18 services upon which our customers rely. PWSA’s Board voted unanimously to suspend
 19 water shutoffs and PWSA waived many of the requirements to enroll in customer
 20 assistance programs. Regardless of ability to pay, customers were protected with access
 21 to necessary water services.

²⁶ A copy of Pittsburgh’s Water Future 2030 and Beyond is available at:
<https://www.pgh2o.com/sites/default/files/2020-01/PGH2o2030Plan%20-%20Smaller.pdf>
²⁷ A copy of the 2019 Update is available at: <https://pgh2o2030.com/2019-update>

1 Despite the challenges presented by the pandemic, PWSA achieved several
2 milestones throughout the year. Of particular note is an accomplishment that I
3 highlighted early in my testimony. Lead levels continued to drop in 2020, and in June
4 2020, these levels fell into compliance at 5.1 parts per billion, the second consecutive 6-
5 month sampling period below the Lead Action Level and the lowest lead levels that
6 PWSA has experienced in 20 years. Since implementing our Community Lead Response
7 in 2018, PWSA has removed 8,319 public lead service lines and 5,391 private lead
8 service lines at no direct cost to the property owner. In addition, PWSA offers an income-
9 based reimbursement program for customers who elect to replace their private lead
10 service line using their own contractor or plumber. Now that lead levels comply with
11 state and federal standards, we will continue to remove lead service lines in conjunction
12 with water main replacement projects taking place across our water service area.

13 PWSA's Customer Assistance Program, which was established in 2018, supports
14 our most vulnerable customers. As a result of the Rate Case Settlement, PWSA
15 implemented several enhancements to simplify the enrollment process and expand
16 accessibility to more customers. These program expansions went into effect on January
17 14, 2021 and are available to income qualified customers.

18 Improving the quality and reliability of our service was also a focus of 2020,
19 when PWSA completed a number of important construction projects. These include the:
20 (i) Bates Water Main Replacement Project (replacement of 1,500 feet of aging main); (ii)
21 Highland Park Microfiltration Plant (improvements to the water retreatment plant that
22 allows the Highland I Reservoir to comply with regulatory requirements); (iii) Highland I
23 Security Improvements (completed projects to meet stricter state water regulations and

1 improve security around the reservoir); (iv) Edgerton Avenue Sewer Relocation
2 (relocated the collapsed sewer); (v) Sawmill Run Stream Restoration (improved water
3 quality and stormwater management in sections of the stream): (vi) Wightman Park Phase
4 I (made stormwater improvements); and (vii) 10th Street (helped to restore the segment of
5 10th Street downtown following a large sinkhole that collapsed in late October 2019).

6 **Q. IS PWSA TRACKING ITS PERFORMANCE AND SHARING THIS**
7 **INFORMATION WITH THE PUBLIC?**

8 Yes. In January 2020, PWSA publicly unveiled “Headwaters” to measure PWSA’s
9 performance regarding five specific goals set forth in PWSA’s 2017 “Focusing on the
10 Future” Report.²⁸ These five goals are to: (1) protect the public health and the
11 environment; (2) ensure customer and stakeholder satisfaction; (3) improve infrastructure
12 reliability; (4) maintain a high-performing workforce; and, (5) be an efficient and
13 effective organization. Each of these five goals includes: (a) a more full description
14 about why the goal is important; (b) what areas in which PWSA will focus to achieve
15 success; and, (c) a real-time progress report measuring PWSA’s progress against
16 expectations. For example, to maintain a high-performing workforce, PWSA is dedicated
17 to investing the necessary resources to recruit, develop and retain a motivated and well-
18 qualified team. In terms of progress, by January 2020, PWSA provided an average of
19 17.6 hours training to its employees per year. Similar information about the other four
20 goals is available at the website and below is a list of all the metrics currently available at
21 the website:

²⁸ See <https://headwaters.pgh2o.com/#Goals>

<i>Goal</i>	<i>Metrics</i>	<i>Report</i>
Protect Public Health and the Environment	Number of Lead Service Line Replacements (PWSA Side)	8,292 as of Feb 2021 <i>Exceeds Expectations</i>
Ensure Customer and Stakeholder Satisfaction	Average Speed of Answer, Contact Center	21 seconds as of Feb 2021 <i>Exceeds Expectations</i>
	Average Speed of Answer, Dispatch	19 seconds as of Feb 2021 <i>Exceeds Expectations</i>
	Average Time to Review Development Permit Applications	14.60 days as of Feb 2021 <i>Exceeds Expectations</i>
	% Social Media Inquiries Addressed in 3 Business Days	100% as of Feb 2021 <i>Exceeds Expectations</i>
	Voluntary Subscriptions to follow PWSA email, Twitter, Facebook	12,028 as of Feb 2021 <i>Tracking Metric</i>
Improve Infrastructure Reliability	# of Water Meters Repaired or Replaced	19,209 as of Feb 2021 <i>Exceeds Expectations</i>
Maintain a High-Performing Workforce	Average Number of Training Hours Per Employee Per Year	17.6 hours as of Jan 2020 <i>Exceeds Expectations</i>
Be an Efficient and Effective Organization	Average Length of Service Disruption	7.07 hours as of Feb 2021 <i>Near Expectations</i>

1

2

B. Infrastructure

3

Q. DID PWSA MAKE SIGNIFICANT PROGRESS REGARDING INFRASTRUCTURE PROJECTS IN 2020?

4

5

A. Yes. PWSA has accomplished crucial water, sewer and stormwater upgrades that

6

provide a higher quality of service to customers. The Authority invested approximately

7

\$122 million in infrastructure projects, making 2020 the Authority’s largest annual

8

investment in its history despite construction delays due to the pandemic.

9

Q. WHAT ARE SOME OF THE HIGHLIGHTS REGARDING SEWER IMPROVEMENT INFRASTRUCTURE PROJECTS IN 2020?

10

11

A. In 2020, we lined nearly 13 miles of sewer, which adds decades of life to the line by

12

creating a new barrier, or sleeve, inside the old pipe. Additionally, in 2020 PWSA

13

performed 3130 inlet cleanings with duplicates (multiple cleanings at site) and 3074 inlet

14

(cleanings without duplicates), and replaced 816 storm catch basins, ensuring that the

15

sewers can properly channel stormwater away from streets, homes and businesses around

1 the city. The Authority announced in January 2021 that it would accept a \$7.750 million
2 loan from PENNVEST to complete approximately 7.4 miles of sewer rehabilitation work
3 in Brighton Heights, the South Side Slopes and Hazelwood. This is a proactive effort to
4 identify aging sewers and complete low-impact improvements to prolong their life.

5 **Q. WHAT ARE SOME OF THE HIGHLIGHTS REGARDING WATER SYSTEM**
6 **INFRASTRUCTURE REHABILITATION PROJECTS IN 2020?**

7 A. In 2020, PWSA rehabilitated some of its larger water facilities, like improvements to the
8 Herron Hill Reservoir and the restoration of the parapet wall around the Highland
9 Reservoir. In September 2020, PWSA opened the main valve of the Microfiltration
10 Plant in Highland Park, restarting the flow of treated water into the PWSA water supply
11 system. The Microfiltration Plant had been taken out of service in 2017 to meet stricter
12 state water quality standards. The project included adding ultraviolet disinfection
13 technology to the treatment process. The plant is now fully operational – distributing
14 approximately 2.5 million gallons of water per day to the approximately 250,000
15 residents served by the open Highland I Reservoir. With the Microfiltration Plant back in
16 service, PWSA has a redundant water system and can spread the demand for water across
17 the entire water distribution network. This enhances PWSA’s ability to reliably provide
18 high quality water to customers.

19 PWSA’s 2020 Small Diameter Water Main Replacement project is nearing
20 completion with the replacement of a total of 15 miles of old pipe in 10 different
21 Pittsburgh areas or neighborhoods.

22 **Q. PLEASE PROVIDE AN UPDATE REGARDING PWSA’S LEAD SERVICE LINE**
23 **REPLACEMENT PROJECT IN 2020.**

24 A. In 2020, PWSA spent over \$30 million on the replacement of lead service lines. In 2020,
25 PWSA replaced a total of 2,264 public and 1,589 private lead service lines. In addition to

1 the replacements, in 2020 PWSA distributed over 3,350 free lead water test kits, provided
2 more than 3,200 certified lead water filters and pitchers, inspected over 16,300 homes,
3 and secured agreements from over 3,700 property owners to replace their private lead
4 lines for free.

5 Since PWSA's LSLR program first began in 2016, PWSA has replaced over
6 8,400 public and 5,450 private lead service lines using innovative and cost-efficient
7 methods and reduced lead levels by improving its water treatment process with the
8 addition of orthophosphate. With PWSA's water system back in compliance with
9 regulatory standards as of June 2020, PWSA will continue to use orthophosphate in its
10 water system to keep lead levels low.

11 In October 2020, PWSA announced its income-based lead line reimbursement
12 program that reimburses up to 100% of eligible costs for a private LSLR. PWSA's water
13 service customers can work with a private plumber to complete private side LSLRs and
14 receive a minimum of a \$1,000 reimbursement. Over 73% of PWSA's customers are
15 eligible to receive at least 50% reimbursement.

16 The Authority's Community Environmental Project ("CEP") concluded in
17 January 2021. The CEP provided free private-side LSLRs to eligible customers based on
18 their income. Funds from the CEP were available from a settlement of an enforcement
19 action between PWSA and the PA DEP. Over 380 private-side lead lines and 280 public-
20 side lead lines were replaced through the CEP.

21 Between 2021 and 2025, PWSA will invest over \$363 million in water main
22 replacements, resulting in dozens of miles in new water mains and non-lead service lines.

1 **Q. WHAT ARE SOME OF THE 2020 HIGHLIGHTS REGARDING STORMWATER**
2 **ISSUES?**

3 A. In 2020, PWSA built new stormwater infrastructure to capture stormwater runoff, reduce
4 flooding and basement backups, and improve capacity within its combined sewer system.
5 As further detailed by Mr. Igwe in his direct testimony, PWSA focused in 2020 on
6 prioritizing its capital projects to abate stormwater overflows or flooding. For example,
7 in August 2020, PWSA completed construction on two new green infrastructure projects
8 to help manage stormwater within Four Mile Run, which consisted of building two
9 engineered drainage channels in Schenley Park. Also, during 2020, PWSA significantly
10 increased its investment in stormwater, with capital expenditures of \$14.4 million in 2019
11 rising to \$15.8 million in 2020.

12 A few other construction projects related to stormwater are worth highlighting.
13 PWSA completed the first phase of the Wightman Park Improvement Project in Squirrel
14 Hill. The innovative park is designed to slow and capture rainwater using a stormwater
15 cascade, a rain garden, permeable pavement, and underground storage. In 2021, PWSA
16 plans to construct stormwater retrofits along nearby streets to capture and direct rainwater
17 to the newly renovated park.

18 In collaboration with the City's South Side Park Stormwater Improvement
19 Project, PWSA is providing stormwater management and green infrastructure within
20 South Side Park. The stormwater management will consist of underground detention
21 systems, natural grass swales and bio-retention facilities. These stormwater facilities will
22 capture and detain the first 1.5-inches of stormwater runoff over nine acres of park
23 impervious area. These facilities are anticipated to increase capacity in our downstream,
24 sewer system and reduce CSOs to the Monongahela River by 6-7 million gallons per

1 year. PWSA and the City have just finished 90% design drawings with final design being
 2 completed in mid-December 2020. The construction is anticipated to start in the second
 3 quarter of 2021.

4 The Saw Mill Run Stream Restoration Project in the Overbrook neighborhood
 5 was completed in July 2020. Engineered and natural solutions were used to reduce the
 6 amount of pollution and debris entering the stream, protect against future erosion, and
 7 slow down water flow during intense storms. This project restored 310 feet of heavily
 8 eroded streambank and stabilized five storm sewer outfalls at two sites, one near Ansonia
 9 Place and the other behind the City of Pittsburgh’s Accamando Center.

10 PWSA constructed the Volunteers Field Rain Garden in the Carrick
 11 neighborhood. This engineered basin at the corner of Riota Way and Plateau Street in the
 12 park uses stones, sandy soil, and plants to capture stormwater runoff and improve water
 13 quality in the Saw Mill Run stream.

14 **C. Customer Service**

15 **Q. WHAT IS PWSA’S FOCUS REGARDING CUSTOMER SERVICE ISSUES?**

16 A. PWSA’s recent customer service goals have focused on 1) developing initiatives to help
 17 customers during the COVID-19 pandemic, and 2) promoting a one call resolution to
 18 resolve customers’ issues in a professional and courteous manner with a renewed focus
 19 on call quality. Customer service issues include billing and payment questions, payment
 20 plans and assistance program enrollment, isolating and repairing leaks on water mains,
 21 resolving inoperable curb boxes, assisting consumers with lead service line replacements,
 22 and responding to customers’ issues as reported to the City of Pittsburgh’s 311 division
 23 regarding sinkholes, sewage back-up’s, and fire hydrant repairs. PWSA also launched its
 24 new customer eBilling and payment portal. Other initiatives to improve customer service

1 since the last rate case include: (a) the expansion of Customer Service to create new
2 positions, including a Quality Control Manager; (b) the launch of the PGH2O Cares
3 Team; and (c) the implementation of after call surveys. I will briefly touch on these
4 initiatives, which are more fully described in Ms. Quigley's direct testimony.

5 **Q. PLEASE HIGHLIGHT SOME OF THE INITIATIVES PWSA HAS**
6 **UNDERTAKEN TO HELP CUSTOMERS DURING THE COVID-19 PANDEMIC.**

7 A. Since the start of the COVID-19 pandemic, PWSA has implemented various outreach
8 efforts designed to reach our most vulnerable customers. Through one of these measures,
9 we provide assistance program flyers to organizations in the community that are
10 delivering food to residents in need. PWSA also engaged our employees and customers
11 in campaigns to fund the Hardship Grant Program, which resulted in over \$23,000 being
12 raised to add to this fund. Additionally, PWSA implemented changes to its customer
13 assistance programs, which make more customers eligible for the Bill Discount
14 Program, including a pilot arrearage forgiveness program, the Hardship Grant Program,
15 and the Winter Moratorium.

16 **Q. PLEASE DESCRIBE PWSA'S NEW CUSTOMER BILLING AND PAYMENT**
17 **PORTAL.**

18 A. PWSA launched its new customer eBilling and payment portal on January 5, 2021.
19 PWSA initiated this project to modernize its eBilling platform, provide customers with an
20 easier way to manage their account, and offer more convenient bill payment options. This
21 new platform features two distinct portals for paperless billing and one-time payments,
22 expanded options for retail payment locations, and improved automated prompts when
23 paying by phone. Customers electing to enroll in electronic billing will also have the
24 option to enroll in autopay for automatic monthly payment of bills. As of this filing,

1 70% of PWSA's existing eBilling customers have successfully enrolled in the new
2 platform.

3 **Q. HOW DOES PWSA INTEND TO PROMOTE EBILLING ADOPTION?**

4 A. As explained more by Ms. Quigley, PWSA is proposing to increase customer adoption in
5 eBilling by offering a one-time bill credit of \$5.00 for each new eBilling enrollee who
6 establishes autopay. By advertising this one-time credit, customers will be incentivized
7 to sign up and receive their monthly bills via email, saving postage, paper, envelope, and
8 ink costs to PWSA ratepayers.

9 **Q. PLEASE DISCUSS PWSA'S STEPS TAKEN TO ENHANCE CUSTOMER**
10 **SERVICE.**

11 A. PWSA expanded Customer Service to include a Quality Control Manager, who will
12 recognize employee development needs, provide coaching, and arrange on the job
13 training to promote quality control measures. The compliance team has also grown to
14 include a new position to facilitate adherence to the Commission's regulatory
15 requirements and the creation of the PGH20 Cares Team.

16 **Q. WHAT IS THE PGH20 CARES TEAM?**

17 A. The PGH20 Cares Team, which was formed effective February 15, 2021, consists of a
18 Cares Coordinator and two Analysts. The primary responsibility of the team is to
19 increase enrollment in PWSA's customer assistance programs. In addition to tracking
20 enrollment numbers, the team will work with Dollar Energy Fund to enable direct
21 enrollment in the programs and to develop productive relationships with community
22 based organizations to engage low-income customers who have yet to enroll.

1 **Q. PLEASE DISCUSS THE AFTER CALL SURVEYS THAT HAVE BEEN**
2 **IMPLEMENTED BY THE CONTACT CENTER.**

3 A. Each Customer Service Representative (“CSR”) has been trained to offer customers the
4 option during a call if they wish to remain on the line to take a brief survey. If so, the
5 customer is routed directly to the survey after the call, during which customers are asked
6 to rate their satisfaction with (i) the CSR; (ii) the resolution of their issues; (iii) the
7 responsiveness of PWSA to inquiries; (iv) the quality of water and wastewater services
8 provided by PWSA; and (v) PWSA’s overall performance. The Customer Service
9 management team reviews the data to identify trends and provide coaching as may be
10 necessary. The data analysis for the first quarter of 2021 is included as PWSA Exhibit
11 JAQ-1 with Ms. Quigley’s testimony illustrates that PWSA’s quality and overall
12 performance scores are high on the scale of 1 to 5, with 5 being extremely satisfied.

13 **D. Information/Operational Support Systems and Cyber Security**

14 **Q. HAS PWSA IMPLEMENTED VARIOUS TECHNOLOGY UPGRADES TO**
15 **IMPROVE OPERATIONS?**

16 A. Yes. PWSA has just begun its Enterprise Resource Planning (“ERP”) system upgrade,
17 implementing an SAP solution that will improve financial reporting, streamline internal
18 operations, and deliver improved Customer Service options for PWSA ratepayers.
19 PWSA is also in the process of completing a comprehensive GIS assessment to evaluate
20 the enterprise GIS tools and architecture currently in place, as well as identify ways that
21 existing tools can improve the use of GIS technology authority wide. In addition, PWSA
22 continues to deploy mobile devices including smartphones and iPads to field staff to
23 support the ongoing implementation of a service and work order management system.
24 Finally, a recently completed document management solution has allowed PWSA to

1 digitize over 140,000 records, including maps and engineering drawings that are now
 2 accessible remotely.

3 **Q. PLEASE EXPLAIN PROGRESS IN 2020 IN THE AREA OF CYBERSECURITY.**

4 A. Using the results of the 2019 DHS led cybersecurity assessments, as well as internal MIS
 5 cybersecurity reviews, PWSA has implemented several new cybersecurity measures in
 6 2020. Some of these measures include implementing an internal vulnerability scanning
 7 and remediation program, implementing an active Endpoint Detection and Response
 8 platform, creating a “geo-fence” in our Office 365 tenant restricting all Microsoft Office
 9 and Email access to specific geolocations, expanding the co-managed threat detection and
 10 response capabilities, and adding 3 additional IT policies.

11 In addition, cybersecurity projects currently in process include implementing an
 12 IT Asset Management system to better track and manage all physical IT assets, replacing
 13 the existing content filtering solution with DNS-layer security to continuously block
 14 malicious domains and IP addresses across all Authority devices, server hardening,
 15 implementing Microsoft Local Admin Password Solution (LAPS), and improving on
 16 existing multi-factor authentication capabilities.

17 **E. Recognition**

18 **Q. DID PWSA RECEIVE RECOGNITION IN 2020 FOR ITS EFFORTS?**

19 A. Yes. In 2020, PWSA’s various efforts were recognized as follows:

- 20 • PWSA was awarded Special Project of the Year at the October 2020 March of Dimes
 21 Pittsburgh Transportation, Building & Construction Award Ceremony for its
 22 Community Lead Response Program. PWSA’s Community Lead Response Program
 23 has become a model for other U.S. cities.
- 24 • In late 2019, representatives from the Tokyo Metropolitan Sewer District and
 25 researchers from the Japanese think tank Mizuho traveled to Pittsburgh to meet with
 26 PWSA’s former Executive Director Robert A. Weimar to learn about PWSA’s efforts

1 to address industry-wide challenges such as aging infrastructure and the increased
2 stress placed on sewer systems by extreme weather resulting from climate change.

- 3 • In 2020, PWSA’s Curb Box Inspection Program received the Geospatial Excellence
4 Award for Surveying/Field Data Collection from MAPPS, the preeminent national
5 association of firms involved in many aspects and benefits of the geospatial field in
6 the United States.
- 7 • In 2021, PWSA was recognized the American Society of Civil Engineers Pittsburgh
8 Section for the Wightman Park Green Infrastructure Project by receiving its
9 sustainability award.

10 **F. Path Forward**

11 **Q. IS PWSA WELL-POSITIONED TO CONTINUE ITS FORWARD PROGRESS?**

12 A. Provided that PWSA’s obtains approval for the necessary rate relief, PWSA will be in a
13 solid position to continue making progress toward enhancing the quality and
14 effectiveness of customer service, providing responsible and responsive operations
15 service, improving infrastructure reliability, and maintaining regulatory compliance.
16 While PWSA has completed a number of construction projects that are designed to
17 provide more reliable service to customers, meet stricter water quality standards and
18 improve stormwater management, we need to continue these efforts so that we are a
19 utility of the future that delivers the highest possible quality of services to our customers.
20 Frankly, continued support from the Commission in the form of rate relief as well as
21 collaborative efforts to improve the safety, quality and reliability of PWSA’s water,
22 wastewater and stormwater services are a must.

23 **VI. CONCLUSION**

24 **Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?**

25 A. Yes.

VERIFICATION

I, William J. Pickering, hereby state that: (1) I am the Chief Executive Officer for The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 03/22/2021 | 10:57 AM PDT

DocuSigned by

William J. Pickering

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William J. Pickering
Chief Executive Officer
The Pittsburgh Water and Sewer Authority

Exhibit WJP-1

TABLE I
Pittsburgh Water and Sewer Authority
FPFTY 2022 INCOME SUMMARY
Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

	(A) PWSA	(B) ALJ	(C) ALJ	(D) PWSA	(E) PWSA	(F) ALJ	(G) ALJ
	FPFTY 2022 Present Rates	Revenue Adjustments	Adjusted FPFTY 2022 Present Rates	Rate Increase to Meet Revenue Requirements	FPFTY 2022 Proposed Rates	Revenue Requirement Adjustments	Pro Forma Adjusted Rates
	(1) \$	\$	\$	\$	(1) \$	(2) \$	\$
INCOME SUMMARY							
Beginning Unrestricted Cash	59,282,643	0	59,282,643	0	59,282,643	0	59,282,643
Revenues:							
Operating Revenues	190,932,625	0	190,932,625	32,214,664	223,147,289	0	223,147,289
DSIC Revenues	9,227,369	0	9,227,369	372,487	9,599,856	0	9,599,856
Less: Uncollectible Revenues	(3,949,530)	(0)	(3,949,530)	(1,768,547)	(5,718,077)	(0)	(5,718,077)
Stormwater Credit Program Cost	0	0	0	(696,685)	(696,685)	(0)	(696,685)
Total Revenues	196,210,463	(0)	196,210,463	30,121,919	226,332,382	0	226,332,382
Revenue Requirements:							
O & M Expense	125,268,731		125,268,731	0	125,268,731	0	125,268,731
Debt Service (Principal & Interest) (3)	89,407,273		89,407,273	0	89,407,273	0	89,407,273
Cash-Financed Capital	10,227,369		10,227,369	372,487	10,599,856	0	10,599,856
Restricted Reserve Contributions	1,000,000		1,000,000	0	1,000,000	0	1,000,000
Total Revenue Requirements	225,903,373		225,903,373	372,487	226,275,859	0	226,275,860
Revenue Surplus / (Deficit)	(29,692,909)		(29,692,909)	29,749,432	56,523		56,523
Ending Unrestricted Cash Balance	29,589,734				59,339,166		59,339,166
KEY FINANCIAL METRICS					PWSA Filing		
Debt Service Coverage							
Senior (1.25 Requirement)					1.45		
Total (1.10 Requirement)					1.18		
Days Cash on Hand (4)					175.1		
Debt Service Coverage							
Senior (1.25 Requirement)	1.05				1.46		1.46
Total (1.10 Requirement)	0.85				1.18		1.18
Days Cash on Hand (4)	87.3				175.1		175.1
Key Ratio Check (Achieved/Not Achieved)	Not Achieved				Achieved		Achieved

(1) Company Main Brief

(2) Revenue adjusted to meet to Revenue Requirements.

(3) Includes Principal and Interest payments on existing and proposed debt.

(4) Calculated using Operating & Maintenance Expenses (excludes non-operating expenses).

TABLE I(A)
Pittsburgh Water and Sewer Authority
FPFTY 2022 KEY RATIOS

Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

	(A)	(B)	(C)
	PWSA	PWSA	ALJ
	FPFTY 2022 Present Rates	FPFTY 2022 Proposed Rates	Pro Forma Adjusted Rates
<u>Key Ratio Breakdown</u>	\$	\$	\$
Debt Service Coverage			
Operating Revenues	200,159,994	232,747,145	232,747,145
Less:			
Bad Debt	(3,949,530)	(5,718,077)	(5,718,077)
Stormwater Credits	0	(696,685)	(696,685)
Net Collected Revenues	196,210,463	226,332,382	226,332,382
Less:			
Current Expenses	(125,268,731)	(125,268,731)	(125,268,731)
Adjustments:			
City Payments	4,780,000	4,780,000	4,780,000
Placeholder			
Placeholder			
Revenues Available for Debt Service	75,721,732	105,843,651	105,843,651
Senior Lien Debt Service	72,441,686	72,441,686	72,441,686
All Other Debt Service	16,965,586	16,965,586	16,965,586
Total Debt Service	89,407,273	89,407,273	89,407,273
Senior Lien Debt Service Coverage	1.05	1.46	1.46
Total Debt Service Coverage	0.85	1.18	1.18
Days Cash on Hand			
Ending Cash Balance	29,589,734	59,339,166	59,339,166
Operating Expenses	125,268,731	125,268,731	125,268,731
Adjustments:			
(Loss) / Gain on ALCOSAN Billings	(1,571,968)	(1,571,968)	(1,571,968)
Add: Adjustments to ALCOSAN	0	0	0
Placeholder			
Net Operating Expenses	123,696,763	123,696,763	123,696,763
Days Cash on Hand (x 365)	87.3	175.10	175.10

(1) Company Main Brief

(2) Revenue adjusted to meet to Revenue Requirements.

TABLE I(B)
Pittsburgh Water and Sewer Authority
COLLECTIONS FACTOR
Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), &
R-2021-3024779 (Stormwater)

Water Sewer Stormwater	
Revenue Collection: 100%	<u>100.0%</u>
Less:	
Uncollectible Accounts Factor (*)	2.0%
Adjustment Factor	0.0%
Revenue Factor	<u><u>98.0%</u></u>
(*) Company Main Brief	
Stormwater Only	
Revenue Collection: 100%	<u>100.0%</u>
Less:	
Stormwater Only Uncollectible	40.0%
Adjustment Factor	0.0%
Revenue Factor	<u><u>60.0%</u></u>
Stormwater Credit Program Cost	
Total Stormwater Revenues	23,729,641
Non-Residential Stormwater Revenues	13,933,702
Non-Res Percent of Total Revenue	59%
Anticipated Credit Cost	5.0%
Adjustment Factor	0.0%
Credit Factor for Total Stormwater Revenues	<u><u>2.9%</u></u>
(*) Company Main Brief	

TABLE II
 Pittsburgh Water and Sewer Authority
 FPPTY 2022 SUMMARY OF ADJUSTMENTS
 Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

<u>Adjustments</u>	(A) Water	(B) Wastewater Conveyance	(C) Stormwater	(D) Total	(E) Water Allocation	(F) Wastewater Allocation	(F) Stormwater Allocation
	\$	\$	\$	\$	%	%	%
REVENUES AT CURRENT RATES							
User Charge Revenues							
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a
Other Operating & Non-Operating Revenues							
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a
REVENUE REQUIREMENTS:							
O&M Reduction							
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a
ALCOSAN Adjustment							
Placeholder	0	0	0	0	n/a	n/a	n/a
Future Debt (CIP) (Senior Lien)							
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a
Future Debt (CIP) (PENNVEST)							
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
Placeholder	0	0	0	0	n/a	n/a	n/a
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a

TABLE II
 Pittsburgh Water and Sewer Authority
 FPFTY 2022 SUMMARY OF ADJUSTMENTS
 Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

PAYGO								
DSIC (Reduction)/Increase	0	0	0	0	39.0%	61.0%	0.0%	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	39.0%	61.0%	0.0%	
Reserves								
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
Placeholder	0	0	0	0	n/a	n/a	n/a	
	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	n/a	n/a	n/a	
Adjustment Summary								
<u>Revenues</u>								
User Charge Revenues	0	0	0	0	n/a	n/a	n/a	
Other Operating & Non-Operating Revenues	0	0	0	0	n/a	n/a	n/a	
<u>Revenue Requirements</u>								
O&M	0	0	0	0	n/a	n/a	n/a	
Future Debt (CIP) (Senior Lien)	0	0	0	0	n/a	n/a	n/a	
Future Debt (CIP) (PENNVEST)	0	0	0	0	n/a	n/a	n/a	
PAYGO	0	0	0	0	39.0%	61.0%	0.0%	
Reserves	0	0	0	0	n/a	n/a	n/a	

TABLE II(A)
Pittsburgh Water and Sewer Authority
FPFTY 2022 ADJUSTMENTS TO PROPOSED DEBT SERVICE
Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

<u>Adjustments</u>	(A) Proposed	(B) Adjustments	(C) Revised
Total FPFTY CIP Costs	170,450,402	0	170,450,402
Funding Sources			
Revenue Bonds	129,994,222	0	129,994,222
PENNVEST Loans	29,856,325	0	29,856,325
Grants	0	0	0
Cash	10,227,369	0	10,227,369
Total Funding Sources	170,077,916	0	170,077,916
Senior Lien Debt			
Principal	0		
Term	30		
Rate	4.0%		
Subordinate Debt			
Principal	0		
Term	20		
Rate	1.0%		
Annual Impact to FPFTY Revenue Requirement	Total		
Senior Lien	0		
All Other Debt	0		
Total Adjustment to Debt Service	0		
Annual Impact to FPFTY Revenue Requirement	Water	Sewer	Stormwater
Senior Lien	n/a	n/a	n/a
All Other Debt	n/a	n/a	n/a
Senior Lien	0	0	0
All Other Debt	0	0	0
Total Adjustment to Debt Service	0	0	0

TABLE III
Pittsburgh Water and Sewer Authority
FPFTY 2022 REVENUE DETAIL
 Docket Nos. R-2021-3024773 (Water), R-2021-3024774 (Wastewater), & R-2021-3024779 (Stormwater)

Description			(A)	(B)	(C)	(D)	(E)	(F)	(G)
			PWSA	ALJ	ALJ	PWSA	PWSA	ALJ	ALJ
			FPFTY 2022 Present Rates	Revenue Adjustments	Adjusted FPFTY 2022 Present Rates	Rate Increase to Meet Revenue Requirements	FPFTY 2022 Proposed Rates	Revenue Requirement Adjustments	Pro Forma Adjusted Rates
		(1)				(1)	(2)		
		\$	\$	\$	\$	\$	\$	\$	\$
Base Rate Revenues									
Water		114,995,615	0	114,995,615	22,295,541	137,291,156	0	137,291,156	
Water - Public Hydrants		509,042	0	509,042	537,874	1,046,916	0	1,046,916	
Wholesale Water Sales	19.8% 19.8%	3,192,713	0	3,192,713	497,419	3,690,132	0	3,690,132	
Sewer		69,551,767	0	69,551,767	(14,845,809)	54,705,958	0	54,705,958	
Stormwater		0	0	0	20,790,682	20,790,682	0	20,790,682	
Stormwater Only		0	0	0	2,938,958	2,938,958	0	2,938,958	
Subtotal: Base Rate Revenues		188,249,137	0	188,249,137	32,214,664	220,463,801	0	220,463,801	
DSIC Revenues	PWSA ALJ								
Water	5.0% 5.0%	5,749,781	0	5,749,781	1,114,777	6,864,558	0	6,864,558	
Sewer	5.0% 5.0%	3,477,588	0	3,477,588	(742,290)	2,735,298	0	2,735,298	
Stormwater (NSWO)	0.0% 0.0%	0	0	0	0	0	0	0	
Stormwater Only	0.0% 0.0%	0	0	0	0	0	0	0	
Subtotal: DSIC Revenues		9,227,369		9,227,369	372,487	9,599,856	0	9,599,856	
Other System Revenues									
Other Operating & Non-Operating Revenues		2,683,488	0	2,683,488	0	2,683,488	0	2,683,488	
Subtotal: Other System Revenues		2,683,488	0	2,683,488	0	2,683,488	0	2,683,488	
Less: Uncollectible Revenues		(3,949,530)	(0)	(3,949,530)	(592,964)	(4,542,494)	(0)	(4,542,494)	
Less: Uncollectible Revenues (SW Only)		0	0	0	(1,175,583)	(1,175,583)	(0)	(1,175,583)	
Less: Stormwater Credit Program		0	0	0	(696,685)	(696,685)	(0)	(696,685)	
Subtotal: Less: Uncollectible Revenues		(3,949,530)	(0)	(3,949,530)	(2,465,232)	(6,414,762)	(0)	(6,414,762)	
Total Revenues		196,210,463	(0)	196,210,464	30,121,919	226,332,382	0	226,332,382	

Revenue from Base Rates	32,214,664
Revenue from DSIC	372,487
Revenue from Other System Revenues	0
Change in Uncollectible Revenues	(1,768,547)
Total Revenue Increase	30,818,604

(1) Company Main Brief

(2) Revenue adjusted to meet to Revenue Requirements.

Exhibit WJP-2

COOPERATION AGREEMENT
BETWEEN THE CITY OF PITTSBURGH AND
THE PITTSBURGH WATER AND SEWER AUTHORITY

This Cooperation Agreement ("Agreement"), is made this 3rd day of October, 2019, by and between the CITY OF PITTSBURGH, a municipal corporation existing under the laws of the Commonwealth of Pennsylvania ("City"), and THE PITTSBURGH WATER AND SEWER AUTHORITY, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania ("PWSA").

WHEREAS, the City and PWSA entered into a Cooperation Agreement dated as of June 15, 1995 but effective as of January 1, 1995 (the "1995 Cooperation Agreement") and a First Amendment to Cooperation Agreement dated March 21, 2011 (the "First Amendment" and together with the 1995 Cooperation Agreement, the "Original Cooperation Agreement") relating to the operation and maintenance of the System, as hereinafter defined; and

WHEREAS, this Agreement is specifically intended to reinforce the concurrence of the parties that neither the City nor PWSA will entertain proposals, make arrangements or allow the sale or ownership of the System to a for-profit private entity; and

WHEREAS, pursuant to Act 65 of 2017, which amended the Pennsylvania Public Utility Code (the "Public Utility Code"), PWSA became subject to the Public Utility Code, except Chapters 11 (relating to certificates of public convenience) and 21 (relating to affiliated interests) in the same manner as a public utility and subject to regulation by the Pennsylvania Public Utility Commission (the "PUC"); and

WHEREAS, the Original Cooperation Agreement terminated on October 3, 2019 and City and PWSA desire to enter into this Agreement to, among other things, (i) reflect changes in their rights and obligations each with respect to the other, (ii) accurately reflect the division of services related to the System, (iii) accurately provide for payments by the City and PWSA to the other based upon actual, verifiable, direct expenses, and in accordance with customary utility practices under the Public Utility Code, (iv) confirm that payments by PWSA to the City continue to be subordinate to all debt obligations of PWSA, (v) provide for cooperation by the City and PWSA in their respective capital projects which may impact each other, (vi) provide for clarification of the responsibilities of PWSA with respect to City Parks larger than 50 acres and other City properties, (vii) confirm that the System will remain under public ownership and (viii) set forth certain other provisions relating to the roles and responsibilities of the City and PWSA with respect to the System.

Therefore, intending to be legally bound, the parties agree as follows:

1. **Incorporation of Recitals.** The foregoing recitals are incorporated herein by reference.

2. **Definitions.**

2.1 "Actual Direct Expenses" will mean all costs and expenses incurred by the City or PWSA that are directly related to services or goods provided to or for the benefit of the

other. Expenses in this category are either documented by a third-party invoice or specifically identifiable in the records of the party incurring the expense.

2.2 "Agreement" means this Cooperation Agreement.

2.3 "ALCOSAN" means the Allegheny County Sanitation Authority.

2.4 "City Parks" means City-owned parks that consist of fifty (50) or more contiguous acres, which include the following: Hays Woods, Frick Park, Schenley Park, Highland Park, Emerald View Regional Park, Riverview Park, McKinley Park, Allegheny Commons, Southside Park, Brookline Memorial Park and Sheraden Park. It is recognized that additional parks may be added, subject to the approval by PWSA, which approval will not be unreasonably withheld.

2.5 "Combination Sewer Laterals" means those Laterals that connect to Combined Sewers.

2.6 "Combined Sewers" means underground pipes or tunnels designed to transport sewage and stormwater.

2.7 "Distribution Mains" means small water mains that convey drinking water to Service Lines.

2.8 The "Effective Date" of this Agreement is October 3, 2019.

2.9 "Sanitary Sewers" means underground pipes or tunnels designed to transport sewage.

2.10 "Senior Debt" means all those bonds, notes, indentures, loan agreements, funding agreements, interest-rate swap agreements, hedge agreements, credit facilities, liquidity facilities, remarketing agreements, intercreditor agreements and any other related financial obligations and indebtedness issued, entered into or undertaken by the PWSA at any time, including but not limited to those in existence on the Effective Date hereof, but will not mean or include any obligations of the PWSA to the City, either under this Agreement or otherwise.

2.11 "Sewer Grates" means a grate that covers the entrance to a ground level Sewer Line, which allows water to enter the sewer.

2.12 "Sewer Lines" means Sewer Mains and Sewage Laterals.

2.13 "Service Lines" means those water lines that connect to System Water Mains and that deliver water from the Water Mains to one or more buildings, premises, or facilities.

2.14 "Sewage Laterals" means those individual Sewer Lines that transport sewage and/or storm water from one or more buildings or premises to the Sewer Mains.

2.15 "Sewer Mains" means the pipes that carry sanitary or combined sewage from Laterals to ALCOSAN sanitary mains or combined sewer mains.

2.16 "Sewer System" means the portion of the System that 1) collects sanitary and combined sewage and conveys it to ALCOSAN and 2) collects and discharges stormwater.

2.17 "Stormwater Conveyance Lines" means stormwater pipes that convey separated stormwater to points of approved discharge.

2.18 "System" means and includes, the following, then owned or operated by PWSA and used in the rendering of water service and sewer service by PWSA as of any particular time: all plants, warehouses, equipment, structures, facilities, lands, easements, rights of way, public Water Lines and public sewer lines, patents, copyrights, contracts with municipalities or authorities outside the boundaries of the City, water treatment plants, pumping facilities, reservoirs, storage tanks, distribution mains, public Service Lines and appurtenances, public sewers, inlets, sewer grates, manholes, diversion structures, pumping stations, force mains, public subsurface Stormwater Conveyance Lines and related facilities conveying stormwater, all patents and copyrights obtained by the City, assigned to the PWSA, or retained directly by PWSA and related to the design, operation, maintenance, replacement or abandonment of water, sewer or stormwater systems, all other tangible public property, fixed or moveable, all capital additions then constructed or otherwise acquired relating to water service and sewer service, and all franchises used or useful to the PWSA at such particular time in the rendering of water, sewer and stormwater service by PWSA and other agreements between the City and PWSA.

2.19 "Water Lines" means Water Mains and Service Lines.

2.20 "Water Mains" means the pipes that distribute drinking water from the treatment plants, pump stations and storage facilities to Service Lines.

2.21 "Water System" means the portion of the System that treats and distributes drinking water.

3. **Services to be Provided between the City and PWSA.**

3.1. The City Services. The City may render to PWSA the following services and goods: (i) participation of eligible PWSA employees in the City's Pension Plan, (ii) fuel for PWSA vehicles, (iii) City permits and licenses relating to PWSA projects (the charges to PWSA to be based on the usual customary charges paid by utilities obtaining similar permits and licenses from the City), (iv) vehicle fleet maintenance services, (v) a portion (50%) of street sweeping costs starting January 1, 2020, and (vi) any other services and goods upon such terms as may be agreed to by the parties hereto performed at usual and customary costs and the charges to PWSA based on the usual customary charges paid by utilities obtaining similar services and goods from the City. Except where otherwise specifically provided, PWSA will compensate the City for those services and goods provided pursuant to this Agreement. Any payments by PWSA pursuant to this Agreement shall be based on Actual Direct Expenses and must meet external audit and PUC auditing standards. The parties to this Agreement acknowledge that due to the unavailability of actual cost data certain current year charges by the City to PWSA may be

based on prior year data. If payments are made based on information other than actual current data, the accounts will be reconciled and overpayment and underpayment corrected no later than July 1 of the following calendar year. The City and the PWSA are not obligated to provide or to purchase these services from each other and may seek the services from other providers.

3.2 PWSA Services. PWSA may render to the City such services as agreed to by the City and PWSA which may include but not be limited to the following: (i) providing water through PWSA water mains to City properties, (ii) fire hydrant services, (iii) conveyance of sewage through PWSA sewer mains to ALCOSAN and payment of ALCOSAN charges, subject to Section 6.3 of this Agreement, and (iv) payment of any subsidy to other water service providers. Any such services by PWSA to the City will either be paid for directly by the City to PWSA or taken as a credit by PWSA against amounts owed by PWSA to the City under this Agreement. Any payments by the City to PWSA shall be based on Actual Direct Expenses. The City and the PWSA are not obligated to provide or to purchase these services from each other and may seek the services from other providers.

4. Capital Improvement Projects. The parties will work together in good faith, consistent with the City Right-of-Way Manual, as the same exists on the date of this Agreement (the "City Right-of-Way Manual") and the PWSA Developer Manual, as the same exists on the date of this Agreement (the "PWSA Developer Manual") to determine the impact of a City project on the System, including the design and location of any project and including the reconstruction and/or resurfacing of roadways. The parties will also work together in good faith, consistent with the City Right-of-Way Manual and the PWSA Developer Manual, to determine the impact of a PWSA project on the City's existing facilities and infrastructure, including the design and location of any replacement facilities or infrastructure resulting from the PWSA's project construction.

5. Water and Sewer Lines To and Within City Properties. The City and the PWSA agree as follows:

5.1 City Parks.

5.1.1 Water Mains and Service Lines. The PWSA will be responsible for the operation, maintenance, repair, and replacement of water mains. The PWSA will be responsible for existing and new service lines, which provide water service by PWSA to City Parks larger than 50 acres. If a water meter is not in place, PWSA shall provide a meter installation, and if necessary, a meter vault, as prescribed in the PWSA Developer Manual and in accordance with PUC requirements. The cost of the meter and meter vault installation shall be shared equally by PWSA and the City. The City shall be responsible for the cost of the repair and replacement of any meter vaults and meters. The City will be responsible for the operation, maintenance, installation, repair and replacement of plumbing inside City Park buildings or other City Park facilities such as fountains, spray pools and swimming pools.

5.1.2 Combined and Sanitary Sewers Mains and Laterals. The PWSA will be responsible for the operation, maintenance, repair and replacement of sanitary

sewer and combined sewer mains. The PWSA will be responsible for existing and new sewer laterals within the City Parks larger than 50 acres.

5.2 Other City Properties.

5.2.1 Water and Sewer Mains, Service Lines and Laterals. The PWSA will be responsible for the operation, maintenance, repair, and replacement of water mains providing water service by PWSA to City properties. The PWSA will be responsible for the operation, maintenance, repair, and replacement of sanitary sewer and combination sewer mains.

The City shall be treated like other commercial customers of PWSA with respect to service lines and sewer laterals with two important exceptions:

First, the operation, maintenance, repair and replacement of water service lines and sewer laterals in City Parks larger than 50 acres shall remain the responsibility of PWSA.

Second, the City will be responsible for the total cost of the operation, maintenance, repair and replacement of all other water service lines and sewer laterals beginning in 2025 and thereafter. Prior to 2025, the City will be responsible for the cost of these service lines and sewer laterals in increasing proportion following this annual schedule:

<u>Year</u>	<u>Percentage of Cost to be paid by City</u>
2020	0%
2021	20%
2022	40%
2023	60%
2024	80%
2025 and thereafter	100%

With respect to water service provided by PWSA, if a water meter is not in place, PWSA shall provide a meter installation, and if necessary, a meter vault, as prescribed in the PWSA Developer Manual and in accordance with PUC meter requirements. The cost of the meter and meter vault installation shall be shared equally by PWSA and the City. The City shall be responsible for the cost of the repair and replacement of any meter vaults and meters. The City shall be responsible for the operation, maintenance, installation, repair and replacement of internal plumbing with respect to all City buildings, facilities and City properties, including City Parks of 50 acres or less.

5.3 Saw Mill Run. PWSA will be responsible for the operation, maintenance, repair and replacement of water and sewer mains located in Saw Mill Run. PWSA shall not be responsible for the operation, maintenance, repair and replacement of service lines and laterals located in Saw Mill Run.

6. **Subsidy Payments; Water to City; Sewage Treatment Charges.**

6.1 **Subsidy Payments.** Pursuant to Ordinance No. 675 of the City enacted on December 27, 1973, the City entered into an agreement, dated December 28, 1973, with the Western Pennsylvania Water Company (now known as the Pennsylvania American Water Company ("PAWC")) (the "Water Rate Subsidy Agreement"). This agreement permitted the City to subsidize the water rates for City residents who are customers served by PAWC. Currently PWSA makes those subsidy payments to PAWC on behalf of the City. PWSA is now subject to PUC regulation and PUC regulations do not permit PWSA to subsidize the rates of a utility which is subject to PUC regulation.

Pursuant to this Agreement, it is agreed by both parties that:

- (1) The original Water Rate Subsidy Agreement is immediately assigned to PWSA;
- (2) It is understood that this Subsidy Agreement will be terminated by PWSA as soon as PWSA's current and projected rate increases have effectively eliminated any measurable subsidy to at least 67% of the residential customers (those with a 5/8" meter) for City residents served by PAWC. A measurable subsidy is defined as more than \$1.00 per month. The termination of the subsidy could occur as early as 2020.
- (3) Until the Water Rate Subsidy Agreement is terminated, PWSA and the City will share in the subsidy payments as follows:

--In 2020, PWSA will pay for any subsidy pursuant to the Water Rate Subsidy Agreement, if one exists;

--In 2021, PWSA and the City will share equally in any subsidy payment pursuant to the Water Rate Subsidy Agreement, if one exists;

--In 2022 and years thereafter, the City will pay any existing subsidy pursuant to the Water Rate Subsidy Agreement, if one exists.

During this period, the City will either promptly reimburse PWSA or PWSA will take as a credit the amount of any subsidy payments made by PWSA against payments to be made by PWSA hereunder.

6.2 **Water to City and Fire Hydrant Charges.** Until January 1, 2020, the City shall be entitled without charge to receive up to 600 million gallons of water each calendar year to be used by the City, its departments, agencies, and instrumentalities.

With respect to the Pittsburgh Zoo & PPG Aquarium, the Bob O'Connor Golf Course at Schenley Park and Phipps Conservatory and Botanical Gardens (collectively, the "Third Party Water Users"), which have agreements (e.g. leases) containing provisions contractually obligating the City to provide water and sewage service without charge as long as the City receives water and sewage service without charge, the water and sewer usage by the Third Party Water Users beginning January 1, 2020, shall be subject to the phased in PWSA

charges set forth in the table included in the second paragraph immediately following this paragraph. After water meters have been installed at the facilities of the Third Party Water Users, PWSA shall directly bill said users for their water and sewer usage in accordance with the aforesaid table.

The City shall not receive a credit for any water not used. To the extent the City uses in excess of 600 million gallons in any calendar year, the PWSA may offset that cost based on normal PWSA charges against monies owed the City under this Agreement. The City will cooperate with the PWSA in providing for the installation of water meters and meter vaults, if necessary, in all City properties including City Parks not metered as of the Effective Date, the cost of which shall be shared equally by PWSA and the City as set forth in Section 5 of this Agreement. The City shall not withhold or impede the installation of water meters and meter vaults at any of its properties including parks. Any City properties including parks not metered by January 1, 2024 will be subject to flat water charges levied by PWSA in accordance with its usual and customary practices.

Beginning January 1, 2020, the City shall pay PWSA normal PWSA charges (currently water, wastewater and ALCOSAN) on City-owned metered properties for all water usage and any fire hydrant usage charge. The foregoing charges shall be phased in over a five-year period as follows:

<u>Year</u>	<u>Percentage of Usage Charged</u>
2020	20%
2021	40%
2022	60%
2023	80%
2024 and thereafter	100%

6.3 Sewage Treatment Charges. As set forth in Section 5B of that certain Memorandum of Understanding by and among the City, PWSA and ALCOSAN dated October 16, 1996, the City will pay ALCOSAN directly for all City property ALCOSAN accounts. If ALCOSAN does not permit the City to pay it directly for the City property ALCOSAN accounts and PWSA makes such payments to ALCOSAN on behalf of the City, the City shall either promptly reimburse PWSA the amount of such payments made by PWSA to ALCOSAN or PWSA shall be entitled to a credit against any payments required to be made by PWSA under this Agreement.

7. Granting of Easements and Rights of Way. Subject to necessary City Council approval, the City shall grant to PWSA all necessary easements and rights of way which may be required by PWSA in the maintenance, repair and capital improvements to the System.

8. City Payroll Tax. Similar to other utility employers subject to the City's Payroll Tax, PWSA hereby agrees to pay the City effective January 1, 2020 an amount calculated based on the prior year's payroll data but otherwise in accordance with the City's Payroll Tax and the regulations issued pursuant to the Title II, Article VII, Chapter 258 of the City Code (the

"Payroll Tax Regulations"). Such amount shall be paid annually or taken as a credit by PWSA against amounts owed by the City under this Agreement.

9. **PURTA Payments.** Similar to other entities furnishing utility services that are regulated by the PUC, PWSA hereby agrees to pay the City, beginning with the year commencing January 1, 2020, an amount calculated pursuant to the Pennsylvania Public Utility Realty Tax (PURTA) (Article XI-A of the Tax Reform Code of 1971 (P.L. 6, No. 2), as amended). Subject to the phase-in below, the amount to be paid by PWSA ("PURTA Payment") shall be calculated based on the fair market value, as determined under PURTA and the regulations thereunder, of the PWSA realty of the System used for the treatment and delivery of water to PWSA customers. The PURTA Payment shall be paid annually by PWSA to the City in an amount that shall be phased in as follows:

<u>Year</u>	<u>% of PURTA Payment to be paid to the City</u>
2020	20%
2021	40%
2022	60%
2023	80%
2024 and thereafter	100%

In lieu of making a PURTA Payment, the amount of such payment, at the sole option of PWSA, may be taken as a credit against amounts owed by the City to PWSA under this Agreement.

10. **Credit May Not Be Pledged.** The credit of one party to this Agreement will not be pledged for payment of any debts of the other party, and neither party will be liable for debt payments of the other party. Unless consented to by the City, the taxing power of the City will not be pledged for payment of any PWSA indebtedness.

11. **Subordination to Senior Debt.** The City agrees to subordinate all legal and equitable rights it has or may have to payment from the PWSA for services rendered and goods provided by the City to the PWSA, whether under this Agreement, any amendment thereto, or otherwise, to the Senior Debt. The PWSA may make and the City may retain regularly scheduled payments under this Agreement when and as due; provided, however, that no payments may be made by the PWSA or retained by the City upon the occurrence of an event of default under any Senior Debt instrument or agreement or if the making of such payment would cause an event of default thereunder. The City agrees to subordinate, and does hereby subordinate, any payments received from the PWSA to the indefeasible payment or satisfaction in full of the Senior Debt.

The City is not obligated to pay the principal, redemption price, if any, or other payments on the Senior Debt. Neither the full faith, credit nor taxing power of the City is pledged to such payments.

This Agreement constitutes a supplement to the Original Cooperation Agreement within the meaning of PWSA's 2017 Amended and Restated Trust Indenture and 2019 Amended and Restated Subordinate Trust Indenture.

12. **Conflict With PUC Regulations.** If any obligation of PWSA to the City under this Agreement conflicts with provisions of the Public Utility Code or regulations of PUC thereunder, the provisions of the Public Utility Code and regulations of the PUC shall control. By signing this Agreement, or any other agreement to which it and PWSA are parties, the City does not consent to automatic PUC jurisdiction and does not waive any right to object thereto.

13. **Notices.** All notices and correspondence between the City and PWSA concerning or in furtherance of this Cooperation Agreement will be addressed to:

The City: Mayor William Peduto
414 Grant Street #512
Pittsburgh, PA 15219
Phone: 412-255-2626

with a copy to: Solicitor
Suite 313, City/County Building
414 Grant Street
Pittsburgh, PA 15219
Phone: 412-255-2001
Fax: 412-255-2285

PWSA: Executive Director
The Pittsburgh Water and Sewer Authority
Penn Liberty Plaza 1
1200 Penn Avenue
Pittsburgh, PA 15222
Phone: 412-255-8949
Fax: 412-393-0522

with copies to: Director of Engineering and Construction
The Pittsburgh Water and Sewer Authority
Penn Liberty Plaza 1
1200 Penn Avenue
Pittsburgh, PA 15222
Phone: 412-255-8949
Fax: 412-393-0522

and

Solicitor for PWSA
Mark F. Nowak, Esq.
Clark Hill PLC
One Oxford Centre
301 Grant Street, 14th Floor
Pittsburgh, PA 15219
Phone: 412-394-2428
Fax: 412-394-2555

Each party will notify the other whenever there is any change in the required contact.

14. **Miscellaneous Matters.**

a. With respect to tap-in fees charged by PWSA, until January 1, 2025, or at such later date as approved by the PWSA Board, the City shall be entitled to a 100% governmental exception to tap-in fee charges with respect to City owned governmental projects, to include community gardens located on City property.

c. PWSA and the City will obtain an appraisal of the water facilities component of the System, the cost of which shall be equally shared by the City and PWSA.

d. With respect to unknown water lines, if PWSA or the City discovers a previously unknown water line PWSA will consider such line to be part of the System provided the line was constructed in accordance with PWSA specifications that existed at that time and located within City owned property.

e. The City and PWSA will jointly create a map identifying water service lines and laterals within the City Parks. Each party will be entitled to an original copy of this map.

f. If PWSA abandons or vacates any System property prior to September 1, 2025, such property shall remain as City-owned property. After PWSA exercises its option to acquire the System, PWSA will provide the City with ninety (90) days prior written notice of its intent to sell any of the System's real property and the City shall have a right of first refusal to purchase said real property at fair market value. The City must exercise said right of first refusal within ninety (90) days after receiving the above written notice from PWSA.

15. **Relationship of PWSA and City.** The City agrees that the interactions between the City and PWSA under this Agreement will be on a business-like, transactional basis and the provisions hereof will be applied to PWSA in a manner similar to utilities operating in the City subject to the provisions of this Agreement.

16. **Public Ownership.** The City and PWSA agree that the System will remain under public ownership.

17. **Entire Agreement.** This Agreement will constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts will be

relevant or admissible for purposes of determining the meaning or intent of any of the provisions hereof.

18. **Amendments**. No changes, additions, modifications or amendments of this Agreement will be effective unless they are set out in writing and signed by the parties hereto.

19. **Assignment**. This Agreement will not be assignable by either party without the written consent of the other party.

20. **Termination**. The City and PWSA shall each have the right to unilaterally terminate this Agreement at any time upon ninety (90) days written notice to the other.

21. **Governing Law**. This Agreement will be governed by the laws of the Commonwealth of Pennsylvania, without reference to its conflicts-of-laws principles.

22. **Conflict**. To the extent that any provision in this Agreement conflicts with any provision of any trust indenture securing any indebtedness of the PWSA, the provisions of the trust indenture will prevail.

23. **Severability**. The provisions of this Agreement will be severable and should any part of the Agreement be declared invalid or unenforceable, the remainder will continue in full force and effect.

24. **No Third-Party Beneficiaries**. This Agreement shall create no rights in any party other than the City and the PWSA and no other party is intended to be a third-party beneficiary of this Agreement, except as specifically indicated herein. Moreover, the respective responsibilities and obligations of PWSA and the City with respect to service lines and the System set forth in this Agreement shall only apply to PWSA and the City and not to any other customer of PWSA.

25. **Pittsburgh Home Rule Charter**. This Agreement is subject to the provisions of the City of Pittsburgh Home Rule Charter.

26. **Authorizing Resolution**. The City is authorized to enter into this Agreement pursuant to Resolution No. 464 of 2019, effective July 25, 2019; and the PWSA is authorized to enter into this Agreement under Agenda Item No. 130 of 2019 duly approved and adopted at a meeting of its Board held on June 28, 2019.

[SIGNATURES ON NEXT PAGE]

IN WITNESS WHEREOF, the parties have duly executed this Cooperation Agreement the day and year first above written.

ATTEST:

Handwritten signature

CITY OF PITTSBURGH

Handwritten signature
Mayor

Reviewed by:

Handwritten signature
Assistant City Solicitor

Approved as to form:

Handwritten signature
City Solicitor

Countersigned by:

Handwritten signature 12-20-19
City Controller 53122



ATTEST:

Handwritten signature
Secretary

THE PITTSBURGH WATER AND SEWER AUTHORITY

Handwritten signature
Chairman

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

EDWARD BARCA

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024773 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:

Support for Proposed Rate Increase

Pro Forma Financial Results

Development of Operating Budget & Capital Needs

Sources of Funding

Calculation of Revenue Requirements

Allocation of Water, Wastewater & Stormwater Costs

Proposed Rates and Charges

April 13, 2021

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TABLE OF EXHIBITS

EB-1	PWSA’s Income Statement, Cash Flow Statement, and Debt Service Coverage Statement at present rates for the HTY (FY 2020), FTY (FY 2021), FPFTY (FY 2022) and the Forecast Period (FY 2023)
EB-2	PWSA’s Income Statement, Cash Flow Statement, and Debt Service Coverage Statement at proposed rates for the HTY, FTY, FPFTY, and the Forecast Period
EB-3	Unaudited year-over-year revenues as of February 28, 2021
EB-4	Additional budget information for HTY, FTY, FPFTY, and the Forecast Period
EB-5	PWSA’s 2021-2025 Capital Improvement Plan
EB-6	PWSA’s Financial Management Policy

EB-7	PWSA's Debt and Swap Portfolio Summary
EB-8	PWSA's 2019 Balance Sheet
EB-9	Moody's Investors Service Rating Report
EB-10	S&P Global Rating Report

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND POSITION FOR THE RECORD.**

3 A. My name is Edward Barca and I am the Director of Finance for The Pittsburgh Water and
4 Sewer Authority (“PWSA” or “Authority”).

5 **Q. WHEN DID YOU TAKE ON THE POSITION OF TREASURER?**

6 A. I was appointed as the Authority’s Treasurer in June 2018 and assumed my duties with
7 the Authority during August 2018. I was promoted to the Deputy Director of
8 Finance/Treasurer in July 2019 and ultimately became the Director of Finance in June
9 2020, which is my current position.

10 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.**

11 A. I have a Master’s Degree in Finance from the Colorado State University-Global Campus
12 and a Bachelor's Degree in Finance from Mercyhurst University.

13 **Q. PLEASE PROVIDE A SUMMARY OF YOUR RELEVANT EXPERIENCE.**

14 A. I have been at the Authority since August 2018. As I stated, I started as the Authority’s
15 Treasurer in August 2018. I remained in that position until I became the Authority’s
16 Deputy Director of Finance/Treasurer in July 2019 and then the Director of Finance,
17 which is the position I currently hold.

18 Prior to working at the Authority, I worked for the City of Pittsburgh (“City”). I
19 joined the City in 2015 and was promoted to the Assistant Director of Finance in 2017.
20 While at the City, I served as a Business Intelligence Analyst, Senior Financial Analyst,
21 Revenue Manager, and, finally, Assistant Director of Finance.

22 Before starting with the City, I had prior work experience as a Financial Planning
23 Analyst for the Allegheny Financial Group and as a Financial Services Representative for

1 E*TRADE Financial. In addition, since November 2015, I have owned and operated a
2 business — Barca Tax Services, LLC — that provides tax preparation services.

3 **Q. MR. BARCA, WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES WITH**
4 **THE PWSA?**

5 A. In my present position, I am responsible for the financial affairs of the Authority along
6 with overseeing the Finance Department. This includes creating, implementing, and
7 monitoring the annual operating and capital budgets. I also manage the Authority's (a)
8 cash and liquidity to ensure that sufficient funds are available to process payments, invest
9 in infrastructure, and service debt while preserving principal and thereafter maximizing
10 return on cash and investments; and (b) debt portfolio, which includes assessing
11 opportunities for financing and refinancing, securing additional debt capital from both
12 bank and capital markets, managing the interest rate swap portfolio and maintaining all
13 credit support vehicles. I further help to ensure compliance with all trust indentures, loan
14 agreements, bond covenants, and filing deadlines.

15 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA**
16 **PUBLIC UTILITY COMMISSION?**

17 A. Yes. I presented written Direct, Supplemental Direct, Rebuttal and Rejoinder testimony
18 in support of PWSA's most recent base rate case at Docket Numbers R-2020-3017951
19 (water) and R-2020-3017970 (wastewater). In addition, I have been directly involved in
20 various financial proceedings before the Pennsylvania Public Utility Commission
21 ("PUC" or "Commission") regarding the issuance of securities certificates. In 2020 and
22 2021, these proceedings included: (1) the issuance of an abbreviated securities certificate
23 for a PENNVEST Loan (S-2020-3019059); (2) the issuance of a securities certificate (S-
24 2020-3019507) for a Capital Line of Credit; (3) the issuance of a securities certificate (S-
25 2020-3022170) for indebtedness (revenue bonds the Authority in an amount up to \$531

1 million in long term debt securities); and (4) the issuance of an abbreviated securities
 2 certificate for a PENNVEST Loan (S-2021-3024057)

3 **Q. PLEASE EXPLAIN THE PURPOSE OF YOUR TESTIMONY?**

4 A. The purpose of my testimony is to:

5 1) Provide the documentation and supporting methodology for the schedules and
 6 exhibits that are included in PWSA’s base rate filing;

7 2) Describe PWSA’s financial results for the fully projected future test year
 8 (“FPFTY”), which is comprised of the period from January 1, 2022 through
 9 December 31, 2022;

10 3) Provide support for PWSA’s requested increase in existing annual base rates of
 11 \$32.2 million; and,

12 4) Explain how the Authority’s capital budget spending will be recovered from
 13 ratepayers

14
 15 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

16 A. Yes. I am sponsoring the following exhibits:

- 17 • **Exh. EB-1:** Exhibit EB-1 provides schedules showing PWSA’s Income
 18 Statement, Cash Flow Statement, and Debt Service Coverage Statement at present
 19 rates for the HTY (FY 2020), FTY (FY 2021), FPFTY (FY 2022) and the
 20 Forecast Period (FY 2023).
- 21 • **Exh. EB-2:** Exhibit EB-2 provides schedules showing PWSA’s Income
 22 Statement, Cash Flow Statement, and Debt Service Coverage Statement at
 23 proposed rates for the HTY, FTY and FPFTY and the Forecast Period.
- 24 • **Exh. EB-3:** Exhibit EB-3 contains unaudited year-over-year revenues as of
 25 February 28, 2021.
- 26 • **Exh. EB-4:** Exhibit EB-4 contains additional budget information for HTY, FTY,
 27 FPFTY, and the Forecast Period.
- 28 • **Exh. EB-5:** Exhibit EB-5 contains PWSA’s 2021-2025 Capital Improvement
 29 Plan.
- 30 • **Exh. EB-6:** Exhibit-6 contains PWSA’s Financial Management Policy
- 31 • **Exh. EB-7:** Exhibit-7 contains PWSA’s Debt and Swap Portfolio Summary
- 32 • **Exh. EB-8:** Exhibit EB-8 contains PWSA’s 2019 Balance Sheet
- 33 • **Exh. EB-9:** Exhibit EB-9 contains Moody’s Investors Service Rating Report
- 34 • **Exh. EB-10:** Exhibit EB-10 contains S&P Global Rating Report

1 **II. SUPPORT FOR PROPOSED RATE INCREASE**

2 **Q. PLEASE SUMMARIZE THE RATE INCREASE SOUGHT BY PWSA IN THIS**
3 **PROCEEDING.**

4 A. PWSA seeks a total increase to base rates for 2022 in the amount of \$32.20 million or
5 17.1%.¹ The proposed base rate increase also includes the introduction of a new
6 stormwater rate and adjustments to the wastewater conveyance rates where stormwater
7 related costs are currently recovered. In consideration of the current COVID-19
8 pandemic, PWSA is proposing the most minimal rate increase necessary to continue to
9 fund operations and to just barely satisfy its rate covenants. In further recognition of the
10 ongoing economic effects of the Pandemic, PWSA is proposing to phase-in the overall
11 increase over a two year period with \$22.0 million to be recovered in 2022 and the
12 additional \$10.20 million to be recovered in 2023.² PWSA's proposal also includes
13 additional features (including the manner in which it is proposing to structure and assess
14 the new stormwater fee and further enhancements to our low income customer assistance
15 programs) intended to mitigate the rate impact for our customers as described more fully
16 in the testimony of Ms. Quigley. PWSA is also proposing to allocate \$100,000 to its
17 Hardship Grant program to address the continuing decrease of available funding in that
18 program as PWSA draws down the existing funding from a prior litigation settlement.

¹ PWSA Exhibit WJP-1 presented by Mr. Pickering present PWSA's proposals in the Rate Case Tables as developed pursuant to the directives of the Administrative Law Judges in PWSA's last rate case proceeding. The information displayed is supported, in part, by my testimony.

² It should be noted that PWSA's proposal to phase in the proposed rate increase over a two year period is based on receiving the amount of rate increase requested. If this amount were to be materially downward adjusted, PWSA likely will not be able to phase in a lowered amount over a two year period as proposed herein and reserves the right to withdraw the phase-in proposal if the permitted rate increase would result in an unreasonably low level of increase in FY 2022. Also, if approved as proposed, the phase-in could obviate the need for PWSA to seek a further rate increase for 2023.

1 **Q. HOW MUCH OF THE REQUESTED RATE INCREASE IS ATTRIBUTABLE TO**
 2 **FUNDING THE CAPITAL IMPROVEMENT PLAN?**

3 A. \$22.4 million (or roughly 70%) of the requested \$32.2 million is needed in order to pay
 4 for debt service costs associated with funding the capital improvement plan and to pay for
 5 the increase in existing debt service costs. The chart below displays a breakdown of these
 6 debt service costs.

Debt Service Costs (\$M) FY 2019 - 2022				
Description	2019 Actual	2020 Actual	2021 Budget	2022 Budget
Existing Debt Service	\$59.3	61.6	67.0	73.6
New Debt Service – 5-year Note	-	-	-	3.0
New Debt Service – Series 2021*	-	-	-	6.4
New Debt Service – Series 2022	-	-	-	6.4
Total	\$59.3	61.6	67.0	89.4
<i>Annual Increase</i>	-	2.3	5.4	22.4
<i>*To be issued in late 2021 with the debt service repayments starting 2022.</i>				

7
 8 As the chart displays, \$6.6 million of the \$22.4 million of increased debt service costs is
 9 associated with existing debt service. Failure to obtain the additional funds in this
 10 proceeding will put PWSA at extreme risk of not meeting its debt service coverage ratios
 11 since this is existing debt. The remaining \$15.8 million of increased debt service costs are
 12 related to funding new debt service costs needed to fund the capital improvement plan.
 13 PWSA is relying on receiving the increased rates requested in this proceeding to continue
 14 its capital improvement plan. Failure to obtain these additional revenues will require
 15 significant reductions to PWSA’s capital improvement plan, which will, among other
 16 things, potentially stop lead line replacements and cause the Authority to fall short in
 17 achieving its regulatory requirements. Since PWSA is a municipal authority, it does not
 18 have the same funding mechanisms for its capital program as investor-owned utilities do.

1 PWSA’s capital improvement plan relies mostly on issuing new debt or receiving state or
 2 federal funding, which also have debt service and coverage costs.

3 PWSA also needs to recover the debt service coverage costs associated with
 4 issuing this additional debt for as long as the debt is outstanding. As displayed in the
 5 charts below, approximately \$6.8 million represents the debt service coverage costs that
 6 PWSA will incur during FPFTY to support the \$22.4 million in new debt service costs.
 7 This means that the *true* cost to issue the debt in FPFTY is \$29.2 million.

Additional Debt Service Cost by Lien (\$M) – FY 2022			
	Senior Lien	Subordinate Lien	Total
Existing Debt Service Increase	\$2.6	4.0	6.6
New Debt Service	\$15.8	-	15.8
Total	\$18.4	4.0	22.4

8

Additional Debt Service Coverage Cost (\$M) – FY 2022			
	Senior Debt	Total Debt	Total
Senior Debt Service Coverage Ratio (1.25x)	\$4.6	-	4.6
Total Debt Service Coverage Ratio (1.10x)	-	2.2	2.2
Total	\$4.6	2.2	6.8

9

1 **Q. HOW MUCH OF THE REQUESTED RATE INCREASE IS ATTRIBUTABLE TO**
 2 **FUNDING THE OPERATING BUDGET?**

3 A. \$9.8 million (or roughly 30%) of the requested \$32.2 million is needed to continue to
 4 increase operations within the Operating Budget. One of the drivers within the Operating
 5 Budget is the costs associated with salaries and benefits. As demonstrated in the chart
 6 below, salary and benefit costs make up \$3.2 million (or roughly 33%) of the \$9.8 million
 7 increase in Operating Budget costs.

Department	2021 Salaries and Benefits Total	2022 Salaries and Benefits Total	Difference
Customer Service	\$5,013,687	5,204,158	190,471
Engineering and Construction	4,577,518	5,377,012	799,494
Environmental Compliance	763,553	846,873	83,320
Chief Executive Officer's Office	1,109,253	1,148,769	39,516
Finance	1,788,939	2,203,038	414,099
Human Resources	692,665	748,821	56,156
Laboratory	710,260	807,546	97,286
Legal	872,552	1,057,169	184,617
Management Information Systems	1,599,141	1,762,713	163,572
Public Affairs	730,206	742,381	12,175
Sewer Operations	2,103,740	2,265,319	161,579
Warehouse	417,468	426,866	9,398
Water Operations	10,649,448	11,259,196	609,748
Water Treatment Plant	5,216,093	5,595,129	379,036
Total	\$36,244,523	39,444,990	3,200,467

8
 9 Increases in the costs of washout disconnection (which is a consent order requirement)³,
 10 and CSO flow monitoring are responsible for an additional \$3.8 million (or roughly 39%)

³ The September 6, 2019 DEP Consent Order and Agreement is discussed more fully by Mr. King and included as PWSA Exhibit BK-1.

1 of the \$9.8 million increase in the Operating Budget. These costs are displayed in the
 2 chart below. The remaining amount of approximately \$2.8 million is attributable to
 3 inflationary costs for professional services and operating contracts and water treatment
 4 plant repairs within the Operating Budget.

	2021 Total	2022 Total	Difference
Washout Disconnection	\$750,000	3,000,000	2,250,000
CSO Flow Monitoring	250,000	1,800,000	1,550,000
Total	\$1,000,000	4,800,000	3,800,000

5

6 **Q. DOES THE REQUESTED INCREASE CONTAIN CLAIMS FOR INCREASED**
 7 **REVENUES OVER AND ABOVE WHAT YOU HAVE DESCRIBED AS BEING**
 8 **NECESSARY TO FUND DEBT SERVICE AND THE INCREASES IN THE**
 9 **OPERATING BUDGET?**

10 A. No. These cost drivers make clear that the Authority would have been fully justified in
 11 proposing additional revenue to improve its liquidity and financial position which, in
 12 turn, would improve its debt service coverages and cash flow levels to the levels that the
 13 bond rating agencies expect for credits such as PWSA. However, the Authority
 14 intentionally limited its requested rate request to what is needed to cover increased
 15 operational and debt service costs (and to propose to phase in the needed rate increase
 16 over a two year period) in recognition of the current difficult economic circumstances
 17 related to the COVID-19 pandemic. Due to the limited nature of the rate request based
 18 on the needs of the Authority, it is imperative that the PWSA receives all or substantially
 19 all of its request here to avoid jeopardizing ongoing operations and needed capital
 20 improvement.

1 **Q. DOES PWSA’S REQUEST INCLUDE ANY CLAIMS FOR COVID-RELATED**
2 **EXPENSES?**

3 A. No. As part of the approval of PWSA’s last base rate case, the Commission permitted
4 PWSA to track and record as a regulatory asset all COVID-19 Pandemic Costs and
5 permitted PWSA to claim these costs for ratemaking purposes in PWSA’s “next general
6 rate proceeding.”⁴ PWSA has been tracking all of these expenses consistent with the
7 terms of the settlement as well as any government benefits that may be applied to
8 minimize the costs to be deferred. PWSA has incurred \$1.3 million in COVID-19 related
9 costs since the start of the pandemic. These expenses have and will continue to put
10 pressure on the financial health of PWSA. However, PWSA has elected not to include
11 any of these costs as part of this rate filing due to the on-going nature of the pandemic
12 and our decision to request the bare minimum amount of rate increase needed to support
13 our operations. PWSA, however, reserves the right to seek recovery of these costs in a
14 future base rate case as it may deem necessary.

15 **Q. CAN YOU PROVIDE ADDITIONAL INSIGHT AS TO WHY PWSA NEEDS TO**
16 **OBTAIN THE FULL INCREASE IT HAS PROPOSED?**

17 A. Yes. This is the third rate case for PWSA under the PUC. While the PUC process has
18 been reasonable and has to some extent recognized PWSA’s substantial capital needs and
19 has prevented PWSA from experiencing a financial crisis, the Authority still has not been
20 able to fully achieve its goals of fully funding its Capital Improvement Plan (“CIP”) so as
21 to permit it to enhance the quality of its water and customer service. As a result, PWSA
22 still has multiple (sometimes competing) obligations for limited capital funds.

⁴ Joint Petition for Settlement, Docket Nos. R-2020-3017951 and R-2020-3017970, Section III.C, page 7.

1 There are three overarching reasons why PWSA continues to need a substantial rate
2 increase at this time 1) PWSA continues to need to increase operations to a level that is
3 sufficient to maintain PWSA's large system. \$9.8 million (or roughly 30%) of the
4 requested \$32.2 million is needed to continue to increase operations within the Operating
5 Budget including salaries and benefits (\$3.2 million, or 33%) and increases in the costs of
6 washout disconnection and combined sewer overflow ("CSO") flow monitoring (\$3.8
7 million or 39%), 2) To fund its substantial Capital Improvement Plan, which includes
8 numerous capital projects necessary to meet regulatory requirements, PWSA must issue
9 new long term bonds, which, together with increased debt service from existing bonds,
10 will cause PWSA to incur an additional \$22.4 million in debt service alone (importantly,
11 new debt service *plus* required debt service coverage at 1.25 times requires a rate increase
12 of \$29.2 million); and 3) the COVID-19 pandemic continues to put stress on the financial
13 health of PWSA. PWSA continues to experience decreased collections and consumption
14 caused by the effects of the COVID-19 pandemic. For example, PWSA's year-over-year
15 collections through February 28, 2021 are down \$3.7 million or -10%.

16 The level of disinvestment that PWSA and its ratepayers experienced in prior
17 years was a result of PWSA not having the financial resources to adequately maintain and
18 improve the system. This ultimately led to the large regulatory mandates from regulatory
19 agencies that PWSA is currently addressing. And, those obligation must now be
20 addressed. Any reduction to the requested rates in this proceeding will cause further
21 deferred maintenance, risk failing to meet all regulatory requirements, and ultimately lead
22 to increased costs to ratepayers.

1 In addition, as discussed more fully by Ms. Quigley, PWSA continues to
2 experience decreased collections and consumption caused by the effects of the COVID-
3 19 pandemic. As displayed in Exhibit EB-3, PWSA's unaudited year-over-year
4 collections through February 28, 2021 are down \$3.7 million or -10%. This is
5 troublesome for PWSA since fixed costs, such as debt service, continue to increase in
6 order to comply with regulatory mandates.

7 **Q. ARE THERE ANY OTHER DRIVERS CONTRIBUTING TO THE NEED FOR A**
8 **RATE INCREASE AT THIS TIME?**

9 A. Yes. As described more fully by Ms. Quigley, during the Stage 1 Compliance Plan
10 process, the Commission concluded that its line extension regulations control as to the
11 PWSA's line extension processes and directed that PWSA – on or before one year from
12 the entry date of the March 26, 2020 Order – file with the Commission either; (1) a
13 petition for a permanent waiver of the line extension regulations; or, (2) a supplemental
14 compliance plan detailing how it will revise its processes to be compliant with the
15 Commission's line extension regulations.⁵ PWSA filed its Supplemental Compliance
16 Plan Regarding Line Extensions on March 26, 2021 proposing to transition to the
17 Commission's line extension regulations and to address both the needed tariff changes
18 and rate impacts of that transition in this proceeding. PWSA, like most municipal water
19 companies, charges a tapping fee even though the Commission has a general, long-
20 standing policy of prohibiting tapping fees. After further evaluation, PWSA has decided
21 to propose to eliminate tapping fees and recover those costs through base rates. This

⁵ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority*
 – *Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Opinion and Order
 entered March 26, 2020 at 73.

1 means that approximately \$3.5 million which was projected to be realized from tapping
 2 fees will now have to be recovered in base rates.

3 **Q. DID PWSA RECENTLY INCREASE ITS RATES AS PART OF A COMMISSION**
 4 **APPROVED RATE CASE?**

5 A. Yes. PWSA increased its rates effective January 14, 2021 as part of the Commission's
 6 approval of a full settlement of its rate increase filed on March 6, 2020 at docket numbers
 7 R-2020-3017951 (water) and R-2020-3017970 (wastewater). The approved rate increase
 8 was estimated to increase revenues by \$19.0 million (\$14.2 million in water revenue and
 9 \$4.8 million in wastewater revenue). This was *significantly* less than the requested
 10 amount of \$43.8 million that was originally requested. During the settlement process,
 11 PWSA agreed to implement a lower rate increase in part due to the newly emerging
 12 anticipated financial burden that the COVID-19 pandemic was imposing on customers.⁶

13 **Q. HOW DID PWSA ADJUST AS A RESULT OF THE SIGNIFICANT DECREASE**
 14 **IN THE AMOUNT OF RATE INCREASE APPROVED AS PART OF THE LAST**
 15 **RATE CASE?**

16 A. PWSA had to defer and/or reduce many crucial aspects of its operation that were planned
 17 in 2021 to 2022. In addition, as previously mentioned, PWSA's year-over-year
 18 collections through February 28, 2021 were down \$3.7 million or negative 10% even
 19 with this rate increase. As discussed more fully by Ms. Quigley, part of the driver for
 20 decreased collections was the Commission's March 13, 2020 prohibition on the
 21 termination of public utility service and the reconnection of service to customers

⁶ PWSA's last rate case was filed on the same day that Governor Tom Wolf issued a Proclamation of Disaster Emergency that identified the COVID-19 pandemic as a disaster emergency affecting the entire Commonwealth. Some parties in that rate case advocated that no rate increase should be permitted during the pandemic.

1 previously terminated.⁷ Both of these factors are driving the need for PWSA to seek
 2 another rate increase in this proceeding.

3 **Q. WAS THE IMPACT OF THE COVID-19 PANDEMIC ON PWSA RATEPAYERS**
 4 **CONSIDERED WHEN FORMULATING THE RATE INCREASE IN THE**
 5 **PROCEEDING?**

6 A. Yes, as noted above, the rate increase that PWSA is requesting is the minimum amount
 7 that is required in order to continue operations while meeting the required financial
 8 metrics and PWSA is proposing to phase in the full amount of the requested rate increase
 9 over a two-year period. In addition to the other rate mitigation features of our proposal as
 10 discussed by Ms. Quigley, PWSA’s requested rate increase and phase in approach are
 11 designed to ameliorate any potential financial burden that this rate increase could have on
 12 ratepayers in recognition of the lingering impacts of the COVID-19 pandemic.

13 **III. PRO FORMA FINANCIAL RESULTS**

14 **Q. HAVE YOU PREPARED A PROFORMA TEST YEAR INCOME STATEMENT,**
 15 **CASH FLOW, DEBT SERVICE COVERAGE STATEMENT THAT PROJECTS**
 16 **THE AUTHORITY’S STATUS IN THE CURRENT YEAR AS WELL AS ON A**
 17 **PROJECTED BASIS?**

18 A. Yes. Please see Exhibit EB-1 and Exhibit EB-2.

19 **Q. FIRST, PLEASE EXPLAIN THE TEST YEAR ON WHICH PWSA’S CLAIMED**
 20 **REVENUE REQUIREMENT IS BASED.**

21 A. As permitted by Act 11 of 2012, PWSA has based its claimed revenue requirement on the
 22 fully forecasted 12 months ending December 31, 2022, referred to as the Fully Projected
 23 Future Test Year (“FPFTY”). The Future Test Year (“FTY”) is calendar year 2021,
 24 January 1, 2021 to December 31, 2021, and the Historical Test Year (“HTY”) is calendar
 25 year 2020, January 1, 2020 to December 31, 2020. Those results are displayed on Exhibit

⁷ *Public Utility Service Termination Moratorium Proclamation of Disaster Emergency – COVID-10*, Docket No. M-2020-3019244, Emergency Order dated March 13, 2020.

1 EB-1. Each page of this exhibit shows data for: (1) the HTY, the 12 months ended
 2 December 31, 2020 or FY 2020; (2) the FTY, the 12 months ended December 31, 2021
 3 or FY 2021; (3) the FPFTY, the 12 months ended December 31, 2022 or FY 2022; and
 4 (4) the Forecast Period, the 12 months ended December 31, 2023 or FY 2023.

5 **Q. HAS THE AUTHORITY RELIED UPON OTHER PROVISIONS OF ACT 11 IN**
 6 **DEVELOPING THIS CASE?**

7 A. Yes, as addressed in two petitions which are being filed simultaneously with the filing of
 8 its rate case package. First, PWSA is filing a Petition for consolidation of the three
 9 dockets (water, wastewater, stormwater) and for authorization to use combined water,
 10 wastewater and stormwater revenue requirements as authorized by 66 Pa. C.S. §
 11 1311(c).⁸ Granting of the Petition will continue the prior accounting and ratemaking
 12 practice of PWSA. With the filing of a stormwater tariff, PWSA is proposing to
 13 determine its revenue requirement on a combined water/wastewater/stormwater basis as
 14 well. Second, PWSA is simultaneously filing a Petition for Waiver of Statutory
 15 Definition of FPFTY to enable it to use a FPFTY beginning on January 1, 2022. Due to
 16 the April 13, 2021 filing date of this rate package, the application of the full suspension
 17 period (60 days plus 7 months) will end on January 12, 2022. The purpose of PWSA's
 18 Petition is to enable it to utilize a FPFTY beginning on January 1, 2022 (rather than
 19 February 1, 2022 as would be required by the statute) which is consistent with PWSA's
 20 budgeting processes.

21 **Q. PLEASE DESCRIBE HOW THE DATA FOR THE HISTORIC TEST YEAR**
 22 **WERE DERIVED.**

⁸ Alternatively, PWSA requests a waiver pursuant to 66 Pa. C.S. § 3203(b) which permits the Commission to suspend or waive the applicability of any provision of the Public Utility Code to PWSA.

1 A. The HTY is the unaudited results for FY 2020. The audited results are not available at
 2 this time. I do not anticipate material differences between the unaudited results and the
 3 audited results, which should be available by late April 2021.

4 **Q. PLEASE DESCRIBE HOW THE FUTURE TEST YEAR AND FULLY**
 5 **PROJECTED FUTURE TEST YEAR RESULTS WERE DERIVED.**

6 A. The FTY (FY 2021) and FPFTY (FY 2022) results were derived through a
 7 comprehensive Authority-wide budgeting process. PWSA uses a zero-based budgeting
 8 method to develop annual budgets. The previous year's budgets are referenced when
 9 developing the FPFTY budget, but each cost is individually considered when developing
 10 the budget. This is contrary to a traditional budgeting approach in which an escalation
 11 factor is applied for an anticipated increase in a specific type of cost. A traditional
 12 budgeting process, using escalation factors, is used to forecast the Forecast Period, the
 13 operating results for FY 2023 are shown on Exhibit EB-1.

14 On Exhibit EB-4, I have provided additional information concerning the budget
 15 process. This Exhibit shows the Operating Budgets for FPFTY (FY 2022) and FY 2023
 16 as well as the anticipated Operating Expenses incurred in the FTY (FY 2021). The types
 17 of expenses incurred or projected for each department are also shown.

18 In addition to the operating expenses, the capital costs related to existing debt
 19 service and debt service related to the additional borrowing described above, PWSA
 20 incurs several other costs.

21 For example, the Authority has an obligation under the Cooperation Agreement
 22 (included as PWSA Exhibit WJP-2 with Mr. Pickering's testimony) to make payments
 23 for services currently provided by the City of Pittsburgh to PWSA, as well as other
 24 negotiated responsibilities that PWSA pays for on behalf of the City. These payments are

1 included in the revenue requirements segregated by water and wastewater conveyance
2 obligation. PWSA has budgeted for the following City services within the 2022 operating
3 budget:

Permits	\$650,000
Vehicle Repairs	\$780,000
Fuel-Gasses	\$350,000
City Indirect Costs	\$3,000,000 (Pension and voluntary taxes)
TOTAL	\$4,780,000

4
5 Additionally, the Authority carries bad debt expense for collections related to
6 pass-through charges by the Allegheny County Sanitary Sewer Authority
7 (“ALCOSAN”), the region’s wastewater treatment provider. All of the wastewater
8 collected and conveyed by PWSA wastewater conveyance system is treated at the
9 wastewater treatment facilities of ALCOSAN. PWSA bills customers on behalf of
10 ALCOSAN for wastewater treatment service via a pass-through charge on PWSA bills.
11 ALCOSAN’s rates are established by ALCOSAN.

12 PWSA made some large adjustments in FY 2017 which resulted in more expenses
13 being paid than expected in HTY (FY 2020) than were budgeted for in the HTY, and an
14 increase in the FPFTY to reflect a budgeted increase in ALCOSAN’s rates. The pass-
15 through charges that are assessed to the Authority are based on billed volume, not
16 collected revenue, and thus the difference between billed and collected revenues has
17 historically cost Authority customers approximately \$1-2 million per year. This annual
18 cost is expected to grow in future years due to decreased collected revenues resulting
19 from the ongoing COVID-19 pandemic and the planned ALCOSAN rate increases.

1 Exhibit EB-4 provides information regarding changes in budgeted levels from the
2 HTY (FY 2020) to the FTY (FY 2021) and from the FTY (FY 2021) to the FPFTY (FY
3 2022) and FY 2023. While the primary focus of this rate filing is justifying the increase
4 for the FPFTY, it is important for the Commission to understand the significant ramp up
5 in costs for compliance with the mandates from the Pennsylvania Department of
6 Environmental Protection, and an enhanced level of service that are reflected in the
7 FPFTY and FY 2023 budgets.

8 **Q. HOW DO THE OPERATING RESULTS SHOWN ON THE ATTACHED**
9 **EXHIBITS TREAT THE COOPERATION AGREEMENT WITH THE CITY?**

10 A. PWSA is legally obligated by the Cooperation Agreement to make certain payments to
11 the City. Accordingly, payments to the City under the Cooperation Agreement are treated
12 as a “known and definite” expense in PWSA’s operating results and resulting financial
13 metrics. However, for purposes of calculating debt service coverage, Cooperation
14 Agreement expenses are subordinate to the payment of debt service as discussed in Mr.
15 Huestis’ testimony.

16 The Authority’s obligations under the Cooperation Agreement are discussed in
17 greater detail by Mr. Pickering. These obligations are included in the revenue
18 requirements segregated by water, wastewater conveyance, and stormwater obligation as
19 previously stated in the amount of \$4.8 million.

20 **Q. ARE THE AMOUNTS SHOWN IN EXHIBIT EB-1 DIFFERENT THAN THOSE**
21 **APPROVED BY PWSA’S BOARD?**

22 A. There are no changes to the Board-approved budget.

1 **Q. ARE THE COSTS OF PWSA’S PLANS TO OBTAIN LONG-TERM FINANCING**
 2 **INCLUDED IN THE FPFTY AND FORECAST YEAR 2023?**

3 A. Yes. The cost of PWSA’s recent loan from PENNVEST, awarded in January 2021, is
 4 included in FTY (FY 2021) as well as the other anticipated loans and issuances of
 5 revenue bonds in the FPFTY have been reflected in the FPFTY and forecast year FY
 6 2023, to the extent that they are reasonably known and definite.

7 **Q. IS THE COST OF THIS RATE CASE AND THE ANNUAL PUC ASSESSMENT**
 8 **FEE INCLUDED IN THE FPFTY?**

9 A. Yes, PWSA has budgeted approximately \$1.8 million for this rate case and \$1.5 million
 10 for the annual PUC assessment fee in FPFTY. With respect to rate case expense, PWSA
 11 is proposing to include these expenditures as projected in its revenue requirement rather
 12 than amortizing or “normalizing” these expenditures over some period of time. As a cash
 13 flow regulated municipal entity, PWSA’s rates reflect what it actually incurs in a year
 14 and collecting those costs in rates over two or three years is not reasonable. Also, PWSA
 15 has been involved in rate-related activity on an annual basis since coming under the
 16 jurisdiction of the PUC at a yearly or every other year pace for the next several years.

17 **IV. DEVELOPMENT OF OPERATING BUDGET AND CAPITAL NEEDS**

18 **A. PWSA 2022 Operating Budget**

19 **Q. PLEASE DESCRIBE HOW PWSA’S OPERATING BUDGETS ARE CREATED.**

20 A. Each of the fourteen departments within PWSA prepares budget requests for the
 21 upcoming fiscal year. Those requests are reviewed by the Finance Department for
 22 accuracy and adherence to the realistic expectations and/or projections. The Finance
 23 Department prepares a “roll-up” of initial funding and expense recommendations for the
 24 Chief Executive Officer and Chief Operating Officer. The Chief Executive Officer and
 25 Chief Operating Officer then may make recommendations on the initial budget requests.

1 Any recommendations are discussed with the applicable department and, if accepted,
 2 results in a revised set of budget requests. Once satisfied, the Chief Executive Officer and
 3 Chief Operating Officer (with the assistance of the Finance Department) prepares an
 4 operating budget for review by the Board. The Board may accept or modify the operating
 5 budget. The final operating budget is approved by the Board. Typically, approval is
 6 received in November or December for the fiscal year commencing on January 1. If
 7 necessary, the Operating Budget can be revised during the fiscal year with Board
 8 approval.

9 **Q. WHAT IS THE REVIEW AND APPROVAL PROCESS ASSOCIATED WITH**
 10 **THIS BUDGET AND TWO-YEAR FORECAST?**

11 A. In addition to an internal review and approval process by the PWSA executive team,
 12 PWSA is required to obtain final approval by PWSA’s Board of Directors. The Board
 13 (whose members are recommended by a nominating committee, appointed by the Mayor
 14 and confirmed by City Council) is the governing body of the Authority and is responsible
 15 for providing strategic direction and oversight to PWSA management team, as well as
 16 adopting the Authority’s annual operating and capital budgets, approving contracts, and
 17 setting rates (that are subject to final review and approval by the Commission). Once
 18 final, PWSA makes its annual operating budget and CIP available to the public on its
 19 website.

20 **Q. DOES PWSA ALSO PREPARE A TWO-YEAR FORECAST OF FINANCIAL**
 21 **OPERATIONS (HERE REFERRED TO AS THE FORECAST PERIOD)?**

22 A. Yes. PWSA rolls forward its budgeted operating results using the Budget year, or the
 23 FPPTY, as the base year to create a two-year forecast, taking account of any known rate
 24 or other changes that might affect the results in a particular year. For this filing, PWSA
 25 accelerated its budgeting process for FY 2022 to establish a fully developed FPPTY as

1 the test year in this proceeding and as a base year of its two-year forecast. Beyond
 2 FPFTY, and FY 2023, for the remainder of the Forecast Period, PWSA uses the
 3 aforementioned traditional budgeting method of applying escalation factors to certain
 4 groups or types of cost in anticipation of increased cost of service. The Forecast Period
 5 results are shown on Exhibit EB-2.

6 **B. The PWSA’s Capital Needs**

7 **Q. PLEASE EXPLAIN THE PWSA’S CAPITAL IMPROVEMENT PLAN (“CIP”).**

8 A. The PWSA Board of Directors approved the 2021-2025 CIP on September 25, 2020.
 9 Please see Exhibit-5 for a copy of the CIP. The CIP, which includes over \$1 billion in
 10 capital improvements, is a result of multiple decades of deferred maintenance and lack of
 11 capital investment. The CIP includes detailed information about the PWSA’s
 12 construction projects related to the Water Treatment Plant, Water Pumping and Storage,
 13 Water Distribution, Wastewater, Stormwater, and Miscellaneous Projects (i.e., cost
 14 shares, surface restoration, etc.). As discussed in Mr. King’s testimony, the projects
 15 within the CIP must be completed in order to maintain adequate levels of service. Delays
 16 in completing these projects will increase the risk for result in poor water quality or a
 17 complete failure to deliver water to the service area and an inability to meet regulatory
 18 requirements of the consent order and agreement, as detailed below.

19 The CIP also includes annual replacement projects designed to retire assets as
 20 they approach the end of their useful life. These projects include meter, water line, sewer
 21 line, valve, hydrant, vehicle and catch basin replacements. Funding these annual
 22 replacements is critical to the future state of the system as it enables the proactive
 23 replacement of assets. This benefits PWSA’s ratepayers in the long-term by “smoothing”
 24 future revenue requirements while assuring reliable levels of service.

1 In addition, as discussed in Mr. King’s testimony, the CIP includes funding for
 2 projects that are related to the Consent Order and Agreement (“COA”) issued by the
 3 Pennsylvania Department of Environmental Protection (“PA DEP”). Below is a summary
 4 of the referenced regulatory requirement.

<u>Consent Order and Agreement</u>	<u>Required Projects</u>	<u>Effective Date</u>	<u>Estimated Costs (FY 2021 and beyond)</u>
Violations of the Pennsylvania Safe Drinking Water Act and the Rules and Regulations Promulgated Pursuant Thereto	1) Replacement of the Clearwell 2) Clearwell Bypass 3) Replacement of Highland 2 Reservoir Cover and Liner 4) Rising Main #3 and #4 Rehabilitation 5) Aspinwall Pump Station to Lanpher Rising Main 6) Aspinwall Pump Station and Bruecken Pump Station Rehabilitations 7) Washout Disconnections	September 6, 2019	\$252,343,776

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 6 The COA entered into on September 6, 2019, among other things, requires the
 7 replacement of the clearwell at the Aspinwall Water Treatment Plant. It will take PWSA
 8 multiple years to meet the obligations of this COA as replacing the Clearwell is a major
 9 project with many subproject components. This COA has strict deadlines which PWSA
 10 must adhere to in order to meet all required obligations. Failure to fund the projects
 11 related to the COA would jeopardize public health as well as make PWSA subject to
 12 fines and/or disciplinary actions.

13 **Q. WHAT ARE THE PWSA’S FPPTY 2022 AND 2023 PROJECTED CAPITAL**
 14 **REQUIREMENTS?**

15 A. Below is a summary of the FPPTY 2022 and 2023 capital requirements.

<u>Capital Requirements</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Total</u>
Water Treatment Plant	\$ 16,422,149	45,559,717	61,981,866
Water Pumping and Storage	70,939,529	106,366,346	177,305,875
Water Distribution	36,345,826	66,150,837	102,496,663
Wastewater System	45,109,155	29,580,401	74,689,556
Stormwater	21,721,607	13,237,377	34,958,984
Other	1,100,000	2,500,000	3,600,000
Total Capital Requirements	\$ 191,638,266	263,394,678	455,032,944

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The costs associated with the previously mentioned COA and unrelated water main replacement program (which includes lead service line identification and replacement) represents approximately a) \$82.266 million (or 43%) of the capital requirements in FPFTY 2022 and b) \$139.838 million (or 53%) of the capital requirements in the FY 2023 Forecast Period. This funding must be available to comply with the COA and to continue replacing lead service lines. Failure to do so increases the risk of public health issues as well as fines or other disciplinary actions.

The majority of the remaining capital requirements in FPFTY 2022 and FY 2023 Forecast Period includes funding for annual replacement costs associated with meters, sewer lines, valves, hydrants, catch basins, and stormwater costs as it relates to combined sewer overflows (CSOs). These projects must also be funded in order to, replace aged infrastructure, implement annual asset replacement cycles, and address the ongoing CSO issue as it relates to stormwater.

V. SOURCES OF FUNDING

Q. WHAT ARE PWSA’S FPFTY 2022 – 2023 PROJECTED FUNDING SOURCES

A. Below is a summary of the FPFTY 2022-2023 funding sources.

	FY 2022	FY 2023
Debt (Revenue Bonds)	\$ 175,038,410	253,747,173
DSIC - Water	6,864,558	6,899,740
DSIC - Sewer	2,735,298	2,747,765
PENNVEST	7,000,000	-
Total Funding Sources	\$ 191,638,266	263,394,678

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The main sources of funding are debt (i.e. revenue bonds), loans from the Pennsylvania Infrastructure Investment Authority (“PENNVEST”), and Distribution System Improvement Charge (“DSIC”). It should be noted that the DSIC funding is being used as a source of internally generated funds (“PAYGO”) to fund capital projects. PWSA is also requesting an additional minimal amount -- \$1 million – from base rates to provide additional PAYGO funding for costs in the Operating Budget that are eligible to be capitalized at year-end. It is important to note that virtually all of the funds needed to finance the CIP come from ratepayers or from borrowings. The cost of borrowing also must be paid by ratepayers.

A. Internally Generated Funds (“PAYGO”)

Q. PLEASE EXPLAIN INTERNALLY GENERATED FUNDS (PAYGO)

A. PAYGO is a funding mechanism which finances capital assets with current year revenues. PAYGO funding is often utilized in the place of long term debt to fund capital assets that have a short useful life (less than 10 years). Capital assets financed through long term debt should have a minimum useful life no shorter than the average maturity of the debt being issued. Failure to do so would result in an “overleveraged” debt position, which would limit the ability and increase the cost to borrow and fund capital projects. In addition to the already established DSIC funding, PWSA is proposing an additional \$1.0 million of PAYGO in FPFTY 2022.

1 PAYGO funding should also be considered when funding capital assets with a
2 longer useful life as it reduces financial risks (such as default), lowers financing costs,
3 makes the Authority less susceptible to market vagaries, as well as provides financial
4 flexibility within the capital program. In addition, PAYGO funding is cheaper compared
5 to the debt service and required debt service coverage costs associated with long term
6 debt when the cost of long-term borrowing is computed.

7 Prior to 2019, PWSA was almost entirely reliant on long term debt in order to
8 fund capital projects. Consistent with the Authority's desire to limit the current rate
9 request for FPPTY 2022 because of the COVID pandemic the Authority is limiting the
10 funding of long-term capital on a PAYGO basis from base rates. However, in future
11 years, PWSA intends to ramp up its use of PAYGO as a funding source for all of the
12 benefits that were previously mentioned.

13 **DOES THE AUTHORITY HAVE A PWSA BOARD APPROVED FINANCIAL**
14 **POLICY WHICH ESTABLISHES A PAYGO FUNDING GOAL?**

- 15 A. Yes. The Financial Management Policy included in Exhibit EB-6 requires financial
16 performance to be evaluated on an annual basis with the goal of funding at least 10% of
17 capital expenditures not supported by grants or intergovernmental aid from PAYGO
18 funding as measured on a five-year basis. At present rates, the PAYGO funding
19 percentage as measured on a five-year basis is 3.5%, which falls short of the Board's
20 10% target given the desire to limit the rate request for reasons previously explained
21 related to the pandemic.

B. PENNVEST and Other Federal Loans**Q. PLEASE EXPLAIN THE FUNDING AVAILABLE THROUGH PENNVEST.**

A. Given PWSA's large capital improvement plan, PWSA has aggressively pursued PENNVEST funding in order to keep costs as low as possible for its ratepayers while completing critical infrastructure improvements. This aggressive push to obtain low-cost funding has paid off in recent years by saving rate payers approximately \$80 million compared to municipal bond funding since 2019 through the following PENNVEST funding awards a) In March 2019, PWSA closed on a funding offer from PENNVEST in the amount of \$49.1 million for the purpose of funding public and private lead service line replacements. \$13.7 million of the funding offer was a grant and the remaining \$35.4 million was a 1% loan. b) In June 2020, PWSA closed on a funding offer from PENNVEST in the form of a 1% loan in the amount of \$65.2 million for the purpose of funding public and private lead service line replacement. This was the largest funding award that PENNVEST had ever granted in its history. c) In January 2021, PENNVEST announced a \$7.8 million funding award in the form of a low-interest loan to PWSA for the purpose of funding sewer rehabilitation and replacements. It is anticipated that PWSA will close on this loan in May 2021.

Q. IS PWSA APPLYING FOR ADDITIONAL PENNVEST FUNDING?

A. Yes, PWSA already has or will be submitting before the end of 2021 PENNVEST applications for the following projects a) \$38.5 million for water main replacements (lead and non-lead replacements), \$45.3 million for sewer rehabilitation and replacement and c) \$126.8 million for partial funding of the COA projects. PWSA has applied for the remaining funding for the COA projects through the EPA's Water Infrastructure Finance and Innovation Act (WIFIA) funding program, which will be discussed shortly.

1 It is important to mention that while PENNVEST funding provides a significant
 2 cost savings to PWSA rate payers, future funding is not guaranteed. The application
 3 process is competitive and awards are based on the availability of funds. However, even
 4 if future funding is awarded, PWSA is still obligated to repay all loans and recover the
 5 associated debt service coverage costs.

6 **Q. WHAT PLANS DOES THE PWSA HAVE TO APPLY FOR FEDERAL**
 7 **FUNDING?**

8 A. As previously mentioned, PWSA is currently pursuing federal funding through the EPA’s
 9 WIFIA funding program in an amount up to \$127,901,498 for the purpose of partially
 10 funding the COA projects. As mentioned previously, PWSA will also be submitting an
 11 application to PENNVEST to fund the remaining portion of the COA projects.

12 After submitting a letter of interest in October 2020, PWSA was one of 55
 13 applicants invited to submit a formal WIFIA funding application, which PWSA plans to
 14 submit by early April 2021. Any potential funding that PWSA receives from submitting
 15 this application will not be awarded until the end of 2021 or the beginning of 2022.
 16 Similar to PENNVEST funding awards, any funding granted through the WIFIA program
 17 is not guaranteed. In addition, if funding is awarded, PWSA would need to repay the
 18 loans and recover the associated debt service coverage costs. .

19 **Q. WILL PWSA’S REVENUE REQUIREMENT BE AFFECTED IF IT IS**
 20 **AWARDED THESE LOW INTEREST LOANS?**

21 A. We do not believe they will affect this rate increase. The loans will be awarded at the
 22 end of 2021 or 2022. As such they will likely be available to replace or partially replace
 23 PWSA bond issuances in the 2023 time frame, after the FPPTY. Accordingly, they will
 24 reduce future capital markets bond issuances and lower debt service costs.

1 **C. Debt (Revenue Bonds)**

2 **Q. WHAT IS THE STRUCTURE OF THE AUTHORITY'S CURRENT DEBT**
3 **PROFILE?**

4 A. As of February 1, 2021, PWSA currently has outstanding \$822.2 million of bonds
5 outstanding, comprised of \$718.0 million (87%) issued under the Senior Lien and \$104.3
6 million (13%) issued as Subordinate Bonds. Additionally, there is approximately \$120.0
7 million outstanding of PENNVEST Loans, issued as a third lien, as well as a capital
8 draw-down line of credit with a credit capacity of \$150.0 million for construction
9 purposes, of which \$26.7 million has been drawn as of February 1, 2021. Of the bonds
10 outstanding, \$218.8 million (27%) were issued as variable rate bonds, hedged with a 70%
11 of 1-month LIBOR receiver and fixed payer interest rate swap (with the exception of \$2.1
12 million of the Senior Lien which is unhedged). All of the outstanding variable rate debt
13 was issued as publicly issued Floating Rate Notes with a Securities Industry and
14 Financial Markets Association ("SIFMA") Index Rate Period prior to a mandatory tender
15 date of December 1, 2023. In addition, PWSA entered into a basis swap where PWSA
16 receives SIFMA and pays 70% of 1-month LIBOR to manage variable rate interest
17 payments. The Debt and Swap Portfolio Summary is attached in Exhibit EB-7.
18 In addition to the financial and other covenants required in the governing Amended and
19 Restated Senior Indenture ("Senior Indenture"), the Authority has a bank agreement and
20 two swap agreements, all with separate events of default and termination events. With the
21 exception of the Series B of 2013 and the September 1, 2021 through 2023 maturities of
22 the Series A of 2019 Bonds, all of the outstanding bonds are secured with a Surety Policy
23 with Assured Guaranty Municipal Corp. ("AGM") to meet the debt service reserve
24 requirement of the Senior Indenture, which is the lesser of (i.) 10% of par, (ii.) maximum

1 annual debt service or (iii.) 125% of average annual debt service. The Authority has also
2 purchased bond insurance on the majority of its outstanding issues with 2021 through
3 2023 maturities of the Series A of 2019 Bonds and Series A of 2020 Bonds being the
4 only exclusions. The Series 1998 Series B Bonds are also partially insured by National
5 Public Finance Guaranty Corporation (“NPFGC”) which has placed additional
6 restrictions on interim borrowings against the Senior Lien. Lastly, PWSA has also
7 purchased swap insurance on its outstanding interest rate swap agreements, also insured
8 by AGM, with regard to certain termination events.

9 **Q. WHAT ARE THE RISKS AND/OR BURDENS ASSOCIATED WITH THE**
10 **AUTHORITY’S CURRENT DEBT PROFILE?**

11 A. Many of PWSA’s bond transactions and PWSA’s swap transactions were entered into
12 before the late 2000’s fiscal crisis and the related bank and bond insurer credit
13 downgrades and, at that time, were viewed as cost effective. Since that time, the
14 Authority has had to spend significant resources in replacing bank agreements,
15 restructuring and/or terminating swap agreements and reaching certain side agreements
16 with the bond insurers. The risks inherent to the debt and swap portfolio are still
17 significant even after these changes especially since PWSA has lower credit ratings
18 compared to most large municipal utility systems and PWSA will need to continue
19 mitigating these risks in the future.

20 Since being under PUC oversight, PWSA has made progress “de-risking” its debt
21 and related swap portfolio. While in 2019 it was able to refund \$103.7 million of variable
22 rate debt and to terminate the related hedged swap agreements replacing the floating rate
23 debt and swaps with low-cost, fixed rate bonds, PWSA has concluded that current
24 financial conditions and other factors make additional “de-risking” inadvisable at the

1 present time. In addition, PWSA's outstanding debt also has several associated rating
2 triggers that could increase costs and/or cause a termination event. For example, all of the
3 swap agreements have rating triggers related to the bond insurer, as well as the Authority,
4 that, if violated, could result in a forced termination event. As a result of the Authority's
5 debt being secured by Surety Policies, any refunding or restructuring requires bond
6 insurer approval, or the Authority would need to fund these debt service reserve funds
7 with cash. Furthermore, the capital draw-down line of credit agreement includes
8 automatic increased spreads (higher interest costs) if PWSA is downgraded to certain
9 rating levels.

10 PWSA's relatively low ratings were a factor during the solicitation of the capital
11 draw-down line of credit. The Authority received three proposals from national financial
12 institutions in February 2020 with proposed schedules of fees and pricing for the
13 respective line of credit. PWSA chose PNC Bank, N.A. ("PNC") to provide financing for
14 the Authority based on the applicable spreads, as well as its local presence in Pittsburgh,
15 Pennsylvania. Soon thereafter, the COVID-19 pandemic commenced and municipalities
16 throughout the country were also looking for short-term liquidity due to the unknown
17 revenue effects of the pandemic. Triple-A (Aaa/AAA) and double-A (Aa/AA) credits
18 were able to secure the liquidity, but banks were much more hesitant to administer short-
19 term credit to single-A or lower graded issuers. Fortunately, PWSA had already accepted
20 the proposal from PNC to receive the line of credit. Unfortunately, PNC had to revise
21 their original price proposal of a three-year term of 79% of 1-month LIBOR plus 52 basis
22 points and increased their borrowing costs to 79% of 1-month LIBOR plus 161 basis
23 points. The difference of 109 basis between the original proposal received in February

1 2020 and the revised proposal later received in April 2020 was substantial, especially
 2 during the onset of the COVID-19 pandemic. The availability of credit support at the
 3 Authority’s rating level at the onset of the COVID pandemic was extremely limited so
 4 PWSA had no alternative but to accept PNC’s higher cost terms.

5 **VI. CALCULATION OF REVENUE REQUIREMENT**

6 **A. Cash Flow Ratemaking**

7 **Q. PLEASE EXPLAIN THE BASIS ON WHICH PWSA HAS CALCULATED ITS**
 8 **REVENUE REQUIREMENT FOR THE FPFTY.**

9 A. PWSA is not regulated on the basis of a fair rate of return on a used and useful rate base
 10 as are investor-owned utilities; instead, the Authority’s revenue requirement is
 11 established on the basis of the “Cash Flow Method.”

12 The Commission has directed that PWSA’s revenue requirement will be
 13 determined using the “Cash Flow” method, the traditional method of determining just and
 14 reasonable rates for municipal utilities such as PWSA.⁹ In PWSA’s first two base rate
 15 cases,¹⁰ PWSA and the other parties determined its revenue requirement using the “Cash
 16 Flow” method.

17 It is appropriate to continue to use the “Cash Flow” method for PWSA, since
 18 PWSA has no shareholders and does not pay a dividend or a rate of return to its owner.
 19 With that in mind, rather than having its revenue requirement determined on the basis of
 20 a fair rate of return on a used and useful rate base, PWSA’s rates should be set by

⁹ *Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water And Sewer Authority*, Docket Nos. M-2018-2640802 and M-2018-2640803, Final Implementation Order entered March 15, 2018 at 27-28.

¹⁰ *Pennsylvania Public Utility Commission v. PWSA*, Docket Nos. R-2018-3002645 (water) and R-2018-3002647 (wastewater), Opinion and Order entered February 27, 2019.

1 determining the levels of cash necessary to fund an operating budget that enables PWSA
 2 to maintain the system, pay for needed capital improvements, the level of debt service
 3 coverage that both meets PWSA’s bond covenant requirements, and also produces
 4 sufficient cash to fund all obligations and maintain access to the capital markets at
 5 reasonable rates.

6 In a 2010 Policy Statement, the Commission described the requirements of the
 7 Cash Flow Method as follows:

8 *(b) ... Included in that requirement [of establishing just and reasonable rates] is the*
 9 *subsidiary obligation to provide revenue allowances from rates adequate to cover*
 10 *[the utility’s] reasonable and prudent operating expenses, depreciation allowances*
 11 *and debt service, as well as sufficient margins to meet bond coverage requirements*
 12 *and other internally generated funds over and above its bond coverage*
 13 *requirements, as the Commission deems appropriate and in the public interest for*
 14 *purposes such as capital improvements, retirement of debt and working capital.¹¹*

15 The Commission also stated that, in determining just and reasonable rate levels
 16 under the Cash Flow Methodology it would consider, among other relevant factors, the
 17 following financial factors:¹²

- 18 • Test year-end and (as a check) projected future levels of non-borrowed
 19 year-end cash.
- 20 • Available short term borrowing capacity and internal generation of
 21 funds to fund construction.
- 22 • Debt to equity ratios and financial performance of similarly situated
 23 utility enterprises.
- 24 • Level of financial performance needed to maintain or improve the
 25 utility’s bond rating thereby permitting the utility to access the capital
 26 markets at the lowest reasonable costs to customers over time.

¹¹ 52 Pa.Code § 69.2702.

¹² 52 Pa.Code § 69.2703.

1 **Q. PLEASE EXPLAIN HOW PWSA DETERMINED ITS REVENUE**
2 **REQUIREMENT IN THE FPFTY?**

3 A. PWSA's revenue requirement in this case was determined by calculating the level of
4 additional revenues the Authority needs in order to fund its capital and operating budgets
5 and maintain financial metrics at least at or above its minimum requirements. As noted
6 earlier, due to the COVID-19 pandemic, the PWSA chose to request the minimum
7 amount needed to meet these standards.

8 **Q. WHAT ARE THE FINANCIAL REQUIREMENTS THAT MUST BE MET IN**
9 **ORDER TO DETERMINE WHETHER PWSA'S RATES ARE ADEQUATE?**

10 A. PWSA's rates must exceed its Rate Covenant and Additional Bonds Test in order to
11 determine whether its rates are adequate. In addition, PWSA's key financial metrics –
12 debt service coverage and days cash on hand - must be at adequate levels in order to both
13 meet its Bond Covenants and satisfy bond rating agencies and bondholders that it has the
14 financial resources, cushion and flexibility to operate and meet its debt service obligation
15 required to remain consistent with similar municipal water and sewer utilities.

16 **Q. EXPLAIN THE REQUIREMENTS OF PWSA'S RATE COVENANTS?**

17 Beginning on January 1, 2020 and each year thereafter, the Authority must calculate
18 whether the Rate Covenant has been complied with for the prior fiscal year. The Senior
19 Indenture states, "The Authority shall fix, charge and collect such rates, fees and other
20 charges for the use of and the services furnished by the System and shall, from time to
21 time and as often as shall appear necessary, revise such rates, fees and other charges so as
22 to satisfy all of the three following independent requirements:

23 1. Net revenues shall be sufficient in each fiscal year to pay annual senior debt
24 service, annual total debt service, all deposits to satisfy the reserve requirement and any
25 additional indebtedness in that fiscal year.

1 2. Net revenues shall not be less than 125% of annual senior debt service plus 110%
 2 of aggregate annual debt service in that fiscal year.

3 3. Rate covenant net revenues, excluding transfers from the rate stabilization fund,
 4 shall equal not less than 100% of aggregate annual debt service.”

5 Pursuant to the Senior Indenture, if PWSA “fails to comply with the Rate Covenant, the
 6 Authority shall promptly request a Qualified Independent Consultant to submit a written
 7 report and recommendations with respect to increases in the Authority’s rates, fees and
 8 other charges and improvements...to bring the Authority into compliance with the Rate
 9 covenant.” The explicit legal language identifies that PWSA would need to file a petition
 10 to the regulatory body (i.e., the PUC) for the increases. The Senior Indenture specifies
 11 that if PWSA cannot establish proper rates, fees and charges to comply with the Rate
 12 Covenant within 180 days of the filed petition to the PUC, then an event of default
 13 occurs. An event of default could lead to an acceleration of bond payments by request of
 14 bondholders where principal and interest on outstanding bonds become immediately due
 15 and payable. In addition, the event of default would cause negative impacts regarding
 16 PWSA’s current bond ratings and access to liquidity and capital markets to continue to
 17 finance the necessary improvements outlined in the CIP for the benefit of ratepayers. It is
 18 very rare that a large municipal water and sewer utility would violate its respective rate
 19 covenant. The consequences of PWSA not meeting the annual Rate Covenant could be
 20 devastating to the Authority. This is one reason why PWSA seeks to establish consistent,
 21 higher debt service coverage levels. The negative financial consequences, of lower
 22 coverage levels and/or the risk of not meeting the Rate Covenant is discussed in more
 23 detail within my testimony, as well as within Mr. Thomas Huestis’ testimony.

1 **Q. WHAT IS THE “ADDITIONAL BONDS TEST” AND WHAT IMPACT DOES**
2 **THAT HAVE AN ISSUING BONDS?**

3 A. As stated in Section 3.02 of the Senior Indenture, PWSA must satisfy the additional
4 bonds test prior to issuing additional bonds as outlined below:

5 A certificate of an independent consultant stating the Authority would have been
6 able to meet the Rate Covenant requirements for any twelve consecutive months
7 within the past twenty-four months taking into account:

- 8 (i) The Maximum Annual Debt Service on the proposed series of
9 additional bonds in the current or any future fiscal year;
10 (ii) the additional net revenue from the rates, fees and other charges
11 adjusted to reflect any rate increases that had not been in effect throughout
12 the consecutive twelve months but that have been approved by and can be
13 implemented by the Authority at the time of delivery of the proposed
14 series of additional bonds to go into effect within the following five years;
15 and
16 (iii) additional net revenues that the Authority may realize from the
17 addition of assets it proposes to finance through the issuance of the
18 proposed series of additional bonds or other funding sources within the
19 following five years or the Authority has met the rate covenant, taking into
20 account the maximum annual debt service on the proposed series of
21 additional bonds.

22 In summary, the Additional Bonds Test requires that PWSA meet its required
23 Rate Covenant debt service coverage ratios taking into account existing and authorized
24 rates and the maximum annual debt service of a proposed series of bonds prior to issuing

1 additional bonds. The Senior Indenture does not allow PWSA to factor in unauthorized
 2 future rate increases when calculating the additional bonds test. Failure to satisfy the
 3 additional bonds test would prohibit PWSA from issuing bonds and thus, would create
 4 obstacles to fund necessary improvements and new projects for ratepayers.

5 **Q. DOES PWSA SATISFY THESE RATE COVENANT TESTS FOR THE FPFTY IF**
 6 **NO RATE INCREASE IS GRANTED?**

7 A. No, PWSA’s present rates do not permit it to satisfy the Rate Covenant or Additional
 8 Bonds Test. Moreover, as shown on my Exhibit EB-1, PWSA does not satisfy its
 9 minimum coverage requirements in FY 2022 on either Senior Debt Service or Total Debt
 10 Service. Its pro forma coverages in the FPFTY at present rates are 1.05 on Senior Debt,
 11 where the minimum requirement is 1.25x, and .85x on Total Debt, where the minimum
 12 requirement is 1.10x.

13 **Q. WILL THE REQUESTED \$32.2 MILLION RATE INCREASE PERMIT PWSA**
 14 **TO SATISFY THE RATE COVENANT OR THE ADDITIONAL BONDS TEST?**

15 A. Barely. As previously mentioned, approximately \$15.8 million of the requested rate
 16 increase of \$32.20 million is needed in order for PWSA to satisfy the Additional Bonds
 17 Test when issuing the required level of debt to fund the capital program for FPFTY 2022.
 18 Further, while the requested \$32.2 million rate increase produces coverages that exceed
 19 the minimum coverage requirements set forth in PWSA’s bond covenants, they just
 20 barely do so.

21
 22 **B. PWSA Financial Metrics**

23 **Q. PLEASE EXPLAIN THE KEY FINANCIAL METRICS FOR THE PWSA.**

24 A. As a “cash flow” regulated municipal entity, PWSA’s operations are entirely funded from
 25 rates, either indirectly as a result of short-term or long-term borrowing (which then must

1 be paid back by ratepayers) or directly through charges to customers. Accordingly, the
2 PWSA's most important financial metrics are:

- 3 1) Reserves and liquidity;
- 4 2) Debt service coverage ratios; and
- 5 3) PAYGO financing

6
7 First, PWSA's debt service coverage levels are crucial because if the Authority
8 falls below the minimum requirements of 1.25x for senior debt or 1.10x for total debt,
9 then it will be technical default and its access to capital markets will become problematic.
10 This is not unique to PWSA as all municipal authorities have a debt service coverage
11 requirement.

12 Second, PWSA's reserves and liquidity, often measured as days cash on hand
13 ("DCOH"), is crucial because PWSA needs an accumulated balance of cash in its
14 accounts throughout the year to pay its obligations. As discussed shortly, PWSA's DCOH
15 has been decreasing since 2020 and will substantially drop in FPFTY and FY 2023 if the
16 requested rate increase in this proceeding is not approved. As covered in the testimony of
17 Mr. Huestis, the Authority is well below its peers when comparing DCOH.

18 Third, PWSA will continue to utilize PAYGO funding to finance a portion of its
19 capital program. As displayed in EB-8, PWSA's total net position is barely positive, thus
20 making PWSA highly leveraged. Utilizing PAYGO funding will reduce PWSA's highly
21 leveraged system over time as well as assist with maintaining adequate debt service
22 coverage ratios and liquidity balances.

23

C. Non-Borrowed Year-End Cash

Q. AT PRESENT RATES, WHAT LEVELS OF YEAR END CASH IS THE PWSA PROJECTING IT WILL EXPERIENCE IN THE FPPTY?

A. At present rates, PWSA’s Days of Cash on Hand (“DCOH”) in the FPPTY (FY 2022) is projected to be 87.1 days. In the Forecast Period PWSA’s DCOH drops to negative 26.8 days. The imperative need for a rate increase to bolster PWSA’s cash position can be seen by comparing its year end cash position in the last several years:

	<i>FY 2020</i>	<i>FY 2021</i>	<i>FY 2022</i>	<i>FY 2023</i>
<i>Days Cash on Hand (“DCOH”)</i>	<i>228.6 DCOH</i>	<i>195 DCOH</i>	<i>87.1 DCOH</i>	<i>(26.8) DCOH</i>

A. The substantial drop in DCOH, which is a result of required increases to operation and capital spending without rate relief to keep up with these additional obligations, demonstrates the imperative need for a substantial increase in rates to repair these cash levels.

Q. DOES THE PWSA HAVE ACCESS TO SHORT TERM BORROWING THAT IT COULD USE TO OFFSET NEGATIVE CASH BALANCES?

A. No. PWSA does not have an Operating Cashflow Line of Credit. That being said, borrowed funds are excluded from the calculation of DCOH at year end. It is for this reason that the Authority must focus on continuing to improve the cash balance, which will also improve the DCOH.

D. Debt Service Coverage

Q. WHY IS IT IMPORTANT TO MAINTAIN OR IMPROVE DEBT SERVICE COVERAGE?

A. The fundamental ratemaking philosophy for most financially stable municipal utilities is to provide safe and reliable service at rates that recover all current costs, plus a margin in

1 excess of current costs. This margin, also referred to as coverage, is a municipal utility's
 2 only real alternative to issuing debt to fund capital program costs. Coverage also provides
 3 assurance to investors that the utility will be able to make timely debt service payments.
 4 The recent rating agency reports by S&P Global Ratings and Moody's Investor's
 5 Services as outlined in Mr. Huestis's testimony have emphasized the need for PWSA to
 6 maintain as well as improve its debt service coverage over time. Adequate coverage is
 7 critically necessary to keep PWSA in a position to continue to have access to the capital
 8 markets on acceptable terms and to finance a portion of the capital program through
 9 internally generated funds as necessary to provide significant savings to ratepayers over
 10 time. Once the effects of the COVID-19 pandemic are mitigated, the PWSA will need to
 11 reprioritize and improve its debt service coverage.

12 **Q. PLEASE DISCUSS, AT PRESENT RATES, PWSA'S DEBT SERVICE**
 13 **COVERAGE RATIOS IN THE FPFTY AND IN THE FORECAST PERIOD.**

14 A. At current rates, the debt service coverage ratios decrease to 1.05 for senior debt and 0.85
 15 for total debt in the FPFTY. For the Forecast Year (FY 2023), coverages decline to 0.96
 16 for senior debt and 0.79 for total debt. The debt service coverage ratios shown below are
 17 well below the legal minimum requirement and show that the PWSA would not be able
 18 to fully pay its senior debt obligations and other financial obligations.

	<i>FY 2020</i>	<i>FY 2021</i>	<i>FY 2022</i>	<i>FY 2023</i>
<i>Senior Debt Service Coverage Ratio</i>	<i>1.51x</i>	<i>1.47x</i>	<i>1.05x</i>	<i>0.96x</i>
<i>Total Debt Service Coverage</i>	<i>1.27x</i>	<i>1.19x</i>	<i>0.85x</i>	<i>0.79x</i>

19
 20

1 **Q. PLEASE EXPLAIN PWSA’S USE OF THE CASH GENERATED BY THE DEBT**
 2 **SERVICE COVERAGE RATIO REQUIREMENT IN EXCESS OF MINIMUM**
 3 **REQUIRED DEBT SERVICE COVERAGE.**

4 A. As noted, the Authority is a “cash flow” regulated municipal utility, which means that
 5 there are no profit margin goals within the organization. Any “profit” or excess of
 6 revenues over expenses is invested back into the system. This benefits the ratepayers of
 7 the Authority because it offsets future revenue requirements that would otherwise be
 8 recovered through rates.

9 Specifically, the Authority would use cash generated in excess of minimum
 10 required debt service coverage in the following ways: (1) increase funding into the rate
 11 stabilization fund; (2) increase the amount of PAYGO funding within a specific year; (3)
 12 pay the costs associated of terminating swaps in favor of refunding current debt with
 13 long-term municipal fixed rate debt; and (4) increase reserves in order to handle
 14 unexpected capital and operating costs. But, it is important to note that the PWSA has *no*
 15 cash in excess of minimum requirements at present rates, either in the FPPTY or the
 16 Forecast Period.

17 **E. Debt To Equity Ratio; Short-Term Borrowing Capacity; Rate Stabilization Fund**

18 **Q. AT PRESENT RATES, WHAT IS PWSA’S PROJECTED DEBT TO EQUITY**
 19 **RATIO FOR THE FULLY PROJECTED FUTURE TEST YEAR?**

20 A. PWSA does not project a balance sheet as part of its budget. Exhibit EB-8 included with
 21 this testimony shows that PWSA’s total net position is barely positive. This highlights the
 22 need to try to reduce PWSA’s use of long term debt in favor of internally generated funds
 23 from its base rates and it’s DSIC.

24 **Q. DOES PWSA HAVE ANY MONEY AVAILABLE THAT COULD PROVIDE AN**
 25 **ADDITIONAL SOURCE OF FUNDS TO PAY FOR UNFORESEEN**
 26 **CIRCUMSTANCES TO MEET THE REQUIRED DEBT SERVICE COVERAGE**
 27 **RATIO?**

1 A. Yes. It has a Rate Stabilization Fund (“RSF”), which is currently funded at \$2.4 million.
 2 The RSF is a standard feature of municipal ratemaking. It is designed to provide
 3 flexibility to a municipal utility to meet minimum debt service coverage ratios as well as
 4 to demonstrate to the financial community that it is financially stable. However, the
 5 Indenture limits the amount that can be transferred from the Rate Stabilization Fund in
 6 any one year to be used for meeting coverage requirements.

7 **Q. IS THE PWSA PROPOSING TO PROVIDE ADDITIONAL RESOURCES FOR**
 8 **THE RSF AS PART OF THIS RATE REQUEST?**

9 A. Yes. We are proposing to allocate \$900,000 to the RSF with revenue received as part of
 10 this base rate case.

11 **F. Financial Results at Present Rates for FPFTY and Forecast Period**

12 **Q. WHAT ARE YOUR CONCLUSIONS BASED ON THE FINANCIAL RESULTS**
 13 **AT PRESENT RATES FOR THE FPFTY AND THE FORECAST PERIOD?**

14 A. The operating results at present rates show that it is crucially important that PWSA obtain
 15 rate relief in order to repair these financial indicators to meet the minimums required by
 16 the bond covenant, as well as to have sufficient cash in order to prudently operate the
 17 Authority at the budgeted levels. A failure to improve these results with additional
 18 revenues would prevent PWSA from issuing additional bonds in FY 2022, for failure to
 19 meet the Additional Bonds Test, and almost certainly result in a bond rating downgrade.
 20 It could also result in a default, which would raise the costs of borrowing and limit
 21 PWSA’s access to capital markets. Moreover, a failure to approve the level of rate relief
 22 requested would threaten PWSA’s ability to pay its bills when due.

23 **Q. WHAT LEVEL OF RATE RELIEF DOES PWSA REQUIRE TO MAINTAIN ITS**
 24 **FINANCIAL INDICATORS AT THE APPROPRIATE LEVELS AND HAVE**
 25 **SUFFICIENT CASH TO PRUDENTLY OPERATE THE AUTHORITY?**

1 A. PWSA has determined that an increase of \$32.2 million would provide barely sufficient
 2 additional revenues to enable it to maintain its financial metrics at adequate levels and
 3 would likely maintain its existing bond rating. It has elected to request this minimal
 4 amount (and propose a phase-in over two years to receive the full amount) in
 5 consideration of the COVID-19 pandemic. However, without a rate increase, PWSA
 6 would need to significantly delay and reduce its capital improvement plan, significantly
 7 reduce its operating expenditures and could slow its regulatory compliance progress.

8 **Q. HAVE YOU CALCULATED PWSA'S FINANCIAL RESULTS IN THE FPPTY**
 9 **AS WELL AS IN THE FORECAST PERIOD IF ITS PROPOSED \$32.2 MILLION**
 10 **RATE INCREASE IS GRANTED?**

11 A. Yes, those results are shown on Exhibit EB-2. At \$32.2 million, PWSA would have
 12 coverages on Senior Debt of 1.46x and 1.18x on Total Debt in the FPPTY. PWSA
 13 projects that the Senior Debt coverage in the Forecast Period (FY 2023) would be 1.36
 14 times and 1.12 times, respectively. As PWSA's financial advisor, Thomas Huestis,
 15 testifies that these coverage levels at proposed rates are just minimally adequate and well
 16 below the levels that bond rating agencies expect for a credit such as PWSA. The
 17 proposed rates will only minimally permit PWSA to have the funds it needs throughout
 18 the FPPTY and the Forecast Period to satisfy all of its financial obligations, as the
 19 projected Total Debt Service coverage in the Forecast Period is 1.12 while the legal,
 20 required coverage is 1.10 times. Even though our financial metrics following the
 21 requested rate increase are barely sufficient to meet the legally required coverage levels
 22 we hope to maintain our existing credit ratings based on the plan to minimize the rate
 23 increase during the pandemic with plans to improve our financial performance in future
 24 years.

25 The proposed rate increase would also result in approximately \$59.3 million in year-end

1 cash, or 175. DCOH, including Unrestricted and Operating Reserve Cash in the FPFTY
 2 (FY 2022). With the rate increase, PWSA is projecting an ending cash balance in 2023 of
 3 152 DCOH. While the FPFTY (FY 2022) cash position is positive compared to the
 4 projected cash using the existing rates, it is well below the levels that PWSA experienced
 5 in 2020 or 2021. Moreover, as explained by Mr. Huestis, the levels produced by the
 6 requested rate increase are below the median levels of similarly rated municipal utilities
 7 as calculated by rating agencies. Again, as previously discussed, PWSA chose to keep its
 8 rate increase at a level that would barely maintain its current financial metrics as a result
 9 of the ongoing COVID-19 pandemic.

10 **G. Bond Ratings**

11 **Q. PLEASE DESCRIBE THE PWSA’S CURRENT BOND RATINGS?**

12 A. The ratings from the two rating agencies that rate the PWSA Revenue Bonds are:¹³

13 S&P: to A (Stable Outlook)
 14 Moody’s A3 (Stable Outlook)

15 **Q. WHY IS IT IMPORTANT FOR THE PWSA TO MAINTAIN ITS CURRENT**
 16 **BOND RATINGS?**

17 A. Credit ratings are important because PWSA, like most utilities, is required to make
 18 significant capital infrastructure improvements each year for new and replacement assets.
 19 Credit ratings are a critical component in determining the cost of debt as the ratings
 20 signal PWSA’s ability and willingness to meet financial obligations in full and on time. A
 21 downgrade of the credit ratings for PWSA’s Bonds would result in an increase in
 22 PWSA’s borrowing costs and necessitate higher rate increases over time.

¹³ See Exhibit EB-9 and EB-10.

1 **Q. WHAT EVENTS, OTHER THAN DEFAULTING ON THE BOND COVENANTS,**
 2 **COULD RESULT IN A DOWNGRADING OF THESE BOND RATINGS?**

3 A. The downgrading of the Authority’s bond ratings is something that should be avoided.
 4 Ultimately, it increases costs to the ratepayer because it increases the cost of financing
 5 due to the perception of increased borrowing risk. In addition, the downgrade of bond
 6 ratings can limit the number of investors willing to lend to the Authority within the
 7 capital markets, which will result in: (1) the reduction of funds needed to fund capital
 8 project; (2) a reduction in the level of service due to a lack of capital investments; (3)
 9 decreased financial flexibility; and (4) decreased public trust.

10 **VII. ALLOCATION OF REVENUE REQUIREMENT BETWEEN WATER,**
 11 **WASTEWATER CONVEYANCE, AND STORMWATER**

12 **Q. AFTER DETERMINING THE TOTAL SYSTEM REVENUE REQUIREMENTS,**
 13 **HOW ARE THE WATER, WASTEWATER CONVEYANCE, AND**
 14 **STORMWATER UTILITY SERVICE REVENUE REQUIREMENTS**
 15 **DETERMINED?**

16 A. PWSA witness Harold Smith, utilizing the results of his class cost of service study, made
 17 recommendations to PWSA for the allocation of the proposed rate increase. Upon review
 18 of those recommended increases, PWSA accepted those recommendations. PWSA’s
 19 review indicated that Mr. Smith’s recommendations made a reasonable attempt to
 20 establish rates for each customer class that were consistent with the class cost of service
 21 or moved toward that goal in a reasonable manner.

22 **VIII. PROPOSED RATES AND CHARGES**

23 **Q. PLEASE DESCRIBE THE RATES UNDER PWSA’S PROPOSED TARIFF.**

24 A. PWSA’s Tariff Supplements containing the proposed rates and charges are contained in
 25 the PWSA Exhibit JAQ-3 and JAQ-4 (Water Tariff Supplement Number 7 clean, and
 26 redlined), PWSA Exhibit JAQ-5 and JAQ-6 (Wastewater Tariff Supplement No. 6 clean

1 and redlined), and PWSA Exhibit TI-4 (Stormwater Tariff). The customer impacts of
2 these proposed rates and charges is discussed by Ms. Quigley and Mr. Smith and also
3 shown in the Filing Requirements at 53.52(b) included in Volume 1, Tab 3 of the rate
4 filing.

5 **IX. CONCLUSION**

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 A. Yes. I do reserve the right to supplement this testimony as may be appropriate.

VERIFICATION

I, Edward Barca, hereby state that: (1) I am the Director of Finance for The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 03/22/2021 | 9:19 AM PDT

DocuSigned by:

Edward Barca

415E545AD9514E4...

Edward Barca
Director of Finance
The Pittsburgh Water and Sewer Authority

Exhibit EB-1

Pittsburgh Water and Sewer Authority
Statement of Income - Existing Rates

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
	<i>HTY</i>	<i>FTY</i>	<i>FPFTY</i>	<i>Forecast</i>
System Revenues				
1	\$ 101,027,060	\$ 108,966,611	\$ 115,504,656	\$ 116,577,476
2	63,426,343	66,044,216	69,551,767	69,860,835
3	-	-	-	-
4	3,044,694	3,192,713	3,192,713	3,192,713
5	-	8,725,089	9,227,369	9,271,011
6	7,365,202	5,347,779	1,834,521	1,871,212
7	1,165,567	832,320	848,966	865,946
8	\$ 176,028,866	\$ 193,108,728	\$ 200,159,993	\$ 201,639,193
System Revenue Requirements				
<u>Operating Expenses</u>				
<i>Direct Operating Expenses</i>				
9	\$ 2,652,942	\$ 2,927,978	\$ 3,055,434	\$ 3,078,409
10	7,069,743	8,611,265	8,787,106	8,891,190
11	2,589,691	4,524,257	4,594,275	4,629,530
12	8,760,049	6,800,285	7,782,394	7,826,455
13	-	-	-	-
14	707,475	942,691	1,180,406	1,195,382
15	4,295,018	6,207,316	5,910,814	5,931,957
16	1,049,867	1,155,269	1,283,083	1,297,931
17	1,403,532	3,217,426	3,977,533	3,994,470
18	400,607	456,859	473,416	481,953
19	18,435	-	-	-
20	1,740,900	2,272,776	1,792,010	1,808,161
21	17,132,272	19,442,694	22,973,908	23,085,810
22	3,459,048	3,831,101	3,437,579	3,482,886
23	13,061,174	14,417,833	15,138,386	15,363,570
24	26,087,632	32,309,411	38,530,420	38,637,960
25	\$ 90,428,386	\$ 107,117,160	\$ 118,916,763	\$ 119,705,663
<i>Other Operating Expenses</i>				
26	\$ 4,961,255	\$ 2,345,874	\$ 1,571,968	\$ 1,650,567
27	4,110,681	3,726,161	4,780,000	4,780,000
28	-	-	-	-
29	\$ 9,071,936	\$ 6,072,035	\$ 6,351,968	\$ 6,430,567
30	\$ 99,500,322	\$ 113,189,195	\$ 125,268,731	\$ 126,136,230
<u>Debt Service</u>				
31	\$ 51,831,499	\$ 54,079,753	\$ 72,441,686	\$ 78,011,315
32	8,138,793	10,967,078	13,465,586	13,303,422
33	1,670,708	2,000,000	3,500,000	3,500,000
34	\$ 61,641,000	\$ 67,046,831	\$ 89,407,273	\$ 94,814,737
<u>Capital Expenditures & Transfers</u>				
35	\$ 15,200,000	\$ -	\$ 1,000,000	\$ 2,000,000
36	-	8,725,089	9,227,369	9,634,591
37	-	-	1,000,000	1,000,000
38	3,470,964	4,131,010	3,949,530	5,726,986
39	-	-	-	-
40	\$ 18,670,964	\$ 12,856,099	\$ 15,176,899	\$ 18,361,577
41	\$ 179,812,286	\$ 193,092,125	\$ 229,852,903	\$ 239,312,544
42	\$ (3,783,420)	\$ 16,603	\$ (29,692,910)	\$ (37,673,351)

Pittsburgh Water and Sewer Authority
Projected Cash Flow - Existing Rates

	<u>FY 2020</u> <i>HTY</i>	<u>FY 2021</u> <i>FTY</i>	<u>FY 2022</u> <i>FPFTY</i>	<u>FY 2023</u> <i>Forecast</i>
Operating Fund				
Beginning Balance	\$ 62,992,625	\$ 59,209,204	\$ 59,225,808	\$ 29,532,898
<u>Sources:</u>				
Operating Surplus/(Deficit)	\$ (3,783,420)	\$ 16,603	\$ (29,692,910)	\$ (37,673,351)
Budgeted Contributions	-	-	1,000,000	1,000,000
<u>Uses:</u>				
Hardship Grant Fund Contribution	-	-	(100,000)	(50,000)
Contributions to Rate Stabilization Fund	-	-	(900,000)	(500,000)
Contributions to Operating Reserve Fund	-	-	-	(1,456,271)
<i>Ending Balance</i>	<u>\$ 59,209,204</u>	<u>\$ 59,225,808</u>	<u>\$ 29,532,898</u>	<u>\$ (9,146,725)</u>
Days Cash on Hand (Days O&M)				
Unrestricted Cash	228.6	195.0	87.1	(26.8)

**Pittsburgh Water and Sewer Authority
Debt Service Coverage - Existing Rates**

	<u>FY 2020</u> <i>HTY</i>	<u>FY 2021</u> <i>FTY</i>	<u>FY 2022</u> <i>FPFTY</i>	<u>FY 2023</u> <i>Forecast</i>
<u>Revenues</u>				
1 Operating Revenue	\$ 176,028,866	\$ 193,108,728	\$ 200,159,993	\$ 201,639,193
2 ALCOSAN Collections	68,226,853	75,849,912	77,026,440	80,877,762
3 Unrestricted Cash on Hand	-	-	-	-
4 <i>Subtotal: Revenues</i>	<u>\$ 244,255,719</u>	<u>\$ 268,958,640</u>	<u>\$ 277,186,434</u>	<u>\$ 282,516,955</u>
<u>Current Expenses</u>				
5 Operating Expenses	\$ (94,539,067)	\$ (110,843,321)	\$ (123,696,763)	\$ (124,485,663)
6 ALCOSAN Charges	(73,188,108)	(78,195,786)	(78,598,409)	(82,528,329)
7 Non-City Water Payments	-	-	-	-
8 Bad Debt Expense	(3,470,964)	(4,131,010)	(3,949,530)	(5,726,986)
9 Stormwater Credit Program Cost	-	-	-	-
10 <i>Subtotal: Current Expenses</i>	<u>\$ (171,198,139)</u>	<u>\$ (193,170,117)</u>	<u>\$ (206,244,702)</u>	<u>\$ (212,740,978)</u>
11 Add: City Services	4,110,681	3,726,161	4,780,000	4,780,000
12 Revenues Available for Debt Service	\$ 77,168,260	\$ 79,514,684	\$ 75,721,732	\$ 74,555,978
<u>Debt Service</u>				
Existing Debt				
13 Senior Debt	\$ 51,831,499	\$ 54,079,753	\$ 56,681,659	\$ 56,750,079
14 Subordinate	3,880,780	4,877,900	4,877,900	4,877,900
15 Pennvest	4,258,013	4,514,406	4,514,405	4,352,241
16 Revolver Interest	1,670,708	2,000,000	3,500,000	3,500,000
17 <i>Subtotal: Existing Debt</i>	<u>\$ 61,641,000</u>	<u>\$ 65,472,059</u>	<u>\$ 69,573,964</u>	<u>\$ 69,480,220</u>
Future Debt				
18 Senior Debt	\$ -	\$ -	\$ 15,760,027	\$ 21,261,235
19 PENNVEST	-	1,574,772	4,073,281	4,073,281
20 <i>Subtotal: Future Debt</i>	<u>\$ -</u>	<u>\$ 1,574,772</u>	<u>\$ 19,833,308</u>	<u>\$ 25,334,517</u>
21 <i>Subtotal: Debt Service</i>	<u>\$ 61,641,000</u>	<u>\$ 67,046,831</u>	<u>\$ 89,407,273</u>	<u>\$ 94,814,737</u>
22 Senior Debt Service Coverage	1.49	1.47	1.05	0.96
23 <i>Minimum Requirement</i>	<i>1.25</i>	<i>1.25</i>	<i>1.25</i>	<i>1.25</i>
24 Total Debt Service Coverage	1.25	1.19	0.85	0.79
25 <i>Minimum Requirement</i>	<i>1.10</i>	<i>1.10</i>	<i>1.10</i>	<i>1.10</i>

Exhibit EB-2

**Pittsburgh Water and Sewer Authority
Statement of Income - Proposed Rates**

	<u>FY 2020</u> <i>HTY</i>	<u>FY 2021</u> <i>FTY</i>	<u>FY 2022</u> <i>FPFTY</i>	<u>FY 2023</u> <i>Forecast</i>
System Revenues				
1	\$ 101,027,060	\$ 108,966,611	\$ 138,338,071	\$ 139,391,296
2	63,426,343	66,044,216	54,705,958	54,955,308
3	-	-	23,729,641	23,729,491
4	3,044,694	3,192,713	3,690,132	3,713,733
5	-	8,725,089	9,599,856	9,647,506
6	7,365,202	5,347,779	1,834,521	1,871,212
7	1,165,567	832,320	848,966	865,946
8	\$ 176,028,866	\$ 193,108,728	\$ 232,747,145	\$ 234,174,491
System Revenue Requirements				
<u>Operating Expenses</u>				
<i>Direct Operating Expenses</i>				
9	\$ 2,652,942	\$ 2,927,978	\$ 3,055,434	\$ 3,078,409
10	7,069,743	8,611,265	8,787,106	8,891,190
11	2,589,691	4,524,257	4,594,275	4,629,530
12	8,760,049	6,800,285	7,782,394	7,826,455
13	-	-	-	-
14	707,475	942,691	1,180,406	1,195,382
15	4,295,018	6,207,316	5,910,814	5,931,957
16	1,049,867	1,155,269	1,283,083	1,297,931
17	1,403,532	3,217,426	3,977,533	3,994,470
18	400,607	456,859	473,416	481,953
19	18,435	-	-	-
20	1,740,900	2,272,776	1,792,010	1,808,161
21	17,132,272	19,442,694	22,973,908	23,085,810
22	3,459,048	3,831,101	3,437,579	3,482,886
23	13,061,174	14,417,833	15,138,386	15,363,570
24	26,087,632	32,309,411	38,530,420	38,637,960
25	\$ 90,428,386	\$ 107,117,160	\$ 118,916,763	\$ 119,705,663
<i>Other Operating Expenses</i>				
26	\$ 4,961,255	\$ 2,345,874	\$ 1,571,968	\$ 1,650,567
27	4,110,681	3,726,161	4,780,000	4,780,000
28	-	-	-	-
29	\$ 9,071,936	\$ 6,072,035	\$ 6,351,968	\$ 6,430,567
30	\$ 99,500,322	\$ 113,189,195	\$ 125,268,731	\$ 126,136,230
<u>Debt Service</u>				
31	\$ 51,831,499	\$ 54,079,753	\$ 72,441,686	\$ 78,011,315
32	8,138,793	10,967,078	13,465,586	13,303,422
33	1,670,708	2,000,000	3,500,000	3,500,000
34	\$ 61,641,000	\$ 67,046,831	\$ 89,407,273	\$ 94,814,737
<u>Capital Expenditures & Transfers</u>				
35	\$ 15,200,000	\$ -	\$ 1,000,000	\$ 2,000,000
36	-	8,725,089	9,599,856	9,634,591
37	-	-	1,000,000	1,000,000
38	3,470,964	4,131,010	5,718,077	6,377,800
39	-	-	696,685	696,685
40	\$ 18,670,964	\$ 12,856,099	\$ 18,014,618	\$ 19,709,076
41	\$ 179,812,286	\$ 193,092,125	\$ 232,690,622	\$ 240,660,043
42	\$ (3,783,420)	\$ 16,603	\$ 56,523	\$ (6,485,552)

Pittsburgh Water and Sewer Authority
Projected Cash Flow - Proposed Rates

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
	<i>HTY</i>	<i>FTY</i>	<i>FPFTY</i>	<i>Forecast</i>
Operating Fund				
Beginning Balance	\$ 62,992,625	\$ 59,209,204	\$ 59,225,808	\$ 59,282,330
<u>Sources:</u>				
Operating Surplus/(Deficit)	\$ (3,783,420)	\$ 16,603	\$ 56,523	\$ (6,485,552)
Budgeted Contributions	-	-	1,000,000	1,000,000
<u>Uses:</u>				
Hardship Grant Fund Contribution	-	-	(100,000)	(50,000)
Contributions to Rate Stabilization Fund	-	-	(900,000)	(500,000)
Contributions to Operating Reserve Fund	-	-	-	(1,456,271)
<i>Ending Balance</i>	<u>\$ 59,209,204</u>	<u>\$ 59,225,808</u>	<u>\$ 59,282,330</u>	<u>\$ 51,790,507</u>
Days Cash on Hand (Days O&M)				
Unrestricted Cash	228.6	195.0	174.9	151.9

Pittsburgh Water and Sewer Authority
Debt Service Coverage - Proposed Rates

	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
	<i>HTY</i>	<i>FTY</i>	<i>FPFTY</i>	<i>Forecast</i>
<u>Revenues</u>				
1 Operating Revenue	\$ 176,028,866	\$ 193,108,728	\$ 232,747,145	\$ 234,174,491
2 ALCOSAN Collections	68,226,853	75,849,912	77,026,440	80,877,762
3 Unrestricted Cash on Hand	-	-	-	-
4 <i>Subtotal: Revenues</i>	\$ 244,255,719	\$ 268,958,640	\$ 309,773,585	\$ 315,052,254
<u>Current Expenses</u>				
5 Operating Expenses	\$ (94,539,067)	\$ (110,843,321)	\$ (123,696,763)	\$ (124,485,663)
6 ALCOSAN Charges	(73,188,108)	(78,195,786)	(78,598,409)	(82,528,329)
7 Non-City Water Payments	-	-	-	-
8 Bad Debt Expense	(3,470,964)	(4,131,010)	(5,718,077)	(6,377,800)
9 Stormwater Credit Program Cost	-	-	(696,685)	(696,685)
10 <i>Subtotal: Current Expenses</i>	\$ (171,198,139)	\$ (193,170,117)	\$ (208,709,934)	\$ (214,088,477)
11 Add: City Services	4,110,681	3,726,161	4,780,000	4,780,000
12 Revenues Available for Debt Service	\$ 77,168,260	\$ 79,514,684	\$ 105,843,651	\$ 105,743,776
<u>Debt Service</u>				
Existing Debt				
13 Senior Debt	\$ 51,831,499	\$ 54,079,753	\$ 56,681,659	\$ 56,750,079
14 Subordinate	3,880,780	4,877,900	4,877,900	4,877,900
15 Pennvest	4,258,013	4,514,406	4,514,405	4,352,241
16 Revolver Interest	1,670,708	2,000,000	3,500,000	3,500,000
17 <i>Subtotal: Existing Debt</i>	\$ 61,641,000	\$ 65,472,059	\$ 69,573,964	\$ 69,480,220
Future Debt				
18 Senior Debt	\$ -	\$ -	\$ 15,760,027	\$ 21,261,235
19 PENNVEST	-	1,574,772	4,073,281	4,073,281
20 <i>Subtotal: Future Debt</i>	\$ -	\$ 1,574,772	\$ 19,833,308	\$ 25,334,517
21 <i>Subtotal: Debt Service</i>	\$ 61,641,000	\$ 67,046,831	\$ 89,407,273	\$ 94,814,737
22 Senior Debt Service Coverage	1.49	1.47	1.46	1.36
23 <i>Minimum Requirement</i>	<i>1.25</i>	<i>1.25</i>	<i>1.25</i>	<i>1.25</i>
24 Total Debt Service Coverage	1.25	1.19	1.18	1.12
25 <i>Minimum Requirement</i>	<i>1.10</i>	<i>1.10</i>	<i>1.10</i>	<i>1.10</i>

Exhibit EB-3

The Pittsburgh Water and Sewer Authority

As of February 28, 2021



	FY 2020		FY 2021		<i>Difference</i>	<i>YTD Growth</i>
	<i>Prior Year-to-Date</i>		<i>Current Year-to-Date</i>			
Receipts						
<u>User Charge & Wholesale Receipts</u>						
Water Collections	\$ 16,599,304	\$	13,615,368	\$	(2,983,935)	-18.0%
Wastewater Collections	8,938,087		8,389,118		(548,968)	-6.1%
DSIC - Water Collections	-		90,076		90,076	n.a.
DSIC - Wastewater Collections	-		44,957		44,957	n.a.
	-		-		-	-
<i>Subtotal: User Charge & Wholesale Receipts</i>	\$ 25,537,390	\$	22,139,520	\$	(3,397,871)	-13.3%
<u>Other Operating Receipts</u>						
Other Misc. and Fee Operating Receipts	\$ 1,487,374	\$	521,725	\$	(965,650)	-64.9%
ALCOSAN Collections	9,571,584		10,259,739		688,155	7.2%
	-		-		-	-
<i>Subtotal: Other Operating Receipts</i>	\$ 11,058,958	\$	10,781,464	\$	(277,494)	-2.5%
	-		-		-	-
Total: Receipts	\$ 36,596,349	\$	32,920,984	\$	(3,675,365)	-10.0%

Exhibit EB-4

		<i>Forecast Period</i>	<i>FPFTY</i>	<i>FTY</i>	<i>HTY</i>	
		2023	2022	2021	2020	2019
		Budget	Budget	Budget	Estimate	Actual
Receipts						
	Water	143,105,029	142,028,203	112,159,324	104,071,754	107,506,128
	Sewage Conveyance	54,955,308	54,705,958	66,044,216	63,426,343	66,037,608
	Stormwater	23,729,491	23,729,641	-	-	-
	DSIC	9,647,506	9,599,856	8,725,089	-	-
	ALCOSAN	80,877,762	77,026,440	75,849,912	68,226,853	73,522,941
	Miscellaneous Revenue	2,737,157	2,683,488	6,180,099	8,530,769	6,671,401
Total Receipts		315,052,253	309,773,586	268,958,640	244,255,719	253,738,078
Operating Expenses						
	Salaries	31,811,941	31,188,177	28,416,486	24,147,039	22,261,855
	Benefits	8,421,951	8,256,815	7,828,039	6,851,987	6,730,702
	Direct Operating	55,565,319	55,565,319	49,851,408	36,054,613	38,378,874
	Inventory	1,675,900	1,675,900	1,665,400	1,448,874	2,048,723
	General & Administrative	27,010,552	27,010,552	23,081,988	26,036,554	26,127,770
	ALCOSAN	82,528,329	78,598,409	78,195,786	73,188,108	71,397,509
Total Operating Expenses		207,013,992	202,295,172	189,039,107	167,727,175	166,945,433
Net Operating Income		108,038,261	107,478,414	79,919,533	76,528,544	86,792,645
Debt Service						
	Debt Service - Principal	43,718,217	40,525,117	28,010,990	25,840,517	24,963,361
	Debt Service - Interest	51,096,520	48,882,155	39,035,841	35,800,483	34,316,404
Total Debt Service		94,814,737	89,407,272	67,046,831	61,641,000	59,279,765
Total Costs		301,828,729	291,702,444	256,085,938	229,368,175	226,225,198
Net Cash Flow		13,223,524	18,071,142	12,872,702	14,887,544	27,512,880
	Internally Generated Funds / PAYGO	2,000,000	1,000,000	-	15,200,000	6,288,985
	Internally Generated Funds / PAYGO (DSIC)	9,634,591	9,599,856	8,725,089	-	-
	Other Transfers to Reserves	1,000,000	1,000,000	-	-	2,510,983
	Bad Debt Expense	6,377,800	5,718,077	4,131,010	3,470,964	2,639,886
	Stormwater Credit Program Cost	696,685	696,685	-	-	-
Revenue Surplus / (Deficit)		(6,485,552)	56,523	16,603	(3,783,420)	16,073,027

Exhibit EB-5



The Pittsburgh Water and Sewer Authority

2021 – 2025 Capital Improvement Plan

Approved on September 25, 2020



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Edward Barca, Director of Finance
John Potanko, Program Manager – Capital Projects

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Introduction

The Pittsburgh Water and Sewer Authority (“**the Authority**” or “**the PWSA**”) is a body corporate and politic organized and existing under the Act pursuant to Resolution No. 36 of the Council of the City of Pittsburgh (the “**City**”), duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 16, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority’s Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on December 11, 1989, to include, among authorized projects, low head dams and facilities for generating surplus electric power. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on May 9, 2008, to extend the term of existence of the Authority to May 21, 2045. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on March 19, 2020, to extend the term of existence of the Authority to March 13, 2070 and to include stormwater systems.

Under its Articles of Incorporation, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, low head dams, facilities for generating surplus power, and stormwater systems.

The System provides water to approximately 81,000 customers or 84% of the total population in the geographic boundaries of the City. The Authority provides wastewater collection and transmission service to almost the entire City, estimated at 306,000 residents. The System does not include wastewater treatment facilities; such facilities are the responsibility of Allegheny County Sanitary Authority (“**ALCOSAN**”), a separate and distinct legal entity.

The Authority operates and maintains a 117 million gallon per day (MGD) rapid sand type water treatment plant, a 26 MGD microfiltration plant, approximately 964 miles of water mains, over 32,000 valves and fire hydrants, 1 raw water pump station, 10 finished water pump stations, 4 in-ground reservoirs, 10 storage tanks, approximately 1,220 miles of sanitary, storm and combined sewers, 29,000 manholes, 30,000 catch basins and inlets, 38 combined sewer overflow outfalls, 185 storm outfalls, and four wastewater pump stations.

Pennsylvania Public Utility Commission Oversight of the Authority

On December 21, 2017, the Pennsylvania legislature enacted Act 65 of 2017 (“**Act 65**”), placing the Authority under the jurisdiction of the Pennsylvania Public Utility Commission (“**PUC**”) pursuant to the Pennsylvania Public Utility Code (the “**Public Utility Code**”). Act 65 applies most of the provisions of the Public Utility Code to the Authority in the same manner as a “public utility,” resulting in regulation of the Authority’s rate making, its operating effectiveness, debt issuances and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Act 65 includes provisions that allow the Authority to impose, charge or collect rates or charges as necessary to permit the Authority to comply with its covenants with the holders of any bonds or other financial obligations of the Authority, and prohibits the PUC from requiring the Authority to take any action that would cause the interest on the Authority’s financial obligations to be includible in gross income of the holders of such obligations for federal income tax purposes.

Capital Improvement Program

Overview

The PWSA’s Capital Improvement Program focuses on sustaining cost-effective operations, while optimizing the system’s asset performance and life expectancy. The 2021-2025 Capital Improvement Program invests in programs which consider risk and consequence of asset failure and levels of service benefits.

Development and Approval Process

The PWSA’s CIP process begins each year in May when project nominations are solicited from the entire organization. At the completion of the nomination period, the Finance Department screens and evaluates the nominated projects to determine the projects that should be included in the CIP. Further planning efforts consist of the preparation of a Project Sheet, which provides more detailed information on a project’s potential scope options, risks, schedule, and the cost

estimate. This process lasts several months and culminates with the presentation of the updated CIP to PWSA's Board of Directors. Projects that are not selected for execution at any stage will be re-assessed during the next year's CIP development process.

Capital Project Prioritization

Due to funding limitations and the need to renew/replacing a significant amount of aging infrastructure, the following criteria are used to evaluate and prioritize capital projects:

- Capacity – Meets community health needs and growth, as needed
- Level of Service – Improvement to customer service
- Operations and Maintenance Efficiency – Potential for operating cost savings
- Regulatory Compliance – Regulatory compliance schedule and potential fines for non-compliance
- Regional Cooperation/Stewardship – Coordination with external stakeholders and local communities
- Reliability/Operational Flexibility – Location, age, and condition of infrastructure and risk if action is not taken
- Safety - Potential health and safety risks to personnel and the public if action is not taken
- Sustainability – Energy efficiency and “green” approach to improving water quality

Funding Sources

The PWSA Capital Improvement Program is funded through several primary sources to which specific programs and projects are allocated. These funding sources include, but are not limited to, Debt, Distribution System Improvement Charge (“**DSIC**”), cost shares with other utilities, and federal and state funding programs.

Capital Improvement Plan Organization

The CIP is organized into six project classes (types):

- Water Treatment Plant
- Water Pumping and Storage
- Water Distribution
- Wastewater System
- Stormwater
- Other

Each project class is then made up of individual projects. Projects are defined based upon current information, which range from annual allowances for asset renewal and/or replacement activities, to major, multiple phase facility renewal projects.

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Project Information

The following information is provided for each project:

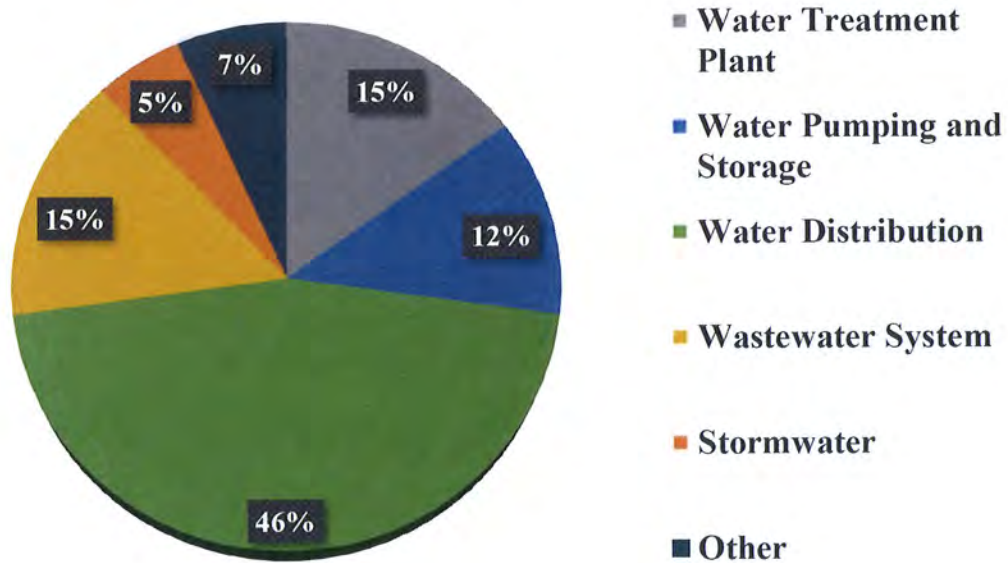
- **Alternatives to the Recommended Action** – Lists the alternatives that were considered or evaluated.
- **Cash Flow Summary** – Estimated five-year cash flow for the project.
- **Funding Source(s)** – Proposed funding source(s) for the project.
- **Impact on Operations** – Describes the anticipated impact to the PWSA’s operations when the project is completed.
- **Phase** – Phase in the project life-cycle (i.e. assessment/design/construction).
- **Priority** – Criteria utilized to prioritize the project.
- **Project Class** – Type of project.
- **Project Description** - A basic understanding of the project’s intent and scope of work.
- **Project Justification** - A detailed explanation to why the project is needed.
- **Project Name** – Descriptive name assigned to the project.
- **Project Number** – Unique number(s) assigned to track the project from inception to completion. This number is established once a project is approved.
- **Risk(s)** - Outlines the risk(s) to the PWSA if the project is delayed or is not selected.
- **Ward** – Project location(s) based within the City of Pittsburgh.

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Historical and Forecasted Capital Expenditures

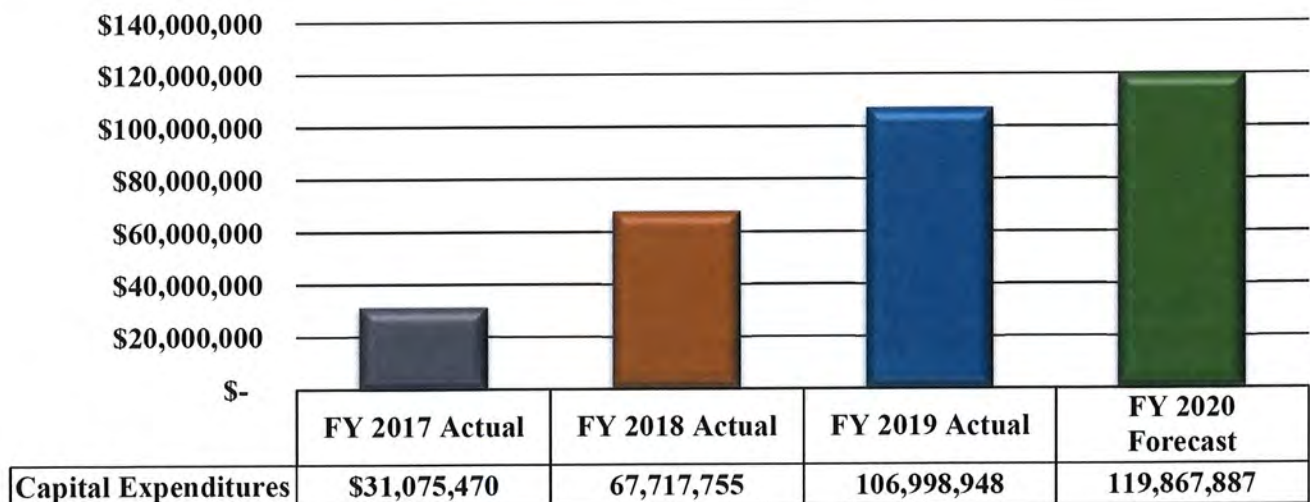
The figures below illustrate the historical capital expenditures by project class for FY 2017 – FY 2019 as well as the historical and forecasted capital expenditures for FY 2017 – FY 2020.

Figure 1. Historical Capital Expenditures by Project Class: FY 2017 – FY 2019



	FY 2017 - Actual	FY 2018 - Actual	FY 2019 - Actual	Total
Water Treatment Plant	\$ 8,156,719	7,275,878	15,665,185	\$ 31,097,782
Water Pumping and Storage	3,562,479	11,732,850	9,667,165	24,962,494
Water Distribution	11,113,101	27,185,518	55,588,889	93,887,508
Wastewater System	6,768,668	9,225,987	15,152,656	31,147,310
Stormwater	953,003	3,156,175	6,901,255	11,010,434
Other	521,500	9,141,347	4,023,798	13,686,645
Total	\$ 31,075,471	\$ 67,717,755	106,998,948	\$ 205,792,173

Figure 2. Historical and Forecasted Capital Expenditures: FY 2017 – FY 2020



2021-2025 Capital Improvement Program

The figures below illustrate the proposed breakdown of the project classes, funding sources, and yearly cash flows for the 2021 to 2025 CIP.

Figure 3. Proposed Yearly Capital Cash Flow by Project Class

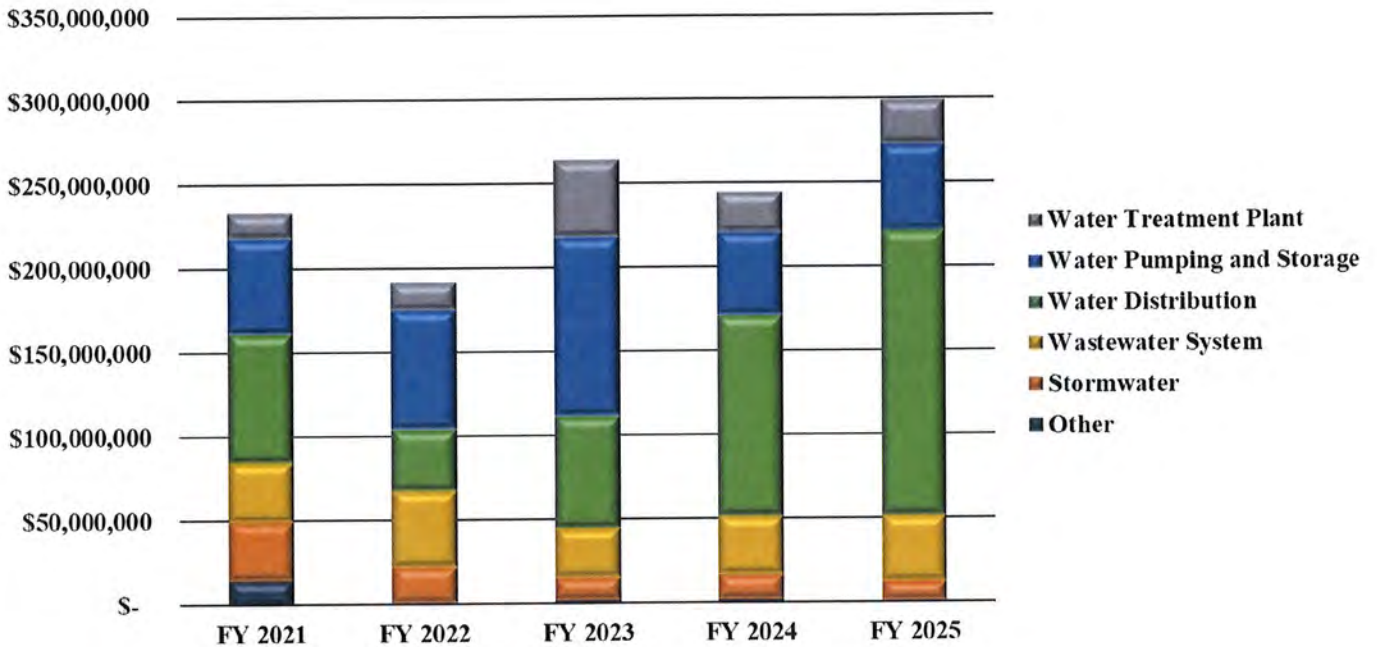


Figure 4. Capital Requirements

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Water Treatment Plant	\$ 15,112,066	16,422,149	45,559,717	23,358,443	26,105,966	\$ 126,558,340
Water Pumping and Storage	56,863,770	70,939,529	106,366,346	49,645,737	51,176,787	334,992,169
Water Distribution	76,245,552	36,345,826	66,150,837	119,049,668	169,246,024	467,037,906
Wastewater System	35,741,675	45,109,155	29,580,401	34,664,259	38,980,692	184,076,182
Stormwater	34,696,272	21,721,607	13,237,377	14,764,949	11,479,750	95,899,955
Other	14,670,000	1,100,000	2,500,000	2,500,000	1,500,000	22,270,000
Total Capital Requirements	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553

Figure 5. Funding Sources

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Debt (Revenue Bonds)	\$ 169,262,753	173,670,904	249,823,825	233,482,080	287,988,242	\$ 1,114,227,804
Debt (Project Fund)	17,219,270	7,466,387	3,069,877	-	-	27,755,534
DSIC - Water	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,253
DSIC - Sewer	4,904,302	5,250,488	5,250,488	5,250,488	5,250,488	25,906,254
PENNVEST	37,038,708	-	-	-	-	37,038,708
Total Funding Sources	\$ 233,329,335	191,638,266	263,394,678	243,983,056	298,489,218	\$ 1,230,834,553



2021-2025 Project Summary



Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Water Treatment Plant							
11	Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements	\$ 3,343,250	1,655,000	3,853,059	3,853,059	3,353,059	\$ 16,057,427
12	Aspinwall Utility Water Improvements - Electrical	210,000	-	-	-	-	210,000
13	Aspinwall Utility Water Improvements - General/Mechanical	1,068,750	-	-	-	-	1,068,750
14	Aspinwall Water Treatment Plant Electrical and Backup Power Improvements	2,337,500	4,250,000	13,732,500	5,482,500	-	25,802,500
15	Aspinwall Water Treatment Plant Raw Water Intakes	1,228,500	1,228,500	9,850,500	9,850,500	2,457,000	24,615,000
16	Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance	308,659	-	-	-	-	308,659
17	Clearwell Emergency Response Project	1,986,316	8,406,316	16,606,316	-	-	26,998,948
18	Corrosion Control Chemical Storage & Feed Systems	600,404	-	-	-	-	600,404
19	Emergency Clarifier Repairs - Clarifiers No. 1, 2 & 4	258,662	-	-	-	-	258,662
20	Hydraulic Valve Replacement Program	-	-	199,334	1,618,744	1,431,922	3,250,000
21	Instrumentation Upgrade	1,040,000	-	-	-	-	1,040,000
22	Lime Slurry System Improvements	1,412,017	882,333	-	-	-	2,294,350
23	Ross Pump Station	1,318,008	-	1,318,008	2,553,640	18,863,985	24,053,641
Total: Water Treatment Plant		\$ 15,112,066	\$ 16,422,149	\$ 45,559,717	\$ 23,358,443	\$ 26,105,966	\$ 126,558,340
Project Class: Water Pumping and Storage							
25	2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4	\$ 11,000,000	11,552,785	6,025,215	-	-	\$ 28,578,000
26	Aspinwall Pump Station Improvements	2,135,526	8,490,526	18,090,526	-	-	28,716,578
27	Aspinwall Pump Station to Lanpher Reservoir Rising Main	5,000,000	16,661,613	34,338,387	-	-	56,000,000
28	Bruecken Pump Station Improvements	1,668,553	6,182,033	16,600,073	-	-	24,450,659
29	Chlorine Booster Station Improvements	2,698,491	3,523,793	3,261,896	-	-	9,484,180
30	Clearwell Improvements	200,000	200,000	1,502,024	29,842,950	25,264,517	57,009,491
31	Disinfection By-Products Mitigation	1,455,000	-	1,155,000	-	-	2,610,000
32	Garfield Tank Improvements	-	-	465,517	1,792,241	1,792,241	4,049,999
33	Herron Hill Pump Station Improvements	-	-	1,259,770	4,850,115	4,850,115	10,960,000
34	Herron Hill Reservoir Improvements	2,751,211	-	-	-	-	2,751,211
35	Herron Hill Tank Pump Station Improvements	-	-	127,586	491,207	491,207	1,110,000
36	Highland No. 2 Reservoir Improvements	17,893,400	8,946,700	-	-	-	26,840,100
37	Highland Reservoir Pump Station and Rising Main	10,000,000	10,670,664	12,926,750	-	-	33,597,414
38	Howard Pump Station Improvements	-	-	-	2,143,678	8,253,161	10,396,839
39	Inline Pump Station (Coral and Pacific) Improvements	-	-	68,966	265,517	265,517	600,000
40	Lanpher Reservoir Improvements	1,000,000	3,879,693	7,879,693	-	-	12,759,386
41	Lincoln Pump Station Improvements	171,489	660,233	-	-	-	831,722
42	Lincoln Pump Station: Bypass Pump Station Project	890,100	-	-	-	-	890,100
43	Lincoln Tank Improvements	-	-	482,184	1,856,408	1,856,408	4,195,000
44	Mission Pump Station Improvements	-	-	1,938,506	7,463,247	7,463,247	16,865,000
45	Saline Pump Station Improvements	-	171,489	-	-	-	171,489
46	Spring Hill Tank Improvements	-	-	244,253	940,374	940,374	2,125,001
Total: Water Pumping and Storage		\$ 56,863,770	70,939,529	106,366,346	49,645,737	51,176,787	\$ 334,992,169

Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Water Distribution							
48	Bus Rapid Transit (BRT) Water Distribution	\$ 9,200,000	2,300,000	-	-	-	\$ 11,500,000
49	District Metering	-	-	3,190,000	3,280,000	3,380,000	9,850,000
50	District Water and Pressure Meters	485,135	-	1,455,404	-	-	1,940,539
51	Duck Hollow	-	-	3,000,270	-	-	3,000,270
52	Herron Hill - Squirrel Hill Boundary Adjustments	-	-	-	-	830,000	830,000
53	Highland Park MFP Improvements Project	225,000	1,732,500	-	-	-	1,957,500
54	Intermediate Main Replacement Program	-	-	2,847,356	12,768,391	22,965,287	38,581,035
55	Intermediate Meters	75,000	80,000	82,000	85,000	87,000	409,000
56	Large Diameter Water Main Replacement	5,500,000	-	2,248,276	11,366,207	21,966,552	41,081,035
57	Large Meter Replacement	1,512,919	1,709,414	1,546,031	1,585,000	587,000	6,940,364
58	Lead Service Identification Program	1,500,000	1,500,000	2,558,667	-	-	5,558,667
59	Lead Service Line Replacement	3,111,200	-	-	-	-	3,111,200
60	Low Pressure Area Remediation	1,029,259	1,093,445	170,654	-	-	2,293,358
61	North Side Boundary Adjustments	-	-	-	-	1,200,000	1,200,000
62	Private Lead Service Line Reimbursement Program	500,000	375,000	375,000	375,000	135,287	1,760,287
63	Regulator Valve and Vault Replacement	2,000,000	1,000,000	3,000,000	4,500,000	3,000,000	13,500,000
64	Small Diameter Water Main Replacement	45,838,708	19,950,643	38,645,977	75,436,736	103,691,564	283,563,628
65	Small Meter Replacement	1,357,684	1,796,385	1,721,106	1,650,000	500,000	7,025,175
66	South Side Slopes Boundary Adjustments	-	-	-	-	1,200,000	1,200,000
67	Unmetered and Flat Rate Properties	1,548,564	1,744,689	527,947	-	-	3,821,199
68	Valve Replacement	1,498,333	1,300,000	2,942,149	6,123,334	7,823,333	19,687,149
69	Water Relay	863,750	1,763,750	1,840,000	1,880,000	1,880,000	8,227,500
Total: Water Distribution		\$ 76,245,552	36,345,826	66,150,837	119,049,668	169,246,024	\$ 467,037,906
Project Class: Wastewater System							
71	31st Ward Sewer System	\$ 2,904,302	348,961	450,000	150,000	2,360,776	\$ 6,214,039
72	Browns Hill Road Sewer Pump Station Replacement	-	-	187,700	1,030,967	281,333	1,500,000
73	Large Diameter Sewer Rehabilitation	2,211,492	6,391,140	3,517,000	4,437,190	4,692,667	21,249,489
74	M-29 Outfall Improvements	3,473,539	-	-	-	-	3,473,539
75	Maytide Storm and Sanitary Sewer System Improvements	2,000,000	1,500,000	1,096,798	-	-	4,596,798
76	Queenston Sewer Improvements	1,601,450	185,600	-	-	-	1,787,050
77	Sewer Reconstruction	970,175	999,979	1,841,144	1,880,000	1,880,000	7,571,297
78	Sewers Under Structures	3,081,151	11,080,611	5,642,667	5,440,122	8,713,821	33,958,372
79	Small Diameter Sewer Rehabilitation	19,499,567	24,602,865	16,845,092	21,725,979	21,052,095	103,725,599
Total: Wastewater System		\$ 35,741,675	45,109,155	29,580,401	34,664,259	38,980,692	\$ 184,076,182

Page	Project Name	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget	Total
Project Class: Stormwater							
81	Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements	\$ 685,000	1,000,000	350,000	-	-	\$ 2,035,000
82	Catch Basin and Inlet Replacement	8,137,621	1,987,720	8,317,500	9,964,949	10,479,750	38,887,540
83	Fleury Way Stormwater Infrastructure Improvements	730,141	-	-	-	-	730,141
84	Four Mile Run Stormwater Infrastructure Improvements	7,000,000	12,800,000	-	-	-	19,800,000
85	Lawn and Ophelia	600,000	-	-	-	-	600,000
86	Martin Luther King Field Stormwater Infrastructure Improvements	2,008,966	1,339,310	-	-	-	3,348,276
87	Maryland Avenue Stormwater Infrastructure Improvements	2,610,000	330,000	-	-	-	2,940,000
88	Nobles Lane Stormsystems Improvements	343,322	-	-	-	-	343,322
89	Saw Mill Run MS4 Compliance Projects	-	-	1,000,000	2,500,000	-	3,500,000
90	Saw Mill Run PWSA & PennDOT Watershed Improvements	-	200,000	500,000	300,000	-	1,000,000
91	Southside Flats Sewer Separation	-	335,365	3,069,877	-	-	3,405,242
92	Southside Stormwater Infrastructure Improvements	2,156,746	2,156,746	-	-	-	4,313,492
93	Thomas and McPherson Stormwater Infrastructure Improvements	4,319,899	1,387,466	-	-	-	5,707,365
94	Tide Gate Installations	-	-	-	2,000,000	1,000,000	3,000,000
95	Volunteer's Field Stormwater Infrastructure Improvements	1,000,000	-	-	-	-	1,000,000
96	Wightman Park Stormwater Infrastructure Improvements	1,750,000	-	-	-	-	1,750,000
97	Winchester Drive at Grovemount Stormsystem Improvements	554,577	-	-	-	-	554,577
98	Woodland Road Stormwater Infrastructure Improvements	1,550,000	185,000	-	-	-	1,735,000
99	Woods Run Stream Removal Stormwater Infrastructure Improvements	1,250,000	-	-	-	-	1,250,000
Total: Stormwater		\$ 34,696,272	21,721,607	13,237,377	14,764,949	11,479,750	\$ 95,899,955
Project Class: Other							
101	Park Maintenance / Upgrades	\$ 700,000	1,000,000	1,000,000	1,000,000	1,000,000	\$ 4,700,000
102	Property Acquisition / Facility Upgrades	700,000	-	1,000,000	1,000,000	-	2,700,000
103	Reconstruction of the Facade at the Central Warehouse	70,000	-	-	-	-	70,000
104	Roof Replacment Brilliant Yard Warehouse	160,000	-	-	-	-	160,000
105	Roof Replacement Herron Hill Pump Station	90,000	-	-	-	-	90,000
106	Surface Restoration (Capital Only)	12,500,000	-	-	-	-	12,500,000
107	Utility Cost Shares	450,000	100,000	500,000	500,000	500,000	2,050,000
Total: Other		\$ 14,670,000	1,100,000	2,500,000	2,500,000	1,500,000	\$ 22,270,000



Water Treatment Plant

PGH₂O

Water Treatment Plant

Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements

PROJECT NUMBER: 2017-322-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Improvements to pretreatment chemical and clarification systems to provide improved water treatment capabilities. This project is the parent project for all of the clarification and pre-treatment related projects.
PROJECT JUSTIFICATION: Chemical treatment systems are critical to producing safe drinking water. The storage and pumping component of the systems have reached the end of their useful life and need to be replaced.
RISK(S): Inefficient operation of chemical systems results in increased operating costs, including chemical consumption, labor, solids generation and disposal, and wear on equipment.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$19,333,383	3,343,250	1,655,000	3,853,059	3,853,059	3,353,059	\$16,057,427	

Water Treatment Plant

Aspinwall Utility Water Improvements - Electrical

PROJECT NUMBER: 2017-322-101-5
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Electrical work related to installation of heaters and SCADA.
PROJECT JUSTIFICATION: Electrical systems at the Water Treatment Plant have reached the end of their useful life and need to be replaced.
RISK(S): Failure of critical electrical systems at the Water Treatment Plant.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$210,000	210,000	0	0	0	0	\$210,000	

Water Treatment Plant

Aspinwall Utility Water Improvements - General/Mechanical

PROJECT NUMBER: 2017-322-101-4

WARD: Systemwide

PHASE:

Construction

PRIORITY:

Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency

PROJECT DESCRIPTION:

Pipe demolition, pipe and appurtenance installation for the Water Treatment Plant's potable and non-potable water line system.

PROJECT JUSTIFICATION:

Water piping throughout the Water Treatment Plant has come to the end of it's service life. Failure of this piping would result in interruptions in the ability to feed treatment chemicals.

RISK(S):

Potable and non-potable water piping throughout the plant has come to the end of it's service life. This piping system is critical to the operations at the Water Treatment Plant.

IMPACT ON OPERATIONS:

Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.

ALTERNATIVES TO THE RECOMMENDED ACTION:

There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,068,750	1,068,750	0	0	0	0	\$1,068,750	

Water Treatment Plant

Aspinwall Water Treatment Plant Electrical and Backup Power Improvements

PROJECT NUMBER: 2017-322-100-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Improvements to electrical systems at the Water Treatment Plant, including provisions for stand-by or backup power systems, upgrades to existing electrical distribution system, replacement of motor control centers, and associated panels, conduit, wiring, and systems.
PROJECT JUSTIFICATION: Electrical systems at the Water Treatment Plant have generally met the end of their useful lives and spare/replacement parts are unavailable.
RISK(S): Electrical power is critical to maintain pumping and treatment of water. Failure of these systems will result in the inability to produce water to meet demand and/or quality requirements.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$26,561,635	2,337,500	4,250,000	13,732,500	5,482,500	0	\$25,802,500	

Water Treatment Plant

Aspinwall Water Treatment Plant Raw Water Intakes

PROJECT NUMBER: 2018-322-100-0
WARD: Systemwide

PHASE: Design
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Project will include condition assessment, renewing or replacing the existing West and East Raw Water Intake Gate House buildings and associated systems, including gates, screens, and associated mechanical equipment as well as the addition of SCADA. Influent piping through the Ross Pump Station will also be addressed.
PROJECT JUSTIFICATION: The West Gate is 90% closed and inoperable. Both gate houses are in need of rehabilitation or replacement. The West Gatehouse is 100 years old, and the East Gate is almost 90 years old.
RISK(S): Both gates have reach the end of their useful life and need replaced. Failure of the East Gate would cause a disruption to the supply of water.
IMPACT ON OPERATIONS: Modernization of systems will require less time spent in operations and maintenance of these facilities.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$24,847,854	1,228,500	1,228,500	9,850,500	9,850,500	2,457,000	\$24,615,000	

Water Treatment Plant

Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety
PROJECT DESCRIPTION: Install new fencing, lighting, and surveillance around the Water Treatment Plant.
PROJECT JUSTIFICATION: The fencing and security infrastructure around the Water Treatment Plant is in need of upgrades.
RISK(S): Increases the likelihood of security issues.
IMPACT ON OPERATIONS: Increased security around the Water Treatment Plant.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay the implementation of the security upgrades.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$308,659	308,659	0	0	0	0	\$308,659	

Water Treatment Plant

Clearwell Emergency Response Project

PROJECT NUMBER: 2017-323-100-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Long-term bypass of the existing 108 year old clearwell (finished water structure) including the construction of pump wetwells at the Aspinwall and Bruecken Pump Stations, modifications to the clearwell inlet and outlet gate house, and the construction of a bypass line around the clearwell to the outlet gate house.
PROJECT JUSTIFICATION: The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. The clearwell has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands and providing sufficient contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. In order to replace the clearwell, a long-term bypass is required in order to provide adequate suction pressure for the pump stations.
RISK(S): Failure of the Clearwell would cause a disruption to the supply of water.
IMPACT ON OPERATIONS: Ability to meet system reliability and water quality regulations.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$28,132,103	1,986,316	8,406,316	16,606,316	0	0	\$26,998,948	

Water Treatment Plant

Corrosion Control Chemical Storage & Feed Systems

PROJECT NUMBER: 2017-322-107-0
WARD: Systemwide

PHASE: Construction
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Installation of three phosphoric acid storage and feed systems located at Aspinwall Pump Station, Bruecken Pump Station, and the Membrane Filtration Plant to provide corrosion control in the distribution system.
PROJECT JUSTIFICATION: Required in order to lower lead levels in water.
RISK(S): The existing corrosion control system was not adequate to maintain lead levels below the PA DEP action limit.
IMPACT ON OPERATIONS: In order to prevent algae growth in the open Highland No. 1 Reservoir, treatment must occur at three major locations with 6 injection points. This requires additional maintenance of treatment facilities at satellite locations.
ALTERNATIVES TO THE RECOMMENDED ACTION: Abandon Membrane Filtration Plant and the Highland No. 1 Reservoir and add orthophosphate at the Water Treatment Plant or use another less effective corrosion control method.

	<u>CASH FLOW SUMMARY</u>							<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$9,346,377	600,404	0	0	0	0	\$600,404	

Water Treatment Plant

Emergency Clarifier Repairs - Clarifiers No. 1, 2 & 4

PROJECT NUMBER: 2017-322-101-6

WARD: Systemwide

PHASE: Construction
PRIORITY: Water Quality, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Replacement of mechanical equipment in Clarifier basin #2, concrete repairs in basins #2 and #4, replacement of sluice gate stem and actuator in basin #1.
PROJECT JUSTIFICATION: Having two clarifier basins inoperable at the same time would likely result in inadequate turbidity removal which is a critical treatment process.
RISK(S): The clarifier basins have come to the end of their useful life and are nearly inoperable. Failure of these basins would negatively impact the treatment of water.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and life expectancy of equipment.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$778,082	258,662	0	0	0	0	\$258,662	

Water Treatment Plant

Hydraulic Valve Replacement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project is retrofitting the various hydraulic valve actuators primarily in the filters to electric valve actuators.
PROJECT JUSTIFICATION: The intent is to improve operational control while modernizing the facility to better align with industry standard practices.
RISK(S): None.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,250,000	0	0	199,334	1,618,744	1,431,922	\$3,250,000	

Water Treatment Plant

Instrumentation Upgrade

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project standardizes the key instrumentation at the remote sites. This project provides a methodical approach to replacement. It includes a study to document all equipment by tag number, location, condition, make and model number. The study would include recommendations for standardization by device type (pressure sensor, flowmeter, etc.) along with replacement costs for work done by a contractor. This project does not include any upgrades to water quality analyzers (turbidimeters, DO, Conductivity, or the like).
PROJECT JUSTIFICATION: At present, devices were added under various projects with no standardization. This has resulted in increased maintenance cost as each brand requires different spare parts, different training, and in most cases different tools for maintenance purposes. Most of the equipment is beyond useful life and due for replacement.
RISK(S): Failure to upgrade systems will cause loss of signal and possible loss of control of systems.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$1,040,000	1,040,000	0	0	0	0	\$1,040,000	

Water Treatment Plant

Lime Slurry System Improvements

PROJECT NUMBER: 2017-322-101-7
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Lime slurry system capacity expansion improvements to include demolition, installation of additional tanks, chemical feed equipment, minor revisions to the existing lime slurry system, and SCADA communications equipment and SCADA interface.
PROJECT JUSTIFICATION: Adequate lime storage is mandated by PADEP. New system will be more efficient/require less labor to operate and maintain.
RISK(S): The extra storage for liquid lime is critical to the reliable operation of the Water Treatment Plant.
IMPACT ON OPERATIONS: Adequate storage, increased reliability and efficiency, less housekeeping labor (for spillage).
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,294,350	1,412,017	882,333	0	0	0	\$2,294,350	

Water Treatment Plant

Ross Pump Station

PROJECT NUMBER: 2018-323-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Water Quality/Regulatory
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, meters, SCADA, electrical equipment, HVAC, auxiliary systems, as well as the rehabilitation of the building architectural and energy management systems.
PROJECT JUSTIFICATION: Pump station is in need of rehabilitation. Pumps and ancillary systems are beyond their design life.
RISK(S): Exposes the Authority to higher capital costs to address emergency failures.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, life expectancy, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$24,266,869	1,318,008	0	1,318,008	2,553,640	18,863,985	\$24,053,641	



Water Pumping and Storage



Water Pumping and Storage

2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4

PROJECT NUMBER: 2019-325-103-0

WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Condition assessment and rehabilitation or replacement of Rising Mains 3 and 4. Replacement or rehabilitation depending upon existing condition of rising mains.
PROJECT JUSTIFICATION: Rising Mains 3 and 4 feed the Highland 2 Pump Station. The capacity of these rising mains may need to be increased to accommodate additional flow during the bypass of the clearwell. These mains will need to accommodate demand from both Highland No. 1 and Highland No. 2 reservoirs during the bypass of the clearwell as well as to supply a redundant feed to the Highland No. 1 reservoir.
RISK(S): The consequences of failure for larger mains are much greater than for smaller distribution mains. Consequences typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Debt (Revenue Bonds)
Total	\$28,929,495	11,000,000	11,552,785	6,025,215	0	0	\$28,578,000	

Water Pumping and Storage

Aspinwall Pump Station Improvements

PROJECT NUMBER: 2017-323-104-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems at the Bruecken and Aspinwall Pump Stations or replacement with a single high service pump station at the Water Treatment Plant.
PROJECT JUSTIFICATION: The pump Station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, and allow the pumps to operate over a wide range of flow, allow the pumps to operate while the clearwell is being replaced. Alternately, a new high service pump station to replace the existing pump stations is also being investigated.
RISK(S): Exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$28,720,269	2,135,526	8,490,526	18,090,526	0	0	\$28,716,578	

Water Pumping and Storage

Aspinwall Pump Station to Lanpher Reservoir Rising Main

PROJECT NUMBER: 2018-323-100-0
WARD: Systemwide

PHASE: Design
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Construction of a new, redundant rising main from Aspinwall Pump Station to Lanpher Reservoir.
PROJECT JUSTIFICATION: The existing 60" rising main that supplies the Lanpher Reservoir is a 150 year old riveted steel pipe, has several tap connections to critical and bulk customers, and has experienced recent pipe failures. The new proposed rising main would serve as a primary supply source for the Lanpher Reservoir during the Clearwell Replacement Project and a redundant supply line in case of a failure or planned cleaning and rehabilitation of the existing 60" supply main.
RISK(S): Failure of the rising main could impact up to half of the Authority's customers.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing 60-inch supply main and construction of a parallel main in sections that cannot currently be isolated to clean, inspect, or rehabilitate.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$58,107,771	5,000,000	16,661,613	34,338,387	0	0	\$56,000,000	

Water Pumping and Storage

Bruecken Pump Station Improvements

PROJECT NUMBER: 2017-323-106-0
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems.
PROJECT JUSTIFICATION: The pump station was constructed in 1931. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, allow the pumps to operate more efficiently over a wide range of flow demands, and will reduce the required size of the new clearwell.
RISK(S): Exposes the Authority to higher capital costs to address emergency facility failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$24,456,425	1,668,553	6,182,033	16,600,073	0	0	\$24,450,659	

Water Pumping and Storage

Chlorine Booster Station Improvements

PROJECT NUMBER: 2019-323-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability
PROJECT DESCRIPTION: Replacement of existing chlorine injection facilities at reservoirs and tanks for chlorine residual.
PROJECT JUSTIFICATION: The Authority boosts chlorine residual at a majority of its storage facilities. Recent changes to PA DEP regulations require an increase in minimum chlorine residual levels in the distribution system. All chlorine booster facilities need to be upgraded in order to meet these requirements.
RISK(S): Exposes the Authority's customers to poor water quality.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$9,732,913	2,698,491	3,523,793	3,261,896	0	0	\$9,484,180	

Water Pumping and Storage

Clearwell Improvements

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of the existing 108 year old clearwell (finished water structure) with multi-celled clearwell to allow for maintenance.
PROJECT JUSTIFICATION: The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. It has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands, and providing sufficient retention contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. Considering the age and condition of the clearwell, it is the water system’s weakest link as there are no practical means to deliver water by bypassing the clearwell, while maintaining the required volume, quality, and contact time.
RISK(S): Failure of the Clearwell would cause a disruption to the supply of water.
IMPACT ON OPERATIONS: Ability to meet system reliability and water quality regulations.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$57,009,491	200,000	200,000	1,502,024	29,842,950	25,264,517	\$57,009,491	

Water Pumping and Storage

Disinfection By-Products Mitigation

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of existing trihalomethane (THM) removal systems at Allentown tanks, Squirrel Hill Tank, and Brashears Tanks.
PROJECT JUSTIFICATION: Repair of the existing system is exceeding the value of the system. When the system fails, water is sprayed outside the tank facility leading to customer complaints.
RISK(S): Delaying the replacement of the existing systems will result in increased downtime of the existing systems for repairs. This will lead to possible regulatory violations for exceeding THM levels.
IMPACT ON OPERATIONS: Decrease in yearly maintenance for the existing system.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to make costly repairs to existing DBP mitigation equipment. Failure of existing equipment has resulted in loss of water and numerous customer complaints as well as possible failure to meet DEP regulations.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,610,000	1,455,000	0	1,155,000	0	0	\$2,610,000	

Water Pumping and Storage

Garfield Tank Improvements

PROJECT NUMBER: Unidentified
WARD: 9

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Rehabilitation or replacement of the existing tank. Increase of tank capacity may be necessary.
PROJECT JUSTIFICATION: The Garfield Elevated Storage Tank was constructed in 1959 and last rehabilitated in 1992. The existing tank does not have sufficient capacity to meet PA DEP's requirements for sizing, which states that a tank must have sufficient capacity to meet average day demand plus fire flow demand. This project will provide adequate storage through system redundancy to meet the pressure district's demand and fire flow conditions.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Do nothing and risk a failure of the tank. Postpone replacement or full rehabilitation until a later date through short-term rehabilitation.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,049,999	0	0	465,517	1,792,241	1,792,241	\$4,049,999	

Water Pumping and Storage

Herron Hill Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 14

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in the late 1890's. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$10,960,000	0	0	1,259,770	4,850,115	4,850,115	\$10,960,000	

Water Pumping and Storage

Herron Hill Reservoir Improvements

PROJECT NUMBER: 2019-323-100-0

WARD: 5

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
PROJECT JUSTIFICATION: The existing cover has reached the end of its useful life and must be replaced. Existing chlorine feed systems are beyond their useful life and must be replaced.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,739,281	2,751,211	0	0	0	0	\$2,751,211	

Water Pumping and Storage

Herron Hill Tank Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,110,000	0	0	127,586	491,207	491,207	\$1,110,000	

Water Pumping and Storage

Highland No. 2 Reservoir Improvements

PROJECT NUMBER: 2019-323-102-0
WARD: Systemwide

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system and an upgrade of the reservoir outlet structure.
PROJECT JUSTIFICATION: The Highland No. 2 Reservoir will be used as a temporary clearwell while the new clearwell is being constructed. Existing chlorine feed facilities must be upgraded to meet PA DEP regulatory requirements for distribution chlorine residual. Existing reservoir outlet structure must be upgraded to accommodate new Highland Reservoir Pump Station.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$27,252,938	17,893,400	8,946,700	0	0	0	\$26,840,100	

Water Pumping and Storage

Highland Reservoir Pump Station and Rising Main

PROJECT NUMBER: 2017-323-101-0
WARD: Systemwide

PHASE: Design
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Level of Service
PROJECT DESCRIPTION: Construction of a new finished water pump station and transmission main to supply water to the Highland No. 1 Service Area from Highland No. 2 Reservoir.
PROJECT JUSTIFICATION: All compliant water supply for the Highland No. 1 Service Area currently flows through the Highland No. 1 Reservoir and the Membrane Filtration Plant. There is no other source water supply for the Highland No. 1 Service Area. In addition to providing alternate supply, this project is to temporarily provide finished water that meets the chlorine disinfection rules to the Highland No. 1 Service Area during the Clearwell Replacement Project. Additionally, this new facility could also be designed to service the Garfield pressure district, thus eliminating the rehabilitation of the Highland Pump Station.
RISK(S): Failure of the two rising mains (No. 1 or No. 2), Membrane Filtration Plant, or Bruecken Pump Station would result in the loss of compliant water supply to approximately 40% of the Authority's customer base.
IMPACT ON OPERATIONS: Increased operation and maintenance labor and expenses. Increased operating flexibility in the future.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new clearwell at the site of the existing west sedimentation basin. However, a previous study still recommended the addition of these assets as part of the Clearwell Replacement project.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$36,056,903	10,000,000	10,670,664	12,926,750	0	0	\$33,597,414	

Water Pumping and Storage

Howard Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 21, 24, 25, 26, 27

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed between 1900 and 1904. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for the staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$10,396,839	0	0	0	2,143,678	8,253,161	\$10,396,839	

Water Pumping and Storage

Inline Pump Station (Coral and Pacific) Improvements

PROJECT NUMBER: Unidentified
WARD: 8

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$600,000	0	0	68,966	265,517	265,517	\$600,000	

Water Pumping and Storage

Lanpher Reservoir Improvements

PROJECT NUMBER: 2017-323-105-0

WARD: 25

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
PROJECT JUSTIFICATION: The existing cover failed and had to be replaced on an emergency basis as part of the PA DEP October 2017 Administrative Order. Existing chlorine feed systems are beyond their useful life and must be replaced.
RISK(S): Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
IMPACT ON OPERATIONS: Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$16,859,005	1,000,000	3,879,693	7,879,693	0	0	\$12,759,386	

Water Pumping and Storage

Lincoln Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, and auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in 1952. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$831,772	171,489	660,233	0	0	0	\$831,722	

Water Pumping and Storage

Lincoln Pump Station: Bypass Pump Station Project

PROJECT NUMBER: 2020-323-100-0
WARD: 12

PHASE: Design
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Construction of a temporary bypass pump station that will be used at the Lincoln Pump Station and Saline pump station. This pump station will allow for the existign pump station to be taken off line completely for rehabilitation.
PROJECT JUSTIFICATION: Repair of existing pump station while trying to keep it online increases the cost and construction time. This is a cost effective way to provide temporary pumping.
RISK(S): Delaying the construction of this pump station will delay the renewal of existing pump stations that are in need of upgrades.
IMPACT ON OPERATIONS: Decrease in yearly maintenance for the existing system.
ALTERNATIVES TO THE RECOMMENDED ACTION: Attempt to rehabilitate/repair existing pump stations while they are in service.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$890,100	890,100	0	0	0	0	\$890,100	

Water Pumping and Storage

Lincoln Tank Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Rehabilitation or replacement of the existing tank.
PROJECT JUSTIFICATION: Constructed in 1939, this tank is nearing the end of its useful life. The last inspection, which was performed in 2018, noted deficiencies that need to be addressed to ensure water quality standards are met.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure.
IMPACT ON OPERATIONS: Increased flexibility and reliability and system compliance.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing tank, which may be a larger investment than replacement.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,195,000	0	0	482,184	1,856,408	1,856,408	\$4,195,000	

Water Pumping and Storage

Mission Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 16, 17, 18, 20

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The Mission Pump Station is the only pumping station located south of the Monongahela River and was originally constructed between 1910 and 1912. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$16,865,000	0	0	1,938,506	7,463,247	7,463,247	\$16,865,000	

Water Pumping and Storage

Saline Pump Station Improvements

PROJECT NUMBER: Unidentified
WARD: 14 & 15

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
PROJECT JUSTIFICATION: The pump station was originally constructed in 1935. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
RISK(S): Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply.
IMPACT ON OPERATIONS: Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
ALTERNATIVES TO THE RECOMMENDED ACTION: Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$171,489	0	171,489	0	0	0	\$171,489	

Water Pumping and Storage

Spring Hill Tank Improvements

PROJECT NUMBER: Unidentified
WARD: 24 & 26

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
PROJECT DESCRIPTION: Perform a comprehensive inspection of the existing storage tanks and rehabilitation or replacement of the existing tanks.
PROJECT JUSTIFICATION: Constructed in 1929 of riveted steel, the coatings and structure of these tanks need to be rehabilitated due to corrosion.
RISK(S): Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure. Additionally, it exposes the Authority's staff and contractors to safety issues.
IMPACT ON OPERATIONS: Increased flexibility and reliability and system compliance.
ALTERNATIVES TO THE RECOMMENDED ACTION: Rehabilitation of the existing tank, which may be a larger investment than replacement.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,125,001	0	0	244,253	940,374	940,374	\$2,125,001	



Water Distribution



Water Distribution System

Bus Rapid Transit (BRT) Water Distribution

PROJECT NUMBER: 2020-325-102-0
WARD: 1 & 4

PHASE: Design
PRIORITY: Regional Cooperation/ Stewardship and Level of Service
PROJECT DESCRIPTION: The City of Pittsburgh is making roadway improvements on Fifth Ave and Forbes Ave from downtown through Oakland, with full depth reconstruction planned on Forbes from Crosstown Blvd to Craft Ave and on Fifth between Crosstown Blvd and the Birmingham Bridge. The City's work, in partnership with the Port Authority, will include signal pole upgrades, traffic redesign, sidewalk bumpouts, and new bus shelters. The full depth reconstruction portion of the project has the potential to affect existing 15-inch, 16-inch, 20-inch, and 6-inch mains that are 80-100+ years old. The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains. These mains should be replaced as part of this project. However, first a study should be completed to ensure proper size of these mains as they could be oversized.
PROJECT JUSTIFICATION: The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains.
RISK(S): Replacement of water mains along the Fifth and Forbes corridor reduces the risk of service outages due to breaks, reduces the potential for inadequate capacity for firefighting activities, and improves water quality.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay the replacement of the required watermains and risk damage to the water system resulting from the project.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$11,697,747	9,200,000	2,300,000	0	0	0	\$11,500,000	

Water Distribution System

2023-2025 District Metering

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of system flow meters to track the flow of water and compare to area consumption to determine where leaks are the greatest.
PROJECT JUSTIFICATION: The district metering is intended to gather additional information on areas with suspected leakage and then prioritize areas for rehabilitation and replacement.
RISK(S): Failure to track water loss will result in loss of revenue.
IMPACT ON OPERATIONS: Decreased water loss.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$9,850,000	0	0	3,190,000	3,280,000	3,380,000	\$9,850,000	
2023 District Metering		0	0	3,190,000	0	0	\$3,190,000	Debt (Revenue Bonds)
2024 District Metering		0	0	0	3,280,000	0	\$3,280,000	
2025 District Metering		0	0	0	0	3,380,000	\$3,380,000	

Water Distribution System

District Water and Pressure Meters

PROJECT NUMBER: 2017-325-114-0
WARD: Systemwide

PHASE: Construction
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of water meters and pressure monitors in the distribution system to determine water usage and loss, and pressure loss.
PROJECT JUSTIFICATION: This project will help determine areas of water loss in the water system. This information can then be used to develop an action plan to mitigate water loss.
RISK(S): Customers may experience temporary service outages as a result of the work on this project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>DSIC - Water</u>
Total	\$2,004,204	485,135	0	1,455,404	0	0	\$1,940,539	

Water Distribution System

Duck Hollow

PROJECT NUMBER: Unidentified
WARD: 14

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Either repair the existing failed 16" main or abandon and provide interconnections with the Squirrel Hill system.
PROJECT JUSTIFICATION: The Duck Hollow 16" main failed as a result of a landslide in 2018. The main will need to either be abandoned and replaced with emergency interconnections or replaced. Rehabilitation of the failed slope may be required.
RISK(S): Existing failed 16" main does not provide any backup water supply leading to a loss of resiliency.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,000,270	0	0	3,000,270	0	0	\$3,000,270	

Water Distribution System

Herron Hill - Squirrel Hill Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve adjustments to move the boundary between the Herron Hill Reservoir and Squirrel Hill pressure districts.
PROJECT JUSTIFICATION: Herron Hill and Squirrel Hill operate on similar hydraulic gradients. There are areas where these two systems intertwine, which has lead to long dead end lines as well as frequent opening and altering of dividing pressure valves. Moving the boundary of the two zones to incorporate more of the Herron Hill system into the Squirrel Hill system will alleviate these issues as well as alleviate demand on the Herron Hill Reservoir.
RISK(S): Existing long dead ends can cause water quality issues.
IMPACT ON OPERATIONS: Decreased leakage between pressure districts.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$830,000	0	0	0	0	830,000	\$830,000	

Water Distribution System

Highland Park MFP Improvements Project

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Rehabilitation of the backwash recovery system; repairs to deteriorated areas of the reinforced concrete metal floor deck slab that comprises the second floor of the MFP building; repair of the deteriorated concrete floor and containment wall of the acid room; replacement of the pipe insulation in the pump room; and, repainting walls, ceiling, exposed structural steel framing, ferrous metal and pipe insulation on the first floor of the MFP building.
PROJECT JUSTIFICATION: Repair of the backwash water recovery system will reclaim up to 400,000 GPD of waste discharge to the public sanitary sewer system. Repairs to the composite floor deck and concrete floor in the acid room are required to preclude potential loss of structural integrity if not mitigated. Replacement of damaged or removed pipe insulation is required to mitigate pipe sweating and dripping onto equipment and walkways below.
RISK(S): Delaying the rehab of the backwash recovery system sends unnecessary wastewater flow to the public sewer system, stressing downstream sewer capacity.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Project Fund)
Total	\$1,957,500	225,000	1,732,500	0	0	0	\$1,957,500	

Water Distribution System

2023-2025 Intermediate Main Replacement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Strategic replacement of water mains to improve system reliability as well as improve water pressure, maintain water quality, and minimize disturbance to the community. Program will focus on 16" to 36" diameter mains.
PROJECT JUSTIFICATION: By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving overall replacement cost. Additionally, projects will be coordinated with other utilities to minimize disturbance to the community and street surface restoration costs. Water quality will also improve by removing tuberculated mains.
RISK(S): Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability, decrease in non-revenue water due to leaks.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	
Total	\$38,581,035	0	0	2,847,356	12,768,391	22,965,287	\$38,581,035	
2023 Intermediate Main Replacement		0	0	2,847,356	9,836,322	9,836,322	\$22,520,000	Debt (Revenue Bonds)
2024 Intermediate Main Replacement		0	0	0	2,932,069	10,128,966	\$13,061,035	
2025 Intermediate Main Replacement		0	0	0	0	3,000,000	\$3,000,000	

Water Distribution System

2021-2025 Intermediate Meters

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of customer meters size 1.5" to 2".
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue or violate regulatory requirements.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$409,000	75,000	80,000	82,000	85,000	87,000	\$409,000	
2021 Intermediate Meters		75,000	0	0	0	0	\$75,000	Debt (Revenue Bonds)
2022 Intermediate Meters		0	80,000	0	0	0	\$80,000	
2023 Intermediate Meters		0	0	82,000	0	0	\$82,000	
2024 Intermediate Meters		0	0	0	85,000	0	\$85,000	
2025 Intermediate Meters		0	0	0	0	87,000	\$87,000	

Water Distribution System

2020, 2023-2025 Large Diameter Water Main Replacement

PROJECT NUMBER: 2020-424-103-0 ,Unidentified
WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Strategic replacement or rehabilitation of large diameter water mains (16" and larger) and appurtenances to improve system reliability and hydraulics, including internal and external inspections.
PROJECT JUSTIFICATION: The Authority's water system has approximately 122 miles of large diameter water mains. Maintaining a proactive approach to replacing large mains will ensure that large mains are replaced before the end of their useful life.
RISK(S): The consequences of failure for larger mains are much greater than for smaller distribution mains, which typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	
Total	\$41,082,455	5,500,000	0	2,248,276	11,366,207	21,966,552	\$41,081,035	
2020 Large Diameter Main Replacement – Four Mile Run	5,500,000	0	0	0	0	0	\$5,500,000	Debt (Revenue Bonds)
2023 Large Diameter Main Replacement	0	0	2,248,276	8,655,862	8,655,862	\$19,560,000		
2024 Large Diameter Main Replacement	0	0	0	2,710,345	10,434,828	\$13,145,173		
2025 Large Diameter Main Replacement	0	0	0	0	2,875,862	\$2,875,862		

Water Distribution System

2020-2025 Large Meter Replacement

PROJECT NUMBER: 2020-325-101-0, Unidentified
WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Annual replacement of water meters larger than 1".
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$7,061,587	1,512,919	1,709,414	1,546,031	1,585,000	587,000	\$6,940,364	
2020 Large Meter Replacement		335,235	0	0	0	0	\$335,235	DSIC - Water
2021 Large Meter Replacement		1,177,684	639,207	0	0	0	\$1,816,891	
2022 Large Meter Replacement		0	1,070,207	683,052	0	0	\$1,753,259	
2023 Large Meter Replacement		0	0	862,979	500,000	0	\$1,362,979	
2024 Large Meter Replacement		0	0	0	1,085,000	250,000	\$1,335,000	
2025 Large Meter Replacement		0	0	0	0	337,000	\$337,000	

Water Distribution System

2020-2021 Lead Service Identification Program

PROJECT NUMBER: 2020-325-100-0, Unidentified

WARD: Systemwide

PHASE: Non Construction / Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Locating lead service lines allows the Authority to identify both individual service lines to replace and waterlines that have a particularly high amount of lead service lines that can be replaced to facilitate the lead service line replacements.
PROJECT JUSTIFICATION: Understanding where the lead service lines are within the water system will allow the Authority to more efficiently replace all lead service lines.
RISK(S): Failure to identify all lead service lines could slow the rate in which they are replaced.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$5,858,328	1,500,000	1,500,000	2,558,667	0	0	\$5,558,667	
2020 Lead Service Identification Program		1,500,000	0	0	0	0	\$1,500,000	Debt (Revenue Bonds)
2022 Lead Service Identification Program		0	1,500,000	2,558,667	0	0	\$4,058,667	

Water Distribution System

Lead Service Line Replacement

PROJECT NUMBER: 2018-325-100-0/1/2/3/4/5
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Replacement of 7% of lead service lines per year.
PROJECT JUSTIFICATION: Due to the exceedance of the action levels from compliance tests for lead and copper, the PA DEP required the Authority to perform additional distribution system water quality monitoring, and the optimization of corrosion control treatment, public education, and lead service line replacement.
RISK(S): Failure to comply will result in regulatory fines and poses a public health risk.
IMPACT ON OPERATIONS: Reduction in service line failure due to replacing with new infrastructure, reducing demands on operations repair crews.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$29,931,717	3,111,200	0	0	0	0	\$3,111,200	

Water Distribution System

Low Pressure Area Remediation

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Fix chronically low pressure areas by either extending neighboring higher pressure districts into the area, booster pump stations, or household booster pumps.
PROJECT JUSTIFICATION: This project is in response to the low pressure monitors required by the October 2017 Administrative Order.
RISK(S): Customers may experience temporary service outages as a result of the work on this project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,393,358	1,029,259	1,093,445	170,654	0	0	\$2,293,358	

Water Distribution System

North Side Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 21, 22, 23, 24, 25, 26, 27

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve installation to move some low pressure areas from the McNaugher Pressure District to the Brashears Pressure District.
PROJECT JUSTIFICATION: Areas within the McNaugher Pressure District that are near the Brashears Pressure District could have increased pressure by moving the pressure zone boundary through main improvements and valve adjustments.
RISK(S): Existing services are near or below minimum standards (20 psi).
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$1,200,000	0	0	0	0	1,200,000	\$1,200,000	

Water Distribution System

2021-2025 Private Lead Service Line Reimbursement Program

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Reimbursement of private line lead service line costs.
PROJECT JUSTIFICATION: Replacing both private and public lead service lines is required to eliminate lead in the water system.
RISK(S): Failure to replace private lead service lines poses a public health risk.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$1,760,287	500,000	375,000	375,000	375,000	135,287	\$1,760,287	
2021 Private Lead Service Line Reimbursement		500,000	0	0	0	0	\$500,000	Debt (Revenue Bonds)
2022 Private Lead Service Line Reimbursement		0	375,000	0	0	0	\$375,000	
2023 Private Lead Service Line Reimbursement		0	0	375,000	0	0	\$375,000	
2024 Private Lead Service Line Reimbursement		0	0	0	375,000	0	\$375,000	
2025 Private Lead Service Line Reimbursement		0	0	0	0	135,287	\$135,287	

Water Distribution System

2021-2025 Regulator Valve and Vault Replacement

PROJECT NUMBER: Unidentified

WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Replacement of pressure zone interconnection vaults including new pressure regulators, flow meters, pressure transmitters, and SCADA communications.
PROJECT JUSTIFICATION: Existing regulator stations are in need of replacement. This will also aid in identification of non-revenue water.
RISK(S): Failure to fix could result in catastrophic failure of the vault.
IMPACT ON OPERATIONS: Decreased leakage will result in decrease of pumping energy.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$13,500,000	2,000,000	1,000,000	3,000,000	4,500,000	3,000,000	\$13,500,000	
2021 Regulator Valve and Vault Replacement	2,000,000	0	0	0	0	0	\$2,000,000	Debt (Revenue Bonds)
2022 Regulator Valve and Vault Replacement	0	1,000,000	0	0	0	0	\$1,000,000	
2023 Regulator Valve and Vault Replacement	0	0	3,000,000	0	0	0	\$3,000,000	
2024 Regulator Valve and Vault Replacement	0	0	0	4,500,000	0	0	\$4,500,000	
2025 Regulator Valve and Vault Replacement	0	0	0	0	3,000,000	0	\$3,000,000	

Water Distribution System

2019-2025 Small Diameter Water Main Replacement

PROJECT NUMBER: 2019-325-101-0, 2019-325-102-0/1/2, 2020-325-106-0/1/2,
Unidentified

WARD: Systemwide

PHASE: Construction / Design / Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Strategic replacement of water mains to improve system reliability as well as improve water pressure, maintain water quality, and minimize disturbance to the community. Program will initially focus on replacing existing 4" and 6" unlined cast iron mains and mains with a history of frequent breaks.
PROJECT JUSTIFICATION: By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving overall replacement cost. Additionally, projects will be coordinated with other utilities to minimize disturbance to the community and street surface restoration costs. Water quality will also improve by removing tuberculated mains.
RISK(S): Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	
Total	\$287,163,430	45,838,708	19,950,643	38,645,977	75,436,736	103,691,564	\$283,563,628	
2019 Small Main Replacement	11,918,082	0	0	0	0	0	\$11,918,082	PENNVEST
2020 Small Main Replacement	25,120,626	0	0	0	0	0	\$25,120,626	
2021 Small Main Replacement	7,300,000	10,950,643	0	0	0	0	\$18,250,643	Debt (Revenue Bonds)
2022 Small Main Replacement	1,500,000	6,000,000	11,500,000	0	0	0	\$19,000,000	
2023 Small Main Replacement	0	3,000,000	14,000,000	21,000,000	0	0	\$38,000,000	
2024 Small Main Replacement	0	0	13,145,977	40,489,609	60,734,414	0	\$114,370,000	
2025 Small Main Replacement	0	0	0	13,947,127	42,957,150	0	\$56,904,277	

Water Distribution System

2020-2025 Small Meter Replacement

PROJECT NUMBER: 2020-325-107-0

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Annual replacement of water meters 1" or less.
PROJECT JUSTIFICATION: Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
RISK(S): Failure to replace meters annually could result in lost revenue or violate regulatory requirements.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$7,321,915	1,357,684	1,796,385	1,721,106	1,650,000	500,000	\$7,025,175	
2020 Small Meter Replacement		255,000	0	0	0	0	\$255,000	DSIC - Water
2021 Small Meter Replacement		1,102,684	639,207	0	0	0	\$1,741,891	
2022 Small Meter Replacement		0	1,157,178	683,052	0	0	\$1,840,230	
2023 Small Meter Replacement		0	0	1,038,054	650,000	0	\$1,688,054	
2024 Small Meter Replacement		0	0	0	1,000,000	250,000	\$1,250,000	
2025 Small Meter Replacement		0	0	0	0	250,000	\$255,000	

Water Distribution System

South Side Slopes Boundary Adjustments

PROJECT NUMBER: Unidentified
WARD: 16, 17

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Main and valve adjustments to move the boundary between the Highland No. 2 and Allentown Pressure Districts.
PROJECT JUSTIFICATION: Areas within the Highland No. 2 pressure district that are near the Allentown pressure district could have increased pressure by moving the pressure zone boundary through main improvements and valve adjustments.
RISK(S): Existing services are near or below minimum standards (20 psi).
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$1,200,000	0	0	0	0	1,200,000	\$1,200,000	

Water Distribution System

2020-2021 Unmetered and Flat Rate Properties

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Metering unmetered and flat rate properties as required by regulations.
PROJECT JUSTIFICATION: Required per the PUC regulations. The impact of not installing meters is the loss of revenue and lack of ability to accurately estimate water loss in the system.
RISK(S): Failure to comply with PUC regulations and the potential of lost revenue.
IMPACT ON OPERATIONS: Increased system reliability, reliability, and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$4,307,553	1,548,564	1,744,689	527,947	0	0	\$3,821,199	
2020 Unmetered and Flat Rate Properties	1,441,278	879,992	0	0	0	0	\$2,321,200	DSIC - Water
2021 Unmetered and Flat Rate Properties	107,286	864,767	527,947	0	0	0	\$1,500,000	

Water Distribution System

2020-2025 Valve Replacement

PROJECT NUMBER: 2020-325-104-0, Unidentified
WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of defective or non-operational valves on transmission and distribution mains throughout the water distribution system, excluding valves replaced during waterline relays.
PROJECT JUSTIFICATION: Increasing the number of operable valves in the system will reduce the number of valves that would need to be closed during emergency conditions, and therefore the number of customers that may be impacted.
RISK(S): A larger number of customers may be subject to service outages.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all repairs. This would require an increase in operation expenses for both personnel and equipment.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$21,204,425	1,498,333	1,300,000	2,942,149	6,123,334	7,823,333	\$19,687,149	
2020 Valve Replacement	998,333	0	0	0	0	0	\$998,333	Debt (Revenue Bonds)
2021 Valve Replacement	500,000	300,000	0	0	0	0	\$800,000	
2022 Valve Replacement	0	1,000,000	708,816	0	0	0	\$1,500,000	
2023 Valve Replacement	0	0	2,233,333	1,116,667	0	0	\$3,350,000	
2024 Valve Replacement	0	0	0	0	5,006,667	2,503,333	\$7,510,000	DISC – Water / Debt (Revenue Bonds)
2025 Valve Replacement	0	0	0	0	0	5,320,000	\$5,320,000	

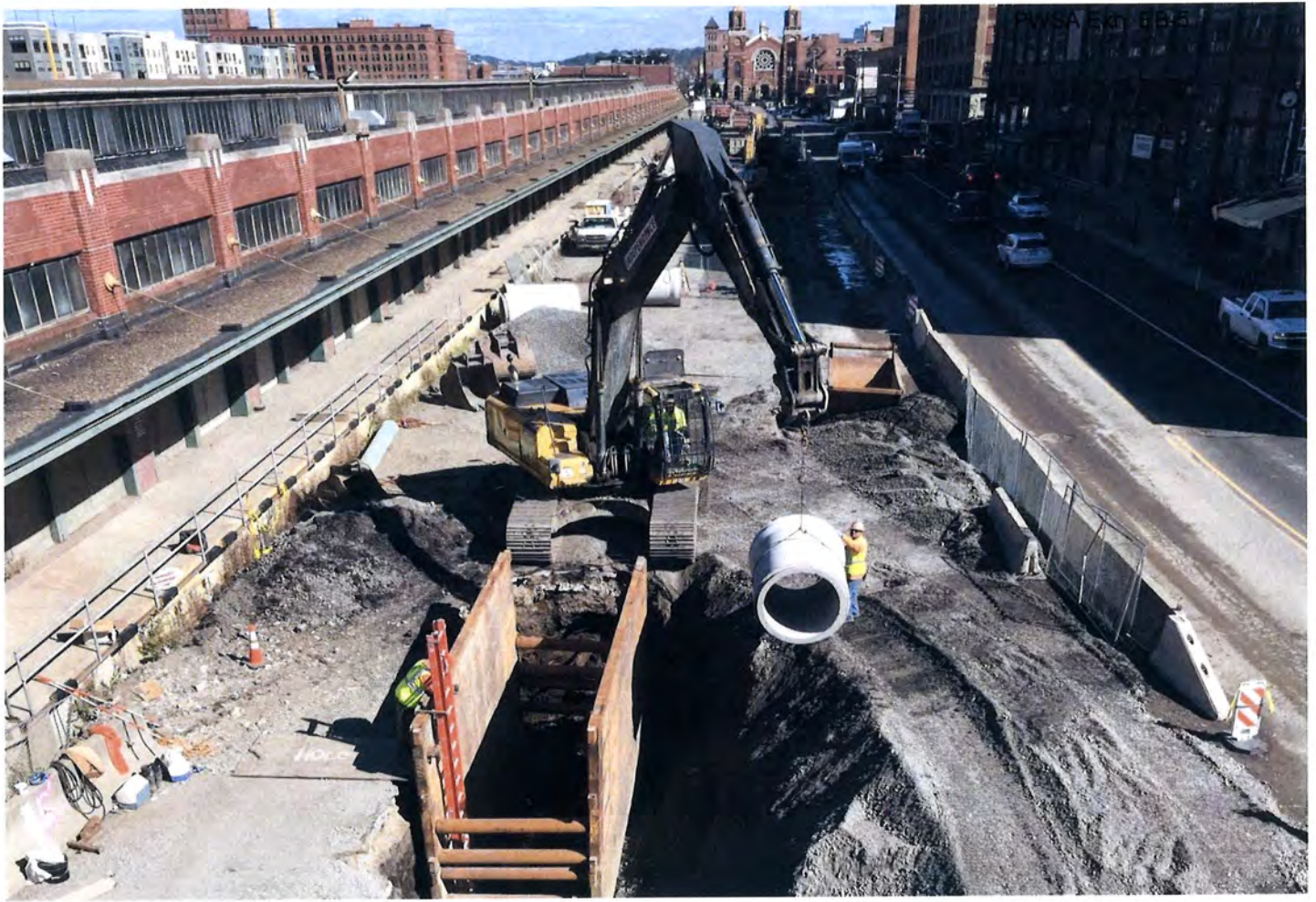
Water Distribution System

2021-2025 Water Relay

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Replacement of existing water mains, valves, fittings, service connections, and hydrants due to emergency situations.
PROJECT JUSTIFICATION: The existing water distribution system is aging and updates are required to address failures that could be significant public safety hazards.
RISK(S): Customers will be subject to service outages or inadequate pressure for firefighting activities until break is addressed.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all upgrades. This would require an increase in operations expenses for both personnel and equipment.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$8,227,500	863,750	1,763,750	1,840,000	1,880,000	1,880,000	\$8,227,500	
2021 Water Relay		863,750	863,750	0	0	0	\$1,727,500	Debt (Revenue Bonds)
2022 Water Relay		0	900,000	900,000	0	0	\$1,800,000	
2023 Water Relay		0	0	940,000	940,000	0	\$1,880,000	
2024 Water Relay		0	0	0	940,000	940,000	\$1,880,000	
2025 Water Relay		0	0	0	0	940,000	\$940,000	



Wastewater System

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Wastewater System

31st Ward Sewer System

PROJECT NUMBER: 2017-424-100-0

WARD: 31

PHASE: Construction
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Regional Cooperation/ Stewardship, Level of Service
PROJECT DESCRIPTION: Evaluation to identify and locate the source(s) of the infiltration and inflow (I/I), removal of public I/I sources, and rehabilitation/replacement of the Rogers Street and Mifflin Road Pump Station and force main.
PROJECT JUSTIFICATION: Both sewage pump stations and the force main that convey flow to the Streets Run Sanitary Trunk Sewer were constructed in the late 1940's and are reaching the end of their useful life. Additionally, past studies suggest this sewershed may be significantly impacted by high levels of infiltration/inflow.
RISK(S): Increased combined sewer overflows and pump station system failures.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Abandonment of the existing pump stations and installation of a new gravity main to convey flows to the West Mifflin Sanitary Authority.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds) / DSIC - Sewer</u>
Total	\$8,047,680	2,904,302	348,961	450,000	150,000	2,360,776	\$6,214,039	

Wastewater System

Browns Hill Road Sewer Pump Station Replacement

PROJECT NUMBER: Unidentified
WARD: 15

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Construction of a replacement 160 GPM sanitary sewer pump station, including standby power, safer ingress and egress for routine maintenance, a water supply for equipment wash down and odor control facilities, if required. Additionally, perform a condition assessment of the 4" force main (approx. 790 l.f.) constructed in 2007, but was not utilized and confirm sanitary sewer separation occurred. Additional sewer separation may need to occur prior to modifying the existing diversion chamber.
PROJECT JUSTIFICATION: The existing sanitary sewer pump station has reached the end of its useful life. The replacement station will provide increased operating efficiency and resiliency and improved safety conditions for staff.
RISK(S): If the station is not replaced, pump or wet well failures could occur, which would result in sanitary sewer overflows. Sanitary sewer overflows could result in fines and notice of violations from regulating agencies.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay the construction and risk pump or wet well failures.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,500,000	0	0	187,700	1,030,967	281,333	\$1,500,000	

Wastewater System

2020-2025 Large Diameter Sewer Rehabilitation

PROJECT NUMBER: 2020-424-101-0, Unidentified

WARD: Systemwide

PHASE: Design / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Proactive, trenchless rehabilitation of 36" diameter or greater sewer mains to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.
PROJECT JUSTIFICATION: Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.
RISK(S): If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$21,249,489	2,211,492	6,391,140	3,517,000	4,437,190	4,692,667	\$21,249,489	
2020 Large Diameter Sewer Rehabilitation		1,187,158	2,443,473	0	0	0	\$3,630,632	Debt (Revenue Bonds)
2021 Large Diameter Sewer Rehabilitation		1,024,333	3,105,667	0	0	0	\$4,130,000	
2022 Large Diameter Sewer Rehabilitation		0	842,000	2,430,000	0	0	\$3,272,000	
2023 Large Diameter Sewer Rehabilitation		0	0	1,087,000	3,293,000	0	\$4,380,000	
2024 Large Diameter Sewer Rehabilitation		0	0	0	1,144,190	3,495,810	\$4,640,000	
2025 Large Diameter Sewer Rehabilitation		0	0	0	0	1,196,857	\$1,196,857	

Wastewater System

M-29 Outfall Improvements

PROJECT NUMBER: 2018-424-103-0

WARD: 15

PHASE: Design
PRIORITY: Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Modifying diversion chamber, rehabilitating culvert, constructing an endwall, and installing flapgate associated with the M-29 outfall structure.
PROJECT JUSTIFICATION: The M-29 outfall structure is critical infrastructure that has been in jeopardy of failing for several years due to significant structural defects in the existing culvert.
RISK(S): The M-29 outfall structure could fail prior to completion of the project.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,614,643	3,473,539	0	0	0	0	\$3,473,539	

Wastewater System

Maytide Storm and Sanitary Sewer System Improvements

PROJECT NUMBER: 2017-424-109-0

WARD: 29

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Reconstruction of storm infrastructure from Merritt Avenue to the storm interceptor on Ravilla Avenue and the realignment of the 10" sanitary sewer on Maytide (Sanderson to Valline).
PROJECT JUSTIFICATION: Localized property and street flooding has been well-documented for several years at this location and the undeveloped right-of-way of Sanderson has significantly deteriorated. Additionally, an inspection of the 10" sanitary sewer on Maytide Street revealed structural and construction defects.
RISK(S): Continual degradation to a steep slope could result in property damage and an increased cost to stabilize. Customers may be subject to basement backups, or overflows may occur due to collapsed pipes.
IMPACT ON OPERATIONS: Increased operating reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds) / DSIC - Sewer
Total	\$5,235,035	2,000,000	1,500,000	1,096,798	0	0	\$4,596,798	

Wastewater System

Queenston Sewer Improvements

PROJECT NUMBER: 2019-424-103-2

WARD: 32

PHASE:

Design

PRIORITY:

Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:

Removal of a combined sewer diversion chamber and installation of new sewer infrastructure, which will result in the separation of the sewershed.

PROJECT JUSTIFICATION:

The existing sewer infrastructure (both storm and sanitary) have significant structural defects, which are located under a large structure in a paper street over 40 feet deep. Additionally, several customers experience sewer backups that are connected to the combined sewer in a mostly separated area.

RISK(S):

Customers may be subject to basement backups or overflows may occur due to collapsed pipes.

IMPACT ON OPERATIONS:

Increased operating flexibility and reliability.

ALTERNATIVES TO THE RECOMMENDED ACTION:

Reroute the infrastructure (laterals and catch basins) connected to the failed mains; however, this may result in additional basement backups for the customers and may not be feasible due to the existing depth of the existing infrastructure.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,927,040	1,601,450	185,600	0	0	0	\$1,787,050	

Wastewater System

2019 -2025 Sewer Reconstruction

PROJECT NUMBER: 2019-424-102-0, 2020-424-102-0, Unidentified

WARD: Systemwide

PHASE: Construction / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Reconstruction of existing sewers, manholes, catch basins, and inlets due to emergency situations or pipe failures.
PROJECT JUSTIFICATION: The existing sewer system is aging and immediate repairs are required to address failures that could be significant public safety hazards.
RISK(S): Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Utilize Authority staff and equipment to perform all repairs. This would result in an increase to labor, equipment, and related operating expenses.

CASH FLOW SUMMARY								FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	
Total	\$10,308,170	970,175	999,979	1,841,144	1,880,000	1,880,000	\$7,571,297	
2019 Sewer Reconstruction		51,290	0	0	0	0	\$51,290	Debt (Revenue Bonds)
2020 Sewer Reconstruction		918,244	0	0	0	0	\$918,244	
2022 Sewer Reconstruction		0	999,979	750,021	0	0	\$1,750,000	
2023 Sewer Reconstruction		0	0	1,091,123	805,080	0	\$1,896,203	DSIC - Sewer
2024 Sewer Reconstruction		0	0	0	1,074,920	805,080	\$1,880,000	Debt (Revenue Bonds)
2025 Sewer Reconstruction		0	0	0	0	1,074,920	\$1,074,920	

Wastewater System

2018-2025 Sewers Under Structures

PROJECT NUMBER: 2017-424-110-0, 2020-424-104-0, 2020-424-104-1,
Unidentified

WARD: Systemwide

PHASE: Design / Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Rehabilitation, relocation, and abandonment, if applicable, of existing sewer infrastructure located under or adjacent to buildings, bridges, or railroads or located on steep slopes.
PROJECT JUSTIFICATION: In recent years, there has been an increasing rate of failure of this asset type due to limited accessibility and pipe age. By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.
RISK(S): Failure of this asset type could result in significant property/structure damage, increased replacement cost, and increased service outages or bypass pumping.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Continue to extend utility component life until a high failure rate justifies replacement.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$34,379,243	3,081,151	11,080,611	5,642,667	5,440,122	8,713,821	\$33,958,372	
2018 Sewers Under Structures	1,833,151	3,333,405	519,444	0	0	\$5,686,000	Debt (Revenue Bonds)	
2020 Sewers Under Structures	1,248,000	7,555,635	4,159,365	0	0	\$12,963,000	DSIC – Sewer/ Debt (Revenue Bonds)	
2022 Sewers Under Structures	0	191,571	766,286	4,445,408	2,431,333	\$7,834,598		
2023 Sewers Under Structures	0	0	197,571	790,286	5,250,488	\$6,238,345		
2024 Sewers Under Structures	0	0	0	204,429	817,714	\$1,022,143	Debt (Revenue Bonds)	
2025 Sewers Under Structures	0	0	0	0	214,286	\$214,286		

Wastewater System

2019-2025 Small Diameter Sewer Rehabilitation

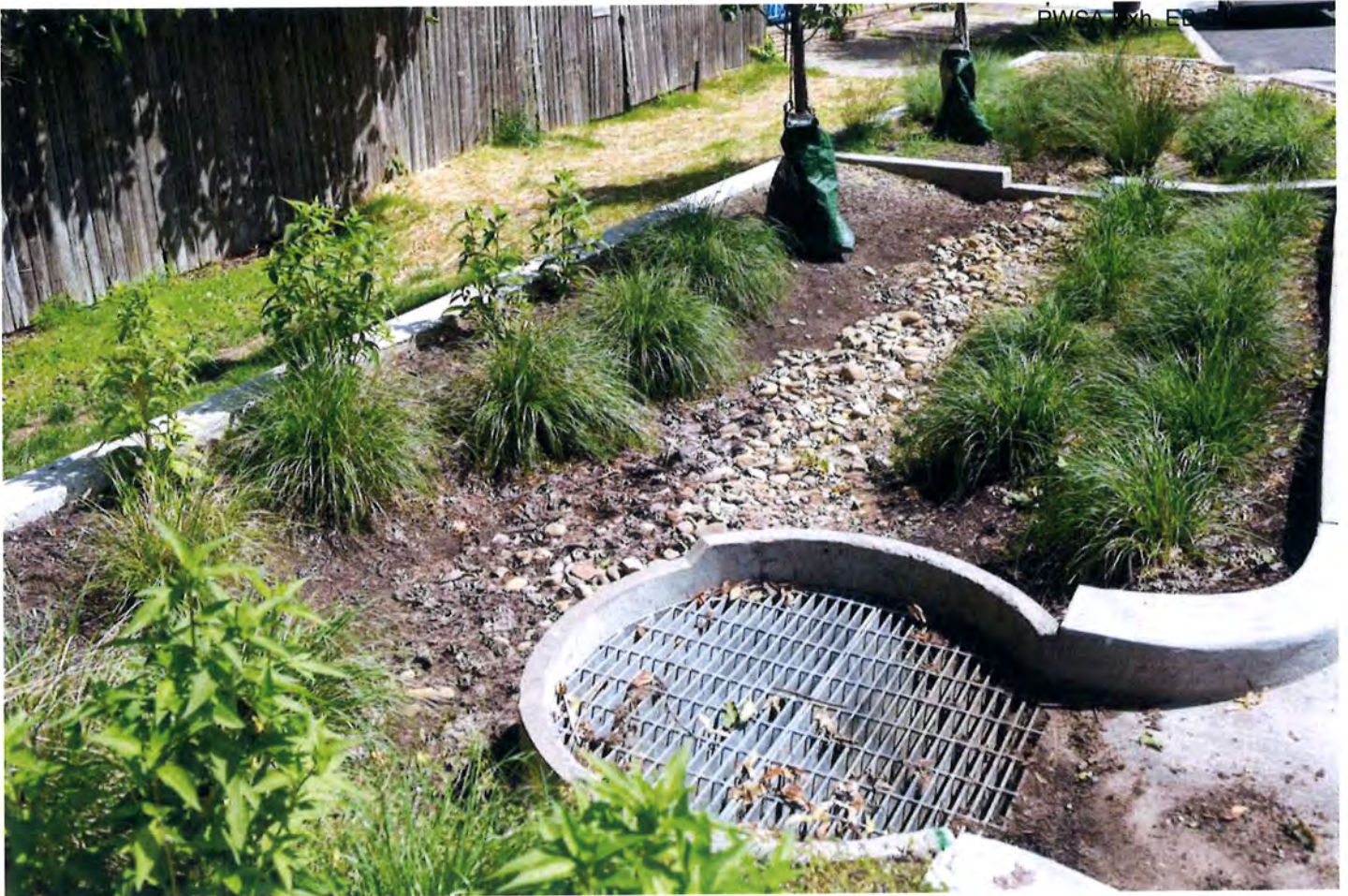
PROJECT NUMBER: 2019-424-100-0 / 2019-424-108-0 / 2020-424-100-0/1/2,
2020-424-106-0/1/2, Unidentified

WARD: Systemwide

PHASE: Design/Construction/Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Proactive, trenchless rehabilitation of sewer mains (36" diameter and less) to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.
PROJECT JUSTIFICATION: Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.
RISK(S): If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$105,187,934	19,499,567	24,602,865	16,845,092	21,725,979	21,052,095	\$103,725,599	
2019 Small Diameter Rehabilitation		482,961	0	0	0	0	\$482,961	Debt (Revenue Bonds)
2020 Small Diameter Rehabilitation		11,493,705	2,916,832	0	0	0	\$14,410,538	
2021 Small Diameter Rehabilitation		6,582,901	12,081,232	0	0	0	\$18,664,133	
2022 Small Diameter Rehabilitation		940,000	8,150,000	2,750,000	0	0	\$11,840,000	
2023 Small Diameter Rehabilitation		0	1,454,800	12,554,292	6,990,908	0	\$21,000,000	
2024 Small Diameter Rehabilitation		0	0	1,540,800	13,133,472	7,325,728	\$22,000,000	
2025 Small Diameter Rehabilitation		0	0	0	1,601,600	13,726,367	\$15,327,967	

**\$941,800 ALCOSAN GROW grant funding secured.



Stormwater



Stormwater System

Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements

PROJECT NUMBER: 2020-GI-100-0

WARD: 1 & 4

PHASE: Design
PRIORITY: Safety, Regional Cooperation/Stewardship, Reliability/Operational Flexibility
PROJECT DESCRIPTION: A cost share with the City of Pittsburgh's Department of Mobility and Infrastructure on the redesign of Forbes Avenue and Fifth Avenue to accommodate bus rapid transit from downtown to Birmingham Bridge. This project will include the installation of permeable paving, underground storage, and bioretention plantings and is tributary to the M-05 and M-19 outfall.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved sytem management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,255,882	685,000	1,000,000	350,000	0	0	\$2,035,000	

Stormwater System

2020-2025 Catch Basin and Inlet Replacement

PROJECT NUMBER: 2020-424-105-0/1, Unidentified

WARD: Systemwide

PHASE:

Procurement / Not Started

PRIORITY:

Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:

Strategic replacement of catch basins and storm inlets throughout the system to replace failed units, stormwater control reliability, and minimize disturbance to the community.

PROJECT JUSTIFICATION:

By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.

RISK(S):

Overland and street flooding could occur due to a defective or undersized catch basin or storm inlet, creating a public health and safety hazard during wet weather events.

IMPACT ON OPERATIONS:

Increased operating reliability.

ALTERNATIVES TO THE RECOMMENDED ACTION:

Continue to extend utility component life until a high failure rate justifies replacement.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	
Total	\$38,887,540	8,137,621	1,987,720	8,317,500	9,964,949	10,479,750	\$38,887,540	
2020 Catch Basin and Inlet Replacement		8,121,621	914,643	0	0	0	\$9,036,264	Debt (Revenue Bonds)
2021 Catch Basin and Inlet Replacement		16,000	1,000,000	200,000	0	0	\$1,216,000	
2022 Catch Basin and Inlet Replacement		0	73,077	8,044,423	962,500	0	\$9,080,000	
2023 Catch Basin and Inlet Replacement		0	0	73,077	8,141,923	985,000	\$9,200,000	
2024 Catch Basin and Inlet Replacement		0	0	0	860,526	8,634,224	\$9,494,750	
2025 Catch Basin and Inlet Replacement		0	0	0	0	860,526	\$860,526	

Stormwater System

Fleury Way Stormwater Infrastructure Improvements

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Construction of storm sewer infrastructure to address persistent and severe street flooding and roadway damage. Project will include installing approximately 500 ft of 18" storm sewers and 4 new catch basins as well as inverting the crown of the road and adding proper curbing for optimal drainage.
PROJECT JUSTIFICATION: After field assessment and review, the stormwater group ranked this issue as a "high priority" because of the severity of road degradation and persistent street flooding caused by lack of stormwater infrastructure and improper road design. This issue is located in the A-42 Green First sewershed. This project is also a good opportunity to coordinate and share costs with DOMI.
RISK(S): Poor level of service and safety risks.
IMPACT ON OPERATIONS: 4 additional inlets operations will need to add to the cleaning schedule.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$730,141	730,141	0	0	0	0	\$730,141	

**\$123,000 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Four Mile Run Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-102-0
WARD: 15

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Sewer separation, stream restoration, stream daylighting, bioretention, and underground storage to remove the existing stream base and wet weather flow currently discharging into the combined sewer located in M-29.
PROJECT JUSTIFICATION: This project will separate wet weather flow being directly discharged into the Authority's combined sewer system.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$25,400,720	7,000,000	12,800,000	0	0	0	\$19,800,000	

Stormwater System

Lawn and Ophelia

PROJECT NUMBER: 2017-424-104-0

WARD: 4

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Project is located in the South Oakland neighborhood in the City of Pittsburgh and is tributary to the M-19B outfall. This project is intended to be a community gathering space combined with stormwater management features.
PROJECT JUSTIFICATION: It is anticipated that 1.9 impervious acres from neighboring roads and roofs can be managed.
RISK(S): Customer within the service area of this project may experience stormwater related issues prior to the completion of this project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$768,341	600,000	0	0	0	0	\$600,000	

**\$313,900 ALCOSAN GROW grant funding secured.

Stormwater System

Martin Luther King Field Stormwater Infrastructure Improvements

PROJECT NUMBER: 2019-GI-104-0
WARD: 4 & 5

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Installation of regenerative bio-swale and underground detention facilities to capture and detain impervious acres from the adjacent streets and upstream separate storm sewers, which currently discharging into the combined sewer located in M-19.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved sytem management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,654,970	2,008,966	1,339,310	0	0	0	\$3,348,276	

**\$855,270 ALCOSAN GROW grant funding secured.

Stormwater System

Maryland Avenue Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-101-0

WARD: 7

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Permeable paver based GSI project to manage approximately 5.3 acres of impervious acres for 1.5" runoff event.
PROJECT JUSTIFICATION: The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
RISK(S): Continued flooding risk unmitigated, which has contributed to frequent reports of basement backups in this area of the PWSA system.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Implementing stormwater management projects at less cost-effective locations.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$4,454,383	2,610,000	330,000	0	0	0	\$2,940,000	

Stormwater System

Nobles Lane Stormsystems Improvements

PROJECT NUMBER: Unidentified

WARD: 29

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Construction of strategically placed basins and storm sewers to reduce or eliminate overland flooding from roadway onto private property.
PROJECT JUSTIFICATION: After field assessment and review, the stormwater group ranked this issue as a "high priority" because of flooding severity and its location in the Saw Mill Run sewershed. This project seeks to install new catch basins and a new storm sewer to help appropriately manage runoff. This area of the Carrick neighborhood does not have any stormwater infrastructure.
RISK(S): Poor level of service.
IMPACT ON OPERATIONS: The proposed basins will include green filters to add water quality benefits to Saw Mill Run. These will need to be routinely cleaned via the green infrastructure maintenance contractor and will be a minimal impact to this particular operations budget.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$343,322	343,322	0	0	0	0	\$343,322	

**\$65,551 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Saw Mill Run MS4 Compliance Projects

PROJECT NUMBER: Unidentified
WARD: 32 & 29

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance
PROJECT DESCRIPTION: Identifying and completing projects related to MS4 compliance.
PROJECT JUSTIFICATION: This project is necessary to become compliant with MS4 regulatory requirements.
RISK(S): The timeline to complete the MS4 compliance projects could take longer than expected.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,500,000	0	0	1,000,000	2,500,000	0	\$3,500,000	

Stormwater System

Saw Mill Run PWSA & PennDOT Watershed Improvements

PROJECT NUMBER: Unidentified

WARD: 32

PHASE: Not Started
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
PROJECT DESCRIPTION: Implementation of stormwater treatment and reconnection of streams to vegetated floodplains to help mitigate stormwater peak flows and reduce sediment and other pollutant loads. This project will demonstrate the effectiveness of green infrastructure in reducing pollutants, controlling CSO/SSOs, and restoring the health of the aquatic ecosystems in the Saw Mill Run watershed to comply with regulatory obligations.
PROJECT JUSTIFICATION: This project will help to comply with regulatory obligations by reducing pollutants and controlling CSO/SSO's.
RISK(S): It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,000,000	0	200,000	500,000	300,000	0	\$1,000,000	

**Future cost share agreement will be negotiated with PennDOT.

Stormwater System

Southside Flats Sewer Separation

PROJECT NUMBER: Unidentified
WARD: 16 & 17

PHASE: Not Started
PRIORITY: Safety, Regional Cooperation/Stewardship, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Separation of 17 acres of combined sewer through the construction of stormdrain along Wharton Street to 18th Street.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Community members are concerned about disruptions during construction and potential rooftop disconnect costs.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,405,242	0	335,365	3,069,877	0	0	\$3,405,242	

Stormwater System

Southside Stormwater Infrastructure Improvements

PROJECT NUMBER: 2019-GI-100-0
WARD: 16 & 17

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: The Southside Green / Stormwater project is located in the M-16 sewershed, which discharges approximately 103MG of combined sewer overflows (CSOs) in typical year as it is defined in the current system model. Additionally, there are 15 known surface streams/seeps within the park that appear to connect into the combined sewer system. The project will focus on stormwater management source control opportunities within Southside Park. The project will look at separating the stormwater runoff from the park and road right-of-way areas. It will connect through a new storm sewer discharge to be built under South 21st Street to the Monongahela. The project will detain and slowly return the stormwater runoff to the combined sewer system.
PROJECT JUSTIFICATION: This project will help with complying with the Consent Order Agreement by reducing CSO's.
RISK(S): It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$4,970,325	2,156,746	2,156,746	0	0	0	\$4,313,492	

**\$1,489,900 ALCOSAN GROW grant funding secured.

Stormwater System

Thomas and McPherson Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-106-0
WARD: 7

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Reliability/Operational Flexibility
PROJECT DESCRIPTION: Installation of roadside bioretention features to capture and detain impervious road runoff in the North Point Breeze neighborhood of the City of Pittsburgh, which is tributary to the A-42 combined sewer outfall.
PROJECT JUSTIFICATION: This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,671,222	4,319,899	1,387,466	0	0	0	\$5,707,365	

**\$1,517,800 ALCOSAN GROW grant funding secured.

Stormwater System

Tide Gate Installations

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
PROJECT DESCRIPTION: Installation of tide gates at 44 combined sewer overflow diversion chamber locations to assist in preventing river water intrusion.
PROJECT JUSTIFICATION: Will prevent the intrusion of sewage into river water during heavy wet weather events.
RISK(S): The length of time to install the tide gates could result in sewage overflowing into river water prior to the completion of the project.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$3,000,000	0	0	0	2,000,000	1,000,000	\$3,000,000	

Stormwater System

Volunteer's Field Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-104-0
WARD: 29

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Project is located in the Carrick neighborhood of the City of Pittsburgh and is tributary to Saw Mill Run. Installation of green infrastrucutre within the Park to reduce sediment and other pollutant loads.
PROJECT JUSTIFICATION: Required for compliance with the MS4 permit and EPA TMDL requirements. Project will also detain stormwater to reduce downstream flooding in Saw Mill Run.
RISK(S): It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$1,641,976	1,000,000	0	0	0	0	\$1,000,000	

Stormwater System

Wightman Park Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-105-0
WARD: 14

PHASE: Construction
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: Project is located in the Squirrel Hill neighborhood of the City of Pittsburgh and is tributary to the M-29 outfall. Stormwater management within the park itself as well as the necessary piping or inlet work to direct up to 3.25 impervious acres from the adjacent streets into the park. The Wightman Park project along with future street bioswale projects are expected to increase the impervious acres captured as well as alleviate reported sewer basement backups in the neighborhood around Wightman Park.
PROJECT JUSTIFICATION: 2.24 million gallons of stormwater runoff will be managed through this project in a typical year, producing downstream CSO reduction. The project will also improve the performance of adjacent, downstream sewers through peak flow reduction.
RISK(S): Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Delay construction which will increase the risk of sewer basement backups.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$3,521,825	1,750,000	0	0	0	0	\$1,750,000	

**\$368,300 ALCOSAN GROW grant funding secured.

Stormwater System

Winchester Drive at Grovemount Stormsystem Improvements

PROJECT NUMBER: Unidentified
WARD: 20

PHASE:
Not Started

PRIORITY:
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

PROJECT DESCRIPTION:
Construction of storm system and roadway improvements to address right of way flooding and damage (hillside erosion and road undercutting) caused by stormwater.

PROJECT JUSTIFICATION:
After field assessment and review, the stormwater group ranked this issue as a "high priority" because of the severity of safety issues caused by lack of inlets and curbing as well as a failing outlet structure. Due to improper basin placement as well as poor road design the intersection at Winchester Drive and Grovemount Road is being undercut by overland stormwater runoff, causing the road to start to fail and collapse. This project seeks to install new catch basins and a new storm sewer as well as stabilize the existing outfall to help appropriately manage runoff.

RISK(S):
Poor level of service, safety risks.

IMPACT ON OPERATIONS:
10 new basins operations will have to add to the cleaning schedule.

ALTERNATIVES TO THE RECOMMENDED ACTION:
There are no practical alternatives to the recommended action.

CASH FLOW SUMMARY

FUNDING SOURCE(S)

	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$554,577	554,577	0	0	0	0	\$554,577	

**\$42,193 will be reimbursed as part of a cost share agreement between the PWSA and the City of Pittsburgh.

Stormwater System

Woodland Road Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-108-0
WARD: 14

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Bioretention based GSI project to manage approximately 7 acres of impervious acres for 1.5" runoff event. Project location is in A-22 sewershed on the campus of Chatham University adjacent to Woodland Road. Design activities include field investigations (site survey, geotech), development of design documents for construction and pre-construction flow monitoring.
PROJECT JUSTIFICATION: The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
RISK(S): Continued flooding risk unmitigated, which has contributed to frequent reports of basement backups in this area of the PWSA system.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: Implementing stormwater management projects at less cost-effective locations.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,073,559	1,550,000	185,000	0	0	0	\$1,735,000	

Stormwater System

Woods Run Stream Removal Stormwater Infrastructure Improvements

PROJECT NUMBER: 2017-424-108-0
WARD: 26

PHASE: Design
PRIORITY: Safety, Regulatory Compliance, Regional Cooperation/Stewardship
PROJECT DESCRIPTION: This project will redirect an existing stream inflow location into a detain and slow release subsurface storage facility. The stream base and wet weather flow currently discharge directly into the 36" diameter the PWSA combined sewer on Mairdale Avenue.
PROJECT JUSTIFICATION: This project will separate wet weather flow being directly discharged into the PWSA's combined sewer system.
RISK(S): Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	<u>Debt (Project Fund)</u>
Total	\$2,619,086	1,250,000	0	0	0	0	\$1,250,000	

**\$1,224,300 ALCOSAN GROW grant funding secured.



Other



Other

2021-2025 Park Maintenance / Upgrades

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project will fund water and sewer infrastructure upgrades within City of Pittsburgh parks.
PROJECT JUSTIFICATION: The water and sewer infrastructure within City of Pittsburgh parks is in need of upgrades.
RISK(S): Deferred maintenance of water and sewer infrastructure could have negative impacts on the functionality of City of Pittsburgh parks.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$4,700,000	700,000	1,000,000	1,000,000	1,000,000	1,000,000	\$4,700,000	

Other

2021-2025 Property Acquisition / Facility Upgrades

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Reliability/Operational Flexibility, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: This project will fund all future property/building acquisitions and facility upgrades.
PROJECT JUSTIFICATION: The current facilities of the Authority are in need of upgrades. In addition, new properties may be acquired to fill the need of increased staffing and equipment levels.
RISK(S): Deferred maintenance on current facilities and limited space will impact operations.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,700,000	700,000	0	1,000,000	1,000,000	0	\$2,700,000	

Other

Reconstruction of the Facade at the Central Warehouse

PROJECT NUMBER: Unidentified
WARD: 9

PHASE: Not Started
PRIORITY: Safety
PROJECT DESCRIPTION: Reconstruction of the facade at the Central Warehouse.
PROJECT JUSTIFICATION: The existing facade is failing and in danger of falling and causing injury to employees or pedestrians.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$70,000	70,000	0	0	0	0	\$70,000	

Other

Roof Replacment Brilliant Yard Warehouse

PROJECT NUMBER: Unidentified
WARD: 12

PHASE: Not Started
PRIORITY: Safety, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Roof replacment at Brilliant Yard warehouse.
PROJECT JUSTIFICATION: Existing roof leaking and causing structural damage.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$160,000	160,000	0	0	0	0	\$160,000	

Other

Roof Replacement Herron Hill Pump Station

PROJECT NUMBER: Unidentified
WARD: 5

PHASE: Not Started
PRIORITY: Safety, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Replace existing roof and gutters at the Herron Hill Pump Station.
PROJECT JUSTIFICATION: Existing roof is leaking and causing structural damage to building.
RISK(S): Employee safety.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$90,000	90,000	0	0	0	0	\$90,000	

Other

Surface Restoration (Capital Only)

PROJECT NUMBER: 2020-325-105-0/1
WARD: Systemwide

PHASE: Construction
PRIORITY: Safety, Operations and Maintenance Efficiency
PROJECT DESCRIPTION: Resurfacing of streets as a result of other capital projects.
PROJECT JUSTIFICATION: Adequately restoring street surface conditions is a requirement for all applicable capital projects.
RISK(S): Customers could experience temporary street closures as a result of street resurfacing work.
IMPACT ON OPERATIONS: Increased system reliability and improved system management.
ALTERNATIVES TO THE RECOMMENDED ACTION: There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$14,328,141	12,500,000	0	0	0	0	\$12,500,000	

Other

Utility Cost Shares

PROJECT NUMBER: Unidentified
WARD: Systemwide

PHASE: Not Started
PRIORITY: Regional Cooperation/ Stewardship
PROJECT DESCRIPTION: This project will fund future cost sharing projects.
PROJECT JUSTIFICATION: Cost sharing projects can provide a savings to the Authority.
RISK(S): Cost sharing projects have the potential to be delayed due to coordination issues.
IMPACT ON OPERATIONS: Increased operating flexibility and reliability.
ALTERNATIVES TO THE RECOMMENDED ACTION: Complete projects without cost sharing agreements.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$2,050,000	450,000	100,000	500,000	500,000	500,000	\$2,050,000	

Exhibit EB-6



Financial Management Policy

PURPOSE:

This policy provides a framework to maintain the PWSA's financial integrity, while serving the long-term interests of its customers and other constituencies. The PWSA recognizes that maintaining financial integrity is critical to accomplishing its goals and discharging the PWSA's customer and public service responsibilities. This policy establishes processes to be used by the PWSA Board of Directors to define the strategic financial plans for the PWSA and to approve specific financial program goals, objectives, and associated budgets.

SCOPE:

This Financial Management Policy applies to all financial practices within the PWSA.

POLICY:

In seeking to fulfill its customer and public service objectives, the PWSA will maintain a high level of financial stability and will seek not to compromise long-term financial integrity to achieve short-term benefits. This philosophy will ensure the sustainable financial health of the organization.

The Executive Director is authorized to engage financial service providers and other related professional service providers, if deemed necessary and appropriate by the Executive Director in consultation with the Director of Finance, Deputy Director of Finance, and/or Treasurer or equivalent staff member, considering the expertise and cost of any such service provider. The engagement of professional service providers will adhere to applicable policies regarding procurements enacted by the PWSA. The Executive Director will provide an annual report to the Board listing all contracts into which the PWSA entered pursuant to this paragraph.

Debt Service Coverage: To provide a margin of safety and flexibility in the PWSA's financial affairs, revenue levels will be set to target a minimum debt service coverage ratio of 1.35x on the total debt service for all senior debt obligations and 1.15x on the annual debt service for all subordinate debt obligations. In the event overall debt service coverage is projected to be below 1.35x for any fiscal year, the Board will promptly implement a plan, to be recommended by staff, which could include rate increases, cost reductions or other means to achieve a debt service coverage ratio of 1.35x over a maximum three-year (3) time period. The plan will take into consideration approved and pending rate increases with the Pennsylvania Public Utilities Commission.

Rates and Prices: The PWSA will design rates and prices that are intended to ensure the PWSA meets its financial obligations, recovers reasonable costs in a timely manner, and maintains financial integrity as required by regulatory and contractual requirements. These rates will provide a stable and predictable flow of revenues to maintain appropriate levels of revenue to achieve the PWSA's goals. Revenue levels will be evaluated in

consideration of, but not limited to, bond ratings, capital funding requirements, current business conditions, economic projections, and consumption assumptions, delays inherent in the regulatory process, and the projected size and frequency of necessary rate adjustments. These revenues will be adequate to cover operating and maintenance expenses, debt service, covenanted debt service reserves, liquidity requirements, and equity funding for the capital program. Rates and Prices for the PWSA's water and wastewater services will be based on the current tariff filing with the Public Utility Commission (PUC).

Sources of Financing: The PWSA may use a combination of equity and debt to finance capital additions to the system such that both current and future customers are allocated an equitable portion of the costs. The PWSA may borrow for capital projects when it is appropriate to spread the costs of capital assets over an approximation of their useful lives.

- Capital market considerations require an equity base to support financing. The PWSA will build equity during those periods when major capital projects are not being undertaken by financing capital projects from revenues. In this way, the PWSA will build equity sufficient to maintain financial integrity, ensure access to the debt markets, and provide for the growing needs of customers.
- As appropriate, the PWSA will evaluate mechanisms to restructure or refinance debt. PWSA will continually evaluate financing opportunities that achieve the objective of lowering the overall cost of capital for ratepayers while also not increasing risks within the debt portfolio.

Pay-As-You-Go Funding and Cash Reserves: The PWSA will adopt the following financial goals to reduce the long-term borrowing requirements of capital projects in addition to providing for maximum liquidity flexibility.

- As part of the annual capital budgeting process, financial performance will be evaluated with the goal of funding at least ten (10) percent of capital expenditures not supported by grants or intergovernmental aid from pay-as-you-go funding as measured on a five-year basis.
- Maintain cash reserves, including the operating reserves, rate stabilization fund, and revenue fund at a level of 100 days cash on hand with the goal of increasing to over 200 days over the next five (5) years.

Variable-Rate Financing: The variable-rate debt limit is ten percent (10%) of total capitalization, long-term debt plus capital employed as presented periodically in the PWSA's financial statements. Variable-rate debt that is hedged by derivative products, such as interest rate swap agreements, will not be considered variable-rate debt when calculating the variable-rate limit. The PWSA will be very cautious about using variable-rate debt because of its increased risk potential. Variable-rate debt will only be used to provide flexibility in its overall capital program and to manage its overall interest rate exposure. In these instances, the Board must be educated on why the use of variable-rate

is preferred over fixed rate debt. The Board must ultimately approve the use of variable-rate debt.

Debt Service Reserves: The amount of debt service requirements for each bond issuance will be governed by the existing Bond Indenture and will support the marketing goals of the bond issue. As allowed in the Restated and Amended Indenture, the PWSA can either secure bonds as a part of the Common Debt Service Reserve Fund or with a Series Debt Service Reserve Fund after considering the financial and market implications.

PLANNING:

Business Plan/Budget Planning: The PWSA will prepare a business plan/budget to be submitted for Board approval before the start of each fiscal year. The business plan/budget will include the organization's goals and objectives and will describe the projects, products and services that comprise a five-year (5) forecast for:

- Operating and maintenance expenses.
- Capital expenditures.
- Capital funding sources.
- Operating and other reserve requirements.
- Debt service requirements.

This information will be provided in appropriate detail to the PWSA staff.

Adoption of the business plan/budget authorizes the Executive Director to complete work plans and make associated expenditures within budgets as provided for in accordance with Board policies. The resolution adopting the business plan/budget will establish the capital and operating budgets for the upcoming fiscal year. Such amounts may not be exceeded without Board approval. Approval of the business plan constitutes authorization to proceed with capital projects included in year one (1) of the plan and establishes the projects' respective lifetime budgets. The resolution adopting the business plan/budget also will include guidelines for authorizing capital spending and reporting requirements for business plan/budget results.

Quarterly Business Plan/Budget Update: The Executive Director will provide quarterly updates that include indicators of year-to-date operational and financial performance, progress toward key goals, and financial performance projections.

Policy Revision History:

Last Updated Date: (MO/DD/20XX)	Editor:	Location of change(s), what was changed, and why:
10/26/2018	Edward Barca	Original
10/03/2019	Edward Barca	Increased financial metric goals in the "Pay-As-You-Go Funding and Cash Reserves" Section

Business Plan/Budget – The business plan/budget is the document approved by the Board annually that establishes the Board's goals and priorities. The business plan/budget includes operating and capital budgets as well as projections of PWSA's overall financial performance and capital financing plans. It describes the projects, products and service that support the associated revenues and expenditures over a five-year period.

Debt Service Coverage (Coverage) – Debt service coverage is the ratio of the fiscal year's ending total revenues minus total operating and maintenance expenses (net of depreciation, amortization, and other revenue and expense exclusions resulting from prior period funding), divided by scheduled debt service on all obligations as approved in the business plan/budget.

Equity Ratio – The calculation is the ratio of total equity divided by total assets.

Fixed-Rate Debt – Fixed-rate debt consists of coupon securities that have a scheduled maturity or mandatory sinking fund redemption date. Fixed-rate debt that has been synthetically converted to variable rate debt via a derivative instrument will be classified as fixed-rate debt for the term of the derivative instrument.

Long-Term Liabilities – Long-term liabilities are (1) principal amounts on long-term debt instruments, (2) pension liabilities, and (3) amounts owed on long-term obligations.

Operating and Maintenance Expenses – Operating and maintenance expenses consist of all reasonable and necessary costs and expenses incurred in the operation and maintenance of the PWSA system.

Variable-Rate Debt – Variable-rate debt consists of securities on which the interest rate varies over time (a) based on an index or formula such as variable-rate demand notes or auction-rate bonds, or (b) based on a rate that varies and allows the successful marketing of the bonds or notes.

Exhibit EB-7

The Pittsburgh Water and Sewer Authority Debt Summary
Outstanding Bonds and Loans Payable (\$000's)

As of February 1, 2021



	A	B	C	D	E	F	G	H	I	J	K	L	M
Senior Lien													
Series Name	Date of Issue	Date of Maturity	Amount Issued	Amount Outstanding	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses ¹	Net Proceeds
Series B of 1998 ²	Mar-1998	9/1/2030	\$ 36,440	\$ 63,352	\$ 70,655	5.18-5.31%	N/A	N/A	N/A	\$ -	\$ -	\$ -	\$ 32,400
Series 2013A	Dec-2013	9/1/2033	130,215	67,420	62,795	0.75%-5.00%	N/A	N/A	N/A	-	10,903	13,436	127,682
Series 2013B	Dec-2013	9/1/2040	86,695	38,760	47,935	3.00%-5.25%	N/A	N/A	N/A	-	3,926	613	90,008
Series 2017A	Dec-2017	9/1/2032	159,795	129,610	30,185	3.00%; 5.00%	N/A	N/A	N/A	-	23,374	1,778	181,391
Series 2017C-1 (JPM Swap) ^{3,4}	Dec-2017	9/1/2039	72,748	72,748	-	SIFMA + 0.65%	3.784%	SIFMA - 0.118%	4.5520%	-	-	693	72,054
Series 2017C-2 (MLCS Swap) ^{3,4}	Dec-2017	9/1/2039	72,748	72,748	-	SIFMA + 0.65%	3.770%	SIFMA - 0.118%	4.5380%	-	-	693	72,054
Series 2017C-3 (JPM Swap) ^{3,4}	Dec-2017	9/1/2040	71,225	71,225	-	SIFMA + 0.65%	3.826%	SIFMA - 0.118%	4.5935%	-	-	679	70,546
Series 2017C-4 (Unhedged) ⁵	Dec-2017	9/1/2035	2,085	2,085	-	SIFMA + 0.65%	N/A	N/A	2.5000%	-	-	20	2,065
Series 2019A	July-2019	9/1/2044	109,855	107,560	2,295	5.00%	N/A	N/A	N/A	-	22,468	1,123	131,200
Series 2020A	Dec-2020	9/1/2022	890	890	-	0.70%	N/A	N/A	N/A	-	-	13	877
Series 2020B	Dec-2020	9/1/2050	91,520	91,520	-	3.00%-5.00%	N/A	N/A	N/A	-	16,665	1,185	107,000
Subordinate Lien													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses ^{1,6}	Net Proceeds
Series 2019B	July-2019	9/1/2035	104,290	104,290	-	4.00%-5.00%	N/A	N/A	N/A	-	22,621	28,952	103,660
Third Lien													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses	Net Proceeds
Pennvest Loans	Various	4/1/2045	157,024	120,014	37,010	1.00% - 2.97%	N/A	N/A	N/A	-	-	-	-
PNC Capital Line of Credit ⁷	June-2020	6/23/2023	150,000	26,665	N/A	79% LIBOR + 1.61%	N/A	N/A	N/A	-	-	-	-

¹ Includes legal and professional costs, underwriters' discount, bond insurance premium, surety premium and/or swap termination payments, if applicable, to respective series of bonds.

² Column C is the Initial Stated Amount (Capital Appreciation Bonds); Column D is based on accreted value as of 02/01/2021 and Column E is the total amount paid and/or refunded as of 02/01/2021.

³ Column C represents the portion of the Series C of 2017 which is connected to certain swap agreements or is unhedged.

⁴ The Authority entered into a SIFMA vs. 70% of 1M LIBOR overlay basis swap with Merrill Lynch Capital Services to manage variable rate interest payments associated with the 2017C Bonds. The overlay basis swap effectively converts the floating leg receipts of the Authority's three fixed payer swaps from 70% of 1M LIBOR to SIFMA in order to match the floating leg payment of the remarketed 2017C Bonds for the three year remarketed period. The overlay basis swap also contains a fixed leg component, payable by the Authority to the swap counterparty, of 0.1180% which effectively increases the fixed rates paid by the Authority on its three fixed payer swaps while the overlay basis swap is outstanding.

⁵ Net rate is assumed of 2.50% for the purposes of this summary.

⁶ Issuance expense includes \$27,605 million for a swap termination payment.

⁷ Has unutilized fee of 0.40% if less than 50% is drawn on the LOC and an unutilized fee of 0.25% if more than 50% is drawn on the LOC.

Exhibit EB-8

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

Assets	2019	2018
Current assets:		
Cash and cash equivalents	\$ 64,680	\$ 46,920
Accounts receivable, net:		
Water:		
Billed	7,138	8,537
Unbilled	8,965	8,583
Total water	16,103	17,120
Wastewater treatment:		
Billed	2,130	7,014
Unbilled	3,725	3,719
Total wastewater treatment	5,855	10,733
Other receivables	2,450	1,510
Total accounts receivable, net	24,408	29,363
Prepaid expenses	707	520
Inventory	1,597	1,984
Total current assets	91,392	78,787
Noncurrent assets:		
Restricted assets:		
Cash and cash equivalents	16,360	13,970
Investments	9,604	9,356
Total restricted assets	25,964	23,326
Hedging derivative - interest rate swap	-	4,750
Capital assets, not being depreciated	135,287	139,303
Capital assets, net of accumulated depreciation	695,291	618,177
Total noncurrent assets	856,542	785,556
Total Assets	947,934	864,343
Deferred Outflows of Resources		
Deferred charge on refunding	99,012	102,534
Accumulated decrease in fair value of hedging derivatives	13,351	757
Total Deferred Outflows of Resources	112,363	103,291

(Continued)

The notes to financial statements are an integral part of this statement.

PITTSBURGH WATER AND SEWER AUTHORITY

STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2019 AND 2018

(Continued)

	2019	2018
Liabilities		
<hr/>		
Current liabilities:		
Bonds and loans payable	27,022	23,400
Accrued payroll and related obligations	989	1,373
Accounts payable wastewater treatment	19,017	19,349
Accounts payable and other accrued expenses	22,720	20,911
Accrued interest payable from restricted assets	9,618	4,629
	<u>79,366</u>	<u>69,662</u>
Total current liabilities		
Noncurrent liabilities:		
Unearned revenue	121	143
Accrued payroll and related obligations	621	558
Swap liability	13,351	13,254
Bonds and loans payable, net	965,303	883,626
	<u>979,396</u>	<u>897,581</u>
Total noncurrent liabilities		
	<u>1,058,762</u>	<u>967,243</u>
Total Liabilities		
<hr/>		
Deferred Inflows of Resources		
<hr/>		
Accumulated increase in fair value of hedging derivatives	-	4,750
	<u>-</u>	<u>4,750</u>
<hr/>		
Net Position		
<hr/>		
Net investment in capital assets	(15,365)	(14,892)
Restricted	19,320	16,388
Unrestricted	(2,420)	(5,855)
	<u>(15,365)</u>	<u>(14,892)</u>
Total Net Position	<u>\$ 1,535</u>	<u>\$ (4,359)</u>

(Concluded)

The notes to financial statements are an integral part of this statement.

Exhibit EB-9

CREDIT OPINION

5 November 2020

✓ Rate this Research

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Pittsburgh Water & Sewer Authority, PA

Update to credit analysis

Summary

The Pittsburgh Water & Sewer Authority, PA's (A3 stable) credit profile continues to improve, with financial metrics steadily strengthening over the last three years. Liquidity is particularly improved and is expected to be maintained at roughly 140 days' cash on hand at the end of fiscal 2020, up from a critically low 29 days' cash at fiscal 2017 year end. The Authority (or "PWSA") continues to benefit from improvements to operations and controls implemented through Pennsylvania Public Utility Commission (PUC) oversight, effective as of April 2018, as well as the strength of its own management team. Both changes to PWSA's governance have contributed to its satisfactory financial position over the past three years.

The Authority continues to face material pressure to improve its infrastructure given years of disinvestment. Coupled with its own consent decree pertaining to combined sewer overflows during wet weather events, which will be negotiated starting 2021, the Authority will necessarily add to its already elevated debt burden in the near term. PWSA anticipates roughly \$1.2 billion in capital spending over the next five years, largely funded by debt. This will add to leverage substantially, and future credit reviews will focus on the Authority's ability to manage additional debt while maintaining satisfactory cash and coverage metrics; largely dependent on PWSA's ability to increase rates as needed.

The Authority provides water distribution and wastewater collection and conveyance for the city of Pittsburgh (A1 stable) and neighboring municipalities. The city's diverse economy is a credit positive for the Authority. Favorably, PWSA reports continued strong revenue collections despite the onset of the coronavirus pandemic; average monthly collections stand at 97.43% as of September 2020, compared to 99.2% for 2019.

The Authority's 10 largest customers (3.7% of revenues) include major Pittsburgh institutions, such as the Fox Chapel Water Authority, Allegheny County (Aa3 stable), University of Pittsburgh (Aa1 stable), and Allegheny Health Network. All of the Authority's five largest customers have been in the system for at least 75 years. Notably, given a newly renegotiated cooperation agreement with the city of Pittsburgh, most city buildings are now metered for water going, with the city paying for water usage - something it had not done previously.

The Authority continues to maintain an ample water supply, providing water to a population of approximately 305,000. The system is permitted to draw up to 100 million gallons per day (MGD) from the Allegheny River, its sole water source, though average demand for water is well below that level, at 70 MGD. The Authority treats drinking water at one plant located on the river, as well as a microfiltration plant at one of its reservoirs. The Authority

has capacity to store approximately 3 days' worth of finished water for uninterrupted supply to its customers.

The Authority does not treat wastewater. It transmits all of its sewage to the Allegheny County Sanitary Authority. There is no contractual limit to the amount of sewage that can be conveyed, however, during wet weather events, the existing system frequently overflows.

The system currently experiences unusually large water loss. One of the Authority's current major infrastructure projects is a complete metering and mapping of its system. Metering will not only address the system's water loss but will also help PWSA target repairs such that widespread boil water advisories should become less frequent. Some of the Authority's other important near term improvements include hiring an expanded workforce to carry out maintenance of the system's general infrastructure up to current industry standards, and replacing water mains in line with accepted industry norms. The Authority has already implemented considerable workforce expansion plans to this end, and now employs a staff of 349 as of September 2020, compared to 247 employees in 2016.

Ordinary system updates and routine infrastructure improvements had been sorely lacking at PWSA, and years of deferred maintenance have led to cost inefficiencies and exacerbated the natural wear and tear on an already aged system. PUC oversight since 2018 has already served to remediate some of this by establishing guidelines for system improvements based on industry-wide standards.

This additional operational oversight by the PUC is a strong credit positive, especially given the onset of the coronavirus pandemic and the possibility of a longer term recessionary impact. During past periods of economic stress, the Authority used capital deferment as a tool to maintain satisfactory finances, and rate increases were heavily influenced by local politics. Through the PUC's oversight, rate increases are still measured against affordability, but are not as politicized. Further, while certain capital projects may be slowed to accommodate softening revenue if necessary, a complete sidelining of the capital plan and required maintenance is unlikely.

Beginning in 2019, the Authority was required to meet a covenant of 125% of senior debt service coverage plus 110% of subordinate debt service coverage without the use of free cash. PWSA met both of these requirements in both fiscal 2019 - with Moody's calculated coverage of 1.97 and 1.68 times, respectively - as well as fiscal 2018, with PWSA reporting senior lien debt service coverage of 1.89x and overall coverage of 1.37x.

The Authority expects a 10.8% rate increase for fiscal 2021, which would bring in an additional \$19 million in revenue if realized. This will be the second rate increase implemented with approval from the PUC; the first was a 13% rate increase in early 2019.

The Authority's rate increases have been prompted by its substantial capital needs. While improved revenues will continue to shore up reserves, consistent rate increases over the long term more will be required to support future debt issuance. Key drivers of Moody's future credit reviews will continue to include management and governance of the Authority, maintenance of satisfactory coverage and liquidity metrics, and PWSA's ability to satisfy environmental and capital improvements while effectively managing leverage and fixed costs.

In November 2017, the Authority entered into a Consent Order and Agreement with PA DEP related to elevated lead levels within the distribution system. To counteract the increased lead levels, the Authority has replaced over 8,000 lead lines since 2016 and implemented an approved corrosion control treatment called orthophosphate into the water system. As of June 2020, the Authority has achieved two consecutive 6 month lead testing periods with results well below the federal action level. The PWSA is now in compliance with the lead action level and has satisfied all obligations under the Consent Order and Agreement.

Credit strengths

- » Diverse, urban Pittsburgh service area, supported by strong "eds & meds" presence
- » Considerable size; system assets include water conveyance and treatment, and sewer conveyance that ties to ALCOSAN
- » Significant, recently implemented rate increases boost revenues; PUC oversight brings improvements and controls

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moody's.com for the most updated credit rating action information and rating history.

Credit challenges

- » Substantial debt burden; debt ratio is 103%
- » Narrow, though improved, liquidity versus similarly sized peers
- » Projected \$1.2 billion in capital needs over the next five years, to be primarily funded with debt
- » Consent decree to remediate combined sewer overflows not yet finalized

Rating outlook

The stable outlook reflects the authority's improved financial position as well as the credit-positive impact of PUC oversight and the strength of PWSA's management team, which we believe will serve to keep the Authority's finances and operations stable in the near term.

Factors that could lead to an upgrade

- » Substantial improvement in liquidity that is maintained over several reporting periods
- » Meaningful reduction of debt
- » Sustained improvements in debt service coverage

Factors that could lead to a downgrade

- » Material narrowing of debt service coverage and liquidity position
- » Inability to raise rates sufficiently to meet debt service coverage covenants while also funding significant deferred capital improvements
- » Failure to effectively deploy new revenues to address near term infrastructure and operating needs
- » Substantial new or worsening long-term environmental concerns

Key indicators

Exhibit 1

Pittsburgh Water & Sewer Authority, PA					
System Characteristics					
Asset Condition (Net Fixed Assets / Annual Depreciation)	46 years				
System Size - O&M (in \$000s)	\$165,230				
Service Area Wealth: MFI % of US median	88.84%				
Legal Provisions					
Rate Covenant (x)	125% Senior plus 110% subordinate debt service				
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test (Aa)				
Management					
Rate Management	A				
Regulatory Compliance and Capital Planning	A				
Financial Strength					
	2015	2016	2017	2018	2019
Operating Revenue (\$000)	\$174,164	\$180,727	\$202,996	\$231,734	\$249,049
System Size - O&M (\$000)	\$116,908	\$131,936	\$157,220	\$153,180	\$165,230
Net Revenues (\$000)	\$57,455	\$49,174	\$47,071	\$81,565	\$87,280
Net Funded Debt (\$000)	\$747,615	\$727,526	\$817,394	\$871,040	\$915,696
Annual Debt Service (\$000)	\$51,412	\$53,174	\$57,818	\$59,406	\$52,010
Annual Debt Service Coverage (x)	1.1x	0.9x	0.8x	1.4x	1.7x
Cash on Hand	88 days	60 days	26 days	112 days	143 days
Debt to Operating Revenues (x)	4.3x	4.0x	4.0x	3.8x	3.7x

Source: Moody's Investors Service, Authority audited financial statements

Profile

PWSA is an authority of the city of Pittsburgh (A1 stable), providing water treatment and conveyance to 84% of the city's population of roughly 305,000 residents and sewer conveyance for the entire city.

Debt and Pensions

The additional borrowing implied by the authority's capital needs will increase an already elevated debt burden. The authority's total debt is equal to 103% of fixed assets as of 2019 year end, well above similarly sized peers. The outstanding debt amortizes slowly, with only 42% of principal scheduled to be repaid in the next 10 years.

The Authority introduced a new indenture in 2017, which strengthened the rate covenant. The new requirement is 125% of senior debt service coverage plus 110% of subordinate debt service coverage. Free cash will no longer be used to increase coverage under the new indenture. The new test was effective for fiscal year 2019. The debt service reserve is funded at the lesser of the three-pronged test.

Debt structure

The Authority materially reduced its variable rate debt outstanding with its Series 2019 A&B issuance. Variable rate debt has been reduced to 29% of the total debt portfolio as of fiscal 2019, from 44%. When the Authority refunded out of this variable rate exposure, it also terminated associated swaps, materially reducing its swap counterparty risk.

There is one variable rate issuance outstanding currently - the Authority's senior lien Series 2017C bonds - which will be remarketed on December 1, 2020. The bonds will be remarketed with a rate indexed to SIFMA, rather than LIBOR. Since the fixed-to-floating rate swaps associated with the 2017C bonds are LIBOR-based, the Authority will layer on a basis swap alongside the remarketing in order to convert the variable rate received on the swaps to SIFMA from LIBOR, creating an effective hedge for the bonds.

Assured Guaranty Municipal Corp. (A2 stable insurance financial strength) insures the authority's variable rate bonds and all of the authority's swaps, except the 2020 basis swap, and provides the surety policy for all debt service reserve funds, except the reserve associated with PWSA's 2013 bonds, which is cash funded.

This counterparty concentration may adversely impact the authority should AGM's credit quality deteriorate.

The Authority also maintains \$123 million outstanding in PennVest loans as of September 2020 and an \$150 million revolving credit facility, of which \$106 million is currently drawn. The Authority will apply proceeds from its Series 2020 issuance to pay down the credit line. Given an intercreditor agreement, PennVest and PNC share a third lien priority on system revenues.

Debt-related derivatives

The authority maintains floating-to-fixed rate swaps in support of its Series 2017C issuance under ISDA Master Agreements with JP Morgan Chase Bank N.A. (64%) and Merrill Lynch Capital Services (36%), whereby the authority pays a fixed interest rate semi-annually (3.79% weighted average) and receives 70% of LIBOR. The Authority will enter into a basis swap in 2020 to convert the LIBOR received rate to SIFMA.

AGM provides swap insurance for all swaps. The aggregate swap mark to market has been reduced to a negative \$13.5 million as of fiscal year end 2019 from a negative \$86 million aggregate mark-to-market prior to the elimination of PWSA's subordinate variable rate debt and associated swaps during the year. The elimination of material, concentrated, counterparty risk is a strong credit positive to the Authority's debt profile.

The floating-to-fixed rate swaps are included in the parameters of a credit support annex (CSA), though there is no collateral posting requirement unless an Insurer Event occurs. The basis swap is excluded from the CSA. The amortization schedule for each swap mirrors that of the corresponding bonds and the swaps terminate at bond maturity. The basis swap terminates in December 2023 with the next mandatory tender of the Series 2017 C bonds. For all of the swaps, per the 2017 indenture, regularly scheduled swap payments are subordinate to subordinate bond debt service. Early termination is optional for the authority only, and termination by the counterparty depends upon specified termination events, including the downgrade of PWSA's underlying rating below investment grade. An authority termination payment would be subordinate to first and second lien debt service payments.

Pensions and OPEB

Most of the authority's employees participate in the city's pension program. The Authority's share of its pension contribution is now accurately provided for through its renegotiated cooperation agreement with the city. Beginning in 2019, all new full time non-union PWSA employees are eligible to participate in a 401(a) retirement plan and do not have the option of enrolling in the city's municipal pension fund plan.

ESG considerations

Environmental

The Pittsburgh metropolitan area faces a high risk of elevated rainfall levels. Demonstrated elevated rainfall levels in the region have directly impacted PWSA, as wet weather events overwhelm the system's current combined sewer infrastructure. This is the reason for the Authority's consent decree related to combined sewer overflows.

Social

Pittsburgh's population is relatively stable at roughly 305,000 and the five year average annual growth rate of the city's full value is a robust 6% as of fiscal 2020, well above the US median of 0.6%. Nevertheless, the city's wealth indicators remain below average with median family income at just 88% of the nation. Poverty is also elevated at 21%. As PWSA has increased rates, it has also implemented a rate relief program for qualifying residents, acknowledging this weakness in its rate base.

The coronavirus pandemic is considered a social risk under our ESG framework. PWSA's current credit profile considers the pandemic's impact on the Authority's finances and operations. Favorably, customer account collections are reportedly down just modestly in 2020 compared to the prior year, and the Authority continues to project a solid liquidity position at year end. If our view of the credit quality of PWSA changes, we will update the our opinion at that time.

Governance

The Authority's current management team has developed a comprehensive plan to bring operations to good working order and to proceed with much needed capital improvements. Strong governance controls at the Authority are evidenced by three consecutive years of materially improved financial performance.

Management views its relationship with the PUC as well as the DEP and EPA as an opportunity for partnership and has proactively sought to engage these agencies as PWSA moves forward with its substantial CIP. This is a definitive, positive change from the authority's prior actions, and informs our stable outlook on PWSA's current credit profile.

The Authority's Board consists of nine members recommended by a nominating committee, appointed by the Mayor, and approved by City Council. Currently, seven of the nine Board seats are filled. Starting in 2020, city water charges are being phased in pursuant to a cooperation agreement, effective as of October 2019. The Authority provided water to the city at no cost prior to 2020. Among other things, the cooperation agreement also provides for payments between the city and the PWSA to be based upon actual, verifiable, direct expenses, and in accordance with customary utility practices under the PUC Code, and importantly, confirms that payments by the PWSA to the city will continue to be subordinate to all debt obligations of the PWSA.

Pennsylvania's Public Utility Commission began oversight of the authority in April 2018. The PUC is responsible for regulating the authority's rate making, operating effectiveness, and debt issuance. We expect that the PUC will bring standardization and effective governance to the authority's future operations. The PUC is required to approve rate increases that will ensure PWSA complies with its bondholder covenants, though we note that the approval process for increases can be lengthy.

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CLIENT SERVICES

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Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

Exhibit EB-10

RatingsDirect®

Summary:

Pittsburgh Water and Sewer Authority; Water/Sewer

Primary Credit Analyst:

Theodore A Chapman, Farmers Branch (1) 214-871-1401; theodore.chapman@spglobal.com

Secondary Contact:

Edward R McGlade, New York (1) 212-438-2061; edward.mcglade@spglobal.com

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Summary:**Pittsburgh Water and Sewer Authority;
Water/Sewer****Credit Profile**

US\$93.36 mil wtr and swr 1st ln rev bnds ser 2020 B due 09/01/2050		
<i>Long Term Rating</i>	A/Stable	New
US\$1.015 mil wtr and swr 1st ln rev bnds ser 2020 A due 09/01/2050		
<i>Long Term Rating</i>	A/Stable	New
Pittsburgh Wtr & Swr Auth WTRSWR		
<i>Long Term Rating</i>	A/Stable	Affirmed
Pittsburgh WS (AGM)		
<i>Unenhanced Rating</i>	A-(SPUR)/Stable	Affirmed
Pittsburgh WS (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed

Rating Action

S&P Global Ratings assigned its 'A' rating to the Pittsburgh Water and Sewer Authority's (PWSA) \$1.015 million taxable series 2020A and \$93.36 million series 2020B first-lien revenue bonds. At the same time, S&P Global Ratings also affirmed the 'A' rating on PWSA's \$218.805 million series 2017C (subseries 1 through 4) first-lien revenue refunding bonds, which are being remarketed with a three-year soft put on Dec. 1, 2023. In the event of a failed remarketing, the series 2017 bonds would reset to the maximum permitted interest rate, not to exceed 12%. The outlook is stable.

The series 2017C bonds will likely be remarketed in floating rate mode; the subseries 1, 2, and 3 will each be associated with a basis swap to effectively convert the variable-rate bonds to the Securities Industry and Financial Markets Association (SIFMA) index rate from 70% of the London Interbank Offering Rate (LIBOR). The counterpart for this overlay swap is Merrill Lynch Capital Services Inc. with a notional amount of \$216.72 million. In addition, subseries 1 is already synthetically fixed by way of an interest rate swap with JPMorgan Chase Bank N.A.; subseries 2 is synthetically fixed by way of an interest rate swap with Bank of America Merrill Lynch N.A.; and subseries 3 is synthetically fixed using an interest rate swap also with JPMorgan Chase Bank N.A. Although only a point-in-time snapshot and--barring a termination event such as the rating on PWSA falling below 'BBB-'--not an actual liability, those swaps are currently substantially out of the money. Subseries 4 is not hedged.

We also affirmed our 'A' rating on PWSA's approximately \$624 million in outstanding first-lien revenue bonds and our 'A-' rating on PWSA's \$104.3 million in subordinate-lien revenue bonds. PWSA also has about \$157 million in subordinate-lien state loans, and--following these transactions--about \$2 million drawn on a \$150 million subordinate-lien committed line of credit with PNC Bank N.A. in place through 2022. The outlook is stable.

The first-lien bonds are secured by a senior-lien pledge on the net revenues of the authority's waterworks and sanitary sewer system. A fully funded common reserve in the amount of the lesser of maximum annual debt service (MADS), 125% of average annual debt service or 10% of par provides additional liquidity on the senior-lien bonds; an amendment in 2017 to the master trust indenture permits a surety to be used to satisfy any future series-by-series reserve fund requirement. The 2017 amendments additionally strengthened the covenants by eliminating consideration of the use of certain cash reserves toward compliance with the rate covenant, and limiting the frequency with which transfers in from the rate stabilization fund can be used toward meeting the rate covenant.

The authority will use the proceeds of the taxable series 2020A bonds to finance the cost of issuance related to the remarketing of the series 2017C bonds. The proceeds of the series 2020B bonds will be used to repay draws of \$107 million on the \$150 million line of credit.

We have applied our primary utility revenue bond criteria to determine the authority's general creditworthiness and have applied this rating to its senior-lien issues. We rate PWSA's subordinate lien one notch lower based on the application of our criteria "Assigning Issue Credit Ratings Of Operating Entities" (published May 20, 2015) given the open status of the senior lien and the likelihood that PWSA will continue to use the senior lien from time to time.

Credit overview

Our view of PWSA's general creditworthiness is based on its very strong enterprise risk profile and its strong financial risk profile. The enterprise risk profile reflects our view of Pittsburgh's:

- Role as the anchor and economic engine for western Pennsylvania, based on an employment base that has reinvented itself from one that once relied heavily on manufacturing and industrial jobs;
- Rates for service that have been pressured over the past decade by the unfunded mandates, and will now need to be reviewed by the state's rate regulator; and
- Operational management assessment (OMA) that we view as good even despite the aforementioned challenges.

The financial risk profile reflects our view of the system's:

- Extremely high leverage, with \$1.2 billion in capital commitments identified through fiscal 2025 likely to continue to pressure the financial profile;
- Strong on-balance sheet liquidity, supported further by available credit lines; and
- Financial management practices and policies we consider good.

The stable outlook reflects our expectation that when PWSA does need to propose a rate case to the state Public Utility Commission (PUC) there will generally be a credit-supportive relationship, observed by both the timing and magnitude of rate adjustments that PWSA is likely to request, versus what the PUC ultimately grants. We are assuming that the financial profile will be further stabilized by the sufficiency test in the rate covenant--which does not allow for the use of cash transfers. We will also likely keep in place the one-notch distinction between the first- and subordinate-lien debt.

Environmental, social, and governance factors

In our view, PWSA has outside risks related to each of environmental, social, and governance factors, although each of these are generally trending favorably. The authority in previous years faced scrutiny from local and state elected officials who voiced concerns over its operations. An auditor general's opinion released in November 2017 cited "aging and deteriorating infrastructure issues and financial and operational long-term viability issues" and was an important factor in legislation that ultimately placed PWSA under Pennsylvania Public Utility Commission's (PUC) oversight as of April 1, 2018. The PUC now regulates the authority's rates and fees, and must approve additional debt. PWSA's management team has worked closely with regulators and other stakeholders and has already achieved several measures that are likely to improve operations and financial capacity. This includes tentative approval of a distribution system improvement charge that will be dedicated to underground infrastructure rehabilitation. PWSA has also implemented various socially directed programs such as lead service line replacements and customer bill-pay assistance programs. We view the latter as a credit quality stabilizer that could allay affordability concerns. PWSA's moratorium on shut-offs and disconnections remains in place as well, out of health and safety concerns related to COVID-19. PWSA's own environmental compliance mandates, as well as drinking water efficiency are two key programs in PWSA's capital budget and have been the major drivers for the need to consider additional rate adjustments; the authority has the ability to administratively pass through and recover costs from its wholesale wastewater treatment provider. PWSA, under its Green First plan, is also piloting approximately a dozen projects to experiment with different approaches to green infrastructure and overflow reduction that could also present capital budget cost savings.

Stable Outlook

Downside scenario

If, as S&P Global Economics projects, credit conditions for all governments and their related utilities face headwinds such as elevated unemployment for the next several years because of a potentially uneven and prolonged recovery, this could increase the likelihood of unfavorable variances to budget.

Upside scenario

Management has represented that total debt service coverage (DSC) will generally trend toward about 1.25x and on-balance sheet available reserves equivalent to four-five months of operating expenses. Consistently outperforming financial projections while meeting the long-term challenges presented by an aging system, compounded by regulatory pressures, would be the key to achieving a higher rating.

Credit Opinion

Enterprise risk

PWSA provides drinking water and sewer collection to more than 81,000 metered accounts in most, but not all, of the city, as well as five neighboring municipalities and three wholesale customers for needs ranging from emergency interconnections and peaking to full requirements. It also provides sewer collection to the entire city. Although median household effective buying income (MHHEBI) is only 78% that of the U.S., the local economy has long since

transitioned from its historical manufacturing base. Those sectors are still part of the employment base. Financial services, health care, and a booming technology sector are all increasingly important contributors to the metropolitan statistical area (MSA) and prior to the COVID-19 pandemic and the subsequent recession were all exhibiting steady growth. The diversification and growth have made the MSA's economy more resilient; as of September 2020 the 8.2% unemployment rate--while still very high--is half of what it was just five months earlier. We do not view there to be any dependence on the authority's principal customers, given they include another water authority and the University of Pittsburgh. Regional water authority wholesale customers do have some minimum contractual payments to PWSA, lending further stability to cash from operations.

Based on our organizational management assessment, we view PWSA to be a '4' on a scale of 1-6, with '1' being the strongest. An assessment of standard, in our opinion, implies that overall alignment between the system's operational characteristics and its management is sufficient although there are areas of opportunity. The 2019 consulting engineer's report noted that although the existing infrastructure is adequate to safely and reliably serve the current customer base, "significant structural, operational, and maintenance improvements are required and must be undertaken in the near term to address longstanding deficiencies in both the water and sewer systems." Although rate regulation of municipal-owned systems is less common in Pennsylvania, we view this as currently neutral to credit quality. We have noted that generally, rate regulation in Pennsylvania is supportive of credit quality, although the relationship between the two entities is still developing. We will look primarily to the magnitude of what is awarded versus what is requested in future rate cases, as well as the timing, and how much of the substantial capital improvement plan (CIP) can be put into the rate base with each review; the PUC is compelled to respond within 270 days. In our view, while serious, the move to PUC oversight is indicative of the identified need for infrastructure investments, which we have observed all parties seem to agree are necessary. The CIP contains projects that are both based on PWSA's prioritization as well as those reflecting consent decrees.

Much of the existing infrastructure was also built to serve a much larger population and a workforce much different from today's. While we note, for example, that the city has an essentially unlimited raw-water supply from the Allegheny River and overall system capacity that could support a population several times the size of the current one, it is also the case that the authority's main focus remains the renewal and replacement of its aging underground infrastructure. The water distribution system is also an identified area of opportunity given the high non-revenue water percentage, attributable to line losses. However, under a 2019 cooperation agreement, the city will no longer receive free service, which alone should help improve non-revenue water. The renegotiated agreement will not affect the capital lease agreement, and PWSA still intends to purchase the system from the city for \$1 in 2025 under the terms of the current agreement.

PWSA is also dealing--directly and indirectly--with mandates from environmental regulators to address combined sewer overflows and wastewater treatment requirements. For example, Allegheny County Sanitary Authority's (ALCOSAN) 2008 consent decree is expected to cost \$2.0 billion by 2036; PWSA represents about 35% of ALCOSAN's total operating revenues based on the 2020 budget. While PWSA may see rising costs from ALCOSAN, it is not party to nor directly financially responsible for ALCOSAN's consent decree. PWSA has also been working its way through its own consent decree since 2004. Most of the projects in scope for PWSA's consent decree have already reached substantial completion, and some of the remaining projects have been proposed to environmental authorities to be

addressed using green infrastructure. Although management has been separating the sewer system in the areas of growth and redevelopment, 77% of the collection system is still a combined storm and sanitary infrastructure. In 2018, PWSA notified the city that the authority intends to assume responsibility for the stormwater system, allowing for more efficient integrated planning and mitigation.

The PUC approved a rate increase of approximately 13% in February 2019, although less than the requested 17.1%; a \$19 million increase to operating revenues for fiscal 2021 (about an 11% increase) is pending final approval from the PUC. PWSA is able to administratively fully pass through and recover ALCOSAN billings and the surcharge for distribution system improvements. Management intends to implement stormwater charges by fiscal 2022. For fiscal 2020, the average customer--using 3,000 gallons of both water and sewer service plus ALCOSAN's treatment surcharge--pays about \$102 per month, or 3% of MHHEBI. As costs increase over time to support the capital plan, headroom for affordability, especially to lower-income customers, could diminish.

Financial risk

Although a moratorium on shut-offs and disconnections remains in place, through the first three quarters of 2020 revenues were only off 2.9% versus budget. All-in DSC by our calculation was below 1x in 2016-2017, but strengthened to almost 1.5x in 2018 and even further, almost 1.7x, in 2019 following the rate increase. Based on our review of management's projections, all-in DSC is likely to trend toward 1.25x assuming additional debt and a supportive relationship with the PUC. All-in DSC is S&P Global Ratings' adjusted DSC metric that includes all obligations of the system regardless of lien or accounting treatment.

The system's liquidity remains an area of consistency and credit strength. Total available reserves also include the line of credit, designated as an interim funding mechanism for capital projects that will be almost completely repaid following the 2020 transactions. A \$20 million line also with PNC to support the operating budget expired in 2019 and was not renewed. All told, cash and equivalents held by PWSA remains sound, usually equivalent to four-six months of operating expenses. At the end of fiscal 2019, the authority had \$65 million in on-balance sheet working capital (exclusive of any undrawn capacity on the credit line), equivalent to four months of total operating expenses (even including the ALCOSAN costs). Even with the COVID-19-related impact to revenues, management's most recent monthly interim financials project a year-end cash balance of \$51 million for fiscal 2020. In addition to the increased revenues related to the 2019 elimination of free service to the city, operating expenses will also be relieved of an annual payment to an adjacent investor-owned water utility, and will have greater defined clarity regarding the financial relationship for indirect costs owed to the city's general fund, further protecting utility cash reserves.

Approximately one-fourth of PWSA's debt is variable rate, most of which is synthetically fixed by way of interest rate swaps. We view the contingent liquidity risk as remote, as the most prominent termination event would be if the ratings on PWSA were to be lowered to below investment grade. Although the current positions of the interest-rate swaps remain materially unfavorable, PWSA has not had to post collateral to its counterparts. Other liabilities include legacy obligations to the city related to PWSA employees who are a part of the city's municipal pension fund plan; PWSA supports about 15% of the \$212 million net pension liability based on authority payroll as a percentage of total municipal employees. This equated to about a \$3.6 million payment in fiscal 2019; the net pension liability reflects a very weak funded level of 46.5%. Beginning in 2019, the pension plan was closed to non-union new hires, who participate in a defined contribution plan, limiting the worsening of the liability. However, the main credit factor that

will determine the future of the rating is the capital plan, given that PWSA has identified over \$1.2 billion of capital needs through fiscal 2025 and expects to debt-finance the bulk of them.

Based on our financial management assessment (FMA), we view the authority to be a '3' on a scale of 1-6, with '1' being the strongest. An FMA of good indicates that we consider practices currently good, but not comprehensive. The authority maintains many best practices we believe are critical to supporting credit quality, particularly in the finance department. These practices, however, may not be institutionalized or formalized in policy, or may not be as robust as those of comparable utilities with an FMA of strong. The FMA of good includes a long-term financial plan that management intends to implement in partnership with the PUC to support its identified capital commitments. The authority also has implemented new, more comprehensive and conservative budgeting assumptions that better capture annual revenue requirements. We understand that the authority's management team regularly tracks budget-to-actual performance and that the new management team is instituting a number of additional best practices to target consistently higher levels of financial performance.

Related Research

- Through The ESG Lens 2.0: A Deeper Dive Into U.S. Public Finance Credit Factors, April 28, 2020

Ratings Detail (As Of November 10, 2020)

Pittsburgh Wtr & Swr Auth WTRSWR		
<i>Long Term Rating</i>	A/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM)		
<i>Unenhanced Rating</i>	A-(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed
Pittsburgh Wtr & Swr Auth WTRSWR (AGM)		
<i>Unenhanced Rating</i>	A(SPUR)/Stable	Affirmed

Many issues are enhanced by bond insurance.

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at www.standardandpoors.com for further information. Complete ratings information is available to subscribers of RatingsDirect at www.capitaliq.com. All ratings affected by this rating action can be found on S&P Global Ratings' public website at www.standardandpoors.com. Use the Ratings search box located in the left column.

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

TESTIMONY OF

THOMAS F. HUESTIS

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024773 (Water)
R-2021-3024774 (Wastewater)
R-2021-3024779 (Stormwater)

Topics:

Support for Proposed Rate Increase
Financial Policies and Goals
Capital Markets Consideration
Peer Review of Financial Metrics

April 13, 2021

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TH-2	Peer Ratings and Comparative Financial Information
TH-3	Moody’s Investors Service, Sector Profile 19 May 2020: Water and Sewer Utilities – US. Medians – Solid Financial Performance, Ability to Increase Rates Underpin Stability
TH-4	Moody’s Investors Service, December 2, 2020: Water and Sewer Utilities – US Outlook – 2021 Outlook Stable Despite Coronavirus Challenges and Economic Slowdown
TH-5	S&P Global Ratings, January 19, 2021: Outlook for U.S. Water and Sewer Utilities: 2021 Provides 2020 Hindsight

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.**

3 A. Thomas F. Huestis. I am a Senior Managing Director and Partner with Public Resources
4 Advisory Group, Inc. (“PRAG”). The business address is 39 Broadway, Suite 1210, New
5 York, New York 10006.

6 **Q. PLEASE DESCRIBE PRAG.**

7 A. PRAG is a national independent financial advisory firm, wholly-owned and managed by
8 its employees that provides independent and in-depth financial capital markets advice to
9 state and local governments, authorities and their agencies and has continuously served
10 governments that access the municipal finance market for the past thirty-five (35) years.
11 PRAG is a Municipal Advisor, registered with the Municipal Securities Rule Making
12 Board (“MSRB”) (MSRB ID K0133) and the Securities and Exchange Commission
13 (“SEC”) (Municipal Advisor Registration Number 867-00146) and an Investment Adviser
14 registered with the State of New York, with additional registrations in the states of
15 California and Florida, the District of Columbia (“District”) and the Commonwealth of
16 Pennsylvania (“Pennsylvania”) (CRD# 113338). PRAG provides independent financial
17 advice to public sector clients with respect to capital planning, debt portfolio management,
18 debt capacity, swaps and derivative instruments, financing options, refunding approaches
19 and techniques, credit rating strategy, bond structure and pricing, and bond proceeds
20 investment strategies. PRAG is one of the leading municipal advisors in the country and
21 has been ranked by Thomson Reuters as either the top one, two or three firm by volume
22 over the past 20 years. Our water and wastewater experience include some of the most
23 active issuers in the country, including The Metropolitan Water District of Southern

1 California, Miami Dade County Water and Sewer Department and the City of Los
2 Angeles Wastewater System.

3 **Q. SUMMARIZE YOUR PROFESSIONAL QUALIFICATIONS AND**
4 **EXPERIENCE.**

5 A. I joined PRAG as a partner of the firm in 2002 and established PRAG's Pennsylvania
6 office at that time. In 2019, I relocated my primary office location to the firm's New
7 York City headquarter office. At PRAG, I work with my colleagues and manage
8 financial advisory engagements, working with a broad range of municipal clients located
9 throughout the East and Midwest regions of the U.S. I am also part of PRAG's three-
10 member executive committee, which is responsible for the overall management of the
11 firm. I am also the Secretary and Treasurer of PRAG's Board of Directors.
12 My background includes 30 years as an independent financial advisor and as a municipal
13 finance executive. Since joining PRAG, I have worked with similar water and sewer
14 clients over the years, including The Bethlehem Authority (PA), Capital Region Water
15 (formerly The Harrisburg Authority; PA), Miami-Dade County Water and Sewer
16 Department (FL), the City of Orlando (FL) and the West Virginia Water Development
17 Authority. I have served as the senior financial advisor to The Pittsburgh Water & Sewer
18 Authority ("PWSA" or "Authority") since 2019.
19 During the City of Harrisburg's financial crisis, PRAG was retained by the Office of the
20 Receiver to assist with the overall recovery plan for the City, including the water and
21 sewer utilities. I assisted with discussions with the utilities' regulators and their
22 enforcement arms (U.S. Department of Justice, U.S. Environmental Protection Agency,
23 the Pennsylvania Department of Environmental Protection), and other parties. It was
24 determined to transfer the operations and remaining assets of the City's utilities to an

1 independent operating authority, was the best course of action. I, worked with the City,
2 Office of the Receiver and The Harrisburg Authority to negotiate the terms of the
3 legislation and agreements to effectuate the transfer. The legislation was approved and
4 became effective at the end of calendar year 2013. In 2014, I assisted the renamed
5 Capital Region Water with its financing of the \$50 million Advanced Wastewater
6 Treatment Facility Improvement project meeting a tight timeline to finance this project to
7 avoid violations of regulatory agreements, with resulting fines and penalties, and court
8 action from the PA DEP, U.S. EPA and Department of Justice.

9 **Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

10 A. I hold a Bachelor of Arts degree in Government from Franklin & Marshall College and
11 an MBA from Carnegie Mellon University. I am a registered Municipal Advisor
12 Representative with a Series 50 and a registered Investment Adviser Representative with
13 a Series 65.

14 **Q. HAVE YOU EVER TESTIFIED BEFORE ANY REGULATORY AGENCIES OR**
15 **IN LEGAL PROCEEDINGS?**

16 A. Yes. I presented written Direct, Supplemental Direct and Rebuttal testimony in support of
17 PWSA's most recent base rate case at Docket Numbers R-2020-3017951 (water) and R-
18 2020-3017970 (wastewater).

19 I have also acted as financial advisor to several state-level public service/public utility
20 commissions. Most recently in 2013, PRAG was engaged by the Public Service
21 Commission of West Virginia to review a proposed Financing Order and Joint Stipulation
22 and Agreement for Settlement submitted by the Appalachian Power Company and
23 Wheeling Power Company regarding whether a proposed Financing Order met the
24 requirements for the issuance of Consumer Rate Relief Bonds.

1 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

2 A. We have been asked by PWSA to provide expert testimony relating to the rate case that
3 PWSA is filing with the Pennsylvania Public Utility Commission (“PUC”), specifically
4 related to the financial policies and goals and capital markets considerations of PWSA in
5 connection with the requested rate increase pending with the PUC. As discussed in other
6 testimonies, PWSA is requesting a reduced rate increase due to the effects of the COVID
7 pandemic. PWSA is seeking to balance the competing priorities of limiting the rate
8 increase for ratepayers during the COVID-19 pandemic and ensuring sufficient resources
9 to continue its operations, pay its debt service obligations, meet its legal covenants,
10 maintain its bond ratings and access the capital markets. This testimony will focus on
11 setting rates at a level in which PWSA can successfully access the capital market and
12 achieve efficient financings at a reasonable cost of capital and which will hopefully
13 permit the Authority to maintain its existing bond ratings. PWSA has a complex debt
14 profile which includes several bank and swap agreements with rating-related cost
15 increases and termination triggers which make maintaining certain credit ratings
16 necessary to avoid escalating borrowing costs. Given the limited nature of the requested
17 rate increase at a level just sufficient to maintain operations and meet existing bond
18 covenants it is extremely important that PWSA receive 100% of its requested rate
19 increase.

20 Further, the financial metrics based on the PWSA’s proposed rates will be discussed in
21 comparison to peer utility systems and water and sewer industry type rating criteria. I
22 will discuss the importance of the financial metrics and even though these metrics are
23 projected to decline in the FY 2022 (“FPFTY”) and FY 2023 (the “Forecast Period”), we
24 are hopeful that PWSA can maintain its current credit profile. The current financial

1 metrics are on the low side of peer utility systems and industry standards and these
2 metrics are projected to further decline based on the reduced rate request. Also noted is
3 the necessity of a municipal utility to maintain a certain level of liquidity and debt service
4 coverage in order to have available internally generated funds required to fund critical
5 capital needs and to have a cushion to mitigate any unforeseen financial or operational
6 emergencies. With the reduced requested rate increase, PWSA's financial margin and
7 financial flexibility will decline, but we project that the Authority will be able to meet its
8 financial obligations. Municipal utilities generally¹ have only two sources of funds to
9 address operational and capital needs; revenues generated from rates, and fees and
10 proceeds from debt issuance (which are then recovered from ratepayers). This is
11 different from investor-owned utilities that can also rely on investor equity. Also, unlike
12 investor-owned utilities, any time PWSA's annual revenue is greater than annual
13 expense, the net revenue stays within the Authority to pay future expenses, capital and
14 liabilities. In this testimony, I have relied on my professional experience in working with
15 similar issuers and credits entering the capital markets, as well as the experience of
16 PRAG's other utility advisory professionals. I have also examined materials, documents,
17 and information produced in this matter, including the testimony of other PWSA
18 witnesses, PWSA bond disclosure statements, PWSA financial statements, PWSA bank
19 and swap agreements and rating agency publications related to PWSA, as well as industry
20 and peer related rating reports.

21 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

22 A. Yes. I am sponsoring the following exhibits:

¹ Other sources of capital could include federal, state or local government grants.

- 1 • **Exh. TH-1:** Exhibit TH-1 contains a summary of PWSA’s Rate Covenant and
2 Flow of Funds from the Amended and Restated Indenture.
- 3 • **Exh. TH-2:** Exhibit TH-2 contains Peer Ratings and Comparative Financial
4 Information
- 5 • **Exh. TH-3:** Exhibit TH-3 contains Moody’s Investors Service, May 19, 2020:
6 Water and Sewer Utilities – US Medians – Solid Financial Performance, Ability
7 to Increase Rates Underpin Stability
- 8 • **Exh. TH-4:** Exhibit TH-4 contains Moody’s Investors Service, December 2,
9 2020: Water and Sewer Utilities – US Outlook – 2021 Outlook Stable Despite
10 Coronavirus Challenges and Economic Slowdown
- 11 • **Exh. TH-5:** Exhibit TH-5 contains S&P Global Ratings, January 19, 2021:
12 Outlook for U.S. Water and Sewer Utilities: 2021 Provides 2020 Hindsight
13

14 **II. FINANCIAL POLICIES AND GOALS**

15 **Q. PLEASE SUMMARIZE THE CREDIT AGENCIES’ VIEW OF THE** 16 **AUTHORITY’S DEBT STRUCTURE.**

17 A. The Authority’s debt structure is complex, consisting of a significant amount of variable
18 rate bonds and interest rate swaps (although a portion of the Authority’s variable rate debt
19 and swaps that were reduced with the 2019 refinancing). In November 2020, S&P wrote:
20 “Approximately one-fourth of PWSA’s debt is variable rate, most of which is
21 synthetically fixed-rate by way of interest rate swaps. We view the contingent liquidity
22 risk as remote, as the most prominent termination event would be if the ratings on PWSA
23 were to be lowered to below investment grade. Although the current positions of the
24 interest-rate swaps remain materially unfavorable, PWSA has not had to post collateral to
25 its counterparties.” See PWSA Exhibit EB-9 & 10 for the most recent ratings reports
26 from the two rating agencies that rate PWSA’s Revenue Bonds.

27 In addition to the complicated nature of the debt portfolio, PWSA is also highly
28 leveraged compared to other systems. As stated in Moody’s most recent rating report
29 dated November 5, 2020, “The authority’s total debt is equal to 103% of fixed assets as
30 of 2019 year end, well above similarly sized peers. The outstanding debt amortizes

1 slowly, with only 42% of the principal scheduled to be repaid in the next 10 years.” This
 2 is a result of many years of structuring bond financings with deferred principal in order to
 3 minimize current year rate increases. The slow principal amortization combined with the
 4 structure of PWSA’s currently outstanding debt – annual debt service which is
 5 approximately level at \$68 million a year through 2040, will mean an increase of annual
 6 debt service each year as the Authority issues additional debt for capital projects. Thus,
 7 PWSA’s scheduled principal repayment does not reduce annual debt service, which
 8 would otherwise mitigate the impact of future borrowing.

9 **Q. PLEASE DESCRIBE THE KEY FINANCIAL METRICS THAT WILL DRIVE**
 10 **THE REVENUE REQUIREMENT AND THE RESULTING IMPACT ON THE**
 11 **AUTHORITY’S CREDIT PROFILE.**

12 A. Currently, the Authority is rated “A3” by Moody’s with a “Stable” outlook. Moody’s
 13 downgraded the Authority’s previous “A2” rating and changed the Rating Outlook to
 14 “Negative” on October 15, 2018 due to PWSA’s “narrow cash position, well below
 15 average for similarly sized peers” and due to the Authority being “pressured by the need
 16 for major capital funding.” In the most recent Moody’s report for the Authority dated
 17 November 5, 2020, the agency specifically mentions that “additional borrowing implied
 18 by the authority's capital needs will increase an already elevated debt burden.” These
 19 risks can be mitigated with appropriate liquidity and debt service coverage resulting from
 20 the proposed rate increase(s) at the requested levels.

21 The Authority is rated “A” by S&P Global Ratings (“S&P”) with a “stable” outlook.
 22 S&P also mentioned the complex nature of the Authority’s debt and makes it clear that
 23 contingent risks are mitigated in part by the assumption of continued improvement in
 24 management, decreased exposure to interest rate risks and maintaining certain financial
 25 metrics, such as debt service coverage and strong liquidity. S&P also notes PWSA’s

1 large capital improvement plan and the need for significant amount of debt to fund the
2 plan in addition to what they view as an already highly leveraged system. Critical to the
3 revenue requirement are financial management policies that support the financial
4 sustainability of the Authority, ensuring a minimum rating in the “A” category which will
5 provide affordable access to the bond market and other financial institutions. The
6 Authority’s Financial Management Policy, which is provided as PWSA Exhibit EB-6,
7 was established in 2018 and most recently updated in October 2019, provides a
8 framework to maintain the PWSA’s financial integrity, while serving the long-term
9 interests of its customers and other constituencies. The Financial Management Policy
10 applies to all financial practices within PWSA and provides guidance to policy makers,
11 staff and stakeholders as PWSA seeks to maintain and improve its financial position.
12 The scope of the guidance includes many of the key metrics that the rating agencies and
13 other credit analysis use to evaluate PWSA’s creditworthiness, including minimum
14 targeted debt service coverage levels, minimum and targeted levels of liquidity and
15 reserve funds, the ability to manage future debt capacity by funding a portion of the
16 capital program with internally generated funds or “pay-go” and asset preservation. Both
17 Moody’s and S&P reference certain financial metrics that are key in order to maintain
18 PWSA’s current credit profile.

19 **Debt Service Coverage Ratio**

20 The first important metric is debt service coverage ratio (Net Revenue to Annual Debt
21 Service), which is discussed in Mr. Barca’s testimony; PWSA’s Amended and Restated
22 Trust Indenture includes a Rate Covenant with the Authority’s bondholders that requires
23 PWSA to maintain an annual debt service coverage ratio at 1.25 times Senior Lien bonds

1 and 1.10 times for total debt. The Authority has covenanted with its bondholders that it
2 will establish rates for each fiscal year to at least achieve these levels. See Exhibit TH-1
3 for a summary of the Authority's Rate Covenant and Flow of Funds provisions.

4 The Authority's Financial Management Policy, which is more stringent than the legal rate
5 covenant, states that if the five year average senior lien debt service coverage is to be less
6 than 1.35 times or less than 1.15 times on total debt service coverage basis, the Board
7 will implement a plan which could include increasing rates, reducing expense or other
8 means to achieve a 1.35 times senior debt service coverage level and 1.15 times overall
9 debt service coverage level, "taking into consideration approved and pending rate
10 increases with the Pennsylvania Public Utilities Commission." It is important to note that
11 while PWSA's financial management debt service coverages are higher than the legal
12 requirements, the overall municipal water and sewer utility sector wide debt service
13 coverage is closer to 2.3 times (using Moody's most recent median report, dated May 19,
14 2020, which is included as Exhibit TH-3) for combined water and sewer governmental
15 systems. While peer and rating comparisons will be discussed later in this testimony, it is
16 clear that PWSA's debt service coverage ratio target is still significantly below industry
17 standards. Therefore, the 1.35 times level should not be viewed as a goal, but a
18 minimum. It is also important to note that if PWSA is able to increase its debt service
19 coverage over time, PWSA will be able to grow its financial resources to fund targeted
20 pay-go capital levels with less reliance on using debt. Without increased coverage levels,
21 PWSA will have to continue its over reliance on debt, further leveraging an already over-
22 leveraged system. In addition to providing pay-go resources, adequate debt service
23 coverage creates critical financial resources that are needed to address potential economic

1 and operational challenges without dipping into the Authority's moderate reserves.

2 Lastly, PWSA has annual obligation payments to the City of Pittsburgh pursuant to a
3 Cooperation Agreement that are subordinate to the Senior Lien and Subordinate Lien,
4 which are also funded from internally generated funds (debt service coverage monies).

5 It is extremely important to establish rates that generate coverage at a level to protect
6 against any unforeseen additional expenses or decreases in expected revenues. Setting
7 coverage at just the minimum legal requirement puts the Authority at significant risk of
8 violating the covenant. Furthermore, the ability to issue additional debt under the bond
9 documents requires certain tests and certifications that the Authority is in compliance
10 with the rate covenant and has sufficient revenues to comply with the covenant taking
11 into account the additional debt service.

12 Additional financial resources generated by rates are needed to support the Authority's
13 capital needs as well as to ensure adequate liquidity necessary to mitigate any financial or
14 operational risks.

15 As described in PWSA Exhibit EB-2, after accounting for the proposed rate increase, the
16 FPPTY (FY 2022) projected debt service coverage for senior debt service is 1.46 times,
17 and projected debt service coverage for total debt service is 1.18 times. While the
18 requested \$32.2 million rate increase produces coverages that exceed the minimum
19 coverage requirements set forth in PWSA's bond covenants, they are less than the
20 coverage levels compared to the budgeted FY 2021 figures of net revenue 1.47 times
21 over senior lien debt service and 1.19 times over total debt service. Although the
22 Authority did have a rate increase for FY 2020, because the rate increase granted was far
23 below what was requested, the resulting coverage actually decreased from the prior year

1 (1.51x Senior and 1.27x Total for FY 2019). Coverages are only marginally above the
2 PWSA's Financial Policy targets for the Senior Lien Debt Service coverage and the All-
3 In Debt Service. After accounting for the second year of the proposed rate increase, the
4 Forecast Period, projected debt service coverage for senior debt service decreasing to
5 1.36 times while the projected debt service coverage for total debt service also decreases
6 to 1.12 times, which is at the Authority's financial management policy for senior lien
7 debt and below the financial management policy for total debt. PWSA's Amended and
8 Restated Trust Indenture coverage requirement for total debt is 1.10 times, so based on
9 the proposed rate increase, revenues are barely sufficient to meet the Authority's Rate
10 Covenant and Additional Bonds test in the Forecast Period. With the proposed rates, the
11 Authority is projecting a \$6.5 million operating deficit in that year, which would mean
12 the Authority would have very little cushion to meet its required Rate Covenant coverage
13 requirements. Further evidencing the importance for the Authority to receive the full rate
14 request.

15 **Reserves and Liquidity**

16 The second critical metric is cash reserves and liquidity, often measured as days cash on
17 hand, which is calculated by taking unrestricted cash and investments times 365 divided
18 by total annual operating and maintenance expenses. This statistic is used by both
19 Moody's and S&P to measure liquid financial resources available for a utility to survive
20 temporary revenue disruptions and unexpected expenses. This metric is fundamental in
21 analyzing the financial strength of a municipal utility. The recent demands put on the
22 Authority during the COVID pandemic evidence the importance of the Authority
23 maintaining appropriate reserves. Moody's has commented on the Authority's liquidity

1 in its most recent rating report. Moody's report asserts that "Liquidity is particularly
2 improved and is expected to be maintained at roughly 140 days' cash on hand at the end
3 of fiscal 2020, up from a critically low 29 days' cash at fiscal 2017 year end." Although
4 Moody's has recognized the Authority's liquidity improvement, the credit agency still
5 states that the PWSA cash position is "narrow, though improved, liquidity versus
6 similarly sized peers" and sees this as a "credit challenge." As Moody's stated in the
7 past, the prior level of liquidity, especially in fiscal year 2017, was not adequate and put
8 the Authority in a position of financial risk, which was a significant factor leading to the
9 rating downgrade by Moody's in October 2018. In addition, although S&P considers the
10 Authority's liquidity as strong and a credit strength, the credit agency considers the
11 Authority's capital line of credit as a source of reserves. The line of credit, in essence, is
12 borrowed money that cannot be used for operational expenses and does not serve as
13 underlying cash and/or liquidity. Therefore, the line of credit should not be included
14 while evaluating the Authority's liquidity. The Authority's Financial Management
15 Policy as of 2019 is to "[m]aintain cash reserves, including the operating reserves, rate
16 stabilization fund, and revenue fund at a level of 100 days cash on hand with the goal of
17 increasing to over 200 days over the next five (5) years."

18 PWSA's goal is to maintain and increase this level, while still maintaining affordable rate
19 increases. As mentioned prior, for FY 2017, the Authority's days cash on hand was 29.
20 For FY 2018, PWSA was able to achieve 112 days' cash on hand and significantly
21 improve its liquidity position followed by 247 and 229 days' cash on hand for FY 2019
22 and FY 2020 respectively. And based on the most recent rate increase, the PWSA is
23 projecting days cash on hand of 195 days for FY 2021, a reduction from the prior year

1 (FY 2020) and lower than the Authority's Financial Management Policy due to the fact
2 the rate increase granted was less than what was requested. As shown in PWSA Exhibit
3 EB-2, after accounting for the proposed rate increase, the days cash on hand for FPFTY
4 (FY 2022) and for FY 2023 is 175 and 152, respectively which is still lower than
5 PWSA's Financial Policy target, rating agencies medians (as discussed previously), the
6 majority of peer utilities (as discussed later in my testimony) and would represent the
7 fourth straight year of a decline in own-source liquidity (as measured by days cash on
8 hand).

9 **Q. PLEASE DESCRIBE HOW THE CREDIT RATING AGENCIES VIEW THE**
10 **COVID-19 PANDEMIC IN RELATION TO WATER AND SEWER UTILITIES**
11 **AND HOW HAS IT HAS AFFECTED THEIR VIEW OF THE AUTHORITY.**

12 A. Credit rating agencies have been monitoring the public finance industry, which includes
13 water and/or sewer utilities, from the onset of the COVID-19 pandemic and the
14 consequential economic decline. Credit rating agencies have noted water and/or sewer
15 utilities revenue declines caused by reduced commercial demand, limited connection fee
16 revenue and increased payment delinquencies, among other reasons. Nevertheless, the
17 credit rating agencies still consider water and/or sewer utilities as a steady sector as
18 utilities provide essential services and have rate-setting authority with diverse and mostly
19 residential customer bases.

20 At the end of 2020, Moody's and S&P published their own respective annual outlook
21 reports for the water and/or sewer sector (provided as Exhibit TH-4 and Exhibit TH-5).
22 These reports comment on the consequences brought on by the COVID-19 pandemic to
23 municipal utilities. Specifically, Moody's determined the water and/or sewer sector as
24 stable even with the effects of the COVID-19 pandemic and subsequent economic
25 decline. Their report cited that the "sector's fundamental strengths, including the

1 essentiality of its services, its autonomous rate-setting authority and its stable, diverse and
2 largely residential customer bases, will preclude material declines in revenues.” Moody’s
3 report discussed that the stable demand and revenue will continue to provide utilities with
4 strong liquidity. In addition, Moody’s presents data that debt service coverage remained
5 stable in 2020, projects that coverage will eventually drop slightly in 2021 and rebound in
6 2022. Moody’s continues to suggest that the outlook could be revised from “stable” to
7 “positive” if there is continued growth in liquidity and debt service coverage, as well as
8 continued spending for capital improvements. Moody’s sector outlook could change to
9 “negative” if the economy contracts, delaying revenue recovery, and thus negatively
10 effecting debt service coverage, liquidity and postponing capital projects. Similarly, S&P
11 has a stable outlook for the water and/or sewer sector, which was a revision from a
12 previous negative outlook. In summary, the S&P report discusses the resilience of the
13 municipal water and sewer during the COVID-19 pandemic. The report also alludes to
14 utilities managing through 2021 with the preservation of cash, rate adjustments and the
15 increase of borrowing due to the COVID-19 pandemic. The S&P report further discusses
16 that the scaling back or postponement of rate adjustments, as well as the reliance of debt
17 for capital improvements “could present credit headwinds in future years.” In conclusion,
18 based on the outlook reports, the COVID-19 pandemic did not bring on significant
19 negative effects to the water and/or sewer sector compared to other sectors, such as
20 higher education and transportation, among others.

21 In regard to the Authority, PWSA presented to Moody’s and S&P the impacts of the
22 COVID-19 pandemic in October 2020. At that time, the Authority showed forecasted FY
23 2020 revenues of \$166.9 million compared to the budgeted FY 2020 revenue of 180.0

1 million. As Exhibit EB-2 displays in Mr. Barca's testimony, the unaudited revenues for
2 FY 2020 were \$176.0 million. The slight decrease of revenue is considered favorably by
3 both Moody's and S&P according to their respective published rating reports in
4 November 2020 following the Authority's presentations. The COVID-19 pandemic did
5 not, in itself materially impact the rating agencies' view of PWSA in 2020. However, it
6 should be noted, that the S&P sector report stated that most utilities preserved cash with
7 the economic uncertainty of the COVID-19, whereas the Authority has less liquidity and
8 lower debt service coverage in FY 2020 compared to FY 2019.

9 **III. CAPITAL MARKETS CONSIDERATION**

10 **Q. PLEASE EXPLAIN THE FINANCIAL RESULTS IF THE PROPOSED RATES**
11 **ARE NOT APPROVED AND THE FINANCIAL METRICS CANNOT BE**
12 **IMPLEMENTED.**

13 A. As outlined in PWSA Exhibit EB-1, which is a part of Mr. Barca's testimony, if the
14 current rates remain in place, the Authority will immediately violate its covenant with
15 bondholders.

16 As described previously, in order to comply with its legally required bond covenants, the
17 Authority must generate net revenues in an amount that exceeds senior debt service of at
18 least 1.25 times and total debt service of at least 1.1 times and is adequate to pay all
19 financial obligations. Without the rate increase, the debt service coverage in FPFTY is
20 projected to be 1.05 times for senior debt service (1.25 times is the legal covenant) and
21 0.85 times for total debt service (1.10 times is the legal documents). Furthermore,
22 without the rate increase, the debt service coverage in FY 2023 is projected to be 0.96
23 times for senior debt service (1.25 times is the legal covenant) and 0.79 times for total
24 debt service (1.10 times is the legal documents). This would cause the Authority to be in
25 non-compliance with its rate covenant in both fiscal years and with insufficient funds to

1 pay its debt service obligations in the second year.

2 If the Authority fails to comply with the rate covenant, the Authority is legally required to
 3 engage a consultant to prepare a report to remedy the failure and to make
 4 recommendations. The Authority has 180 days after the tested fiscal year to revise rates,
 5 fees and charges or to petition the PUC to establish the necessary rates, fees and charges
 6 to address the rate covenant failure. If, after this time period, the Authority continues to
 7 fail the rate covenant, then an Event of Default under the Trust Agreement will have
 8 occurred. An event of default results in certain remedies available to bond holders,
 9 including acceleration of principal. An event of default would likely result in an
 10 emergency request to the PUC to allow PWSA to raise rates and would likely lead to a
 11 downgrade of the Authority’s credit ratings, making future borrowing more problematic
 12 and costly and requiring increased rate revenue to cover the Authority’s higher cost of
 13 borrowing. In terms of days cash on hand, without the rate increase, days cash on hand
 14 falls to 87.1 days cash on hand. The Authority would have to use its cash reserves to pay
 15 its FPFTY (FY 2022) debt service and other long-term financial obligations.

16 **Q. WHAT ARE THE LIKELY CONSEQUENCES IF PWSA FAILS TO MEET ITS**
 17 **BOND COVERAGE TARGETS OR FAILS TO MAINTAIN ADEQUATE CASH**
 18 **ON HAND?**

19 A. The failure to maintain adequate debt service coverage levels and/or a notable
 20 deterioration in days of cash on hand would likely cause a downgrade in PWSA’s credit
 21 ratings. Credit ratings are an important component in determining the cost of debt as the
 22 ratings signal PWSA’s ability and willingness to meet financial obligations in full and on
 23 time. A downgrade of the credit ratings for PWSA would result in an increase in
 24 PWSA’s borrowing costs and necessitate higher rate increases over time.

1 There are also the consequences for failure to comply with the debt service coverage
2 requirement (rate covenant). As I explained, if there is an event of default, there are
3 certain remedies available to bond holders, including acceleration of principal. This
4 would create an obligation that PWSA could not possibly meet without extraordinary rate
5 relief or an infusion of cash from some other sources. Additional information is provided
6 later in my testimony regarding risks of the PUC not approving the full amount of the
7 requested rate increase, including rating downgrades and the possible collateral
8 consequences.

9 Failure to maintain sufficient available cash could result in a rating downgrade, and thus,
10 increase the Authority's borrowing costs. If sufficient revenue is not generated to cover
11 all the PWSA's costs and obligations, as well as not having sufficient reserves to have the
12 cash to fully cover operating expenses, debt service and other could result in financial
13 failure. Additionally, the Authority could experience bondholder lawsuits related to its
14 failure to raise sufficient rates to meet its rate covenant. As mentioned above, and in Mr.
15 Barca's testimony, the PWSA is requesting a reduced rate increase than could otherwise
16 be justified due the effects of the COVID pandemic to ratepayers. Even with the full
17 requested rate increase, the Authority will have annual lower coverages and days cash on
18 hand, each year, for four years in a row (FY 2020 through FY 2023). Despite the
19 declining financial metrics, we are hopeful that the rating agencies will maintain PWSA's
20 existing ratings. However, we are concerned that any less of a rate increase than what is
21 being sought will negatively impact the Authority and likely result in a rating downgrade.
22 Thus, I strongly believe that 100% of the proposed rate adjustment is needed. The
23 Authority's historical and projected debt service coverage and days cash on hand with

1 and without the proposed rate increase is provided in the table below. The Authority's
 2 Rate Covenant Requirement for coverages and the Authority's Financial Management
 3 Policy related to debt service coverages and Liquidity (measured in days cash on hand)
 4 are provided below:
 5

PWSA's Historical and Projected Financial Metrics with Rate Increase					
	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
Senior Debt Service Coverage	1.88	1.51	1.47	1.46	1.36
Total Debt Service Coverage	1.49	1.27	1.19	1.18	1.12
Days Cash on Hand	242	229	195	175	152
PWSA's Historical and Projected Financial Metrics without Rate Increase					
	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
Senior Debt Service Coverage	1.88	1.51	1.47	1.05	0.96
Total Debt Service Coverage	1.49	1.27	1.19	0.85	0.79
Days Cash on Hand	242	229	195	87	(27)
Bond Indenture -- Rate Covenant Coverage Requirement					
	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
Senior Debt Service Coverage	1.25	1.25	1.25	1.25	1.25
Total Debt Service Coverage	1.10	1.10	1.10	1.10	1.10
PWSA's Financial Management Policy					
	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
Senior Debt Service Coverage	1.35	1.35	1.35	1.35	1.35
Total Debt Service Coverage	1.15	1.15	1.15	1.15	1.15
Days Cash on Hand	100-200	100-200	100-200	100-200	100-200

6
 7 As shown in table above, even with the proposed rate increase, the metrics drop slightly
 8 in FY 2022 and decrease even further in FY 2023. The proposed rates will only
 9 minimally permit PWSA to have the funds it needs throughout the FPFTY and the

1 Forecast Period to satisfy all of its financial obligations as the projected Total Debt
 2 Service coverage in the Forecast Period is 1.12 while the legal, required coverage is 1.10
 3 times. Any lower level of revenue and cash will risk Rate Covenant violations, be even
 4 more inconsistent with the Authority’s financial management policies and will jeopardize
 5 the Authority’s bond ratings.

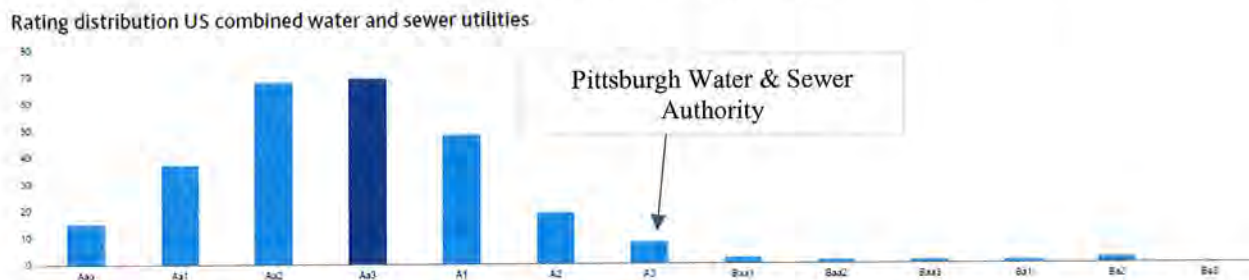
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7 **IV. PEER REVIEW OF FINANCIAL METRICS**

8 **Q. DISCUSS THE AUTHORITY’S CREDIT PROFILE IN COMPARISON TO**
 9 **OTHER PEER UTILITIES.**

10 A. The Authority’s senior lien credit ratings are “A3” and “A”, from Moody’s and S&P
 11 respectively. As can be seen within Exhibit TH-3, as well as in the graphic below, in
 12 terms of other US municipal water and sewer systems, PWSA, with its A3 rating, is in
 13 the bottom 6% percent of all governmental water and sewer utilities that are rated by
 14 Moody’s.

15 **Distribution of Moody’s Ratings for Combined Municipal Water and Sewer Issuers**
 16 *(Median is Shown in Dark Blue)*



*Highlighted bar represents median rating
 Source: Moody's Investors Service

17

18 US municipal water and sewer credits are generally well received by the investor
 19 community with rating agencies viewing the industry overall with a stable outlook. It is
 20 expected that the industry outlook will remain stable with increasing rates as necessary
 21 while still balancing affordability concerns. Rating agencies have been reviewing and

1 updating methodologies with a view towards transparency and a more quantitative
 2 approach. Both Moody’s and S&P have published credit scorecards which identify
 3 certain rating factors, as well as assigning certain factor weighting. Both credit
 4 scorecards include some level of qualitative analysis, as well as above and below-the-line
 5 notching. While the approach is slightly different, the factors considered both include
 6 debt service coverage and liquidity measures as critical components of any credit review.
 7 **Moody’s** – Moody’s identifies broad factors for consideration and further provides sub-
 8 factors in the scorecard. The broad categories include system characteristics (asset
 9 condition, service area and system size), financial strength (debt service coverage, days
 10 cash on hand, debt to operating revenues), management (rate management, regulatory
 11 compliance and capital plans) and legal provisions (rate covenant, debt service reserve
 12 requirements). In general, Moody’s reports that the median coverage for all Moody’s
 13 rated credits (using 2018 data) is 2.3x for combined water and sewer systems, 2.2x for
 14 water systems and 2.1x for sewer systems. The Moody’s median for days cash on hand
 15 are 467 days for combined systems, 416 days cash on hand for water systems and 620
 16 days cash on hand for sewer systems.

17 Below are PWSA’s key ratios from the most recent Moody’s Median report dated May
 18 19, 2020 (which uses 2018 data) compared to median peers for the “A3”, “A2” and “A1”
 19 rating categories that illustrates that the Authority is below each median indicator.



20 Increasing rates to provide cash flow available to fund an increasing amount of projects
 21 on a pay-go basis will help mitigate PWSA’s relative position.

Moody’s Key Indicators	PWSA (2020)*	A3 Rated Medians	A2 Rated Medians	A1 Rated Medians
Debt Service Coverage	1.25x	1.6x	1.9x	1.8x
Days Cash on Hand	229	348	339	373

22 Source: Moody’s Water and Sewer Median Report dated May 19, 2020

23 *PWSA metrics based on FY 2020 unaudited financials.

1 **Standard & Poor’s** – S&P has also developed a credit scorecard to provide a qualitative
 2 analysis of a systems credit profile. S&P measures credit through an enterprise risk
 3 profile (economic fundamentals, industry risk, market position and operational
 4 management assessment) and a financial risk profile (“all in” coverage, liquidity and
 5 reserves, debt and liabilities and financial management assessment). They also provide
 6 notch adjustments for certain factors. When reviewing assessment scores for “A” rated
 7 water and sewer credits, debt service coverage averaged 1.5 times for S&P A-rated
 8 systems and liquidity measures averaged approximately 387 days cash on hand.
 9 Below is a summary of the Authority’s most recent rating recent reports, outlining the
 10 strengths, challenges and viewpoints of the credit agencies.
 11

 A3 (Stable)	 A- (Stable)
Credit Strengths	
<ul style="list-style-type: none"> ■ Diverse, urban service area, supported by strong “eds & meds” presence ■ Considerable size ■ Significant rate increase implemented recently ■ Rate increase boost revenues ■ PUC oversight should bring improvements and controls. 	<ul style="list-style-type: none"> ■ Employment base that has reinvented itself from previously relying on manufacturing and industrial jobs ■ View operational management assessment (OMA) as “good” ■ Strong on-balance sheet liquidity
Credit Challenges	
<ul style="list-style-type: none"> ■ Substantial debt burden ■ Narrow liquidity versus similarly sized peers ■ Projected \$1.2 billion in capital needs over next five years to be primarily funded with debt ■ Consent decree to remediate sewer overflows not yet finalized 	<ul style="list-style-type: none"> ■ Extremely high leverage with \$1.2 billion in capital commitments ■ Exposure to large regional consent decree through Allegheny County Sanitary Sewer Authority ■ Best practices for financial management not as comprehensive as utilities with strong financial management

13

14 **Regulatory Oversight:** Moody’s views PUC oversight as a credit positive while S&P
 15 views it more as a credit neutral, however, both agencies have stated in recent reports that
 16 PUC oversight has contributed to their stable outlooks for PWSA. Moody’s noted that the

1 PUC oversight, as well as the internal management team, has brought the Authority to a
2 “satisfactory financial position over the past three years.” “The Authority expects a
3 10.8% rate increases for fiscal 2021, which would bring in an additional \$19 million in
4 revenue if realized. This will be the second rate increase implemented with approval from
5 the PUC; the first was a 13% rate increase in early 2019. “S&P’s view PUC’s oversight
6 as an indication of the Authority’s infrastructure improvement needs deemed necessary
7 by all parties.

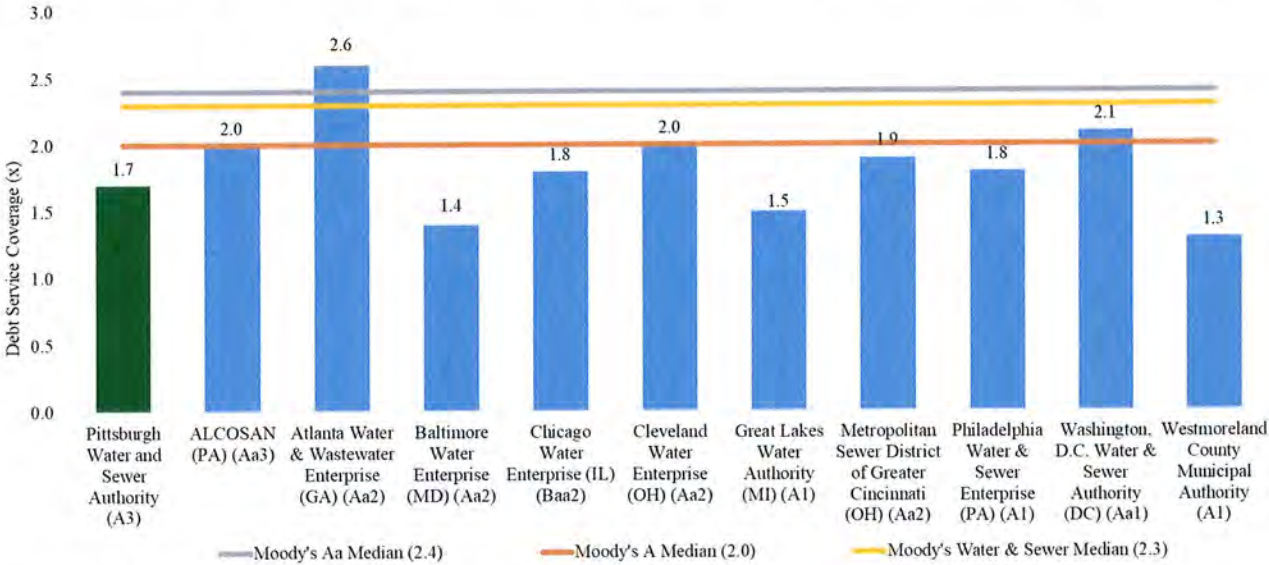
8 **Peer Utilities:** PWSA has selected certain large city municipal peer systems to provide
9 important benchmarking critical to organizational best practices. While systems have their
10 own characteristics based on regions, size, and service area, the selected peers are of similar
11 size, service areas of industrial urban centers and are located largely in the mid-Atlantic
12 and Midwestern regions of the country. Peer comparisons and benchmarking performance
13 indicators are a component of best practices and have been incorporated into the
14 Authority’s financial policies. Data gathered on peer systems is provided by recent
15 Moody’s Credit Opinion reports for each respective peer.

16 Below are charts which indicate that PWSA, as compared to its peers, remains on the
17 weaker side of certain key financial ratios. It is important to note that viewing data for
18 peer systems should be used to provide a general perspective, since each system has its
19 own characteristics. Please see Exhibit TH-2 for additional financial data on the peer
20 systems.

21 Provided below is a peer comparison chart of debt service coverage levels that compares
22 PWSA to other large city water and sewer entities. Higher debt service coverage levels
23 are looked upon more favorably by the rating agencies because it indicates a better ability

1 to pay debt service and issue further debt while maintaining a strong financial position.
 2 PWSA’s 2019 debt service coverage levels are among the lowest of its peer utilities and
 3 also compared unfavorably to Moody’s overall and “A” and “Aa” rated utility medians.

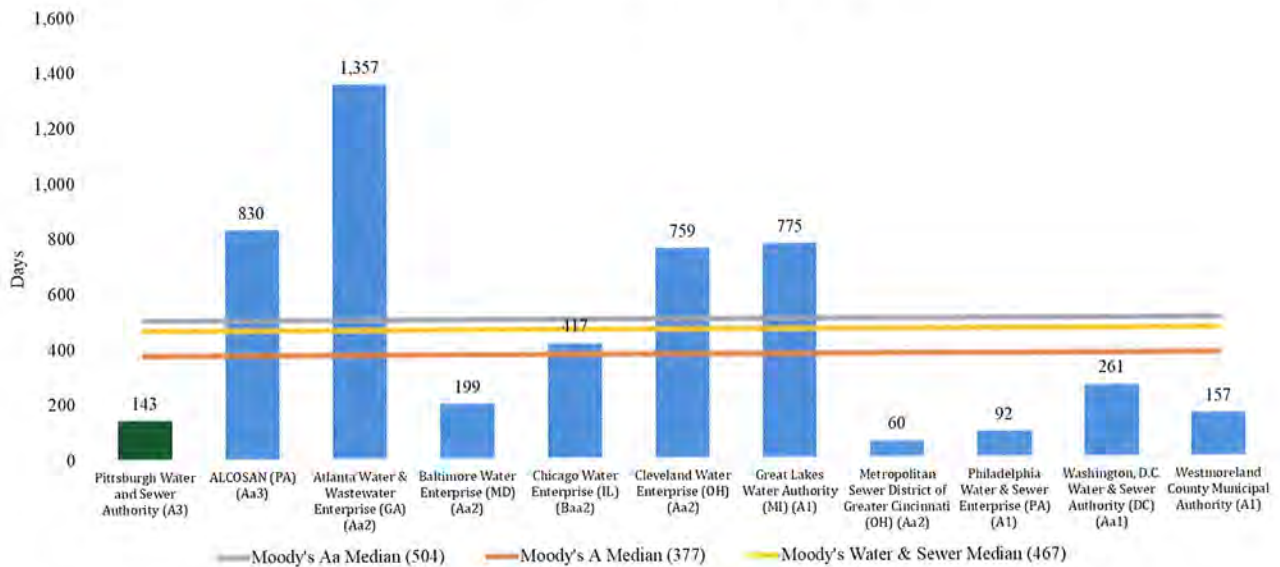
4 **DEBT SERVICE COVERAGE**
 5 **(2019 net revenue divided by 2019 debt service, expressed as a multiple)**
 6
 7



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 9 *** Washington DC’s debt service coverage is based on 2018 data.**
 10 Sources: Moody’s Investor Service: Water and Sewer Utilities Medians – Solid Financial Performance, Ability to
 11 Increase Rates Underpin Stability, May 19, 2020 (2018 data) and Moody’s Investor Service latest rating
 12 reports for each entity (2019 data).
 13
 14

1 Provided below is a peer comparison chart of days cash on hand that compares PWSA to
 2 other large city water and sewer entities. The rating agencies like to see more days cash
 3 on hand because it shows a better liquidity position and therefore, more financial
 4 flexibility. In 2019, PWSA had 143 days cash on hand which ranked the Authority as the
 5 third lowest liquidity of its peer utilities and also compared very unfavorably to Moody's
 6 overall and "A" and "Aa" rated utility medians.

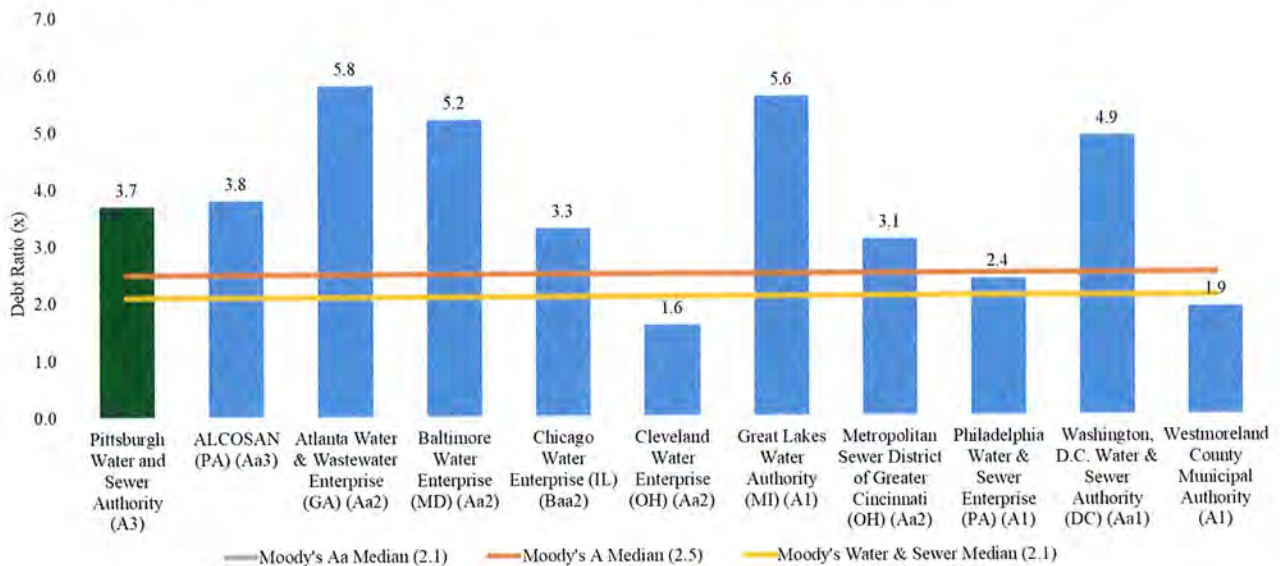
7
 8 **DAYS CASH ON HAND**
 9 **(2019 unrestricted cash and liquid investments times 365 divided by 2019 operating and**
 10 **maintenance expenses, expressed in days)**
 11



12
 13 *** Washington DC 's cash on hand is based on 2018 data.**
 14 Sources: Moody's Investor Service: Water and Sewer Utilities Medians – Solid Financial Performance, Ability to
 15 Increase Rates Underpin Stability, May 19, 2020 (2018 data) and Moody's Investor Service latest rating
 16 reports for each entity (2019 data).
 17

1 Provided below is a peer comparison chart of debt ratios that compares PWSA to other
 2 large city water and sewer entities. The rating agencies would like to see a low debt ratio
 3 since that would indicate that the entity is not overextended in debt obligations. In 2019,
 4 PWSA ranked as the bottom half of utilities for its debt ratio compared to its peer utilities
 5 and also compared unfavorably to Moody's overall and "A" and "Aa" rated utility
 6 medians.

7 **DEBT RATIO**
 8 **(2019 net debt divided by 2019 operating revenues, expressed as a multiple)**
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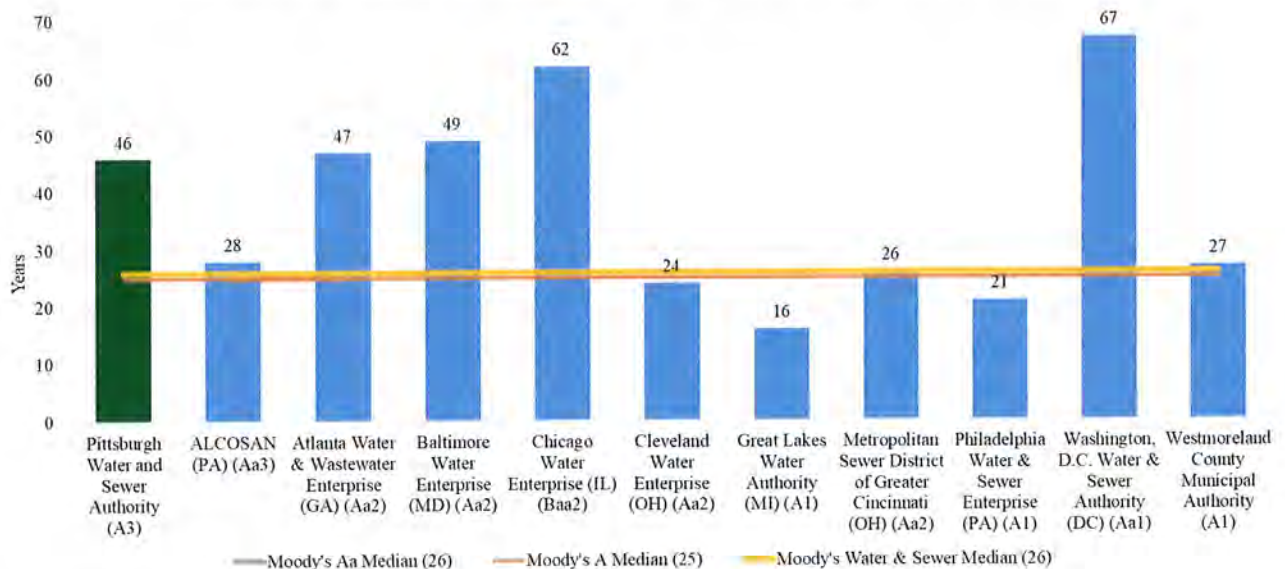
* Washington DC 's debt ratio is based on 2018 data.

** Moody's Water and Sewer Median is 2.1, as well as Moody's Aa Median, and thus, only one line is visible within the chart.

Sources: Moody's Investor Service: Water and Sewer Utilities Medians – Solid Financial Performance, Ability to Increase Rates Underpin Stability, May 19, 2020 (2018 data) and Moody's Investor Service latest rating reports for each entity (2019 data).

1 Provided below is a peer comparison chart of asset condition in years that compares
 2 PWSA to other large city water and sewer entities. A low number indicates that the
 3 assets of an entity are nearing their end of useful life and can indicate that large
 4 maintenance and/or replacement costs are on the horizon. In 2019, PWSA compared
 5 favorably to its peer utilities in Asset Condition and also compared favorably to Moody’s
 6 overall and “A” and “Aa” rated utility medians.

7 **ASSET CONDITION**
 8 **(2019 net fixed assets divided by 2019 depreciation, expressed in years)**



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* Atlanta, GA's asset condition is based on 2018 data.

** Washington DC 's asset condition is based on 2017 data.

Sources: Moody's Investor Service: Water and Sewer Utilities Medians – Solid Financial Performance, Ability to Increase Rates Underpin Stability, May 19, 2020 (2018 data) and Moody's Investor Service latest rating reports for each entity (2019 data).

18 **Q. DESCRIBE HOW THE MEDIANS AND KEY FINANCIAL METRICS WILL BE**
 19 **AFFECTED BY THE COVID-19 PANDEMIC.**

20 A. As noted throughout my testimony, Moody's medians are based on 2018 data, which is
 21 well prior to the COVID-19 pandemic in 2020. Furthermore, the key financial ratios for
 22 the majority of the Authority's peers are based on 2019 data. The comparative analysis

1 among the Authority and its peers based on dated data normally serves as an efficient
2 measure of water and/or sewer utilities in the current environment. As described prior in
3 my testimony and based on commentary of the rating agencies within their outlook reports,
4 even with the extremely rare occurrence of the COVID-19 pandemic, utilities were
5 minimally affected. That said, Moody's expects that medians, as well as the key financial
6 ratios, will deteriorate slightly in FY 2021 and rebound in FY 2022 as a result of the
7 pandemic. The financial metrics of water and/or sewer utility issuers will change specific
8 to their respective unique characteristics of the system, such as demographics, location and
9 rate setting abilities.

10 **Q. DESCRIBE THE RISKS TO NOT APPROVING THE REQUESTED REVENUE**
11 **INCREASE.**

12 A. There are several risks that occur if the PUC does not approve the full requested rate
13 increase. Previously, I described the repercussions if the rate increase was not approved
14 in relation to the debt service coverage and liquidity and the violations of the Authority's
15 Rate Covenant. In addition to those risks, there are several other risks that correlate if
16 there is no revenue increase for the Authority.

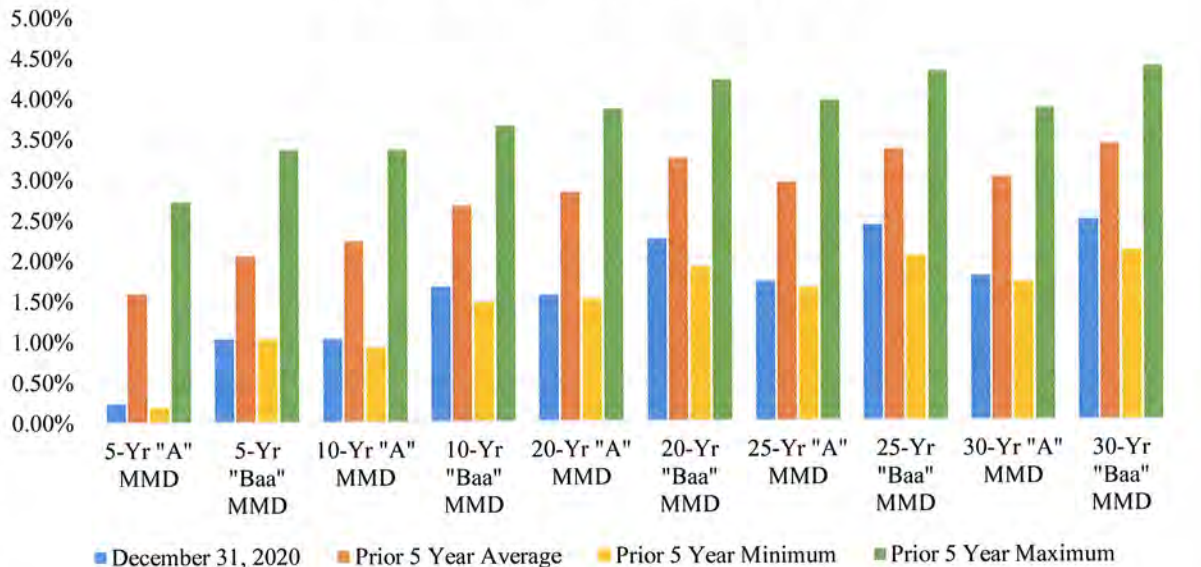
17 **Operations.** The Authority has put off investing in improvements of infrastructure in the
18 past, which has led to cost inefficiencies and a deteriorated system. The Authority's new
19 management has prioritized addressing the system infrastructure and put forth capital
20 requirements in updating its water pumping and storage and water distribution, among
21 others. In order to cover costs and expenses for these projects, revenue has to be
22 adequate. The total system revenues would accumulate to \$232.7 million in FPFTY if
23 the rate were to be approved by the PUC and cover the necessary costs and expenses.

1 However, if rates were not increased, total system revenues would only be \$200.4
2 million, and the Authority runs the risk of having a deficit in fulfilling their debt service
3 payments and creating an event of default. As mentioned in Mr. Barca’s testimony, \$6.6
4 million of the \$22.4 million of increased debt service costs is associated with existing
5 debt service while \$15.8 million is associated with new debt service to fund capital
6 improvements. The ability to fund the necessary capital improvements would cease and
7 harm the ratepayers if the PUC did not rule in favor in the establishment of the full rate
8 increase request.

9 **Rating Downgrade.** Rating downgrade(s) could lead to a myriad of issues for the
10 Authority. Specifically, the cost of fixed-rate borrowing for infrastructure would
11 increase, as well as rates/costs impacts to the Authority for their current line(s) of credit
12 and outstanding swaps. In addition, the Authority could see a lack of options for the
13 required regular refinancing of its existing variable bonds, which would likely lead to
14 higher interest and support costs.

15 **Cost of Capital.** In addition to ensuring that rate increases provide the necessary cash
16 flow for liquidity and pay-go, the Authority’s rating has a direct impact on the cost of
17 capital. This has an impact on the cost of annual debt service, as well as the cost to
18 PWSA of alternative financing options, such as letter of credits, bank loans, and
19 implementing a commercial paper program. Higher rated credits enjoy a range of options
20 in financing increasing Capital Improvement Programs and these short term, variable rate
21 options can be even more advantageous in a rising rate environment. Below are current
22 and historical credit spreads for “A” and “Baa” ratings.

Current and Historical MMD Rates



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*Municipal Market Data (MMD) is the standard index for municipal bonds. MMD publishes various yield curves (1 to 30 years) for different credits/rating categories.

Below is a historical representation of the range in interest rates for “A” and “Baa” rated credits provided by Municipal Market Data. Based on data from the last five years, the average between “A” and “Baa” rates of yield curves ranged from 41 to 46 basis point in the 5-year, 10-year, 20-year and 30-year MMD scales.

Stats	5-Year			10-Year			20-Year			30-Year		
	"A" MMD	"Baa" MMD	Basis Point Difference	"A" MMD	"Baa" MMD	Basis Point Difference	"A" MMD	"Baa" MMD	Basis Point Difference	"A" MMD	"Baa" MMD	Basis Point Difference
December 31, 2020	0.23%	1.03%	80	1.03%	1.67%	64	1.56%	2.25%	69	1.78%	2.47%	69
Prior 5 Year Average	1.59%	2.05%	46	2.23%	2.66%	43	2.83%	3.24%	42	2.99%	3.40%	41
Prior 5 Year Minimum	0.19%	1.03%	84	0.92%	1.47%	55	1.51%	1.90%	39	1.70%	2.09%	39
Prior 5 Year Maximum	2.72%	3.36%	64	3.36%	3.65%	29	3.85%	4.21%	36	3.85%	4.36%	51

Source: Municipal Market Data.

Over the next five years, the Authority expects to issue \$1.114 billion in additional revenue bond debt. For every 44 basis point increase, which is approximately the difference between the prior five-year interest rate average between an A credit and Baa rates, PWSA and ultimately rate payers could expect to pay an additional \$4.90 million in

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1 annual debt service or more than \$147 million over the life of the bond issue. This
2 increase adds up and can place additional stress on debt service coverage requirements.

3 **Costs of Revolving LOC.** The revolving line of credit agreement that the Authority
4 executed with PNC Bank, NA in June 2020 has legal language that sets the applicable
5 spread regarding the cost of the line of credit. According to the agreement, the Authority
6 is currently paying 79% of LIBOR + 1.61% based on PWSA's current rating. However,
7 if the Authority were to be downgraded in the future to Baa1 or BBB+ by Moody's
8 and/or S&P, respectively, then the Authority would be paying a spread to LIBOR at
9 1.68%. The spread would increase even more to 1.71% if the Authority were to be
10 downgraded further to Baa2 or BBB by Moody's and/or S&P, respectively.

11 Additionally, the Authority pays an annual unutilized commitment fee for the revolving
12 line of credit of 0.40% if daily usage is less than one-half of the faculty or 0.25% if daily
13 usage is greater than or equal to one-half of the faculty based on their current ratings.

14 **Swap Agreements.** The Authority's amended swap agreements for the outstanding
15 2017C Bonds do not have variable rate or fixed rate triggers related to credit ratings
16 downgrades. Nevertheless, there is legal language relating to an Authority's credit rating
17 in regards to downgrades constituting an additional termination event if the Authority's
18 credit rating should be downgraded to Baa3 or BBB- by Moody's and/or S&P,
19 respectively. As of December 31, 2020, the swap termination net present value for the
20 swaps related to the 2017C Bonds was negative \$103,437,788, which is quite substantial.

21

1 **V. IMPACT OF MULTI-PHASE RATE ADJUSTMENT AND FUTURE RATE**
 2 **INCREASES**

3 **Q. HOW WILL THE AUTHORITY’S CREDIT PROFILE BE IMPACTED IF THE**
 4 **PUC APPROVES A MULTI-PHASE RATE ADJUSTMENT?**

5 A. Rating Agency Rating Considerations

6 In regards to the PWSA and the current rate request, it should be noted that PWSA chose
 7 to keep its rate request increase at the minimum level needed to maintain operations and
 8 meet legally required financial covenants as a result of the ongoing COVID-19 pandemic
 9 to provide financial relief to the ratepayers. Moody’s scorecard has a rate management
 10 sub-factor under the management factor that is worth 10% of the overall score.

11 According to Moody’s methodology, since rates are typically the primary mechanism to
 12 pay for a utility’s operations, ideally their rate would increase steadily. Management’s
 13 track record at setting rates appropriately and increasing them when necessary drives this
 14 score. Moody’s also takes into account the length of time required to implement a rate
 15 increase, especially when the utility must seek approval from the state. In the case of
 16 PWSA, Moody’s has noted that an inability to raise rates sufficiently to meet debt service
 17 coverage covenants while also funding significant deferred capital improvements could
 18 lead to a downgrade.

19 S&P uses a scorecard approach for their water and sewer ratings. There are four factors
 20 that go into the Operational Management Assessment score. “Rate Setting Practices,”
 21 which represents 40% of the Operational Management Assessment score, is the largest
 22 factor within the Operational Management Assessment score.

- 23 • *Strong Rate Setting Practices* occur when rate increases have been needed, the
 24 decision-making body has been supportive and timely, even to the extent that
 25 multiyear, preapproved rate increases are common, if not standard. Financial

1 decisions are prudent, in our view, rather than simply politically expedient and
2 that could possibly be to the detriment of the utility's near-term financial health.
3 Periodic rate studies (internal or external) are common.

- 4 • *Good Rate Setting Practices* occur when rate considerations are done on a year-
5 to-year planning horizon, rather than over a long-term time frame, but generally
6 are politically approved if, and when, necessary.
- 7 • *Standard Rate Setting Practices* occur when setting rates for the rate covenant
8 and/or additional bonds test are the de facto guide as to when rate adjustments are
9 necessary, but that instill enough for the political decision makers to agree to a
10 rate increase.
- 11 • *Vulnerable Rate Setting Practices* occur when rate increases are often in reaction
12 to a weakened financial position, including a technical default or some other legal
13 covenant violation, even if the recent debt service payments were made on time
14 and in full. There is clear evidence of recent political decisions to defer or
15 downsize needed rate increases.

16 Specifically, as mentioned previously, S&P has noted in the past that their stable outlook
17 for PWSA reflects an expectation that both the timing and magnitude of rate adjustments
18 that PWSA requests, versus what the PUC ultimately grants, will generally prove to be
19 aligned. S&P assumes that PUC oversight will be a supportive relationship of credit
20 quality observed by both the timing and magnitude of rate adjustments that the Authority
21 requests versus what the PUC grant. S&P also noted in the past that should rate increases
22 be insufficient to support strong finances, they could lower the rating. As can be seen in
23 PWSA Exhibit EB-2, which is a part of Mr. Barca's testimony, if requested rates are

1 granted by the PUC, the Authority would barely comply with its bond rate covenants
2 with bondholders, specifically the total debt service coverage. Therefore, it is imperative
3 the PUC the requested rate adjustments “align” in what the PUC approves.

4 Stable Financial Performance.

5 Multi-year planning and rate adjustments contribute to municipal utilities’ stable financial
6 performance. The table below summarizes the historical debt service coverages and days
7 cash on hand for PWSA and peer utilities. The peer agencies generally have stable
8 financial metrics. In cases where metrics have deteriorated sharply for respective peers,
9 such as the City of Baltimore in FY 2016 and PWSA in 2017, bond ratings have been
10 lowered following the reported results. On the contrary, when metrics increase for peers,
11 such as Allegheny County Sanitary Sewer Authority (“ALCOSAN”) or the Great Lakes
12 Water Authority, bond ratings have been upgraded. The absence of annual rate increases
13 has caused substantial volatility in the Authority’s financial metrics in the past and it is
14 imperative that annual rate increases occur with an appropriate adjustment to keep or
15 increase the financial metrics of the Authority. Neither bond investors, nor the rating
16 agencies will look favorably on consistently deteriorating financial metrics or the
17 variability of sporadic rate increases and/or inadequate adjustments, as these
18 characteristics are inconsistent with highly rated municipal utilities.

19

Historical and Project Financial Metrics of PWSA Compared to Historical Financial Metrics of Peers											
Debt Service Coverage*											
	Pittsburgh Water and Sewer Authority (A3)	ALCOSAN (PA) (Aa3) ¹	Atlanta Water & Wastewater Enterprise (GA) (Aa2)	Baltimore Water Enterprise (MD) (Aa2)	Chicago Water Enterprise (IL) (Baa2)	Cleveland Water Enterprise (OH) (Aa2)	Great Lakes Water Authority (MI) (A1) ²	Metropolitan Sewer District of Greater Cincinnati (OH) (Aa2)	Philadelphia Water & Sewer Enterprise (PA) (A1)	Washington, D.C. Water & Sewer Authority (DC) (Aa1)	Westmoreland County Municipal Authority (A1)
2015	1.1	1.6	2.1	1.8	2.5	2.2	1.3	1.5	1.5	1.8	1.2
2016	0.9	1.6	1.8	1.1	2.6	2.0	1.6	1.7	1.4	2.0	1.0
2017	0.8	2.2	1.9	1.4	2.3	1.7	1.6	1.5	1.7	2.1	1.5
2018	1.4	2.1	2.4	2.3	2.2	1.9	1.6	2	1.5	2.1	1.6
2019	1.7	2.0	2.6	1.4	1.8	2.0	1.8	1.9	1.8	2.1	1.3
2020	1.5										
2021	1.5										
2022	1.5										
2023	1.4										

Days' Cash on Hand*											
	Pittsburgh Water and Sewer Authority (A3)	ALCOSAN (PA) (Aa3) ¹	Atlanta Water & Wastewater Enterprise (GA) (Aa2)	Baltimore Water Enterprise (MD) (Aa2)	Chicago Water Enterprise (IL) (Baa2)	Cleveland Water Enterprise (OH) (Aa2)	Great Lakes Water Authority (MI) (A1) ²	Metropolitan Sewer District of Greater Cincinnati (OH) (Aa2)	Philadelphia Water & Sewer Enterprise (PA) (A1)	Washington, D.C. Water & Sewer Authority (DC) (Aa1)	Westmoreland County Municipal Authority (A1)
2015	78	424	1,313	205	462	469	266	448	78	244	90
2016	53	450	1,243	113	591	781	391	564	79	265	75
2017	26	620	1,364	58	598	848	670	613	88	250	98
2018	112	684	2,005	258	480	796	731	708	88	261	115
2019	143	870	1,357	199	417	759	675	60	92	261	157
2020	229										
2021	195										
2022	175										
2023	152										

1

2 *Sources: Moody's Investors Service Reports for years 2015 through 2019.

3 ¹ALCOSAN was upgraded to Aa3 from A1 on August 27, 2020. The debt statistics are shaded green in 2019 as this

4 is the most recent financial metric data.

5 ²Great Lakes Water Authority was upgraded to A1 from A2 on March 13, 2020. The debt statistics are shaded

6 green in 2019 as this is the most recent financial metric data.

7 Notes: Yellow shaded cells represent rating Moody's downgrades. Green shaded cells represent rating Moody's

8 upgrade. Orange shaded cells represent years when PWSA rate adjustment is scheduled.

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1 **Q. PWSA IS PROPOSING TO CONTINUE ITS EXISTING WATER RATE**
2 **STRUCTURE WHEREIN A CUSTOMER’S MINIMUM CHARGE INCLUDES A**
3 **CERTAIN AMOUNT OF COMMODITY (1000 GALLONS FOR A**
4 **RESIDENTIAL 5/8TH METER. IN ADDITION TO THE OTHER POLICY**
5 **REASONS DISCUSSED BY PWSA WITNESS SMITH SUPPORTING THIS**
6 **POSITION, IS THERE A FINANCIAL RISK TO PWSA ASSOCIATED WITH**
7 **REMOVING THE AUTHORITY’S MINIMUM ALLOWANCE FROM THE**
8 **RATE STRUCTURE?**

9 A. Yes. The Authority is projecting that a removal of the Minimum Allowance from the rate
10 structure would result in a reduction of more than 70% of PWSA’s fixed (non-
11 volumetric) water and wastewater revenue. Given the historic and projected volatility in
12 the Authority’s key credit metrics (debt service coverage and days cash on hand) and the
13 fact that the Authority expects continued declines in water consumption over the
14 projection period, a more than 70% drop in the fixed revenue amount would be seen as
15 creating additional volatility to the net revenue pledged to pay debt service. This change
16 in the rate structure would have to be discussed and justified to the rating agencies. Thus,
17 at this time, we see removing the minimum allowance as a credit negative, not a credit
18 positive.

19 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

20 A. Yes; however, I do reserve the right to supplement this testimony as may be appropriate.

VERIFICATION

I, Tom Huestis hereby state that: (1) I am Senior Managing Director Certifications/Licenses of Public Resources Advisory Group; (2) I have been retained by The Pittsburgh Water and Sewer Authority and am authorized to present testimony on its behalf; (3) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and (4) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C .S. § 4904 (relating to unsworn falsification to authorities).

03/22/2021 | 10:15 AM PDT

Dated

DocuSigned by:
Thomas Huestis
A5755238CBB7400...

Tom Huestis, Senior Managing Director
Certifications/Licenses of Public Resources Advisory Group

Consultant to:
The Pittsburgh Water and Sewer Authority

Appendix A

Firm Overview. PRAG is an independent financial advisory firm organized as a subchapter S corporation wholly-owned and managed by its employees. The firm was founded in 1985 to provide in-depth financing, investment and derivative advice to state and local governments, authorities and agencies and has continuously served governmental entities for the nearly thirty-six (36) years that our firm has been in business. PRAG's only business is providing independent financial and investment advisory services to municipal clients. Today, PRAG has five offices around the country, including our New York City headquarters, and in suburban Philadelphia, Los Angeles, Oakland and St. Petersburg, Florida.

National Experience. PRAG has been consistently ranked among the top three financial advisors in the nation over the last decade for all long-term municipal issuance and has been ranked the #1 financial advisor by volume of competitive issuances in 2017, 2018, 2019, and 2020, as illustrated in the table to the right. Our success is built on a history of providing comprehensive, high-quality, and independent advice to public sector issuers with respect to capital planning, debt portfolio management, debt capacity, swaps and derivative instruments, financing options, refunding approaches and techniques, bond structure and pricing, and bond proceeds investment strategies.

PRAG's Financial Advisory Rankings (2010 -2020)						
Year	Long-Term Municipal Issuance Rankings		Competitive Sale Rankings		Negotiated Sale Rankings	
	Total Amount*	Rank	Total Amount*	Rank	Total Amount*	Rank
2020	\$43.4	2	\$13.5	1	\$29.9	2
2019	\$40.6	2	\$19.4	1	\$21.2	3
2018	\$36.1	2	\$17.4	1	\$18.7	2
2017	\$52.4	2	\$20.2	1	\$32.2	2
2016	\$33.4	3	\$12.6	2	\$20.8	3
2015	\$30.9	3	\$12.4	2	\$18.5	3
2014	\$27.9	2	\$11.4	1	\$16.4	3
2013	\$31.0	2	\$9.9	2	\$21.1	2
2012	\$26.5	2	\$8.2	2	\$18.2	3
2011	\$20.9	2	\$8.1	2	\$12.8	3
2010	\$31.1	2	\$6.7	2	\$24.4	2

*\$'s in billions.

Source: Refinitiv.

Water and Wastewater Experience. In 2019 and 2020, PRAG was ranked #4 in the nation by Refinitiv (formerly Thomson Reuters) for utility long-term municipal financings, having served as financial advisor on bond issues totaling over \$5.3 billion over those two years. Since 2000, PRAG has advised water and wastewater authorities and agencies on their complex needs, including over \$40.3 billion in financings. Our water and wastewater transactions include fixed and variable rate bonds, negotiated transactions, public sales and private placements, new money and refundings. Provided below is a list of select water and wastewater clients. In addition to our water and wastewater transaction experience, we also have ample experience with general financial advisory services, such as preparing feasibility studies, credit rating strategies, long-term financial plans, debt affordability studies, advising in an Independent Registered Municipal Advisor role, monitoring legislation and more. PRAG advised the Pittsburgh Water and Sewer Authority ("PWSA") on its bond transactions in 2019 and 2020: \$109,855,000 Water and Sewer System First Lien Revenue Bonds, Series A of 2019; \$104,290,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series B of 2019; \$92,410,000 Water and Sewer First Lien Revenue Bonds Series A of 2020 (Taxable) and Series B of 2020 and the remarketing of the \$218,805,000 Water and Sewer System First Lien Revenue Refunding Bonds, Series C of 2017. Provided below is a list of select water and wastewater clients.

Summary of PRAG's Water and Wastewater Experience	Bond Issuance	Innovative Debt Products	Structuring and Restructuring	Long-Term Financial Plan	Investments	Swaps & Derivatives	Credit Rating Strategy	Special Studies & Reports	Financial Policies	Inter-Agency Agreements
Metropolitan Water District of Southern CA	✓	✓	✓		✓	✓	✓			
San Francisco Public Utilities Commission	✓		✓	✓			✓			
Miami-Dade County Water & Sewer	✓		✓	✓		✓	✓		✓	✓
Orange County Sanitation District	✓	✓	✓	✓	✓	✓	✓	✓		
Santa Clara Valley Water District	✓	✓	✓	✓	✓	✓	✓	✓		
West Virginia Water Development Authority	✓						✓			
LA Department of Water & Power	✓	✓	✓		✓	✓	✓	✓		✓
Hillsborough County	✓						✓		✓	
Baltimore County	✓		✓	✓			✓	✓	✓	
Anne Arundel County	✓		✓	✓			✓		✓	
City of Virginia Beach	✓		✓	✓			✓			
Bethlehem Authority	✓		✓	✓	✓	✓	✓	✓	✓	✓
Capital Region Water (Harrisburg)	✓		✓	✓	✓		✓	✓	✓	✓
Pittsburgh Water and Sewer Authority	✓		✓			✓	✓			

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Thomas Huestis
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Mr. Huestis joined PRAG in 2002 as Senior Managing Director, and is an officer of the firm, a member of the firm's board of directors and the manager of the firm's Pennsylvania office. Mr. Huestis brings a unique understanding of public sector investment, debt management and financial management based on his 30 years of experience as an independent financial advisor and as a municipal finance executive. He provides advice to a wide variety of PRAG clients including states, counties, cities and authorities and has experience with all types of financing structures. Mr. Huestis has worked with a variety of PRAG clients on water, sewer and storm water financings including: The Pittsburgh Water and Sewer Authority, The Bethlehem Authority, Capital Region Water (formerly The Harrisburg Authority), The Metropolitan Council (MN), Miami-Dade County, New Castle County (DE), the City of Orlando and the West Virginia Water Development Authority. Mr. Huestis has advised the West Virginia Public Service Commission, the Ohio Public Service Commission and the Government of the District of Columbia related to the securitizations of non-bypassable utility charges on customers' bills. Mr. Huestis testified as financial advisor to PWSA in the PUC rate case in 2020, as well.

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Mr. Huestis worked with the PWSA on its bond transactions in 2019 and 2020, including \$109.9 million Senior Lien Revenue Bonds, Series A of 2019, the proceeds of which were used to repay \$131.2 million on its construction revolving line of credit. PWSA also settled its \$104.3 million Subordinate Lien Revenue Refunding Bonds, Series B of 2019 the proceeds of which, in combination with \$5.7 million in PWSA funds, were used to refund all of the \$103.6 million in outstanding subordinate variable rate debt and terminate the related interest rate swaps. Mr. Huestis assisted with PWSA's \$890,000 Water and Sewer System First Lien Revenue Bonds, Series A of 2020 (Taxable), of which the proceeds paid for the costs related to the 2017C Remarketing and closed \$91,520,000 Water and Sewer System First Lien Revenue Bonds, Series B of 2020, of which were used to pay down \$107 million on its capital line of credit note. Mr. Huestis assisted with the structuring of the bonds and presenting to the rating agencies and describing the PWSA's operational and financial improvement and positive trajectory for the future. Following this meeting, Moody's revised its outlook on all of the Authority's outstanding senior bonds from negative to stable and assigned a stable outlook on the 2019 A and B bonds. Moody's affirmed the stable outlook for the 2020 bonds, as well.

Mr. Huestis has worked also with Capital Region Water on various financing and operating improvements following the transfer of all the water and sewer assets and liabilities of the City of Harrisburg's water and sewer department to Capital Region Water. Mr. Huestis led the effort on the transfer, which included drafting the term-sheet that became the basis for legislation. He then worked with the City, Office of the Receiver of the City of Harrisburg and the Authority to negotiate the terms of the transfer and operating arrangements.

Prior to joining PRAG, Mr. Huestis was the Treasurer of the District of Columbia where he was responsible for the management of the District's financial assets, all debt offerings and financing programs. During his tenure, Mr. Huestis implemented the financial aspects of the transfer of the District of Columbia Department of Water and Sewer to the newly created District of Columbia Water and Sewer Authority.

Mr. Huestis received an MBA from Carnegie Mellon University and a Bachelor of Arts Degree in Government from Franklin & Marshall College. Mr. Huestis is a Registered Municipal Advisor Representative and Investment Adviser Representative.

Exhibit TH-1

The Pittsburgh Water and Sewer Authority Rate Covenant and Flow of Funds

Rate Covenant

The Rate Covenant in the Amended and Restated Indenture that the Authority made with bondholders requires the Authority to satisfy the three requirements below:

1. Net Revenues shall be sufficient in each Fiscal Year to pay Annual Senior Debt Service, Annual Subordinate Debt Service, all deposits to satisfy Reserve Requirements and any additional Authority Indebtedness in that Fiscal Year.
2. Net Revenues shall not be less than 125% of Annual Senior Debt Service, plus 110% of aggregate Annual Debt Service in that Fiscal Year.
3. Rate Covenant Net Revenues, excluding transfers from the Rate Stabilization Fund, shall equal not less than 100% of aggregate Annual Debt Service.

Rate Covenant Net Revenues include Net Revenues plus any transfers from the Rate Stabilization Fund to the Revenue Fund; less any transfers to the Rate Stabilization Fund to the Revenue Fund.

It should be noted that the City's Cooperation Payment is specifically not included as an operating expense for purposes of calculating the rate covenant.

Flow of Funds

1. Revenue Fund - All revenues received by the Authority must be deposited into Revenue Fund.
2. Operating Fund - The Authority shall transfer from the Revenue Fund to the Operating Fund from time to time amounts needed to pay Current Expenses.
3. Debt Service Fund - On the 20th day of each month before debt service is due, the Authority shall transfer to: (1) senior debt service fund (including periodic payments of swap agreements); (2) the senior debt service reserve fund, if needed; (3) the subordinated debt service fund (including periodic payments of swap agreements); the subordinated debt service reserve fund, if needed; (5) any payments owed to swap providers other than periodic payments.
4. Operating Reserve Fund - Amounts necessary to restore the operating reserve requirement of 116th of current expenses of the most recent annual audited financial statements. Such amounts shall be restored if drawn upon within 24 months of the withdrawal by depositing 1/24 of the operating reserve requirement monthly.
5. City Cooperation Agreement - Amounts owed to the City pursuant to the Agreement.
6. Any funds remaining in the Revenue Fund after all of the previous required payments have been made can be transferred to the Rate Stabilization Fund; the Debt Service Fund; the Operating Fund to pay for construction or capital projects.

Exhibit TH-2

Peer Ratings and Comparative Financial Information											
	Pittsburgh Water and Sewer Authority	ALCOSAN (PA)	Atlanta Water & Wastewater Enterprise (GA)	Baltimore Water Enterprise (MD)	Chicago Water Enterprise (IL)	Cleveland Water Enterprise (OH)	Great Lakes Water Authority (MI)	Metropolitan Sewer District of Greater Cincinnati (OH)	Philadelphia Water & Sewer Enterprise (PA)	Washington, D.C. Water & Sewer Authority (DC)	Westmoreland County Municipal Authority
Year	2019	2019	2020	2020	2019	2019	2020	2019	2020	2019	2020
Current Senior Most Rating	A3	Aa3	Aa2	Aa2	Baa2	Aa2	A1	Aa2	A1	Aa1	A1
Total Current Cash, Cash Equivalents and Investments (\$000)	64,680	175,477	807,599	85,769	441,881	405,002	394,441	20,975	132,483	256,660	29,664
Total Revenue Bonds (\$000)	922,339	677,935	2,720,285	1,003,329	N/A	447,275	N/A	N/A	2,149,469	N/A	N/A
Total Long Term Debt (\$000)	922,339	677,935	3,044,666	1,003,329	2,497,156	548,869	2,835,365	912,783	2,149,469	3,237,089	516,890
Total Operating Revenues (\$000)	249,049	180,238	478,397	216,396	744,378	320,155	334,254	272,273	733,318	705,147	105,460
Total O&M Expenses (\$000)	165,230	77,131	252,956	134,534	387,007	194,837	136,123	126,593	466,173	311,680	66,859
Net Revenues (\$000)	87,280	112,073	401,549	86,220	381,886	134,418	251,266	168,045	290,862	402,774	43,421
Total Annual Senior Lien Debt Service (\$000)	44,227	N/A	212,820	44,031	7,550	50,390	122,319	60,737	192,478	75,282	40,194
Total Annual Debt Service (\$000)	52,010	54,891	227,640	69,520	208,750	68,440	169,183	89,486	192,478	193,035	40,194
Operating Ratio (%)	66.3	42.8	52.9	62.2	52.0	60.9	40.7	46.5	63.6	44.2	63.4
Debt Ratio (%)	103.2	62.4	43.4	46.5	45.3	23.2	118.1	38.1	55.2	42.9	79.0
Total Annual Senior Lien DSC (x)	2.0	N/A	1.9	2.0	50.6	2.7	2.1	2.8	1.5	5.4	1.1
Total Annual Debt Service Coverage (x)	1.7	2.0	1.8	1.2	1.8	2.0	1.5	1.9	1.5	2.1	1.1

Sources: Moody's rating reports for each issuer.

Exhibit TH-3

MOODY'S

INVESTORS SERVICE

SECTOR PROFILE

19 May 2020

✓ Rate this Research

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EMEA 44-20-7772-5454

Water and sewer utilities – US

Medians - Solid financial performance, ability to increase rates underpin stability

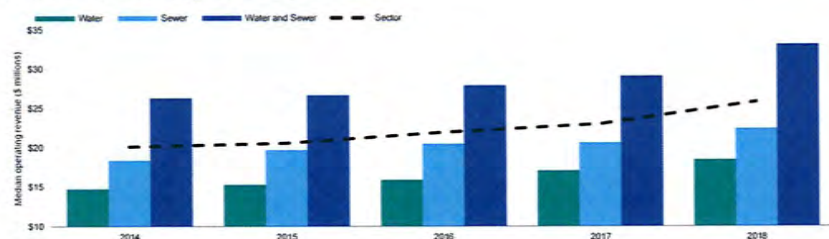
Municipal water and sewer utilities continued to demonstrate stable to modestly improving financial metrics, according to our 2018 medians, primarily driven by systems' willingness and ability to raise rates to support operations and debt service coverage. However, declining asset conditions across the sector indicate underinvestment in capital infrastructure, auguring additional leverage or reserve spend-down in future years. These trends are reflected in our [stable outlook for the sector](#). Improving credit metrics over the last several years will enable systems to mitigate negative impacts from the coronavirus pandemic.

- » **Revenue growth supplies solid base to cover operations and debt service.** Revenue rose in the three subsectors – water, sewer and combined enterprises – indicating growing customer bases and rate increases reflecting the sector's independent rate-setting ability.
- » **Operating and maintenance (O&M) expenses rise.** O&M expenses grew modestly across the entire sector as systems expanded and added customers. The increase in system size creates financial stability for systems through economies of scale. Growth was most rapid among large combined water and sewer systems that often serve urban areas.
- » **Net revenue continued to improve, indicating continued financial strength and flexibility.** Higher net revenue supplies ample cushion for systems to either increase debt or weather the impact of resource availability issues, increases in delinquencies and nonpayment, or other unforeseen future needs.
- » **Liquidity improves to 475 days cash on hand in 2018.** Sewer entities maintained the healthiest cash positions, though all three system types retained over a year's worth of operating expenditures. Improved liquidity supports systems in cases of service disruption.
- » **Debt burden begins to rise driven by combined water and sewer systems.** A slight rise in leverage sectorwide in 2018 was driven by an increase in debt issuances by combined water and sewer systems. Before 2018, however, years of rate increases and falling debt burdens have left capacity to add debt without overburdening customers.
- » **Debt service coverage is healthy for all system types.** Coverage rose to just over 2.2 times, indicating a healthy cushion to absorb fluctuations in revenues or expenses.
- » **Asset condition decline continues, signaling underinvestment in capital projects.** Deferral of capital projects drove a decline in the remaining useful life of assets sectorwide as depreciation outpaced investment in infrastructure. Some systems are investing in capital to reduce environmental risks and meet regulatory requirements.

Revenue

Exhibit 1

Revenue continues to grow across the sector



Source: Moody's Investors Service

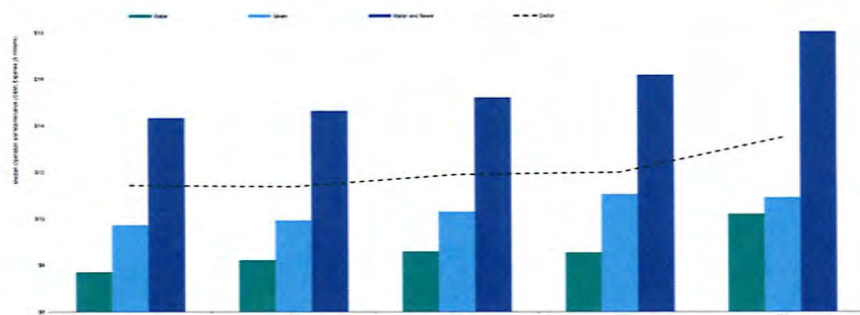
Strong revenue growth highlights strength of independent rate-raising authority

- » Revenue grew in all three sectors, driven by growth in customer base and by rate increases to address higher operating expenses and debt service.
- » Combined water and sewer systems led the increases. They are larger, more complex and more expensive to run, requiring larger revenue increases to support additional customers.
- » System growth and revenue diversity can reduce the need for systems to drastically raise rates, allowing them to instead implement smaller increases spread across more customers to pay debt or address capital needs.

Expenses

Exhibit 2

Operation and maintenance expenditures continue to grow



Source: Moody's Investors Service

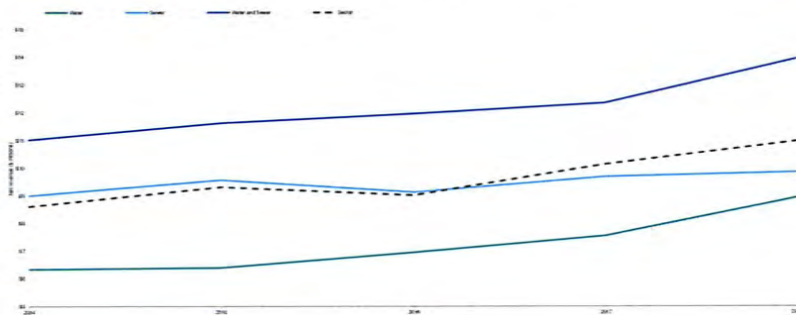
Operation and maintenance (O&M) expenditures increased as systems expanded; growth in service for larger utilities creates greater economies of scale

- » Sectorwide O&M expenses increased, with the largest rise coming in combined utilities. O&M growth sectorwide was largely due to service area growth, offset somewhat by energy-efficient upgrades to facilities and flat-to-declining water usage driven by increased conservation.
- » Larger utilities benefit from economies of scale and are better equipped to handle unexpected expenses, service and revenue disruptions than smaller utilities.
- » [San Francisco Public Utilities Commission Water Enterprise, CA](#) (Aa2 stable) has used its size and sophistication to build water storage and redundancy that protects the system against periodic drought conditions in California and addresses other climate change risk associated with sea-level rise.

Net revenue

Exhibit 3

Net revenues improve as system revenue outpaces expenditures

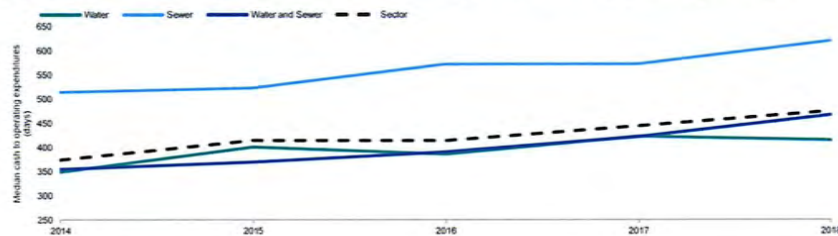


Source: Moody's Investors Service

Liquidity

Exhibit 4

Liquidity remains strong, with all sectors retaining more than one year of operating cash



Source: Moody's Investors Service

Improving net revenues indicate continued financial strength and flexibility

- » Net revenue continued to rise across all three utility types, providing a strong basis for paying debt and building up liquidity to further address capital needs through pay-go financing.
- » While both revenue and expenditures increased, the rise in net revenue shows the positive effect of the sector's independent rate-raising ability.
- » Healthy net revenue growth provides a strong base to cover continuing maintenance without the need to increase leverage.

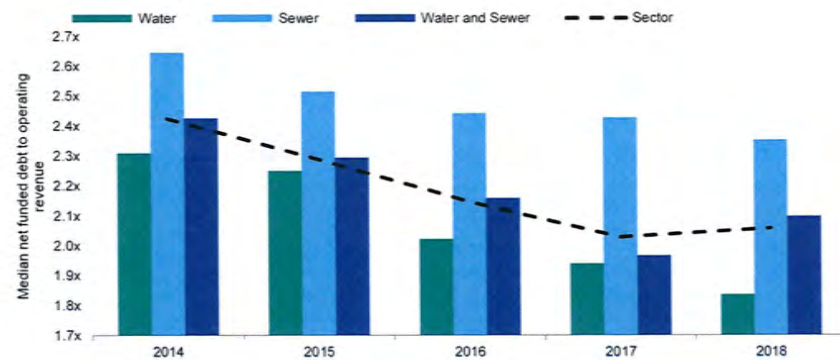
Strong liquidity provides flexibility and protection from revenue loss

- » Liquidity improved across all subsectors. Sewer and combined systems had large increases in 2018, while water systems' liquidity dipped. All system types had much stronger cash positions than in 2014.
- » Strong liquidity protects systems from the need to raise rates unexpectedly and provides a cushion against unforeseen capital expenditures and delinquencies in times of economic stress.
- » Sewer entities maintain higher cash balances, given the need to fund maintenance and environmental mitigation projects to meet increasingly strict environmental regulations.
- » Hawaii's [Honolulu \(City and County of\) Sewer Enterprise](#) (Aa2 senior lien, Aa3 junior lien) built cash reserves up to 3,179 days cash on hand from 1,847 days in 2014 to address an aggressive capital plan that involves mitigation projects related to a consent decree.

Leverage

Exhibit 5

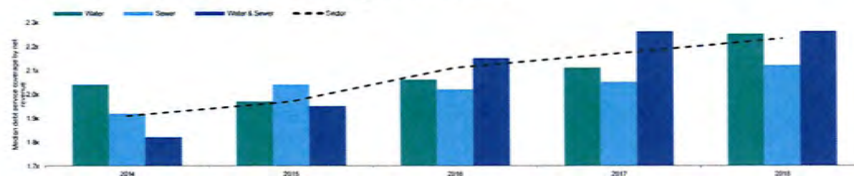
Leverage sectorwide begins to increase after a multiyear decline



Source: Moody's Investors Service

Exhibit 6

Debt service coverage remains healthy at above 2.0x



Source: Moody's Investors Service

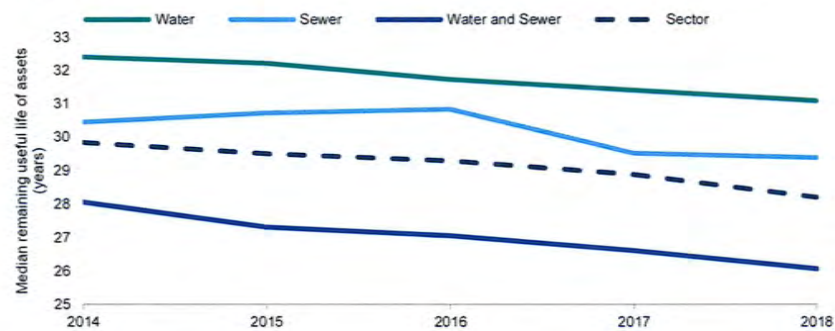
Overall leverage begins to rise as combined systems fund new plans

- » Debt to operating revenue across the sector began to rise in 2018 as large combined utilities embark on new 10-year capital plans following the end of major capital plans driven by Build America Bonds.
- » South Carolina's [Columbia \(City of\) Water and Sewer Enterprise \(Aa1 stable\)](#) increased its debt to operating revenue to 4.0 times in 2018 from 3.4 times in 2017 as it began to issue debt to fund a \$120 million a year five-year capital plan.
- » Leverage at single-purpose water and sewer systems continued a multiyear decline, which provides capacity to address future capital needs.

Debt service coverage improves across all system types

- » Systems' willingness and ability to adjust rates for operations and debt service drove coverage to 2.2 times in 2018. Coverage remained well in excess of standard rate covenants that are usually 1.0-1.5 times annual debt service.
- » Water and sewer entities had continued growth in coverage, while recent large issuances drove flat coverage of 2.3 times in 2018 and 2017 for those for combined systems.
- » [City of Peoria, AZ Water and Sewer Enterprise \(Aa2 stable\)](#) implemented steady rate increases, allowing it to improve its debt service coverage while addressing capital needs on a pay-go basis.

Exhibit 7
 Remaining useful life of assets continues to decline as depreciation outpaces capital investment



Source: Moody's Investors Service

Declining asset condition indicates underinvestment in infrastructure

- » Asset condition declined modestly, though remained at a healthy 28 years, giving systems time to address capital needs before system failure.
- » Deferral of capital investment increases the risk of broken water mains and sewer overflows. These issues can lead to revenue loss and increased expenses to meet regulatory requirements.
- » The median asset condition for water systems remained stable and was stronger, at 31 years, than sewer systems, at 29, and combined water and sewer systems, at 26.

Basis for medians

This medians report conforms to our US Municipal Utility Revenue Debt rating methodology published in October 2017. As such, the medians presented here are based on the key metrics outlined in the methodology and the associated scorecard. The appendix of this report provides additional metrics broken out by sector and rating category.

We use data from a variety of sources to calculate the medians, some of which have differing reporting schedules. Whenever possible, we calculated these medians using available data for fiscal year 2018. The median family income data was derived from the 2018 US Census American Community Survey.

Medians for some rating levels, namely Aaa- and Baa-rated issuers, are based on relatively small sample sizes. These medians may therefore be subject to substantial year-over-year variation.

Our ratings reflect our forward-looking opinion derived partly from forecasts of financial performance and qualitative factors, as opposed to strictly historical quantitative data. Our expectation of future performance, combined with the relative importance of certain metrics on individual local government ratings, account for the range of values that can be found within each rating category.

Key ratios

- » Net revenue: total operating revenue minus operating expenditures
- » Debt service coverage: annual net revenues (including connection or impact fees) divided by annual debt service.
- » Liquidity: unrestricted cash and liquid investments multiplied by 365 and divided by operating and maintenance expenses (net of depreciation), expressed in days.
- » Days cash on hand: Unrestricted cash and liquid investments times 365 divided by operating and maintenance expenses, expressed in days
- » Debt to operating revenues: net long-term debt less debt service reserve funds divided by most recent year's operating revenues.
- » Asset condition: net fixed assets divided by depreciation expense, expressed in years.

Appendix A: Water, sewer and combined water and sewer utilities

Exhibit 8

Medians for US water utilities

Selected Indicators	2014	2015	2016	2017	2018
Moody's Median Senior Revenue Rating					Aa3
Median Family Income (% of US Median)	98.6%	98.8%	99.2%	100.0%	99.9%
Asset Condition: (Remaining Useful Life)	32	32	32	31	31
Debt to Operating Revenues	2.3	2.2	2.0	1.9	1.8
Annual Debt Service Coverage	2.1	2.0	2.1	2.1	2.2
Days Cash on Hand	349	402	387	423	416
System Size: (O&M, \$000)	7,703	8,220	8,587	8,544	10,192
Debt Service (\$000)	2,909	2,974	3,002	3,027	3,785
Net Revenues (\$000)	6,325	6,382	6,936	7,539	8,919
Net Funded Debt (\$000)	32,610	32,703	32,828	31,701	32,680
Total Revenues (\$000)	14,701	15,257	15,866	17,055	18,441

Source: Moody's Investors Service

Exhibit 9

Medians for US sewer utilities

Selected Indicators	2014	2015	2016	2017	2018
Moody's Median Senior Revenue Rating					Aa3
Median Family Income (% of US Median)	98.1	98.3	98.5	100.0	100.0
Asset Condition: (Remaining Useful Life)	30	31	31	30	29
Debt to Operating Revenues	2.6	2.5	2.4	2.4	2.4
Annual Debt Service Coverage	1.9	2.0	2.0	2.0	2.1
Days Cash on Hand	515	524	572	572	620
System Size: (O&M, \$000)	9,731	9,925	10,305	11,056	10,909
Debt Service (\$000)	4,339	4,067	3,813	3,948	4,089
Net Revenues (\$000)	8,991	9,560	9,118	9,682	9,839
Net Funded Debt (\$000)	38,311	39,492	39,700	38,781	38,456
Total Revenues (\$000)	18,354	19,705	20,464	20,605	22,407

Source: Moody's Investors Service

Exhibit 10

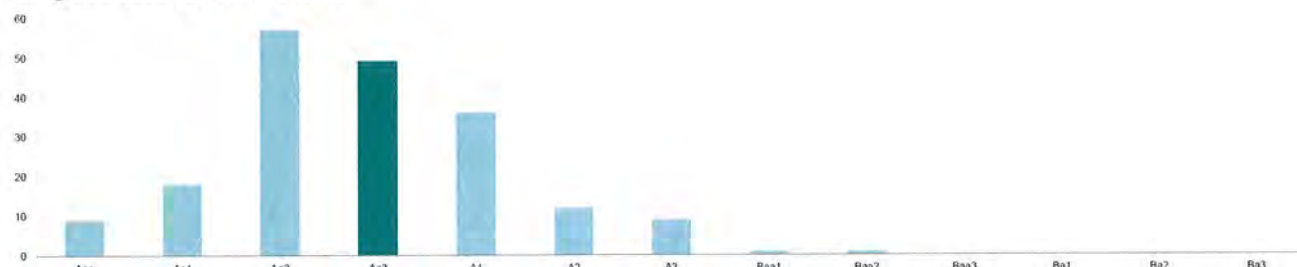
Medians US combined water and sewer utilities

Selected Indicators	2014	2015	2016	2017	2018
Moody's Median Senior Revenue Rating					Aa3
Median Family Income (% of US Median)	91.6	91.0	91.1	90.9	90.2
Asset Condition: (Remaining Useful Life)	28	27	27	27	26
Debt to Operating Revenues	2.4	2.3	2.2	2.0	2.1
Annual Debt Service Coverage	1.8	2.0	2.2	2.3	2.3
Days Cash on Hand	355	370	391	422	467
System Size: (O&M, \$000)	14,322	14,623	15,205	16,164	18,476
Debt Service (\$000)	4,934	5,136	5,228	5,228	5,805
Net Revenues (\$000)	11,013	11,619	11,951	12,335	13,916
Net Funded Debt (\$000)	55,061	53,053	51,433	50,062	59,249
Total Revenues (\$000)	26,261	26,617	27,870	29,037	33,080

Source: Moody's Investors Service

Appendix B: Water utilities

Exhibit 11
Rating distribution US water utilities



*Highlighted bar represents median rating
Source: Moody's Investors Service

Exhibit 12
2018 medians for US water utilities

Selected Indicators	2018
Moody's Median Senior Revenue Rating	Aa3
Median Family Income (% of US Median)	99.9%
Asset Condition: (Remaining Useful Life)	31
Debt to Operating Revenues	1.9
Annual Debt Service Coverage	2.2
Days Cash on Hand	416
System Size: (O&M, \$000)	10,355
Debt Service (\$000)	3,837
Net Revenues (\$000)	8,979
Net Funded Debt (\$000)	34,020
Total Revenues (\$000)	19,081

Source: Moody's Investors Service

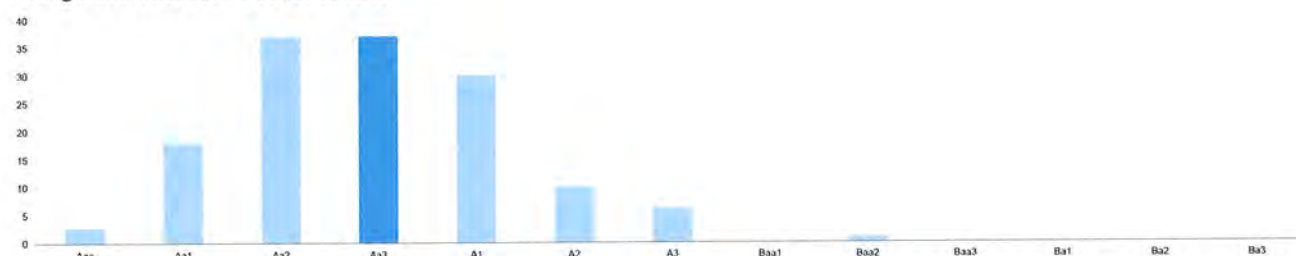
Exhibit 13
2018 medians for US water utilities by rating category

Selected Indicators	Aaa	Aa	A	Baa	Ba
Median Family Income (% of US Median)	109.2	103.7	87.9	91.7	N/A
Asset Condition: (Remaining Useful Life)	36	32	26	41	N/A
Debt to Operating Revenues	2.0	1.7	2.0	2.2	N/A
Annual Debt Service Coverage	2.6	2.4	1.9	2.2	N/A
Days Cash on Hand	640	417	413	465	N/A
System Size: (O&M, \$000)	81,274	16,631	3,138	118,805	N/A
Debt Service (\$000)	40,191	5,006	1,626	98,363	N/A
Net Revenues (\$000)	99,168	14,758	2,301	290,508	N/A
Net Funded Debt (\$000)	421,652	45,523	15,270	1,246,788	N/A
Total Revenues (\$000)	194,362	34,006	5,744	409,313	N/A

Source: Moody's Investors Service

Appendix C: Sewer utilities

Exhibit 14
Rating distribution for US sewer utilities



*Highlighted bar represents median rating
Source: Moody's Investors Service

Exhibit 15
2018 US sewer medians

Selected Indicators	2018
Moody's Median Senior Revenue Rating	Aa3
Median Family Income (% of US Median)	100.0
Asset Condition: (Remaining Useful Life)	29
Debt to Operating Revenues	2.4
Annual Debt Service Coverage	2.1
Days Cash on Hand	620
System Size: (O&M, \$000)	10,909
Debt Service (\$000)	4,089
Net Revenues (\$000)	9,839
Net Funded Debt (\$000)	38,456
Total Revenues (\$000)	22,407

Source: Moody's Investors Service

Exhibit 16
2018 medians US sewer utilities by rating category

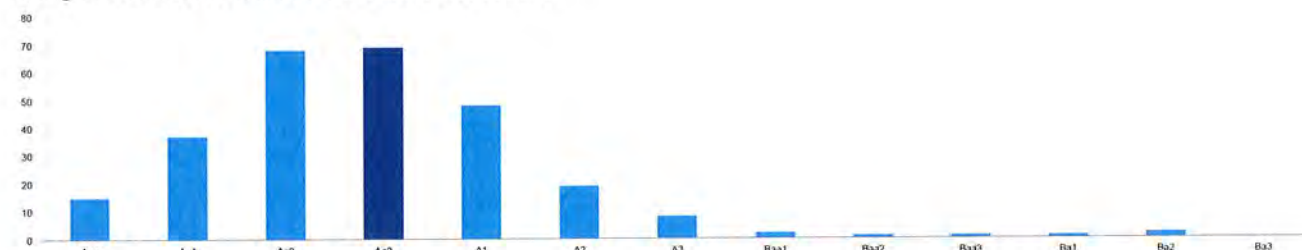
Selected Indicators	Aaa	Aa	A	Baa	Ba
Median Family Income (% of US Median)	130.2	101.2	85.9	87.0	N/A
Asset Condition: (Remaining Useful Life)	27	30	25	56	N/A
Debt to Operating Revenues	2.8	2.3	2.2	4.8	N/A
Annual Debt Service Coverage	2.9	2.2	1.6	1.7	N/A
Days Cash on Hand	1,581	652	590	417	N/A
System Size: (O&M, \$000)	99,685	21,050	3,928	149,634	N/A
Debt Service (\$000)	44,827	8,069	1,799	135,036	N/A
Net Revenues (\$000)	128,628	18,047	2,564	227,515	N/A
Net Funded Debt (\$000)	551,369	74,349	13,429	1,788,124	N/A
Total Revenues (\$000)	228,313	39,056	7,432	377,149	N/A

Source: Moody's Investors Service

Appendix D: Combined water and sewer utilities

Exhibit 17

Rating distribution US combined water and sewer utilities



*Highlighted bar represents median rating

Source: Moody's Investors Service

Exhibit 18

2018 US combined water and sewer utilities

Selected Indicators	2018
Moody's Median Senior Revenue Rating	Aa3
Median Family Income (% of US Median)	90.2
Asset Condition: (Remaining Useful Life)	26
Debt to Operating Revenues	2.1
Annual Debt Service Coverage	2.3
Days Cash on Hand	467
System Size: (O&M, \$000)	18,476
Debt Service (\$000)	5,805
Net Revenues (\$000)	13,916
Net Funded Debt (\$000)	59,249
Total Revenues (\$000)	33,080

Source: Moody's Investors Service

Exhibit 19

2018 medians US combined water and sewer utilities by rating category

Selected Indicators	Aaa	Aa	A	Baa	Ba
Median Family Income (% of US Median)	118.0	92.4	82.9	86.3	60.7
Asset Condition: (Remaining Useful Life)	28	26	25	26	26
Debt to Operating Revenues	2.2	2.1	2.5	2.9	4.2
Annual Debt Service Coverage	3.4	2.4	2.0	2.0	0.9
Days Cash on Hand	844	504	377	176	59
System Size: (O&M, \$000)	87,835	24,509	7,600	4,040	10,421
Debt Service (\$000)	20,768	8,036	2,334	1,001	1,641
Net Revenues (\$000)	79,087	21,776	4,488	1,939	5,499
Net Funded Debt (\$000)	271,387	81,576	27,884	18,203	16,417
Total Revenues (\$000)	156,109	16,082	13,006	5,978	15,919

Source: Moody's Investors Service

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Exhibit TH-4

OUTLOOK

2 December 2020

 Rate this Research

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Municipal water and sewer utilities – US

2021 outlook stable despite coronavirus challenges and economic slowdown

The outlook for the US municipal water and sewer utility sector remains stable despite the effects of the coronavirus pandemic and resulting economic downturn. The sector's fundamental strengths, including the essentiality of its services, its autonomous rate-setting authority and its stable, diverse and largely residential customer bases, will preclude material declines in revenues. Debt service coverage and liquidity will remain robust in spite of reduced commercial demand, limited connection fee revenue because of slower customer growth, and increased payment delinquencies. Asset condition will remain on a steady decline. Strong governance will be crucial in mitigating environmental and social risks.

- » **Utilities will continue to benefit from stable, largely residential customer bases.** Large, primarily residential service areas and essentiality of services will support continued stability in demand and revenue, mitigating declines in nonresidential consumption.
- » **Stable demand and revenue will continue to support strong liquidity.** The sector's robust liquidity will providing a buffer against revenue declines, allowing utilities to maintain financial stability without rate increases.
- » **Debt service coverage will remain solid.** Lower nonresidential consumption, increased payment delinquencies and reduced rate increases are likely to depress coverage in 2021, but stability in the sector's demand and revenue from residential customers will preclude material declines.
- » **Asset condition will continue a steady decline.** Some utilities are likely to delay capital projects in 2021 in order to manage cash flow issues. But most will continue their long-term progress toward these goals despite any short-term disruption from the pandemic.
- » **Governance will be critical to mitigating environmental and social risks.** Strong governance remains key to managing water resources, protecting coastal utilities against sea-level rise and staying ahead of federal regulations.
- » **What could change the outlook.** We could revise our outlook to positive if increased certainty over health and economic conditions leads to continued growth in debt service coverage and liquidity as well as an increase in capital investment that improves system asset conditions. We would revise the outlook to negative if the contraction in economic activity extends beyond current expectations, significantly delaying the gradual recovery in revenue that is likely to begin in the second half of 2020.

The outlook reflects our expectations for the fundamental conditions that will drive the credit quality of the municipal water and sewer utilities sector over the next 12 to 18 months. The outlook does not imply the likelihood or direction of rating actions for individual issuers.

Utilities will continue to benefit from stable, largely residential customer bases

The fundamental strengths that have enabled the sector, both operationally and financially, to withstand the impact of the coronavirus and resulting economic downturn will remain key credit drivers over the next 12 to 18 months.

Most water and sewer utilities we rate serve broad, primarily residential areas and have diverse economies. These factors provide a high degree of stability, since most utilities will not undergo significant shifts in overall consumption or any material contraction in service area. Of the more than 700 water and sewer systems we rate, about half serve a geographic area that is at least countywide. Others serve diverse metropolitan areas or even multiple areas through member agency or intergovernmental agreements.

The stable demand and revenue supplied by large residential customer bases also help to offset volatility or declines in commercial or industrial usage. However, utilities with significant exposure to reduced commercial demand or large college populations will remain at greater risk of lower demand.

With economic activity likely to pick up in 2021 after contracting in 2020, the sector will benefit from a recovery in commercial and industrial demand. At the same time, revenue from residential sales will remain above historical levels, as many utility customers continue to work and study from home. Our latest [macroeconomic board outlook](#) forecasts real GDP growth rates in the US of 4.2% in 2021 and 3.9% in 2022, following a 3.6% contraction in 2020. The pace of economic recovery, however, is uncertain and will depend on the development and distribution of a vaccine, on effective pandemic management and on government policy.

The essentiality of water and sewer services will also promote continued sector stability. There has been little or no disruption of utilities' operations during the pandemic because of the critical importance of maintaining the services they provide. For some utilities, fixed charges that mitigate the impact of lower usage on revenues, as well as indexed rate increases that automatically move in line with a specified cost index (such as CPI), will support steady performance even if the current economic environment makes rate increases less politically palatable in 2021.

Stable demand and revenue will continue to support strong liquidity

Stable demand and revenue will continue to support strong liquidity through the economic slowdown. Strong liquidity enhances operating flexibility and will provide a buffer against revenue declines resulting from lower nonresidential demand and increased customer delinquencies in 2021, allowing utilities to maintain financial stability without rate increases.

To be sure, the economic slowdown will result in a modest decline in liquidity in 2021 as many utilities make greater use of cash reserves – rate stabilization reserves when available, as well as existing unrestricted cash balances – to manage through any cash flow issues that arise. However, the decline is unlikely to impair credit quality. With median days cash on hand (DCOH) remaining above 400 days for the sector, most utilities will still have sufficient liquidity – combined with broad flexibility to adjust budgets – to preserve credit strength amid the coronavirus-induced turmoil, even under [extreme stress scenarios](#).

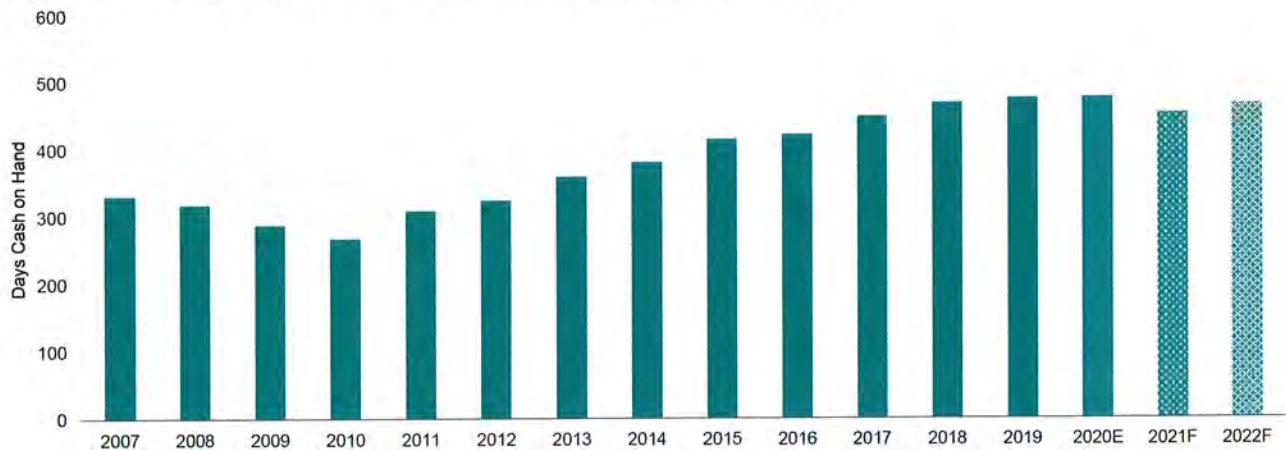
Median days cash on hand in sector reached 477 days in 2019, the highest level in over a decade (see Exhibit 1) after nine consecutive years of growth due to a strengthening economy and rising revenue. Deferral of infrastructure investment, while generally a weakness of the sector, nonetheless allowed systems to build up liquidity in recent years. Most utilities were reporting another year of strong financial performance in 2020 before stay-at-home orders, the closure of nonessential businesses and moratoriums on service shut-offs for nonpayment were implemented in the second quarter.

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The resulting economic slowdown will temper gains in liquidity in 2020, and median days cash on hand will consequently remain level leading into 2021. Although aid from the federal Coronavirus Aid, Relief and Economic Security (CARES) Act provided cash flow relief in 2020 to offset unbudgeted expenses directly resulting from the pandemic, the legislation prohibited the use of those funds to offset lost utility revenues.

Exhibit 1

Strong liquidity provides a buffer against negative effects of the pandemic
Sectorwide median DCOH, also known as median days of operations and maintenance expense (O&M)



"E" stands for estimate, "F" stands for forecast
Source: Moody's Investors Service

Utilities also benefit from autonomous rate-setting authority as a buffer against revenue declines, although social risks stemming from high unemployment are likely to make rate increases politically difficult. Indeed, many utilities have reduced, deferred or eliminated planned such increases for 2021. Using unrestricted cash or reserve funds, such as a rate stabilization fund, provides utilities with a way to mitigate or smooth rate increases. We expect most utilities, however, will not need to draw on rate stabilization reserves in 2021 to compensate for lower rate increases.

While utilities are being disciplined in their management of expenditures, which reduces the impact of declining revenue on their ability to maintain financial stability, material operating expenditure cuts are unlikely as the sector must continue to provide essential services. Salary and benefit costs for essential personnel tend to account for a large share of a utility's total O&M, limiting expenditure reduction flexibility. The sector's ability to reduce personnel costs is minimal and limited to furloughs or reductions for nonessential staff.

Liquidity will likely return to growth in 2022 as the US economy continues on a path of steady recovery. Many utilities plan to return to their normally scheduled rate increases for the 2022 budget cycle.

Liquidity will vary by size, type and region

While strong cash balances are common to water and sewer utilities of all types and sizes, as shown in Exhibit 2, smaller utilities often keep proportionately more cash on hand than larger utilities, for which even a small rate increase can generate significant revenue.

Exhibit 2

Liquidity is strong across the sector, but varies by system type, region and size Median days of operations and maintenance expense (O&M)

	2013	2014	2015	2016	2017	2018	2019	2020E	2021F	2022F	10-year trend
Type											
Sewer	418	502	524	562	566	596	590	590	586	608	
Water	332	350	403	393	423	422	439	439	417	433	
Combined	357	367	385	413	440	469	465	465	441	458	
Region											
Midwest	384	387	432	423	469	474	477	477	454	471	
Northeast	214	243	282	283	336	314	373	373	355	368	
Southeast	324	364	402	427	434	471	461	461	438	455	
Southwest	376	376	358	396	430	437	427	427	406	421	
West	446	478	494	486	523	544	568	568	540	560	
Size (O&M)											
Less than \$1 million	384	403	533	413	564	499	739	739	703	729	
\$1-3 million	433	445	461	517	480	551	529	529	503	521	
\$3-10 million	363	363	410	385	428	441	477	477	454	471	
\$10-30 million	369	389	432	444	490	509	530	530	504	523	
\$30-65 million	367	405	385	424	436	456	450	450	428	444	
Over \$65 million	262	306	326	346	405	388	391	391	372	386	

"Size" based on operations and maintenance (O&M) expenses

Source: Moody's Investors Service

Liquidity also varies by system type. Sewer utilities will continue to maintain stronger liquidity than water systems and combined water and sewer systems, because sewer utilities have large capital requirements related to mechanical systems to treat wastewater. Additionally, many need added funds to comply with environmental consent decrees and more stringent environmental regulations. Mostly issued by the Environmental Protection Agency (EPA), consent decrees are enforceable agreements that typically require systems to manage sanitary sewer overflow or combined sewer overflow, both of which require large-scale capital projects and substantial borrowing.

Regionally, liquidity tends to be strongest in the western US, based on medians data. Water and sewer systems in this part of the country generally benefit from population growth and have newer infrastructure than systems in the Northeast, where liquidity tends to be weaker because of declining customer bases and rising maintenance costs. Additionally, systems in the west maintain higher levels of liquidity due to their experience with drought, which causes many utilities to restrict water usage and suppress demand.

Contagion risk from parent governments will pose credit challenges for some utilities

Utilities that operate as an enterprise or component unit of a city or county face additional credit stress if a parent government encounters cash flow issues. The financial difficulties posed by the current economic downturn may cause some cities and counties to transfer cash from their utility systems into their general operating funds.

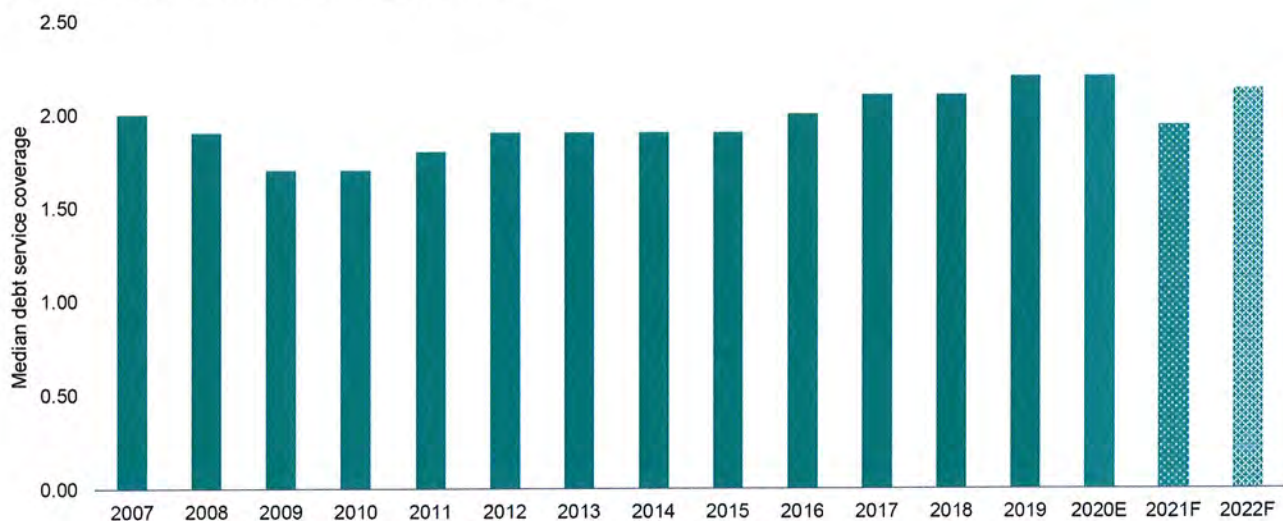
Most utilities share the same governing body (council, board or commission) with their parent government, which maintains budgetary and rate-setting authority over the enterprise. In times of financial stress, parent governments may look to their water and sewer systems as a resource to support general governmental operations by seeking financial transfers above levels already in place. As a result, declines in parent government credit quality can impair utility credit quality, given their close linkage. However, we do not expect any instances of material impairment.

Debt service coverage will remain solid

Stability in the sector's demand and revenue will also preclude any material declines in debt service coverage in 2021, even without rate increases. Declines in nonresidential consumption, increased payment delinquencies and reduced rate increases will slightly depress debt service coverage in 2021 for most utilities. However, steady demand from residential customers and disciplined management of operating and maintenance (O&M) expenditures will allow for continued stability in credit quality. An increase in strategic refunding of debt amid low interest rates will also support solid debt service coverage, which is likely to remain above 1.5x for the sector in 2021.

Most utilities were on track for another year of improving debt service coverage in 2020, with a ratio of more than 2.0x (see Exhibit 3) before the pandemic and related economic slowdown began in the second quarter of the year. Debt service coverage will remain level in 2020, drop slightly in 2021 and improve in 2022. Economic conditions are likely to improve in 2021, which will positively affect revenue for fiscal 2022, which for many utilities starts on July 1, 2021.

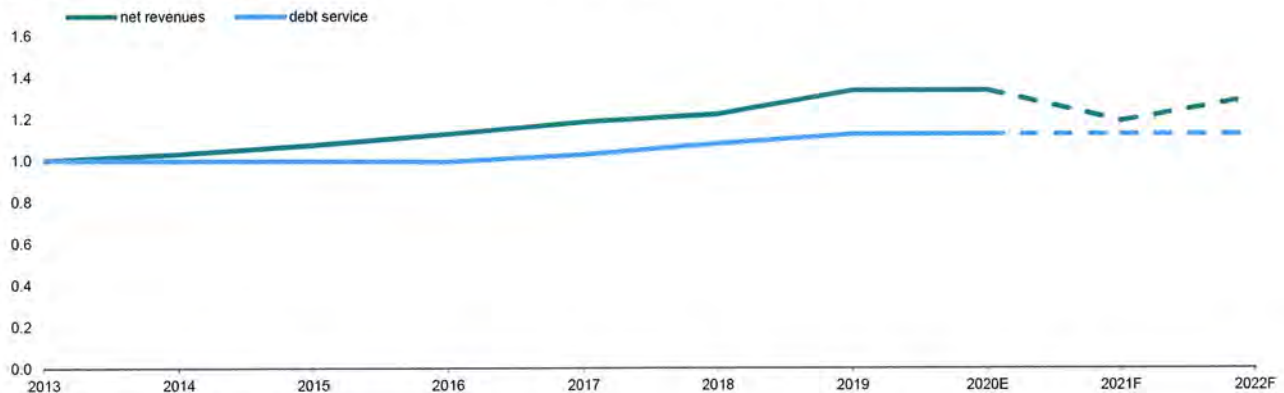
Exhibit 3
Debt service coverage will remain adequate through 2022
 Median sectorwide annual debt service coverage by fiscal year



"E" stands for estimate, "F" stands for forecast
 Source: Moody's Investors Service

Net revenue will soften in 2021 because of lower nonresidential consumption and bad debt expenses from increased customer payment delinquencies, a negative for debt service coverage. Over the past seven years, net revenue has grown faster than debt service (see Exhibit 4), bolstering coverage (2013-2019) and improving financial flexibility. Net revenue will likely return to growth in 2022, leading to improved debt service coverage.

Exhibit 4
Net revenues will decline slightly in 2021 but maintain a healthy margin over debt service
 Median growth, indexed to 2013



"E" stands for estimate, "F" stands for forecast
 Source: Moody's Investors Service

Coverage varies by region and system type

Debt service coverage is solid sectorwide but varies by region and system type (see Exhibit 5). Coverage will likely remain strongest in the West and Southeast, where systems benefit from population growth that tops the Midwest and Northeast. Sewer systems typically lag behind water systems and combined water and sewer systems in coverage. Sewer systems that treat wastewater are more capital-intensive, operate with more stringent environmental regulations and tend to have more debt.

Exhibit 5
Debt service coverage is stronger in the West and Southeast and among combined water and sewer systems
 Median annual debt service coverage (x) by system type, region and size by fiscal year

	2013	2014	2015	2016	2017	2018	2019	2020E	2021F	2022F	10-year trend
Type											
Sewer	1.80	1.90	2.00	1.90	2.00	2.00	2.10	2.10	1.88	2.06	
Water	2.00	2.00	1.90	2.00	2.00	2.20	2.10	2.10	1.89	2.06	
Combined	1.80	1.80	1.90	2.10	2.20	2.20	2.30	2.30	2.02	2.22	
Region											
Midwest	1.90	1.90	1.80	1.95	2.00	1.90	2.00	2.00	1.76	1.95	
Northeast	1.40	1.60	1.60	1.60	1.70	1.60	1.70	1.70	1.50	1.66	
Southeast	1.80	1.90	2.00	2.20	2.30	2.20	2.40	2.40	2.12	2.34	
Southwest	1.70	1.60	1.70	1.90	1.90	2.10	1.90	1.90	1.68	1.85	
West	2.30	2.30	2.20	2.20	2.50	2.80	2.60	2.60	2.29	2.53	
Size (O&M)											
Less than \$1 million	2.00	1.95	1.80	2.00	1.90	1.85	1.90	1.90	1.68	1.85	
\$1-3 million	1.90	1.80	1.90	2.00	1.90	1.90	2.15	2.15	1.90	2.09	
\$3-10 million	1.80	1.90	2.00	2.00	2.10	2.00	2.00	2.00	1.76	1.95	
\$10-30 million	1.90	1.90	1.90	2.10	2.20	2.25	2.20	2.20	1.94	2.14	
\$30-65 million	2.00	2.00	1.95	2.10	2.30	2.20	2.40	2.40	2.12	2.34	
Over \$65 million	1.80	1.90	1.90	1.90	2.10	2.20	2.30	2.30	2.03	2.24	

"Size" based on operations and maintenance (O&M) expenses
 Source: Moody's Investors Service

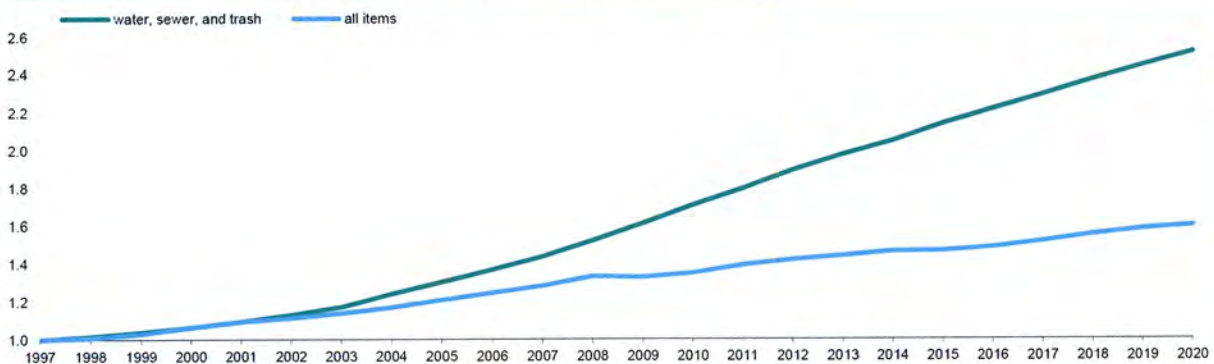
Rate affordability will remain a challenge for the sector

While autonomous rate-setting authority is a key credit strength for the sector, affordability for ratepayers remains a social risk. Rates are likely to continue rising, despite any short-term lull during the pandemic, as revenue growth will be critical for utilities to continue to meet future infrastructure needs and emerging mandates, such as the removal of lead service lines. Even though some systems and local governments have prohibited shutting off utilities for nonpayment because of health and safety concerns stemming from the coronavirus pandemic (water and sewer services are critical to stem transmission of the virus), these situations are unlikely to materially impair sector revenues.

Infrastructure needs, increasing regulatory mandates, rising operating expenses and changes in population and demand continue to drive up the cost of providing water and sewer services, leading to steady annual increases in rates across the sector. Since 2001, increases in the typical residential water and sewer bill have outpaced inflation, according to the Bureau of Labor & Statistics' Consumer Price Index (BLS, CPI). The EPA suggests that combined water and sewer bills exceeding 4.5% of median family income are unaffordable.

Exhibit 6

Growth in household water and sewer bills has outpaced the general rate of inflation Increase in cost of water, sewer, and trash service compared with CPI for all items, indexed to 1997



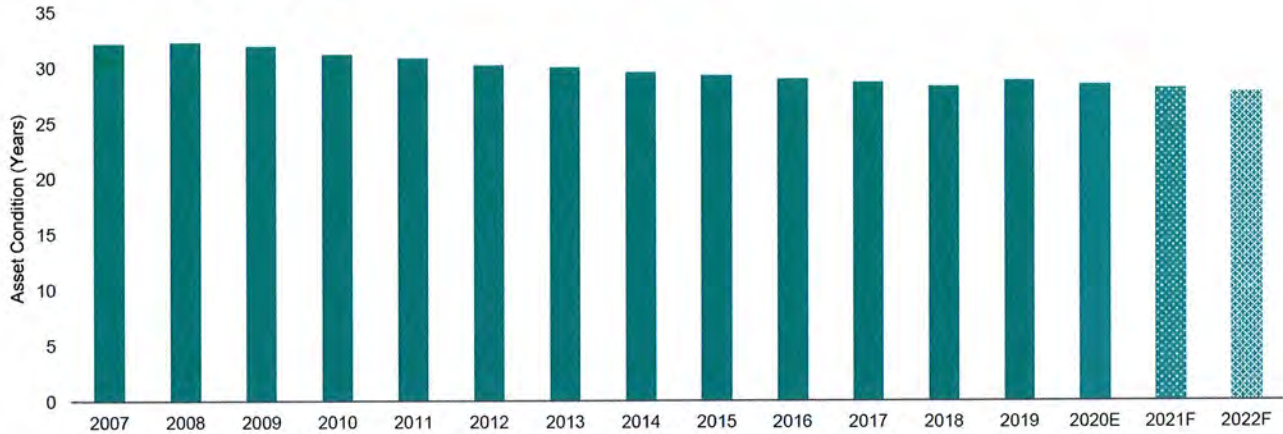
The BLS does not separately report costs for water, sewer and trash.
Source: US Bureau of Labor Statistics (BLS)

Asset condition will continue a steady decline

Asset condition, the remaining useful life of capital assets calculated by dividing net fixed assets by annual depreciation expense, will continue to decline at the same pace as over the past decade. Declining asset conditions represent an underinvestment in capital infrastructure, leading to increased risk of system inefficiencies or failures. Failure to properly maintain capital assets threatens to increase expenses for repairs, maintenance, upgrades and regulatory compliance. Heightened public health concerns related to clean drinking water are a reputational, social and financial risk.

While low interest rates will make borrowing for mandatory capital projects more affordable, some utilities will delay capital projects in 2021 and 2022 to manage cash flow issues. However, most utilities maintain multiyear capital improvement plans and will make continued progress toward these goals over the long term, despite any short-term disruption related to the pandemic, preventing a material weakening of asset condition. Asset condition will decline to a median 28 years of remaining useful life in 2020, down from a median 32 years in 2007, as shown in Exhibit 6.

Exhibit 7
Depreciation outpaces investment as capital asset conditions weaken
 Median remaining useful life (fiscal years)



"E" stands for estimate, "F" stands for forecast
 Source: Moody's Investors Service

Asset condition varies by system type

Within our rated universe, the decline in median remaining useful life is greatest for combined water and sewer systems, and the trend is likely to continue. The median remaining useful life for combined water and sewer systems fell to 26 years in 2019 from 29 years in 2013. The median useful life for water systems experienced a similar trend, decreasing to 30 years in 2019 from 32 years in fiscal 2013. Sewer systems, on the other hand, improved slightly, to 30 years in fiscal 2019 from 29 years in fiscal 2013 (see Exhibit 7).

Exhibit 8
Asset condition varies across system type
 Median remaining useful life (years)

Type	2013	2014	2015	2016	2017	2018	2019	2020E	2021F	2022F	10-year trend
Sewer	29	30	30	30	29	28	30	29	29	28	
Water	32	32	33	32	31	31	30	30	30	29	
Combined	29	28	27	27	27	27	26	26	25	25	

Source: Moody's Investors Service

Low-interest financing helps utilities tackle sizable capital needs

Grants and low-interest financing significantly reduce borrowing costs for water and sewer systems which finance infrastructure needs primarily with debt. The EPA's most recent assessment, released in March 2018, reports an estimated \$473 billion in [drinking-water infrastructure needs](#) over the next 20 years, a 10% increase over the previous assessment in 2014. The increase is driven by a growing necessity to replace aging pipes and water mains, which account for 60% of the reported needs. Additionally, the EPA's most recent assessment of [clean watersheds needs](#), released in 2016, anticipates infrastructure needs for sewer systems of \$271 billion over the next 20 years, primarily consisting of treatment, sewer mains and conveyance, and combined sewer overflow correction projects. Together, the combined needs of water and sewer utilities amount to \$744 billion.

State revolving fund loans are the primary mechanism for grants and low-interest financing, but available funding is limited. For 2020, Congress appropriated roughly [\\$2.8 billion](#) to the revolving funds (both the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund), with each state providing a 20% match on dollars received.

Funding provided through the federal Water Infrastructure Finance and Innovation Act (WIFIA) expands the sector's access to low-cost infrastructure financing. WIFIA allows the EPA to provide low-interest loans and loan guarantees to cover up to 49% of large infrastructure and water reuse projects, with utilities or states responsible for the remaining 51%. The most recent federal appropriation for water infrastructure provides \$50 million in budget authority for WIFIA, which will allow the EPA to provide \$5 billion in credit assistance and stimulate as much as [\\$10 billion in total infrastructure investments](#). While this amount is still only a fraction of the estimated annual need, it will allow some systems to pursue needed infrastructure projects by reducing any required rate increases.

Governance will be critical to mitigating environmental and social risks

Strong governance will continue to play a crucial role in the sector's ability to effectively manage water resources in drought-prone regions, to protect infrastructure against sea-level rise, and to stay ahead of EPA regulations aimed at preventing contamination among vulnerable populations. Environmental risks stemming from rising temperatures and more frequent severe weather events, such as heavy rainfall and wildfires, will be manageable for most systems but have the potential to weaken credit quality in the medium to long term. The sector will, however, continue to evaluate these risks and make plans to adapt.

Flooding remains a primary concern for local governments. Large municipal water and sewer systems are investing in combined sewer overflow (CSO) correction plans to divert untreated sewage from waterways during heavy rainfall, often requiring the construction of large underground storage tunnels. The most recent EPA estimate of future capital needs for CSO projects is \$48 billion, with the 10 largest outstanding consent decrees for CSO projects totaling \$23 billion.

Risk of drought is especially high in the West, where management of water resources is necessary across state lines. The Colorado River system is in a prolonged drought that is likely to result in reduced water allocations. The recent adoption of a Drought Contingency Plan by [Arizona](#) (Aa1 stable), [Nevada](#) (Aa1 negative) and [California](#) (Aa2 stable) to collectively manage water from the Colorado River highlights the severity of the drought facing utilities in the West. In [Utah](#) (Aaa stable), meanwhile, the state is requiring more aggressive monitoring of water usage to tackle drought conditions through secondary water metering.

EPA proposal highlights social and financial risks posed by lead

The EPA's [proposed reform of the Lead and Copper Rule](#) highlights the social and financial risks of unsafe drinking water, requiring utilities to take additional steps to detect lead. Adherence to the new rule, if adopted, would require strong governance to manage increased compliance costs. The proposal would require utilities to test for lead in schools and child care facilities, create an inventory of lead service lines, and replace lead service lines under certain conditions. The EPA estimates there are between 6 and 10 million lead service lines in the US

[Denver Board of Water Commissioners, CO](#) (Aaa stable) is an example of a utility that has been proactive in informing customers of their exposure to the health risks of lead service lines and has been aggressive in replacement efforts. After receiving approval from EPA in December 2019, Denver Water began a 15-year program to remove customer-owned lead service lines at an estimated cost of \$500 million. The program is supported by enhanced corrosion control, pitcher filter distribution and a broad public outreach campaign. The program is likely to be funded through increased water rates and additional debt issuance.

[Newark, NJ](#) (Baa2 positive) illustrates the high cost of lead remediation efforts. Faced with unsafe drinking water associated with lead pipes, the city is replacing 15,000 lead service lines and recently financed the third and final initiative to be funded with \$120 million in debt. Favorably, the city also received substantial funds from the state and the debt, though ultimately secured by the city's general obligation pledge, is being paid by the utility system, which is financially strong.

Compliance with new standards for PFAS represent a major regulatory cost

New regulations requiring water and sewer systems to address the health risks associated with per- and polyfluoroalkyl substances (PFAS) – a group of chemicals used to make coatings and products that resist heat, oil, stains, grease, and water which do not break down over time - pose a major near-term regulatory challenge. While there is currently no enforceable federal limit on PFAS levels in drinking water, several states are moving forward with their own regulations in preparation for the EPA's final determination of a maximum contaminant level. Complying with evolving PFAS regulations, including the implementation of remediation technologies and operational changes, represent another social and financial risk related to unsafe drinking water that will require strong governance to manage increased compliance costs.

What could change the outlook

We could revise our outlook to positive if increased certainty over health and economic conditions leads to continued growth in debt service coverage and liquidity as well as an increase in capital investment that improves system asset conditions.

We could revise the outlook to negative if the contraction in economic activity extends beyond current expectations, significantly delaying the gradual recovery in revenues. A longer lull in economic activity could lead to a more material disruption of collections and demand, negatively impacting debt service coverage and liquidity, further deferral of capital investment, and increased contagion risk from parent governments.

Moody's 2021 Global Credit Themes affecting water and sewer utilities



RISING DEBT BURDENS

- » Declines in nonresidential consumption, increased payment delinquencies and reduced rate increases will slightly depress debt service coverage
- » But steady residential demand and disciplined management of O&M expenditures will maintain stable credit quality
- » Strategic refunding of debt amid low interest rates will also support solid debt service coverage



ENVIRONMENTAL IMPACT

- » Environmental risks from rising temperatures and more frequent severe weather events, such as heavy rainfall and wildfires, will be manageable
- » But the risks have the potential to weaken credit quality in the medium to long term
- » Governance will be key to managing water resources in drought-prone regions and protecting coastal systems from sea-level rise



SOCIAL TRENDS

- » Affordability for ratepayers remains a social risk
- » Existing rates are still too low for many systems to generate enough revenue to cover operating, maintenance and debt service expenses
- » Increased compliance costs from adhering to new federal lead and copper rule underscore social and financial risks of unsafe drinking water

Six themes will shape global credit in 2021

Policy challenges

Prospects of an unwinding of extraordinary fiscal support measures will create credit risks; geopolitical and trade tensions, especially between the US and China, will be a top policy focus

Digital transformation

Growth of digital service delivery, e-commerce and remote work will accelerate changes in sectors such as retail, healthcare, education, banking and commercial real estate

Social trends

Public health and safety issues stemming from the coronavirus, growing inequality, demographic trends and other social challenges will have substantial credit implications



Uneven recovery

Recovery from the unprecedented economic shock of the coronavirus will be tenuous and inconsistent across countries, regions and sectors



Rising debt burdens

Weak earnings and more solvency concerns will weigh on hard-hit companies and governments; higher debt levels and more relaxed underwriting will erode the positive effects of low interest rates on debt servicing capacity



Environmental impact

The consequences of climate change will require increased adaptation and mitigation efforts, with wide-ranging effects on governments and companies



Moody's related publications

Outlook

- » [Global Macro Outlook 2021-22: Nascent economic rebound takes hold globally but recovery will remain fragile](#), November 12, 2020
- » [States – US: 2021 outlook negative as coronavirus continues to hamper revenue](#), December 1, 2020

Sector In-Depth

- » [Strong liquidity and debt service coverage will blunt effects of coronavirus crisis](#), July 23, 2020
- » [Puerto Rico ruling highlights importance of parent government credit quality](#), May 14, 2019

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Exhibit TH-5

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

January 19, 2021

Sector View: Stable

The negative pressures from COVID-19 may take longer to present themselves, if they materialize at all. Many factors that steadied ratings in 2020 might be less of a factor in 2021, depending on both the recovery and additional federal actions; still, just enough positives exist to lend rating stability.

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What We're Watching – U.S. Municipal Water And Sewer Utilities



Vaccination progress

Will normalcy return too late to save FY 2021 for many utilities?



Affordability

Did COVID simply exacerbate the "K-shape"?



Regulation

Lead, PFAS, maybe more. But who pays and what is the magnitude of the capital costs?



Credit conditions

With low rates, will borrowing increase to preserve utility cash? But might stressed local governments take that cash?



Federal policy changes

Does a (barely) blue wave finally mean an infrastructure bill? Will water benefit?



Resilience

For water utilities, ESG is just a day at the office, though with climate change there's still much work to be done.

Municipal water and sewer systems were remarkably resilient and even the unsung heroes of the municipal market during and immediately after the worst of the pandemic-related recession. Most systems have, to date, not experienced a material financial impact. Utility managers are in fact used to unfavorable variances to budget, albeit nearly always because of the weather. In our view longer-term headwinds are on the horizon; for every rate adjustment that is scaled back or

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

deferred so too will there be deferred maintenance. Further, challenges associated with potential drought conditions, rate affordability, and regulatory changes may pressure the sector. The impact of President Biden's administration and a Democrat-controlled Congress through at least 2022 is probably slightly credit positive but far from fully defined. Utilities will, however, remain the darling asset class for ESG investors, even as they are also on the front line for dealing with climate change.


Our view on 2021 highlights three key questions that matter for the health and stability of credit quality of municipal water and sewer systems. While there remain challenges, the risk profile still points to balanced credit performance. The lack of a unified federal response to COVID-19 and varying recessionary--and recovery--impacts means that among the nearly 50,000 community drinking water systems in the U.S., there are nearly as many stories. Immediate-term disruptors still loom, on top of the longer-term challenges of aging infrastructure and workforce and how to pay for it all.

Chart 1

U.S. Municipal Water & Sewer Utility Sector: By The Numbers

3.0% 

Percent of utility ratings in 2020 that changed. In 2012 considered the high water mark for Great Recession rating transitions, it was 8.7%

2010 to 2012 

Period of one of the worst La Niña weather patterns on records. By summer 2012, more than 80% of the lower 48 states were in at least some stage of drought. Meteorologists believe La Niña conditions have returned.

\$7.8 bil.

Federal credit assistance provided since 2018 by the Water Infrastructure Finance and Innovation Act for 41 different projects 

157 days 

Median days cash of BBB- utilities over the last three years, indicating that even the lowest investment grade-rated systems were reasonably well situated heading into 2020

\$467 bil.

Estimated revenue lost by state and local governments between fiscals 2020 and 2022 

4.9 

Average score, on a 1 to 7 basis with 7 being the most favorable, in the annual America Water Works Association's 2020 survey of water professionals about their current state of the water industry. This marked a 16-year high score

Beyond 2023? 

S&P Global Economics' baseline forecast projects that spending by state and local governments will decline in 2021 then grow at only 0.6% in 2022 and 2023, much less than the average projected inflation rate of 1.9%. So it could be several more years before public sector spending even keeps up at least with CPI

Sources: S&P Global Ratings; National Oceanic and Atmospheric Administration; United States Environmental Protection Agency. S&P Global Economics; Brookings Institute; American Water Works Association. Copyright © 2021 by Standard & Poor's Financial Services LLC. All rights reserved.

Questions That Matter

1. Why has S&P Global Ratings revised its sector view to stable from negative?

The impact of COVID-19 on communities has clearly been uneven, but fortunately not ruinous. For those that have experienced a dip in revenues and a spike in late-paying customers, we have observed that even the biggest dips are mostly high single digits. For many communities--generally suburbs with revenues mainly from single-family residential customers who could work from home--there were no impacts at all. The immediate dip in financial capacity--including the ability to meet an additional bonds test--has thus far not played out for most of our rated systems.

How this will shape 2021

Scaling back or even postponing larger rate adjustments. Many local governments and utility boards did not blink when it came to inflationary-sized rate adjustments for fiscal 2021. But for others in which the magnitude of a considered adjustment was going to be larger, we observed instances in which a lesser rate increase--or no increase at all--was ultimately part of the final adopted budget. This will also greatly influence the preparation of the fiscal 2022 budget and the multi-year capital plan.

Continued preservation of cash. For most systems we rate, the capital budget is supported by a variety of financial resources. Most commonly it is a mix of borrowing and use of annual operating revenues. In 2020 it became increasingly common for utilities to postpone pay-as-you-go projects (which are usually more discretionary in operational priority) in an effort to maintain or even build available reserves in the face of economic uncertainty and cash flow deviations. For those few systems whose operating revenues were materially disrupted in 2020, they will need to see a return to normalcy sooner than later to avoid another bad year of financial performance.

Magnitude of impacts, and management's responses, will vary by service area. Rating-relevant factors such as declines in median household effective buying income and an increase in the number of households below the poverty line are likely in at least some communities. In addition, loss of major employers or a bankruptcy could be a risk in a prolonged recovery in certain sectors. We are seeing utilities responding through assistance programs to lessen the effect on lower income rate payers.

What we think and why

Revisiting rate adjustments heightens the risk of deferred maintenance. We expect the tempered recovery to result in continued elevated delinquencies and potentially more rate increases. In most cases we believe this will be only modestly impactful to credit. However, the recovery among certain sectors and states may lag and thus service areas with exposure to industries that have outsized effects from the pandemic will be more exposed to consumption declines and political headwinds associated with rate increases. S&P Global Ratings' criteria includes an operational assessment that examines the condition and adequacy of assets as a

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

direct input into our ratings. The sector continues to use, and share, best practices such as effective utility management and asset management. But even a brief pause in rate increases, no matter how compassionate the intention, means that improvements that had to be done anyway are going to be more expensive and more critical to operations by the time they are finally addressed. We previously estimated that this sector's fixed and capital costs generally rise by 4% to 6% per year (see "U.S. Municipal Water And Sewer Utilities 2019 Sector Outlook: Stable, Although Potential Disruptions Are Not Making Planning Easy," published Jan. 15, 2019, on RatingsDirect). This all heightens the odds that while 2021 may lean toward fiscal stability, the three to five years that follow could be a great deal tougher.

Some utilities might increase their pace of borrowing. On the heels of a year in which operating revenues generally didn't suffer as badly as originally feared, utilities may look to preserve cash even further and rely more on debt financing to address projects to which they are still committed. So, even after the record issuance in the municipal market last year, 2021 could be just as busy since the essential service nature of utilities and historically low rates could allow the same level of system reinvestment while still maintaining cash reserves. A federal infrastructure package will be influential, too (see below). The continued ability to procure lines of credit will be important for utilities that operate with a more narrow cash cushion.

What could change the trajectory

The "K-shaped", or bifurcated, recovery is about the have and have-not utilities just as much as it is about have and have-not Americans. Many factors that helped steady utility finances in 2020 may be different in 2021. The "safer at home" lockdowns were most widespread during the spring and summer, which are normally the peak operating revenue seasons anyway due to outdoor watering. Based on the \$900 billion package signed into law in December, stimulus checks directly to households plus supplements to unemployment benefits both appear to be more restrained in 2021 than in 2020. Eventually the eviction moratorium and suspensions of service shut-offs and disconnections will end and the rental assistance package will run out. Many small businesses won't ever come back. Utilities most at risk of credit quality headwinds are those that have large operating revenues from multi-family residential customers and small businesses (two customer classes that have a high overlap of the same actual people).

Local governments may need to plug a budget gap. We begin 2021 with 11 of our state ratings carrying a negative outlook. In addition, some local tax revenues are also exhibiting meaningful weakness. This is expected to lead to pressure on future local government finances. If local governments need to lean on their cash to offset weakness in current revenues, city managers could look to their enterprise units for relief. Just as in the private sector, public sector entities that have robust cash reserves draw attention. Even those utilities that we rate 'BBB-' had a median days cash on hand over the last three years equivalent to about five months of operating expenses. This suggests that the utility funds of local governments were reasonably well-situated heading into 2020. For those local governments for whom budget gaps are profound, probably due to sharp declines in key tax revenues (down 17% just in the first two quarters of 2020) or the collapse of convention and tourism business, they might look to surplus net revenues and/or cash reserves of their own utility to maintain service levels.

2. What is the federal role and how might it affect credit quality?

The razor thin blue wave is both auspicious and inauspicious. Environmental rulemaking may increase, as will enforcement actions, including those related to environmental justice. That drives up costs for the local ratepayers already worried about the affordability of a service needed to support life, let alone public health and safety. What could serve to blunt the costs, at least a little, would be increased federal government participation in the total cost of those investments. During his campaign, President Biden announced intentions for a \$2 trillion package, as both a means to improving physical infrastructure and as an economic stimulus measure.

How this will shape 2021

Deferring capital projects has a cost, but it might still happen anyway. Postponing projects for any reason moves the utility operationally closer to the "run to fail" moment when something breaks. We think utility managers will continue to be cautious in how they deploy cash in 2021, especially if downside scenarios to our GDP forecast play out. Deferrals could be further exacerbated if utility managers are content to sit on the sidelines with projects that are already "shovel ready," waiting to see how much the federal government might share costs.

Environmental rulemaking will get a shot in the arm in 2021 too. Pun intended. With the years-in-the-making update to the Lead and Copper Rule finally completed, attention is likely to turn to other unregulated and emerging contaminants. For example, there seems to be consensus to explore setting a maximum contaminant level for per- and polyfluoroalkyl substances (PFAS); initial work began last year. PFAS compounds are not just "forever" chemicals, they're also "everywhere" chemicals in more than just fire retardants and non-stick cookware. They're in your moisture-wicking clothes, food wrapping paper, and even non-stick dental floss. Not all utilities suffer PFAS the same. The infrastructure investment to treat such contaminants is not necessarily cost-prohibitive but the requirements associated with shutting down wells and relying on purchased water or other options may strain budgets or create supply constraints.

What we think and why

Believe in unicorns. There has long been bipartisan support for an infrastructure bill, held up mainly by how the federal government would share costs. With the Democrats--who have been supporters of large and direct federal participation in an infrastructure stimulus package--now in control of Congress and the White House, we believe there could be greater momentum for funding a comprehensive infrastructure program before 2022. S&P Global Economics notes that a \$2.1 trillion boost to public infrastructure spending over 10 years could add as much as \$5.7 trillion to U.S. GDP in a decade. That's 10 times what was lost during the COVID-19 recession. It would also create 2.3 million jobs by 2024 as the work is being completed, and the additional 0.3% boost to productivity generated per year would add a net 713,000 jobs by 2029 (see "Economic Research: Georgia Gains Give Biden A Legislative Leg Up: The Pandemic And Economy Are First Priorities," Jan. 7, 2021).

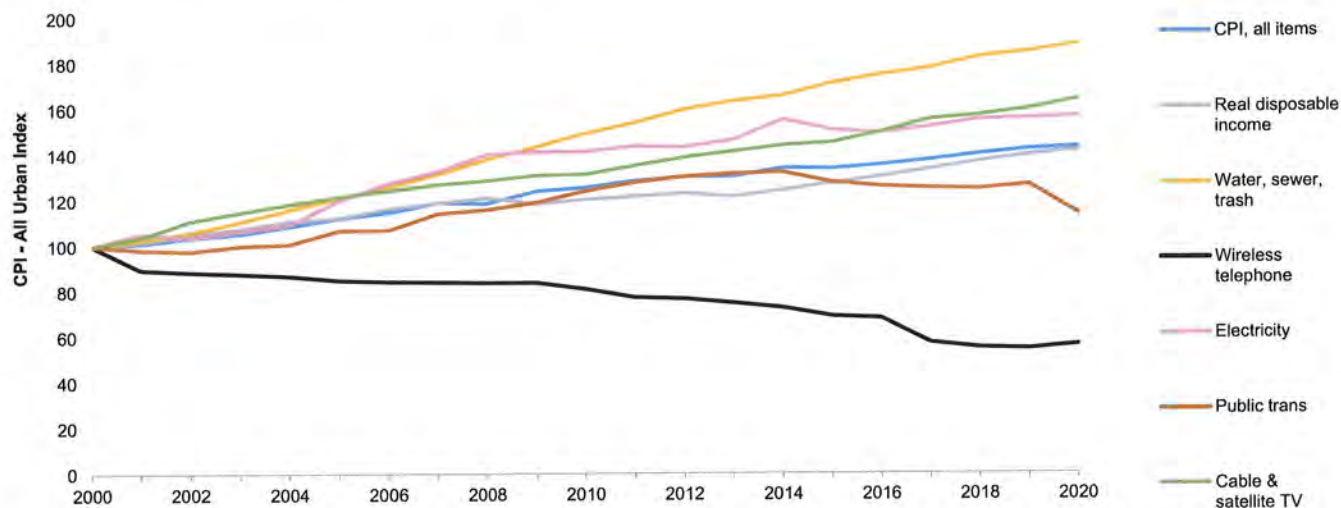
Discussion of water affordability could reach a fever pitch. The federal government in the early 1980s implemented the low-income home energy assistance program (LIHEAP) to assist Americans with home heating and energy efficiency costs and which can be used to help with

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

heating and cooling bills in qualified homes. While never making it out of committees, proposed bills--as recently as in the 116th Congress--included a water version of LIHEAP. It could become even more pressing because of the impacts of COVID-19 and the decades-long rise in water and sewer bills (see chart 2). We include affordability as a direct rating factor, both as a percentage of household disposable income and also incorporating how many people in the county live below the federally defined poverty threshold.

Chart 2

Selected Inflation Rates, 2000-2020 (2000=100)



Source: Bureau of Labor Statistics.
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What could change the trajectory?

What infrastructure might the federal government target? Because previous discussions have focused on surface and air transportation as well as broadband internet, it is less certain that drinking and clean water programs such as the Water Infrastructure Finance and Innovation Act (WIFIA) and the state revolving fund loan programs will be increased should President Biden and Congress pass an infrastructure stimulus bill. President Biden has thus far hinted only at historically underserved communities to remediate environmental justice situations.

Policy inertia and "secret science." EPA has always had a mandate that rulemaking be based in science and not science fiction--meaning the technology must exist to address the pollutant and the costs cannot be disproportionately burdensome compared to the environmental and public health benefits derived. With the early January 2021 adjustment in the methodology used for EPA rulemaking, cost-benefit analysis has become more politicized, making it more difficult to offer into evidence the documentation of certain public health benefits. It is not known how easily President Biden could change this given likely court challenges from states and the private sector, especially now that the rule change has already been published in the Federal Register.

3. Among public finance sectors, isn't water and sewer the asset class most correlated with environmental, social, and governance factors?

Yes.

How this will shape 2021

Blue is green, too. According to S&P Global Ratings' research, 2020 saw a global explosion in the issuance of social impact bonds. Water and wastewater utilities were already one of the larger classes of green bond issuance, along with those who issue bonds for green energy purposes and energy efficient retrofits of existing buildings. President Biden has long stated his intention to re-commit the United States to the Paris Climate Accord goal to limit global warming. He announced Cabinet and Cabinet-level nominees to his team that will play a feature role. We anticipate that the near-term goals will involve direct greenhouse gas emitters. It is possible, however, that longer-term goals will include support of resilience projects that involve adaptation to and mitigation from climate change impacts, possibly including drinking water and stormwater; a federal stormwater task force report is expected to be submitted to Congress in 2021.

What we think and why

The sector continues to lead by quiet example. Environmental stewardship and public health are the "business as usual" scenario that utility managers achieve simply by virtue of waking up and going to work each day. In 2020, as a response to the pandemic, we saw an explosion in the proliferation of new customer bill-pay assistance and other social programs, and a doubling down on those that already had such programs in place. This willingness to keep customers connected does not yet seem to be associated with a material sacrifice in revenues or a burn-through of cash on hand.

It is at the forefront in addressing climate change, because it is among the most exposed to the impacts of climate change. As we noted in "Better Data Can Highlight Climate Exposure: Focus On U.S. Public Finance" (Aug. 24, 2020), large swathes of the U.S. already face water stress, defined primarily as a mismatch between supply and demand. This only gets more pronounced in droughts and will likely worsen over time. Currently about four in 10 Americans lives in a county that is on either the Atlantic, Pacific, or Gulf coasts. Sea level rise and more--and more severe--weather events will only exacerbate these exposures. Because water utilities must be able to serve uninterrupted every day, all day, contingencies and backups are common. The America's Water Infrastructure Act of 2018 went so far as to compel nearly all but the smallest systems to engage in vulnerability self-assessments, develop and certify emergency response plans to natural and manmade threats.

What could change the trajectory?

If Mother Nature transposes "2021" with "2012".

If extreme drought conditions return, such as that which already exists right now in the southwestern U.S., utilities that have high fixed "take or pay" costs or have to pivot to a more expensive alternate water supply, when combined with drastic water restrictions they'll likely have to mandate, will likely see financial capacity compressed. By summer 2012, more than 80% of the

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

lower 48 states were in at least some stage of drought. Meteorologists believe La Niña conditions have returned this year, potentially introducing the same risks to operating budgets in 2021.

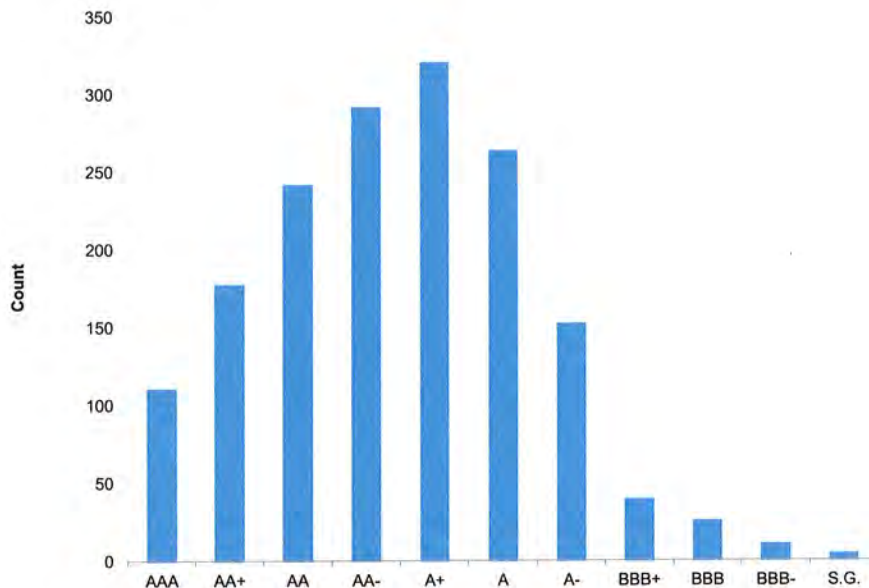
In Conclusion

With all due respect to Pete Townshend (Google him, TikTok-ers), meet the new year. Same as the old year. U.S. municipal water and wastewater systems showed remarkable financial resilience despite 2020 being 2020, just as in the years of and immediately following the Great Recession. Although downgrades outnumbered upgrades for the first time in years, the number of rating changes as a percentage of our more than 1,600 ratings was the lowest in decades. The fears in early 2020 of calamitous impacts from the pandemic (and later the ongoing but uneven recovery) were not unfounded. These negative credit factors thus far have been slower to present themselves (consumption patterns) and smaller in magnitude (declines in operating revenues and financial capacity) than in other sectors of U.S. public finance. Long-term credit stability will be driven mainly by management: scaling back or postponing rate adjustments is understandable as the economy continues its recovery. Similarly, increasing reliance on debt to fund projects to which the utility is already committed, in order to maintain or even build cash right now, is also understandable. In combination, however, both of those decisions serve to erode total financial capacity, all other things being equal, which could present credit headwinds in future years.

Rating Distribution And Trends

Chart 3

Rating Distribution

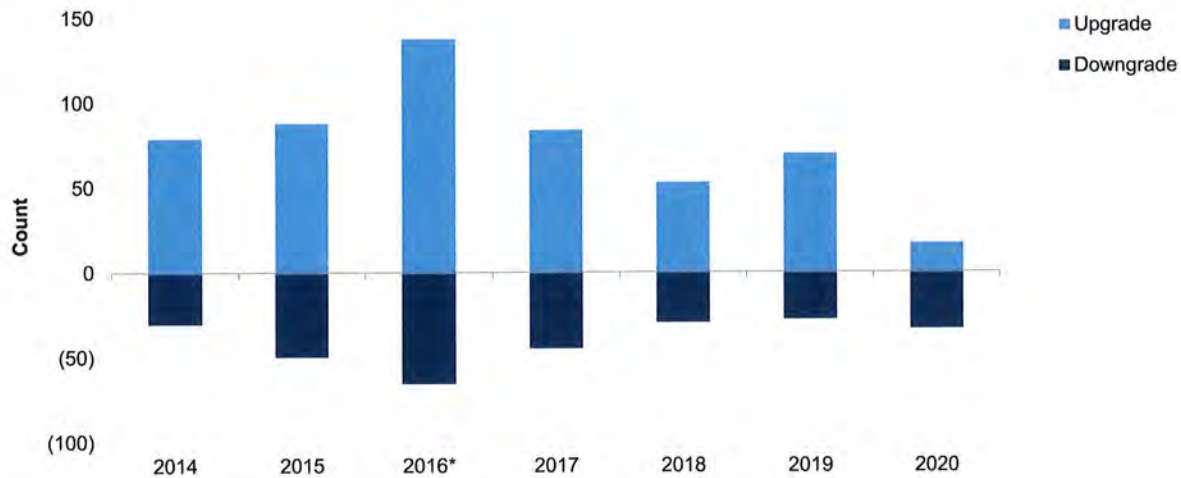


S.G.-speculative grade. Data as of Dec. 31, 2020.
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Chart 4

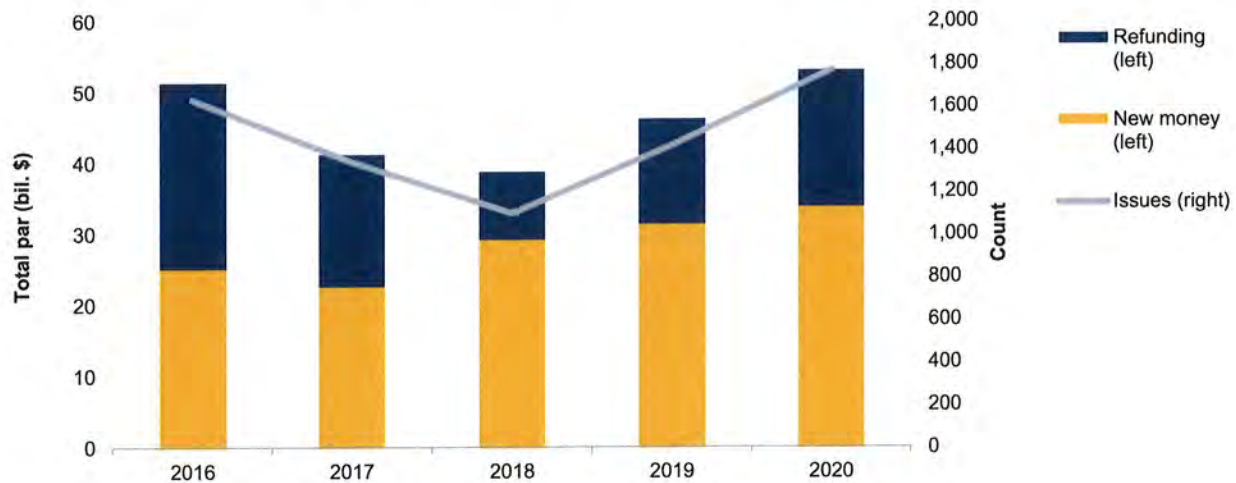
Sector Downgrades and Upgrades, Last Five Years



*New criteria in January 2016. Data as of Dec. 31, 2020.
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Chart 5

Utility Revenue Bond Market Activity, 2016-2020



Source: Bond Buyer municipal market data and S&P Global Ratings.
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Table 1

Summary And Trends of Rating Transitions, Last Five Years

	--Calendar year ending Dec. 31.--				
	2020	2019	2018	2017	2016
Total ratings	1,633	1,616	1,605	1,571*	1,650
Pct of ratings changed during year (up or down) (%)	3.00	5.87	4.78	7.10	13.94§
Upgrades to downgrades	0.5 to 1	2.5 to 1	1.8 to 1	1.8 to 1	1.9 to 1
Positive outlooks	3	10	12	5	14
Non-stable outlooks	40	32	27	11	42

Data as of Dec. 31, 2020. *The decrease in ratings was due to the reclassification of wholesale utilities. §We expected increased rating transitions given the January 2016 implementation of revised criteria.

Table 2

Rating Actions In 2020

Utility	State	Date	--To--		--From--	
			Rating	Outlook	Rating	Outlook
Chuckey Utility District	TN	1/14/2020	A	Stable	A-	Stable
Portland	TX	1/21/2020	AA-	Stable	A+	Stable
Tohopekaliga Water Authority	FL	1/23/2020	AAA	Stable	AA+	Stable
Santa Ynez River Water Conservation District, Improvement District No.1	CA	1/31/2020	AA-	Stable	A+	Stable
Polk County	FL	2/6/2020	AA+	Stable	AA	Stable
Derry Township Municipal Authority (sewer)	PA	2/12/2020	BBB	Stable	A	Stable
Belton (sewer)	MO	2/13/2020	AA-	Stable	A+	Stable
Reading Area Water Authority	PA	2/13/2020	A-	Stable	A	Stable
JEA (water & sewer)	FL	2/21/2020	AA+	Developing	AAA	Stable
Silverdale Water District No. 16	WA	2/21/2020	AA-	Stable	A+	Stable
Madison Water & Wastewater Board	AL	3/4/2020	AA+	Stable	AA	Stable
Boston Water & Sewer Commission	MA	3/6/2020	AAA	Stable	AA+	Positive
Sugar Land	TX	3/6/2020	AA	Stable	AA+	Stable
Greater New Haven Water Pollution Control Authority	CT	3/23/2020	AA+	Stable	AA	Stable
North Prairie Rural Water District	ND	4/17/2020	A	Stable	A+	Stable
Amador Water Agency	CA	4/27/2020	BBB	Negative	A-	Negative
Hot Springs, AR Water System	AR	5/5/2020	A	Negative	A+	Negative
Shamokin-Coal Township Joint Sewer Authority	PA	6/19/2020	BBB+	Stable	A-	Stable
Columbus (sewer)	IN	6/26/2020	A	Stable	A+	Stable
Mountlake Terrace	WA	7/2/2020	AA-	Stable	AA	Stable
Tyler	TX	7/9/2020	AA+	Stable	AAA	Stable
St. Joseph (sewer)	MO	7/10/2020	A	Stable	A+	Negative
Wilkinsburg Joint Water Authority	PA	7/20/2020	AA-	Negative	AA	Stable
Dinuba (sewer)	CA	8/4/2020	BBB+	Negative	A-	Negative

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Table 2

Rating Actions In 2020 (cont.)

Utility	State	Date	--To--		--From--	
			Rating	Outlook	Rating	Outlook
Opelika Utilities Board	AL	8/5/2020	A	Stable	A+	Stable
Keokuk (water)	IA	8/7/2020	BBB+	Stable	A-	Negative
Pennichuck Waterworks, Inc	NH	8/14/2020	A	Negative	A+	Negative
Sapulpa Municipal Authority	OK	8/14/2020	A-	Stable	A	Stable
Ralls County Public Water Supply District No. 1	MO	8/27/2020	BBB	Negative	A-	Stable
Vernon County Consolidated Public Water Supply Dist No. 1	MO	9/14/2020	A	Stable	A+	Stable
Spirit Lake	IA	9/15/2020	A	Stable	A+	Stable
Missouri Valley	IA	9/15/2020	A-	Stable	A	Stable
Brewton Waterworks Board	AL	9/17/2020	BBB+	Stable	BBB	Stable
Portland	TN	10/5/2020	A	Stable	A-	Stable
Texarkana	TX	10/8/2020	A+	Stable	AA-	Stable
Texarkana	AR	10/9/2020	A+	Stable	AA-	Stable
Dekalb-Jackson Water Supply District	AL	10/16/2020	BB	Stable	B	Negative
La Marque	TX	10/16/2020	A-	Stable	A	Stable
United Water Conservation District	CA	10/22/2020	AA-	Stable	AA	Stable
Turlock (water)	CA	11/4/2020	AA-	Stable	AA	Stable
Ceres (water)	CA	11/6/2020	AA-	Stable	A	Stable
La Porte (sewer)	IN	11/9/2020	A-	Stable	A	Stable
Fairmon (water)	WV	11/16/2020	BBB+	Stable	A	Stable
Napoleon	OH	11/23/2020	A+	Stable	AA-	Stable
Rogersville Waterworks & Sewer Board	AL	12/3/2020	A	Stable	A-	Stable
Jackson	MS	12/4/2020	BB+	Stable	BBB-	CW-Neg
Artesia	NM	12/9/2020	A	Stable	A+	Negative
Northeastern Schuylkill Joint Municipal Authority	PA	12/21/2020	BBB	CW-Neg	A-	Stable
Jemison Water and Sewer System	AL	12/22/2020	BB-	Positive	B+	Stable

Related Research

- Outlook For U.S. Local Governments: Revenue Pressures Mount And Choices Get Harder, Jan. 6, 2021
- Outlook For U.S. States: Symptoms Persist, But A Shot In The Arm Could Lead To Growth, Jan. 5, 2021
- Economic Research: Staying Home for the Holidays, Dec. 2, 2020

This report does not constitute a rating action.

Outlook For U.S. Water And Sewer Utilities: 2021 Provides 2020 Hindsight

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

HAROLD J. SMITH

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024772 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:

Allocation of Total System Revenue Requirements
Water Cost Allocation and Rate Design
Wastewater Cost Allocation and Rate Design
Stormwater Cost Allocation and Rate Design,
Gradualism Adjustment, Two Year Phase In

April 13, 2021

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Table of Exhibits

No.	Description
HJS-1 to HJS-3	Combined Utility Schedules
HJS-4	CAP-BDP Bill Frequency
HJS-1W to HJS-19W	Water Schedules
HJS-1WW to HJS-18WW	Wastewater Schedules
HJS-1SW to HJS-9SW	Stormwater Schedules

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Harold J. Smith and my business address is 5619 DTC Parkway Suite 850
4 Greenwood Village, CO 80111.

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY.**

6 A. I am a Vice President of Raftelis Financial Consultants, Inc. (Raftelis), a consulting firm
7 specializing in the areas of water and wastewater finance and pricing. Raftelis was
8 established in 1993 in Charlotte, North Carolina, by George A. Raftelis to provide
9 financial and management consulting services to public and private sector clients.
10 Raftelis is a national leader in the development of water, wastewater, and stormwater
11 rates.

12 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK**
13 **EXPERIENCE.**

14 A. I obtained a Master of Business Administration from Wake Forest University in 1997 and
15 a Bachelor of Science in Natural Resources from the University of the South in 1987. As
16 an employee of Raftelis Financial Consultants, I have been involved in numerous projects
17 for public utilities including a number of studies involving a wide range of technical
18 specialties including water utility cost of service and rate structure studies and water
19 utility financial planning studies.

20 **Q. DO YOU BELONG TO ANY PROFESSIONAL ORGANIZATIONS OR**
21 **COMMITTEES?**

22 A. Yes. I am a member of the American Water Works Association where I served as
23 chairman of the Competitive Practices Committee and I am a member of the New
24 England Water Works Association.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED IN PROCEEDINGS BEFORE THE**
2 **PENNSYLVANIA PUBLIC UTILITY COMMISSION (PAPUC) ON BEHALF OF**
3 **PWSA?**

4 A. Yes, I provided testimony for the Pittsburgh Water and Sewer Authority's (PWSA) first
5 two water (Docket Nos. R-2018-3002645 and R-2020-3017951) and wastewater
6 conveyance (Docket Nos. R-2018-3002647 and R-2020-3017970) rate filings before the
7 PAPUC.

8 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE ANY OTHER REGULATORY**
9 **AGENCIES ON UTILITY RATE RELATED MATTERS?**

10 A. Yes. I have provided testimony before the Rhode Island Public Utilities Commission
11 (RIPUC) in Providence Water Supply Board's nine most recent filings before the Rhode
12 Island Public Utility Commission (RIPUC) (Docket Nos. 3832, 4061, 4070, 4080, 4287,
13 4406, 4571, 4618 and 4994) and in Newport Water's nine most recent filings (RIPUC
14 Docket Nos. 3578, 3675, 3818, 4025, 4128, 4243, 4355, 4595 and 4933). I have also
15 provided testimony on water, sewer and stormwater rate related matters before the
16 Tennessee Regulatory Authority as well as in court proceedings in Arizona, Connecticut,
17 Indiana, Maryland and Maine.

18 **II. PURPOSE OF TESTIMONY**

19 **Q. PLEASE DESCRIBE YOUR ROLE IN THIS PROCEEDING?**

20 A. I have worked with the staff of PWSA to prepare a class cost of service study (CCOSS)
21 and develop cost based rates and charges for water, wastewater conveyance and
22 stormwater service. The results of my analyses are included in the schedules
23 incorporated herein with my testimony.

1 **Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.**

2 A. I am sponsoring PWSA’s CCOSS and rate designs for the water, wastewater conveyance
 3 and stormwater tariffs. The purpose of the CCOSS is to allocate PWSA’s costs of
 4 providing service to each utility and rate class. The rate design analysis results in water,
 5 wastewater conveyance and stormwater rates that help ensure that PWSA’s costs are
 6 recovered from each class in a fair and equitable manner and in a way that reflects the
 7 demands that each class place on the systems.

8 **Q. HAVE YOU PERFORMED SIMILAR ANALYSES FOR PWSA IN THE PAST?**

9 A. Yes, Raftelis performed a water and wastewater conveyance rate study for PWSA in
 10 2016 and again in 2017. Raftelis also prepared the CCOSS that supported PWSA’s first
 11 and second rate filings before the PAPUC.

12 **Q. IN PWSA’S LAST TWO RATE CASES HOW DID YOU ADDRESS**
 13 **STORMWATER RELATED COSTS?**

14 A. The Commission’s FIO directed PWSA to show the costs associated with its MS4 system
 15 as part of the cost of service study to be filed with its *Initial Rate Case*. The purpose was
 16 to provide a functional level cost allocation to apportion costs between the MS4 and the
 17 sanitary systems to demonstrate a projection of the revenue requirement attributable to
 18 the MS4 system.¹ PWSA provided this information in both of its prior rate cases.²
 19 However, the allocated stormwater related costs identified in the prior two rate cases
 20 were recovered through the wastewater conveyance rates and charges.

21 **Q. IN THE SETTLEMENT AGREEMENT APPROVED IN DOCKET NOS. R-2020-**
 22 **3017951 DID PWSA AGREE TO ADDRESS CERTAIN ISSUES WITH THE**

¹ FIO at 28-29.

² See PWSA Exhibits HJS-1WW through HJS-6WW (July 2, 2018), Docket Nos. R-2018-3002645 (water) and R-2018-3002647 (wastewater); PWSA Exhibits HJS-1 through HJS-6 (Mar. 6, 2020), Docket Nos. R-2020-3017951 (water) and R-2020-3017970 (wastewater).

1 **CCOSS AS PART OF THE MOST RECENT RATE CASE SETTLEMENT**
2 **ENTERED IN DOCKET NO. R-2020-3017951 (WATER) AND R-2020-3017970?**

3 A. Yes, in the Settlement Agreement, PWSA agreed to address the following issues related
4 to cost allocation and rate design:

- 5 1) Consider the removal of the minimum usage allowances
6 2) Submit a plan to address infiltration cost remediation
7

8 **Q. DID YOU PERFORM THE ANALYSIS FOR ANY OTHER SETTLEMENT**
9 **COMMITMENTS FROM THE LAST RATES CASE?**

10 A. Yes. PWSA also agreed to conduct a bill frequency analysis that shows actual billed
11 usage of participants in usage increments of 1,000 gallons and provide the results with its
12 next rate case filing. We performed this analysis and the results are attached as Exhibit
13 HJS-4.

14 **Q. HAVE ALL OF THESE ISSUES BEEN ADDRESSED IN THIS DOCKET?**

15 A. Yes. All items have been addressed in this rate case.

16 **Q. HOW DOES YOUR TESTIMONY RELATE TO THAT OF OTHER PWSA**
17 **WITNESSES?**

18 A. Mr. Barca's testimony supports PWSA's revenue requirements for the total system
19 revenue requirements. My testimony uses PWSA's revenue requirements for the Fully
20 Projected Future Test Year ("FPFTY") as a starting point. Additionally, Mr. Keith
21 Readling has provided testimony relating to the development of PWSA's proposed
22 stormwater tariff.

23 **Q. PLEASE DESCRIBE HOW YOUR TESTIMONY IS ORGANIZED?**

24 A. I will first describe the process used to allocate PWSA's operating and capital costs to
25 each utility service. I will then describe the process used to develop rates that will recover
26 revenue requirements for water and wastewater conveyance services. Mr. Keith Readling
27 will provide testimony that describes the process used to develop rates for stormwater

1 service. Next, I will address the use of gradualism to help ensure that no single rate class
 2 experiences rate shock once the approved rates are implemented. Lastly, I will describe
 3 PWSA's plan to phase in the proposed rates over a two year period such that the new
 4 rates do not place an undue burden on customers that will still be recovering from the
 5 economic turmoil created by the COVID-19 pandemic.

6 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE EXHIBITS THAT YOU**
 7 **ARE SPONSORING.**

8 A. My testimony includes four separate sets of exhibits, one set for total system revenue
 9 requirements, a second set for water rates, a third set for wastewater conveyance rates and
 10 a fourth set for stormwater conveyance rates. They are as follows:

11 **Allocation of Total System Revenue Requirements Exhibits:**

- 12 a. **HJS-1 Allocation of Total System FPFTY Revenue Requirements:** This
 13 schedule shows the total system revenue requirements for the FPFTY. It also
 14 provides the allocation of the total system revenue requirements to the water,
 15 wastewater conveyance, and stormwater utility services.
- 16 b. **HJS-2 Total System Allocation Factor Summary:** This schedule provides a
 17 summary of the factors used to assign costs to the water, wastewater conveyance,
 18 and stormwater utility services.
- 19 c. **HJS-3 City Services Mapped to Budget Departments:** This schedule provides a
 20 summary of the budget departments which house payments for services to the City
 21 of Pittsburgh.

22 **Water Cost of Service Allocation and Rate Design Methodology Exhibits:**

- 23 a. **HJS-1W FPFTY Water Revenue Requirements:** This schedule shows the water
 24 revenue requirements that must be recovered from the various water rates and
 25 charges assessed by PWSA.
 26

- 1 b. **HJS-2W Assignment to Functional Categories:** This schedule shows the way in
2 which the FPPTY revenue requirements are allocated to different functional
3 categories.
- 4 c. **HJS-3W Allocation to Base/Extra Capacity Categories:** This schedule shows
5 the way in which the FPPTY revenue requirements are allocated to different cost
6 of service categories.
- 7 d. **HJS-4W Allocation Factor Summary:** This schedule provides a summary of the
8 factors used to assign costs to functional categories and to allocate costs to the cost
9 of service categories.
- 10 e. **HJS-5W Allocation Factor Detail:** This shows the derivation of the allocation
11 factors presented in Schedule HJS-2.
- 12 f. **HJS-6W Water Units of Service:** Projected water consumption and peaking
13 factors for each customer are shown on this schedule.
- 14 g. **HJS-7W Fire Protection Cost Allocation and Units of Service:** This schedule
15 shows the derivation of allocation factors for allocating costs to public and private
16 fire protection service as well as the equivalent units of service for fire charge
17 calculations.
- 18 h. **HJS-8W Water Unit Cost of Service:** This schedule shows the calculation of the
19 unit costs of providing service to meet the various and extra capacity demands
20 placed on the water system as well as the unit cost of the various fixed cost
21 components.
- 22 i. **HJS-9W Cost Distribution to Customer Classes:** The allocation of categorized
23 costs to customer classes based on their demand characteristics is shown on this
24 schedule.
- 25 j. **HJS-10W Adjustments to Allocated Cost of Service:** This schedule shows the
26 adjustments PWSA is required to make to the allocated cost of service by customer
27 class.
- 28 k. **HJS-11W Forgone Revenue Cost of the Bill Discount Program:** This schedule
29 calculates the forgone revenue cost of the Bill Discount Program for assignment to
30 customer classes.

- 1 l. **HJS-12W Rate Design:** This schedule demonstrates the calculation of the
- 2 Minimum Charges and Volumetric Charges under both Cost of Service and
- 3 Adjusted Cost of Service.
- 4 m. **HJS-13W Proposed Rates:** This schedule shows the proposed water Minimum
- 5 Charges and Volume Charges for each customer class, Fire System Charges, and
- 6 the changes that the proposed charges represent over existing rates.
- 7 n. **HJS-14W Comparison of Revenues by Customer Class:** This schedule provides
- 8 a comparison of revenue generated from each customer class under both the
- 9 existing and proposed rates. Also shown is the percent difference between revenues
- 10 under existing and proposed rates. This schedule also provides a comparison of
- 11 revenue by class with the indicated class cost of service and adjusted cost of service.
- 12 o. **HJS-15 FPFTY CCOS Comparison – Water:** This schedule summarizes the
- 13 differences in revenue at existing rates, revenue at proposed rates, and the
- 14 unadjusted cost of service.
- 15 p. **HJS-16W Typical Bill Comparison:** This schedule provides a comparison of
- 16 typical monthly bills under the existing and proposed rates for typical customers
- 17 from each customer class.
- 18 q. **HJS-17W Revenue Proof:** This schedule provides a summary of the revenue
- 19 requirements and revenue to be recovered under both the unadjusted Cost of
- 20 Service rates and proposed rates.
- 21 r. **HJS-18W Projected Units of Service:** This schedule summarizes consumption
- 22 data for each of PWSA’s customer classes for the HTY, FTY, FPFTY and the
- 23 previous two fiscal years.
- 24 s. **HJS-19W Proposed Rate Phase-In:** This schedule presents the proposed
- 25 incremental phase-in of the water rates determined in the CCOS study.

26
27 **Wastewater Conveyance Cost of Service Allocation and Rate Design Methodology**
28 **Exhibits:**

- 29 a. **HJS-1WW FPFTY Wastewater Conveyance Revenue Requirements:** This
- 30 schedule shows the wastewater conveyance revenue requirements that must be
- 31 recovered from the various rates and charges assessed by PWSA.

- 1 **b. HJS-2WW Assignment to Functional Categories:** This schedule shows the way
2 in which the FPPTY revenue requirements are allocated to different functional
3 categories.
- 4 **c. HJS-3WW Allocation to Cost Categories:** This schedule shows the way in which
5 the FPPTY revenue requirements are allocated to different cost of service
6 categories.
- 7 **d. HJS-4WW Allocation Factor Summary:** This schedule provides a summary of
8 the factors used to assign costs to functional categories and to allocate costs to the
9 cost of services categories.
- 10 **e. HJS-5WW Allocation Factor Detail:** This shows the derivation of the allocation
11 factors presented in Schedule HJS-2.
- 12 **f. HJS-6WW Wastewater Conveyance Units of Service:** Projected wastewater
13 flow for each customer class are shown on this schedule.
- 14 **g. HJS-7WW Wastewater Conveyance Unit Cost of Service:** This schedule shows
15 the calculation of the unit costs of providing service to meet the demands placed on
16 the wastewater conveyance system as well as the unit cost of the various
17 components of the Minimum Charge.
- 18 **h. HJS-8WW Cost Distribution to Customer Classes:** The allocation of categorized
19 costs to customer classes based on their demand characteristics is shown on this
20 schedule.
- 21 **i. HJS-9WW Adjustments to Allocated Cost of Service:** This schedule shows the
22 adjustments PWSA is required to make to the allocated cost of service by customer
23 class.
- 24 **j. HJS-10WW Forgone Revenue Cost of the Bill Discount Program:** This
25 schedule calculates the forgone revenue cost of the Bill Discount Program for
26 assignment to customer class.
- 27 **k. HJS-11WW Rate Design:** This schedule demonstrates the calculation of the
28 Minimum Charges and Volumetric Charges under both Cost of Service and
29 Adjusted Cost of Service.

- 1 **l. HJS-12WW Proposed Rates:** This schedule shows the proposed wastewater
 2 conveyance Minimum Charges and Volume Charges for each customer class and
 3 the percent change that the proposed charges represent over existing rates.
- 4 **m. HJS-13WW Comparison of Revenues by Customer Class:** This schedule
 5 provides a comparison of revenue generated from each customer class under both
 6 the existing and proposed rates. Also shown is the percent difference between
 7 revenues under existing and proposed rates. This schedule also provides a
 8 comparison of revenue by class with the indicated class cost of service and adjusted
 9 cost of service.
- 10 **n. HJS-14WW FPFTY CCOS Comparison – Wastewater Conveyance:** This
 11 schedule summarizes the differences in revenue at existing rates, revenue at
 12 proposed rates, and the unadjusted cost of service.
- 13 **o. HJS-15WW Typical Bill Comparison:** This schedule provides a comparison of
 14 typical monthly bills under the existing and proposed rates for typical customers
 15 from each customer class.
- 16 **p. HJS-16WW Revenue Proof:** This schedule provides a summary of the revenue
 17 requirements and revenue to be recovered under both the Cost of Service rates and
 18 proposed rates.
- 19 **q. HJS-17WW Projected Units of Service:** This schedule summarizes consumption
 20 data for each of PWSA’s customer classes for the HTY, FTY, FPFTY and the
 21 previous two fiscal years.
- 22 **r. HJS-18WW Proposed Rate Phase-In:** This schedule presents the proposed
 23 incremental phase-in of the wastewater conveyance rates determined in the CCOS
 24 study.

Stormwater Cost of Service Allocation and Rate Design Methodology Exhibits:

- 27 **a. HJS-1SW FPFTY Stormwater Revenue Requirements:** This schedule shows
 28 the stormwater revenue requirements that must be recovered from the stormwater
 29 rates assessed by PWSA.

- 1 b. **HJS-2SW Net Revenue Requirements:** This schedules shows revenue
- 2 requirements under a “full cost-of-service” and a net revenue requirement proposed
- 3 for ratemaking.
- 4 s. **HJS-3SW Stormwater Units of Service:** Projected stormwater parcels and
- 5 equivalent residential units (ERUs) for each customer class are shown on this
- 6 schedule.
- 7 c. **HJS-4SW Stormwater COS by Customer Class:** This schedule shows the
- 8 calculation of the unit cost per ERU of providing service to meet the demands
- 9 placed on the stormwater conveyance system and the assignment to customer
- 10 classes.
- 11 t. **HJS-5SW Adjustments to Allocated Cost of Service:** This schedule shows the
- 12 adjustments PWSA made to the allocated cost of service by customer class.
- 13 u. **HJS-6SW Rate Design:** This schedule demonstrates the calculation of the monthly
- 14 stormwater rate under the Adjusted Cost of Service.
- 15 v. **HJS-7SW FPFTY CCOS Comparison – Stormwater:** This schedule summarizes
- 16 the differences in revenue at existing rates, revenue at proposed rates, and the
- 17 unadjusted cost of service.
- 18 w. **HJS-8SW Revenue Proof:** This schedule provides a summary of the revenue
- 19 requirements and revenue to be recovered under both the Cost of Service rates and
- 20 proposed rates.
- 21 x. **HJS-9SW Proposed Rate Phase-In:** This schedule presents the proposed
- 22 incremental phase-in of the stormwater rates determined in the CCOS study.

23

24**III. ALLOCATION OF TOTAL SYSTEM REVENUE REQUIREMENTS**

25 **Q. WHAT IS THE LEVEL OF TOTAL SYSTEM REVENUE REQUIREMENTS?**

26 A. Mr. Barca’s testimony supports PWSA’s revenue requirements for the total system. The

27 total system revenue requirements for the FPFTY is \$232.7 million, as shown on

28 Schedule HJS-1. This produces an overall rate increase of \$32.2 million.

29

1 **Q. AFTER DETERMINING THE TOTAL SYSTEM REVENUE REQUIREMENTS,**
2 **HOW ARE THE WATER, WASTEWATER CONVEYANCE, AND**
3 **STORMWATER UTILITY SERVICE REVENUE REQUIREMENTS**
4 **DETERMINED?**

5 A. The revenue requirements are designated as water only, wastewater only, stormwater
6 only or allocated between water, wastewater and stormwater based on a set of allocation
7 factors. The allocation of total system revenue requirements to water, wastewater and
8 stormwater for the FPPTY are shown on Schedule HJS-1.

9 **Q. WHAT COSTS ARE DESIGNATED AS WATER ONLY?**

10 A. Operating budgets for the water quality lab, water treatment plant, and water distribution
11 system are designated as water only costs, as shown on Schedule HJS-1 W.

12 **Q. WHAT COSTS ARE DESIGNATED AS WASTEWATER CONVEYANCE**
13 **ONLY?**

14 A. The majority of the operating budget for sewer operations is designated as wastewater
15 only with the exception of the costs associated with catch basin cleaning which are
16 designated as stormwater only costs.

17 **Q. ARE ANY OTHER COSTS DESIGNATED AS STORMWATER ONLY?**

18 A. No, the only cost line item in the PWSA operating budget that is allocated directly to
19 stormwater is Catch Basin Cleaning.

20 **Q. HOW ARE THE REMAINING COSTS ALLOCATED BETWEEN WATER AND**
21 **WASTEWATER CONVEYANCE?**

22 The remaining costs are allocated using a set of allocation factors. The allocation factors
23 used in the establishment of utility service revenue requirements are summarized and
24 described in Schedule HJS-2. The majority of the Administrative Division expenses were
25 allocated between water, wastewater and stormwater based on each utility's
26 proportionate share of operations costs. The only exception is Customer Service.

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Q. HOW ARE CUSTOMER SERVICE COSTS ALLOCATED BETWEEN WATER, WASTEWATER AND STORMWATER?

A. The majority of Customer Service costs are allocated based on the number of bills generated, or expected to be generated, for each utility. The only exception is the Meter Service line item which is allocated based on the number of meters. Since stormwater is not a metered service, no meter costs are allocated to stormwater, as shown on Schedule HJS-2.

Q. HOW ARE THE REMAINING COSTS ALLOCATED BETWEEN WATER WASTEWATER AND STORMWATER?

A. Under the Operations Division, most costs are allocated as 100% water or wastewater conveyance. The exceptions are:

- Environmental Compliance, which is allocated based on PWSA staff's determination of time spent on activities;
- Warehouse, which is allocated based on operations factors;
- Engineering and Construction is allocated based on the CIP.

Existing debt is allocated by fixed assets. Proposed debt and PAYGO are allocated by the capital plan and known sources and uses. Costs of transfers to reserves are allocated based on FPPTY rate revenue between water, wastewater, and stormwater.

Q. HAVE YOU IDENTIFIED THE LEVEL OF PROJECTED STORMWATER COSTS FOR THE FPPTY?

A. Yes. As previously mentioned, the breakdown is presented on Schedule HJS-1, which shows PWSA's total revenue requirements allocated between water, wastewater conveyance and stormwater. These costs were derived using the allocation factors provided in HJS-2. The allocation factors were applied to the total system revenue

1 requirements in some cases and to only the wastewater conveyance costs in other cases, as
2 shown in the allocation tables. The stormwater costs identified through the allocation
3 process serve as the revenue requirements for the stormwater fees that that PWSA will be
4 proposing. The process used to develop the proposed stormwater rates will be described
5 later in this testimony and in the testimony of PWSA witness Mr. Keith Reading.

6 **IV. WATER COST ALLOCATION**

7 **Q. WHAT IS THE LEVEL OF REVENUE REQUIREMENTS TO BE RECOVERED**
8 **BY WATER RATES AND CHARGES?**

9 A. Mr. Barca's testimony supports PWSA's total revenue requirements, and HJS-1 and HJS-
10 2 support the allocation of total revenue requirements for water service. As shown on
11 HJS-1W, the total water system revenue requirements for the FPFTY is \$150.3 million.
12 A portion is projected to be recovered by a proposed Distribution System Improvement
13 Charge (DSIC) at 5% of water revenues, which will be used to fund capital projects as
14 outlined in Mr. King's and Mr. Barca's testimony. The water system revenue
15 requirements net of DSIC are \$143.4 million.

16 **Q. HOW ARE WATER REVENUE REQUIREMENTS ALLOCATED TO COST**
17 **CATEGORIES AND CUSTOMER CLASSES?**

18 A. Costs are allocated in a manner consistent with the methodology described in the
19 American Water Works Association (AWWA) Manual M-1 "Principle of Water Rates,
20 Fees and Charges" using the Base/Extra Capacity cost allocation methodology which is a
21 three step process that involves first assigning costs to functional categories, then
22 assigning the costs from each functional category to Base/Extra Capacity cost categories
23 based on system demand characteristics and then allocating the Base/Extra Capacity cost
24 categories to customer classes based on customer class demand patterns.

1 **Q. HOW ARE PWSA'S OPERATING AND MAINTENANCE COSTS ASSIGNED**
2 **TO FUNCTIONAL CATEGORIES?**

3 A. The process of assigning costs to functional categories allows costs to be recovered from
4 customer classes based on the way that PWSA utilizes the resources within each function
5 to meet the demands of each customer class. The functions to which costs are assigned
6 are:

- 7 • Supply
- 8 • Treatment
- 9 • Storage
- 10 • Transmission
- 11 • Distribution
- 12 • Meters
- 13 • Billing
- 14 • Fire Protection
- 15 • Administrative Support

16 As shown on HJS-2W, the FPFTY water operating and maintenance (O&M) expenses
17 are accounted for in a manner consistent with PWSA's O&M budget. With the exception
18 of Customer Service, Water Distribution and Engineering & Construction, all of the
19 budget divisions relate directly to one functional category. Costs that are incurred in
20 support of only one function are assigned directly to that function, while costs that are
21 incurred in support of two or more functions are assigned to functions using allocation
22 factors that reflect the way a particular budget division supports each function. The
23 allocation factors used to assign costs to functional categories are listed and described on
24 Schedules HJS 4W and 5W. Schedules HJS 4W and 5W also show allocation factors
25 used to allocate costs to Base/Extra Capacity cost categories as described later.

1 **Q. HOW ARE CUSTOMER SERVICE COSTS ASSIGNED TO FUNCTIONAL**
2 **CATEGORIES?**

3 A. Since the Customer Service division supports both the Meters and Billing functions,
4 Customer Service costs are assigned to these two functional categories using factor W-I.
5 This factor was developed based on an analysis of each of the cost line items in the
6 division's budget as shown on Schedule HJS-5W.

7 **Q. HOW ARE WATER DISTRIBUTION COSTS ASSIGNED TO FUNCTIONAL**
8 **CATEGORIES?**

9 A. Since the Water Distribution division supports both the Transmission and Distribution
10 functions, Water Distribution costs are assigned to functional categories using factor W-
11 D. This factor was developed based on an analysis of the water pipe inventory as shown
12 on Schedule HJS-5W.

13 **Q. HOW ARE ENGINEERING & CONSTRUCTION COSTS ASSIGNED TO**
14 **FUNCTIONAL CATEGORIES?**

15 A. The Engineering & Construction division is responsible for planning and executing
16 PWSA's capital projects; therefore, the division's costs are allocated using factor W-J
17 which is based on the composition of the utility's CIP as shown on HJS-5W.

18 **Q. HOW ARE CAPITAL COSTS ASSIGNED TO FUNCTIONAL CATEGORIES?**

19 A. PWSA's capital costs consist of three components: (1) Internally Generated
20 Fund/PAYGO funded capital projects; (2) debt service; and (3) contributions to
21 reserves. To properly assign these costs to Base/Extra Capacity cost categories they must
22 first be assigned to functional categories. All water capital costs are assigned to functions
23 based on the make-up of the fixed assets that currently comprise PWSA's water system.
24 This process involved assigning each of PWSA's fixed assets to the appropriate
25 functional category and determining the percentage of the total value of the assets that is

1 assigned to each function. These percentages are then applied to the capital costs to
2 determine the appropriate distribution of capital costs across the functional categories.
3 Schedule HJS-2W shows the break-down of water fixed assets by functional categories
4 and the resulting allocation of water capital costs to functional categories.

5 **Q. WHAT IS THE NEXT STEP IN THE COST ALLOCATION PROCESS?**

6 A. Once costs have been assigned to functional categories, the next step is to allocate the
7 functionalized costs to Base/Extra Capacity cost categories.

8 **Q. HOW ARE PWSA'S COSTS ALLOCATED TO THE DIFFERENT BASE/EXTRA**
9 **CAPACITY COST CATEGORIES?**

10 A. O&M and capital costs are assigned to one or more of five Base/Extra Capacity costs
11 categories based on how costs are incurred to meet the demands of the water system as a
12 whole. The assignment of costs to the Base/Extra Capacity categories is shown on
13 Schedule HJS-3W, Allocation to Base/Extra Capacity Categories. The six cost categories
14 consist of:

- 15 • Base – Base costs are those costs that are incurred to meet the average or “base”
16 demands of the system.
- 17 • Max Day – Max Day costs are those costs that are incurred to meet peak daily
18 demands of the system.
- 19 • Max Hour – Max Hour costs are those costs that are incurred to meet peak
20 hourly demands of the system.
- 21 • Meters – Meter costs are the costs associated with installing, maintaining,
22 repairing and replacing water meters.
- 23 • Billing – Billing costs are those costs associated with the determining each
24 customers consumption and then billing them for that consumption.
- 25 • Fire Protection – Fire protection costs are the costs associated with providing
26 and maintaining the hydrants and associated infrastructure throughout the
27 system and ensuring that the system is capable of meeting fire flow demands
28 when needed.

1 Costs are assigned to cost categories using the allocation factors listed and described on
2 Schedules HJS 4W and 5W. Most of the allocation factors are developed using system
3 wide demand data and others are developed based on other analyses.

4 **Q. PLEASE DESCRIBE HOW EACH OF THE ALLOCATION FACTORS SHOWN**
5 **ON SCHEDULE HJS 4W WAS DEVELOPED.**

6 A. Each of the allocation factors was developed as follows:

- 7 • The Base allocator (W-AA) simply assigns all of the costs to the Base cost category
8 in recognition that these costs are incurred solely to meet the average demands
9 placed on the system.
- 10 • The Maximum Day allocation factor (W-BB) recognizes the way in which costs
11 are incurred to meet the peak day demands placed on the system by all of the
12 customer classes. This factor also allocates a portion of costs to Fire protection in
13 recognition of the potential peak day demand that fire protection service could place
14 on the system. This allocation factor is based on plant production data and is
15 developed by dividing average day plant production by peak day plant production.
- 16 • The Peak Hour allocation factor (W-CC) was developed in the same way as the
17 Maximum Day allocation factor except that average day plant production is divided
18 by the peak hour plant production. Similar to factor W-BB, this factor also allocates
19 a portion of costs to Fire Protection in recognition of the potential peak demands
20 that fire protection service places on the system.
- 21 • The Customer-Meters allocation factor (W-DD) simply allocates all meter related
22 costs to the meter component of the Minimum Charge.
- 23 • The Customer-Billing allocation factor (W-EE) allocates all billing related costs to
24 the billing component of the Minimum Charge.

- 1 • The Fire Protection allocation factor (W-FF) assigns all costs it is used to allocate
2 to the Fire Protection category in recognition that these costs are incurred to meet
3 the potential demands placed on the system by the public fire protection system and
4 private fire connections.
- 5 • The Administrative Support allocation factor (W-GG) is used to allocate costs that
6 do not readily fall into a specific functional category. This allocation factor is based
7 on the percentages of overall costs that are allocated to each Base/Extra Capacity
8 cost categories once all other allocations have been performed.

9 **Q. PLEASE DESCRIBE HOW THE COSTS ARE ALLOCATED TO THE BASE**
10 **EXTRA CAPACITY COST CATEGORIES.**

11 A. In the cost allocation model, allocation factors are applied to costs in each functional
12 category such that costs are allocated in a way that reflects the type of demand being met
13 by the function to which the costs have been assigned, as shown in Schedule HJS-3W.
14 For instance, the costs in the Treatment function are allocated using the Allocation Factor
15 W-BB which allocates costs in a way that reflects that the treatment facilities are operated
16 in a way to meet average day demand as well as peak demands. Allocation Factor W-BB
17 allocates costs to Base and Max Day based on the relationship between the system peak
18 day and the system average day demand.

19 **Q. PLEASE DESCRIBE SOME OF THE OTHER PRIMARY ALLOCATION**
20 **FACTORS THAT ARE USED TO ALLOCATE COSTS TO BASE/EXTRA**
21 **CAPACITY CATEGORIES.**

22 A. In addition to Allocation Factor W-BB, which is used to allocate approximately 44.1% of
23 the water revenue requirements, the two factors used to allocate the majority of the
24 revenue requirements are Allocation Factors W-CC and W-GG.

- 1 • Allocation Factor W-CC is used to allocate costs associated with facilities used to meet
- 2 average day, maximum day and peak hour demands, primarily costs associated with
- 3 the distribution system.
- 4 • Allocation Factor W-GG is a composite allocator based on the distribution of non-
- 5 Administrative Support costs allocated to each of the cost categories and is used to
- 6 allocate Administrative Support costs.

7 **Q. WHAT IS THE NEXT STEP IN THE COST ALLOCATION PROCESS?**

8 A. The next step in the allocation of water costs is the distribution of costs to each customer

9 class in a manner that reflects the way each class demands service.

10 **Q. HOW ARE THE REVENUE REQUIREMENTS ALLOCATED TO EACH OF**

11 **PWSA'S CUSTOMER CLASSES?**

12 A. As demonstrated on Schedule HJS-8W, the revenue requirements from each cost

13 category are used to determine the unit cost of providing service to meet both average

14 day and peak demands. For example, approximately \$86.6 million in water revenue

15 requirements were allocated to the Base cost category. This amount is reduced by

16 approximately \$0.9 million to reflect revenue from miscellaneous revenue, resulting in

17 approximately \$85.7 million in Base revenue requirements to be recovered through retail

18 and wholesale rates. This amount is used to determine the unit cost to meet average day

19 demand for retail classes and the wholesale class. For example, the unit cost for average

20 day demand for retail classes is determined by first taking the net revenue requirement of

21 \$86.6 million less \$15.4 million for Distribution related costs (which wholesale isn't

22 responsible for) and dividing by the FPFTY projected water sales volume to arrive at a

23 unit cost for average day demand for all costs except Distribution related costs. The

24 Distribution related costs of \$15.4 million are divided by the FPFTY projected water

25 sales volume for retail classes only and the two sub unit costs are combined to arrive at

26 the retail classes' unit cost to meet average day demand of \$10.38 per kgal. This unit

1 cost is then multiplied by each class' projected annual water sales volume required to
 2 meet average day demand to arrive at the amount of Base costs to be recovered from each
 3 retail class, as shown in HJS-9W. For example, the Residential class is projected to
 4 purchase approximately 2.7 million kgal to meet its average day demands. This amount
 5 is multiplied by the unit cost of \$10.385 to arrive at the total Base costs to be recovered
 6 from the Residential class. The same process is applied to the wholesale class but with a
 7 reduced unit cost of average day demand of \$8.355, reflecting the removal of the
 8 Distribution-related costs.

9 This process is repeated for each of the Base/Extra Capacity cost categories and
 10 customer classes to arrive at the total costs to be recovered from each class.

11 **Q. ARE COSTS ALLOCATED TO THE WHOLESALE CUSTOMERS?**

12 A. Yes, costs have been allocated to the Wholesale customer class as shown on HJS-9W.
 13 As shown, the Wholesale class is allocated an appropriate share of Base, Max Day and
 14 Max Hour costs based on their demand characteristics.

15 **Q. ARE ANY ADJUSTMENTS MADE TO THE CLASS COST OF SERVICE?**

16 A. Yes. Adjustments to class cost of service were based on several factors, including rate
 17 case settlement items, negotiated agreements with the City of Pittsburgh and other
 18 entities, bad debt and customer assistance program forgone revenue.

19 **Q. WHAT ADJUSTMENTS WERE MADE TO THE ALLOCATED WATER COST**
 20 **OF SERVICE BY CUSTOMER CLASS?**

21 A. PWSA is required to make six adjustments to the cost of service allocated to each
 22 customer class. These adjustments are shown on Schedule HJS-10W. The adjustments
 23 are described below:

- 1 **1. Public Fire Protection** – PWSA is required to reduce the costs allocated to public
2 fire protection for two reasons. First, PWSA is limited in only recovering no more
3 than 25% of public fire costs based on section 1328 of the Public Utility Code
4 Second, per PWSA’s revised Cooperation Agreement with the City of Pittsburgh,
5 PWSA has agreed to “phase-in” charges for public fire service based on an
6 increasing scale of 20% per year over five years (20% in 2020, 40% in 2021, 60%
7 in 2022, 80% in 2023, and 100% in 2024). Public fire costs that cannot be recovered
8 through hydrant charges are reallocated among customer classes by equivalent
9 meters.
- 10 **2. Wholesale Contracts** – While rates that reflect the full cost of service for
11 Wholesale customers are developed in this rate filing, PWSA currently maintains
12 separate contracts for wholesale water service with each of their existing wholesale
13 customers. Rates are set per each agreement and are unable to be changed until the
14 contracts expire or are due for renewal. At this time, PWSA is unable to modify
15 any rates with existing customers beyond what is legally allowed in the individual
16 agreements. As such, costs that were allocated to wholesale service that PWSA is
17 unable to recover through wholesale rates are allocated among retail customers by
18 unadjusted cost of service.
- 19 **3. City of Pittsburgh Phase-In** – As stated above, PWSA has agreed to “phase-in”
20 charges for water service based on an increasing scale of 20% per year over five
21 years. As such, costs allocated to Municipal customers are reduced by 40% and
22 those costs must be recovered from the other retail customer classes, based on
23 unadjusted cost of service.
- 24 **4. City of Pittsburgh Unmetered Properties** – PWSA has agreed to not assess the
25 City of Pittsburgh flat charges for unmetered properties until 2024. Costs allocated
26 to these connections have been redistributed among the other customer classes
27 based on unadjusted cost of service.
- 28 **5. Bad Debt Expense** – The CCOSS introduces Bad Debt Expense with the other
29 adjustments on Schedule HJS-10W since it must be allocated directly to customer
30 classes. Bad Debt Expense is allocated among the customer classes based on each
31 class’ historical contribution for such costs over a three-year period (2018-2020).

1 **6. Customer Assistance Program** –The cost of the Customer Assistance Program is
2 allocated among customer classes based on the unadjusted cost of service, as shown
3 on Schedule HJS-11W.

4 **Q. HOW ARE PROJECTED AVERAGE DAY AND EXTRA CAPACITY DEMANDS**
5 **DETERMINED FOR EACH CUSTOMER CLASS?**

6 A. Demand projections were developed using the customer class demand data from the three
7 most recent complete years available (FY 2018 – FY 2020).

8 **Q. PLEASE EXPLAIN HOW THE CUSTOMER CLASS DEMAND DATA WAS**
9 **USED TO DEVELOP THE DEMAND PROJECTIONS.**

10 A. FPFTY demand by class was set equal to the average annual demand exhibited by each
11 class based on averaging annual demand by class in 2018, 2019 and 2020. PWSA has
12 been experiencing a decline in customer demand since 2017 at approximately 5.5% per
13 year in aggregate. While this appears to be a trend, PWSA has elected to honor the
14 request of developing forecast demand based on averaging of three years. Therefore, as
15 stated, forecasted FPFTY annual demand represents a three-year average (FY 2018 – FY
16 2020).

17 Modifications were made to the Residential and CAP classes to reflect the ramp
18 up of CAP customers based on improved participation in the bill discount program to
19 approximately 4,100 water customers in 2022. Residential bills and demand are reduced
20 by the corresponding bills and demand associated with the incremental increase in CAP
21 participation. No other modifications were made. While PWSA anticipates installing
22 meters for City accounts that are currently unmetered, no modifications were made to the
23 forecast of municipal demand because of the uncertainty of the timing, size or flow of the
24 accounts added.

1 The average day demand for each class was then determined by dividing each
2 class' projected annual demand by 365 days. In order to determine the units of service
3 for allocating base/extra capacity costs between customer classes, peaking factors were
4 developed that recognize the level of peak demands placed on the system by each
5 customer class. PWSA customer class data from 2018 through 2020 was used to establish
6 peaking factors by customer class. During 2020, PWSA investigated and recategorized
7 many Industrial customers as Commercial customers. The peaking factor for Industrial
8 customers is based only on the usage and bills (during FY 2018 – FY 2020) for the 18
9 Industrial customers remaining after recategorization.

10 We calculated Maximum Month to Average Day factors for each class as shown
11 on HJS-6W. These factors were then adjusted by a system Maximum Day to Maximum
12 Month factor (1.13) which was derived using a three-year average of PWSA water
13 treatment plant production data for 2018-2020. Multiplying those two factors together
14 provided Maximum Day peaking factors for each class. In order to estimate peak hour
15 factors, we utilized an estimated Maximum Hour to Maximum Day factor which was
16 1.33 for industrial and 1.66 for all other customer classes. This factor was utilized to
17 recognize that industrial customers typically have stable usage patterns and thus exhibit
18 lower peak usage. Multiplying the estimated Maximum Hour to Maximum Day factor by
19 the Maximum Day factor provided the Maximum Hour peaking factor, as shown on
20 Schedule HJS-6W. FPFTY demands and historical demand data are shown on HJS-18W.

21

1 **V. WATER RATE DESIGN**

2 **Q. PLEASE DESCRIBE PWSA'S EXISTING WATER RATE STRUCTURE.**

3 A. PWSA's current rate structure for retail customers consists of a monthly Minimum
4 Charge that varies by meter size and a Volume Charge that varies by customer class, as
5 shown on Schedule HJS-13W. The Minimum Charge is used to recover PWSA's
6 customer costs as well as some of PWSA's costs associated with providing capacity to
7 meet customer demand. Additionally, the Minimum Charge recovers the cost of a water
8 usage allowance that also varies by meter size.

9 The Volume Charge is designed to recover PWSA's costs that vary based on customer
10 demand as well as the portion of PWSA's fixed costs that are not recovered through the
11 Minimum Charge. The volumetric rate per thousand gallons (kgal) of water consumed
12 varies by customer class based on the way in which each class demands service. The
13 water customer classes are:

- 14 • Residential (which includes Residential CAP),
- 15 • Commercial (which includes Municipal),
- 16 • Industrial,
- 17 • Health or Education,
- 18 • Fire, and
- 19 • Wholesale

20 PWSA assesses a monthly Fire System Charge to non-residential customers with fire
21 suppression systems connected to PWSA's water system and a public fire protection
22 charge, in the form of a per hydrant charge, to the City of Pittsburgh.

23 PWSA also assesses a number of miscellaneous charges for various services and
24 activities that it performs periodically at the request of its customers. PWSA has
25 conducted an analysis to update many of these fees based on cost of service, as detailed
26 in Ms. Julie Quigley's testimony.

1 **Q. ARE YOU PROPOSING TO MAKE CHANGES TO THE EXISTING RATE**
2 **STRUCTURE?**

3 A. Not at this time. In the Settlement Agreement, PWSA agreed to explore options for the
4 removal of the Minimum Allowance but determined that doing so at this point would
5 create a number of challenges that could likely be avoided by delaying the change to a
6 future filing.

7 **Q. PLEASE EXPLAIN THE CHALLENGES CREATED BY REMOVING THE**
8 **MINIMUM ALLOWANCE FROM THE RATE STRUCTURE.**

9 A. First, removing the Minimum Allowance from the rate structure would result in a
10 significant drop in total fixed revenue for PWSA. Since the Minimum Charge includes
11 the recovery of the cost to provide the Minimum Allowance, the Minimum Charge
12 currently generates approximately 34.2% of PWSA's water and wastewater conveyance
13 user charge revenue. If the Minimum Allowance is eliminated and the costs of providing
14 the allowance are removed from the Minimum Charge, PWSA's fixed revenue would
15 drop to approximately 19.7%. Higher fixed revenue recovery yields a more stable and
16 reliable cashflow for the utility, which has never been more critical than during the
17 COVID-19 pandemic when PWSA experienced reduced demand from non-residential
18 customers and a higher number of residential non-payments. Higher fixed revenue
19 recovery can lead to a more favorable bond rating, as discussed by witness Mr. Tom
20 Huestis.

21 Second, removal of the Minimum Allowance would result in adverse bill impacts for a
22 significant number of PWSA's customers.

23 **Q. CAN YOU EXPLAIN WHAT YOU MEAN BY ADVERSE BILL IMPACTS?**

24 A. Yes, this a subjective measure that looks at the relationship between the actual impact to
25 a customer's typical bill and the overall revenue adjustment that a utility is seeking. If

1 the percent change to a customer’s bill is approximately 1.5 times or more different that
 2 the overall percent revenue that the utility is seeking it is considered to be adversely
 3 impacted. For example, for this filing PWSA is seeking a 17% overall increase in
 4 combined water, wastewater conveyance and stormwater rate revenue. Therefore, any
 5 customer whose typical monthly water, wastewater conveyance and stormwater bill
 6 would change by more than 25.5%, or 1.5 times 17%, would be considered to be
 7 impacted adversely.

8 As shown in the table below, removal of the Minimum Allowance results in
 9 approximately 48% of the non-residential bills experiencing an increase in their monthly
 10 combined water, wastewater conveyance and stormwater services bill of over 26%.
 11 Almost one-third of the non-residential bills will see an increase greater than 40%.
 12 Additionally, by removing the minimum, more than 30% of residential customers would
 13 see an increase in their monthly bill of more than 26%. These impacts are mitigated by
 14 retaining the existing rate structure. Under the proposed rates, less than 14% of the
 15 residential customers would see an increase in their bill of over 26%.

% Increase on Customer Bill	Proposed Rates					
	Residential	%	CAP-BDP	%	Non-Residential	%
Bill Decrease	1,967	2.3%	710	22.1%	439	5.0%
0-8%	3,164	3.7%	82	2.6%	716	8.1%
8-17%	47,767	56.5%	1,585	49.4%	2,818	31.8%
17-26%	20,120	23.8%	457	14.2%	1,513	17.1%
26%-40%	4,724	5.6%	185	5.8%	701	7.9%
>40%	6,841	8.1%	189	5.9%	2,677	30.2%
Total Customers	84,583	100.0%	3,208	100.0%	8,864	100.0%

% Increase on Customer Bill	Minimum Allowance Removed					
	Residential	%	CAP-BDP	%	Non-Residential	%
Bill Decrease	6,886	8.1%	495	15.4%	1,503	17.0%
0-8%	7,860	9.3%	129	4.0%	405	4.6%
8-17%	23,679	28.0%	283	8.8%	918	10.4%
17-26%	20,392	24.1%	384	12.0%	1,811	20.4%
26%-40%	15,279	18.1%	449	14.0%	1,485	16.8%

>40%	10,487	12.4%	1,468	45.8%	2,742	30.9%
Total Customers	84,583	100.0%	3,208	100.0%	8,864	100.0%

1

2 **Q. ARE THERE OTHER CHALLENGES THAT WOULD ARISE IF PWSA**
 3 **ELIMINATED THE MINIMUM ALLOWANCE AT THIS TIME?**

4 A. Yes, the third challenge created by removal of the Minimum Allowance is related to the
 5 second. Over 60% of customers participating in PWSA’s Bill Discount Program (BDP)
 6 would see bill increases well in excess of 1.5 times the overall revenue increase because
 7 the resulting fixed charge is significantly reduced, which is the basis for the BDP
 8 discount. In fact, over 45% of the current BDP customers would experience a bill
 9 increase in excess of 40%. Burdening BDP customers with significantly larger utility
 10 bills at a time when they are still reeling from the impacts of the COVID-19 pandemic
 11 would place them in a precarious situation.

12 **Q. HOW ARE THE MINIMUM CHARGES CALCULATED?**

13 A. As shown on Schedule HJS-12W the Minimum Charges are comprised of three
 14 components, the Meter component; the Billing component; the Usage component; and
 15 Adjustments.

16 **Q. HOW IS EACH OF THESE COMPONENTS CALCULATED?**

17 A. The Meter component is calculated by dividing all costs allocated to the Meter category
 18 by the number of 5/8” equivalent meters in the system to determine a cost per 5/8”
 19 equivalent meter. The meter size specific service charges are determined by then
 20 multiplying the cost per 5/8” equivalent meter by the appropriate AWWA meter
 21 equivalency ratio (shown on HJS-5W) to determine the appropriate charge for each meter

1 size.

2 The Billing component is calculated by dividing the costs allocated to the Billing
3 category by the total number of bills prepared each year to determine a unit cost per bill.

4 The Usage component is used to recover the costs of providing the volume
5 allowance included in the Minimum Charge. It is calculated, as shown on Schedule HJS-
6 12W, by multiplying the allowance for each meter size by the retail volumetric unit cost.
7 For example, accounts with a ¾” meter receive a 2 kgal/month allowance. Therefore, the
8 Usage component for a ¾” meter is equal to 2 kgal times the volumetric unit cost of
9 \$16.51, or \$33.02.

10 The final component is the adjustments. Two adjustments are made for the
11 standard customer classes:

12 1) Public fire protection. The amount of public fire protection costs that are not
13 recovered from the public hydrant charge are recovered on an equivalent meter basis in
14 rate design.

15 2) Readiness-to-serve. 5.0% of PWSA’s debt service cost allocated to water is
16 recovered on an equivalent meter basis in rate design.

17 Once each of the four components of the Minimum Charge are calculated, they
18 are added together to arrive at the Minimum Charge for each meter size. For example,
19 the proposed Minimum Charge for an account with a ¾” meter is \$48.76/month. This
20 charge is comprised of a metering component of \$4.94, plus a billing component of
21 \$2.42, plus a usage component of \$33.02, plus \$8.37 of adjustments. The resulting
22 amount is then rounded up to the nearest cent. This process is demonstrated on HJS-12W

1 and the proposed Minimum Charges are shown on HJS-13W. HJS-13W also provides a
2 comparison of the proposed Minimum Charges to the existing Minimum Charges.

3 **Q. HOW ARE VOLUME CHARGES CALCULATED?**

4 A. Volumetric charges are calculated by dividing the total of the base and extra capacity
5 costs allocated to each customer class, adjusted by the remaining adjustment factors
6 described above and net of revenues provided by the assessment of the minimum charges,
7 by the projected FPPTY consumption of that customer class as demonstrated on HJS-
8 12W. For example, the rate for the Health or Education class is determined by dividing
9 the total adjusted base and extra capacity costs allocated to the Health or Education class,
10 net of the revenues provided by the minimum charge, by projected Health or Education
11 class consumption in the FPPTY to arrive at the consumption rate. The resulting value,
12 rounded to the nearest cent, is the proposed rate for the Health or Education class. HJS-
13 12W shows the calculation of volumetric rates and HJS-13W shows the proposed
14 Volume Charges as well as a comparison of the proposed charges to the existing charges.

15 As a reminder, the wholesale rate will only be applicable to new wholesale
16 customers while existing contracts remain in effect for current wholesale customers.
17 Additionally, the metered City accounts will be paying a rate equivalent to the
18 Commercial class, but both the water rates, wastewater conveyance rates and public fire
19 charges will be assessed at 60% of the full rate for FPPTY 2022 per the Cooperation
20 Agreement with the City of Pittsburgh.

21 **Q. DOES PWSA ASSESS FIRE PROTECTION CHARGES?**

22 A. Monthly fixed Fire System charges are assessed to non-residential customers that have
23 private fire suppression systems connected to PWSA's system. PWSA also assesses a
24 Volumetric Charge for all water used by all fire system customers for purposes other than

1 firefighting. PWSA assesses a public fire protection charge, in the form of a per hydrant
2 charge, to the City of Pittsburgh, but again, as mentioned above, that charge is being
3 phased-in.

4 **Q. HOW ARE THE FIXED FIRE SYSTEM CHARGES CALCULATED?**

5 A. Fire System Charges are comprised of three components, the Meter component; the
6 Billing component; and the Fire component, as shown on Schedule HJS-12W. The
7 Billing component is calculated in the same manner as for the Minimum Charge, but the
8 Meter component is derived for meters larger than 5/8". The Fire component is
9 calculated by dividing the costs allocated to the Fire Protection cost category by the
10 number of 5/8" meter equivalents represented by the projected number of fire suppression
11 connections and hydrant connections during the FPPTY. The Fire System Charge for
12 each group of meter sizes is the sum of the four components for each group of meter
13 sizes.

14 **Q. PLEASE EXPLAIN WHY METERS ARE GROUPED FOR FIRE SYSTEM**
15 **CHARGES?**

16 A. The fire system charge is based on four groupings of meter sizes, which were used when
17 Raftelis first developed water rates for PWSA in 2016. The exact origin of these
18 groupings are not known, but we propose to continue to use these groupings in the
19 interest of rate stability.

20 **Q. HOW ARE THE PROPOSED VOLUMETRIC FIRE SYSTEM CHARGES**
21 **CALCULATED?**

22 A. The volumetric Fire System Charges are calculated in the same manner as the other
23 Volumetric Charges, by dividing the adjusted base and extra capacity costs allocated to
24 fire protection by the projected demand for water from fire systems that is not used for
25 fighting fires. The volume charge calculation is shown on Schedule HJS-12W.

1 **Q. HOW ARE PUBLIC FIRE PROTECTION CHARGES CALCULATED?**

2 A. Public Fire Protection Charges are assessed on a per hydrant basis, and each hydrant is
 3 set at the equivalent of a six inch meter, which is standard in the water industry. The
 4 Public Fire Protection Charges are first calculated based on the allocated fire costs for a
 5 six-inch meter. In accordance with Public Utility Code Section 1328, they are then
 6 adjusted so that only 25% of public fire protection costs are assessed in the form of a
 7 Public Fire Protection Charge. For this Water Tariff, Public Fire Protection Charges will
 8 be further adjusted downward based on PWSA’s revised Cooperation Agreement with
 9 the City of Pittsburgh, which stipulates that PWSA will “phase-in” charges for public fire
 10 service based on an increasing scale of 20% per year over five years (20% in 2020, 40%
 11 in 2021, 60% in 2022, 80% in 2023, and 100% in 2024).

12 **Q. AT WHAT LEVEL IS THE DSIC BEING INCORPORATED INTO THE RATE**
 13 **PACKAGE?**

14 A. PWSA is continuing its previously approved 5% DSIC as detailed in Mr. Barca’s
 15 testimony. This is included on Schedule HJS-13W.

16 **Q. DO THE PROPOSED CHARGES GENERATE REVENUE BY CLASS THAT IS**
 17 **CONSISTENT WITH EACH CLASS’ COST OF SERVICE AS INDICATED BY**
 18 **THE CCROSS?**

19 A. No. Revenue recovery from the proposed charges for the aforementioned City,
 20 Wholesale, CAP customer classes and Public fire Protection are lower than each class’
 21 unadjusted cost of service. This is the result of intentionally under recovering because of
 22 a discount or agreements in place. However, after the adjustments are made as described
 23 above, the proposed charges generate revenue consistent with the adjusted class cost of
 24 service .

1 **Q. HAVE YOU PROVIDED INFORMATION ON WHAT THE CUSTOMER**
 2 **IMPACTS ARE PROJECTED TO BE?**

3 A. Yes, Schedule HJS-16W shows example monthly bills under existing and proposed rates
 4 and the percentage impacts that are likely to occur for typical customers in each class.
 5 For a typical residential customer using 3 kgal per month, their monthly water bill would
 6 increase from \$54.36 to \$61.79 which represents a 13.7% increase.

7 **Q. WHAT CONSIDERATION HAS BEEN GIVEN AS TO WHETHER THE**
 8 **REVENUES FROM THE RATES AND CHARGES ARE SUFFICIENT TO**
 9 **COVER REVENUE REQUIREMENTS FOR PWSA?**

10 A. Schedule HJS-17W serves as a revenue proof to determine revenue sufficiency of the
 11 proposed rates and charges. The revenues that would be generated under the proposed
 12 rates and charges are shown along with the anticipated revenue from the DSIC. As
 13 shown on this schedule, revenue generated by the proposed rates and charges recovers the
 14 full water system revenue requirements.

15 **VI. WASTEWATER COST ALLOCATION**

16 **Q. WHAT IS THE LEVEL OF REVENUE REQUIREMENTS TO BE RECOVERED**
 17 **BY WASTEWATER CONVEYANCE RATES AND CHARGES?**

18 A. Mr. Barca's testimony supports PWSA's total revenue requirements and HJS-1 and HJS-
 19 2 support the allocation of total revenue requirements for wastewater conveyance service.
 20 As shown on HJS-1WW, the total wastewater conveyance system revenue requirements
 21 for the FPFTY is \$45.7 million. A portion is projected to be recovered by a Distribution
 22 System Improvement Charge (DSIC) at 5% of wastewater conveyance revenues, which
 23 will be used to fund capital projects as outlined in Mr. King's and Mr. Barca's testimony.
 24 The wastewater conveyance system revenue requirements net of DSIC are \$43.0 million.

1 **Q. HOW ARE WASTEWATER CONVEYANCE REVENUE REQUIREMENTS**
 2 **ALLOCATED TO COST CATEGORIES AND CUSTOMER CLASSES?**

3 A. Wastewater conveyance costs are allocated according to standard industry practice as
 4 described in the Water Environment Federation's (WEF) Manual of Practice No. 27,
 5 "Financing and Charges for Wastewater Systems". Similar to the allocation methodology
 6 used for determining PWSA's water rates, the allocation process involves three steps: 1)
 7 assigning costs to functional categories; 2) assigning the costs from each functional
 8 category to cost categories; and 3) allocating the costs from each cost category to
 9 customer classes.

10 **Q. HOW ARE PWSA'S OPERATING AND MAINTENANCE COSTS ASSIGNED**
 11 **TO FUNCTIONAL CATEGORIES?**

12 A. The process of assigning costs to functional categories allows costs to be recovered from
 13 customer classes based on the way that PWSA utilizes the resources within each function
 14 to meet the demands of each customer class. The functions to which costs are assigned
 15 are:

- 16 • Conveyance & Collection
- 17 • Meters
- 18 • Billing
- 19 • Administrative Support

20 Similar to the water expenses, the FPPTY operating and maintenance (O&M)
 21 expenses are accounted for in a manner consistent with PWSA's O&M budget. The
 22 wastewater conveyance revenue requirements are shown on HJS-2WW. With the
 23 exception of Customer Service, all of the budget divisions relate directly to one
 24 functional category. Costs that are incurred in support of only one function are assigned
 25 directly to that function, while costs that are incurred in support of two or more functions
 26 are assigned to functions using allocation factors that reflect the way a particular budget

1 division supports each function. The allocation factors used to assign costs to functional
2 categories are listed and described on Schedules HJS 4WW and 5WW.

3 **Q. HOW ARE CUSTOMER SERVICE COSTS ASSIGNED TO FUNCTIONAL**
4 **CATEGORIES?**

5 A. Since the Customer Service division supports both the Meters and Billing functions,
6 customer Service costs are assigned to functional categories using factor WW-E. This
7 factor, as shown on Schedule HJS-5WW, was developed based on an analysis of each of
8 the cost line items in the division's budget.

9 **Q. HOW ARE ENGINEERING & CONSTRUCTION COSTS ASSIGNED TO**
10 **FUNCTIONAL CATEGORIES?**

11 A. The Engineering & Construction division is responsible for planning and executing
12 PWSA's capital projects; therefore, as was the case with the water expenses, the
13 division's costs are allocated based on the composition of the utility's CIP. Unlike the
14 water CIP, all of the wastewater conveyance projects are related to the improvement,
15 repair, replacement and expansion of the wastewater conveyance and collection system;
16 therefore, all of the Engineering & Construction expenses are allocated to Conveyance &
17 Collection as shown on Schedule HJS-2WW.

18 **Q. HOW ARE CAPITAL COSTS ASSIGNED TO FUNCTIONAL CATEGORIES?**

19 A. PWSA's capital costs consist of three components: (1) Internally Generated
20 Funds/PAYGO funded capital projects and; (2) debt service; and (3) contributions to
21 reserves. To properly assign these costs to cost categories they must first be assigned to
22 functional categories. All capital costs are assigned to functions based on the make-up of
23 the fixed assets that currently comprise PWSA's wastewater conveyance system. This
24 process involved assigning each of PWSA's fixed assets to the appropriate functional
25 category and determining the percentage of the total value of the assets that is assigned to

1 each function. These percentages are then applied to the capital costs to determine the
2 appropriate distribution of capital costs across the functional categories. Schedule HJS-
3 2WW shows the break-down of wastewater conveyance fixed assets by functional
4 categories.

5 **Q. WAS INFILTRATION AND INFLOW INCLUDED IN THE WASTEWATER**
6 **CONVEYANCE CCOSS?**

7 A. Yes. In accordance with the Settlement Agreement from the previous rate case, PWSA
8 determined the cost in the FPPTY to address infiltration and inflow (I&I) remediation in
9 the sanitary only wastewater conveyance system to be incorporated into the CCOSS.
10 One capital project, "Contract 1", within the Small Diameter Sewer Rehabilitation
11 program has been identified to address this and is projected to cost \$4.47 million.
12 Assuming this project will be financed by revenue bond debt, the annual debt service
13 payment will be approximately \$258,000. This annual cost in the FPPTY was
14 incorporated as an additional functional cost in this analysis.

15 **Q. WHAT IS THE NEXT STEP IN THE COST ALLOCATION PROCESS?**

16 A. Once costs have been assigned to functional categories, the next step is to allocate the
17 functionalized costs to cost categories.

18 **Q. HOW ARE PWSA'S COSTS ALLOCATED TO THE DIFFERENT COST**
19 **CATEGORIES?**

20 A. O&M and capital costs are assigned to one or more of three cost categories based on how
21 costs are incurred to meet the demands of the wastewater conveyance system as a whole.
22 The assignment of costs to the cost categories is shown on Schedule HJS-3WW,
23 Allocation to Cost Categories. Since all of the wastewater collected and conveyed by
24 PWSA's wastewater conveyance system is treated at the ALCOSAN wastewater
25 treatment facilities, the process of assigning costs to cost categories is greatly simplified

1 because no costs need to be allocated to any of the treatment related categories addressed
 2 in WEF Manual No. 27.

3 The three cost categories consist of:

- 4 • **Volume** – Volume costs are those costs that are a function of the amount of
 5 wastewater that is collected and conveyed by the system
- 6 • **Meters** – Meter costs are the costs associated with installing, maintaining,
 7 repairing and replacing water meters. While the water meters are not used to
 8 measure wastewater flow, the water flow measured by the meters serves as a
 9 proxy for the volume of wastewater discharged by each customer and therefor
 10 the meters serve a vital role in the process of assessing wastewater conveyance
 11 charges to PWSA’s customers.
- 12 • **Billing** – Billing costs are those costs associated with billing PWSA wastewater
 13 conveyance customers for wastewater collection and conveyance.

14 Costs are assigned to cost categories using the allocation factors listed and
 15 described on Schedules HJS 4WW and 5WW. Most of the allocation factors are
 16 developed using system wide demand data and others are developed based on other
 17 analyses.

18 **Q. PLEASE DESCRIBE HOW EACH OF THE ALLOCATION FACTORS SHOWN**
 19 **ON SCHEDULE HJS 4WW WAS DEVELOPED.**

20 A. The Volume allocator (WW-AA) assigns all of the costs to which it is applied to the
 21 Volume cost category in recognition that these costs are driven by the volume of
 22 wastewater collected and conveyed by the wastewater conveyance system.

23 The Customer-Meters allocation factor (WW-BB) allocates all meter related costs
 24 to the meter component of the Minimum Charge.

25 The Customer-Billing allocation factor (WW-CC) allocates all billing related
 26 costs to the Billing component of the Minimum Charge.

1 The Administrative Support allocation factor (WW-DD) is used to allocate costs
2 that do not readily fall into a specific functional category. This allocation factor is based
3 on the percentages of overall costs that are allocated to each of the other cost categories
4 once all other allocations have been performed.

5 The Inflow and Infiltration costs are allocated between volume and billing to
6 reflect that infiltration is linked both to customers' level of flow and number of
7 connections in the system. In this analysis, aligning with the example in WEF Manual
8 No. 27, I&I costs were allocated 1/3rd to volume and 2/3rd to billing.

9 **Q. PLEASE DESCRIBE HOW THE COSTS ARE ALLOCATED TO THE COST**
10 **CATEGORIES.**

11 A. In the cost allocation model, allocation factors are applied to costs in each functional
12 category such that costs are allocated in a way that reflects the type of demand being met
13 by the function to which the costs have been assigned, as shown on Schedule HJS-7WW.
14 For instance, the costs in the Collection & Conveyance function are allocated using the
15 Allocation Factor WW-AA which allocates costs in a way that recognizes that all of the
16 costs in this function are to some degree dependent upon the volume of wastewater
17 collected and conveyed by the wastewater conveyance system. Over seventy percent
18 (70%) of PWSA's wastewater conveyance costs are allocated using the WW-AA
19 allocation factor.

20 **Q. HOW ARE THE COSTS ALLOCATED TO EACH OF PWSA'S CUSTOMER**
21 **CLASSES?**

22 A. As demonstrated on Schedule HJS-7WW, the revenue requirements from each cost
23 category are used to determine the unit cost of providing wastewater collection and
24 conveyance service. For example, approximately \$37.7 million in wastewater
25 conveyance revenue requirements were allocated to the Volume cost category. This

1 amount is reduced by approximately \$0.6 million to reflect revenue from miscellaneous
2 revenue, resulting in approximately \$37.1 million in Volume revenue requirements to be
3 recovered through retail rates. This amount is divided by the FPPTY projected billable
4 flows (approximately 8.8 million kgal) to arrive at the unit cost of \$4.22 per kgal. This
5 unit cost is then multiplied by each class' projected billable wastewater flows to arrive at
6 the amount of Volume costs to be recovered from each class as shown on Schedule HJS-
7 8WW. For example, the Residential class is projected to discharge approximately 3.5
8 million kgal. This amount is multiplied by the unit cost of \$4.22 to arrive at the total
9 Volume costs to be recovered from the Residential class. This process is repeated for
10 each of the customer classes to arrive at the total costs to be recovered from each class.

11 **Q. ARE ANY ADJUSTMENTS MADE TO THE CLASS COST OF SERVICE?**

12 A. Yes. Adjustments to class cost of service were based on several factors, including rate
13 case settlement items, negotiated agreements with the City of Pittsburgh and other
14 entities, bad debt and customer assistance program forgone revenue.

15 **Q. WHAT ADJUSTMENTS WERE MADE TO THE ALLOCATED WASTEWATER**
16 **CONVEYANCE COST OF SERVICE BY CUSTOMER CLASS?**

17 A. PWSA is required to make four adjustments to the cost of service allocated to each
18 customer class. All four adjustments are shown on Schedule HJS-9WW and the forgone
19 revenue for the CAP customers is derived on HJS-10WW. The adjustments are described
20 below:

- 21 1. **City of Pittsburgh Phase-In** – As stated previously, PWSA has agreed to “phase-in”
22 charges for wastewater conveyance service based on an increasing scale of 20% over
23 five years. As such, costs allocated to Municipal customers are reduced by 40% and
24 those costs must be recovered from the other retail customer classes proportionally
25 based on the unadjusted cost of service.

- 1 2. **City of Pittsburgh Unmetered Properties** – PWSA has agreed to not assess the City
2 of Pittsburgh flat charges for unmetered properties until 2024. Costs allocated to these
3 connections have been redistributed among the other customer classes by the
4 unadjusted cost of service.
- 5 3. **Bad Debt Expense** – The CCOSS introduces Bad Debt Expense with the other
6 adjustments on Schedule HJS-9WW since it must be allocated directly to customer
7 classes. Bad Debt Expense is allocated among the customers based on their historical
8 responsibility for such costs.
- 9 4. **Customer Assistance Program** – The cost of the Customer Assistance Program,
10 derived on Schedule HJS-10WW, is allocated among customer classes on Schedule
11 HJS-9WW. These costs are allocated to classes based on the unadjusted cost of service.

12 **Q. PLEASE EXPLAIN HOW THE FY2018 -FY2020 DATA WAS USED TO**
13 **DEVELOP THE DEMAND PROJECTIONS.**

- 14 A. FPPTY demand by class was set equal to the average annual demand exhibited by each
15 class based on averaging annual demand by class from 2018, 2019 and 2020, as shown
16 on HJS-17WW. Modifications were made to the Residential and CAP classes to reflect
17 the ramp up of CAP customers based on improved participation in the bill discount
18 program to an estimated 5,700 customers in 2022. The estimated CAP customers for
19 wastewater conveyance service is higher than water service due to more overall
20 wastewater conveyance customers. This is because PWSA services approximately
21 30,000 customers that are wastewater conveyance only. Residential bills and demand are
22 reduced by the corresponding bills and demand associated with the incremental increase
23 in CAP participation. No other modifications were made. While PWSA anticipates
24 installing meters for City accounts that are currently unmetered, no modifications were
25 made to the forecast of municipal demand because of the uncertainty of the timing, size
26 or flow of the accounts added. As previously discussed, since the forecasted units for
27 FPPTY is the average of 2018, 2019, and 2020 and result in a forecast of demand that is

1 approximately 8% higher than 2020 actuals, it is assumed that any slight increase in
 2 collections of municipal demand may be covered in the higher FPPTY projected demand.

VII. WASTEWATER CONVEYANCE RATE DESIGN

4 **Q. PLEASE DESCRIBE PWSA’S EXISTING WASTEWATER CONVEYANCE**
 5 **RATE STRUCTURE.**

6 A. PWSA’s current wastewater conveyance rate structure for retail customers consists of a
 7 monthly Minimum Charge that varies by meter size and a Volume Charge that varies by
 8 customer class. The Minimum Charge is used to recover PWSA’s customer costs and the
 9 cost of a wastewater usage allowance that also varies by meter size.

10 The Volume Charge is designed to recover PWSA’s costs that vary based on customer
 11 demand as well as the portion of PWSA’s fixed costs that are not recovered through the
 12 Minimum Charge. The volumetric rate per thousand gallons (kgal) of wastewater
 13 demand varies by customer class based on the way in which each class demands service.

14 The wastewater conveyance customer classes are:

- 15 • Residential (which includes Residential CAP),
- 16 • Commercial (which includes Municipal),
- 17 • Industrial, and
- 18 • Health or Education.

20 **Q. IS PWSA PROPOSING TO MAKE ANY CHANGES TO THE EXISTING**
 21 **WASTEWATER CONVEYANCE RATE STRUCTURE?**

22 A. No. As described in my testimony relating to the water rate structure, PWSA is not
 23 proposing to make any changes to the wastewater conveyance rate structure at this time.

24 **Q. HOW ARE THE MINIMUM CHARGES CALCULATED?**

25 A. As shown on Schedule HJS-11 WW the Minimum Charges are comprised of three
 26 components, the Meter component; the Billing component and the Usage component.

1 **Q. HOW IS EACH OF THESE COMPONENTS CALCULATED?**

2 A. The Meter component is calculated by dividing all costs allocated to the Meter category
3 by the number of 5/8" equivalent meters in the system to determine a cost per 5/8"
4 equivalent meter. The meter size specific service charges are determined by then
5 multiplying the cost per 5/8" equivalent meter by the appropriate AWWA meter
6 equivalency ratio to determine the appropriate charge for each meter size.

7 The Billing component is calculated by dividing the costs allocated to the Billing
8 category by the total number of bills prepared each year to determine a unit cost per bill.

9
10 The Usage component is used to recover the costs of providing the volume
11 allowance included in the Minimum Charge. It is calculated, as shown on Schedule HJS-
12 11WW, by multiplying the allowance for each meter size by the retail volumetric unit
13 cost. For example, accounts with a 3/4" meter receive a 2 kgal/month allowance.
14 Therefore, the Usage component for a 3/4" meter is equal to 2 kgal times the volumetric
15 unit cost of \$3.95, or \$7.91.

16 The final step in the development of the Minimum Charge is the Readiness-to-
17 Serve adjustment. This is a rate design adjustment that involves assigning 5% of the
18 debt service costs allocated to wastewater conveyance for recovery through the Minimum
19 Charge

20 Once each of the three components of the Wastewater Conveyance Minimum
21 Charge are calculated and the Readiness-to-Serve adjustment is made, the three
22 components and the adjustment are added together to arrive at the Wastewater
23 Conveyance Minimum Charge for each meter size. For example, the proposed
24 Wastewater Conveyance Minimum Charge for an account with a 3/4" meter is

1 \$12.16/month. This charge is comprised of a metering component of \$0.95, plus a billing
 2 component of \$2.45, plus a usage component of \$7.91, plus a Readiness-to-Serve
 3 adjustment of \$0.85. The resulting amount is then rounded up to the nearest cent.

4 **Q. HOW ARE WASTEWATER CONVEYANCE VOLUME CHARGES**
 5 **CALCULATED?**

6 A. As shown on HJS-11 WW, wastewater conveyance Volume Charges are calculated by
 7 dividing the net volumetric revenue requirements for each class by the projected volume
 8 of wastewater discharged by each class. Net volumetric revenue requirements are
 9 determined by first subtracting the revenue generated from Wastewater Conveyance
 10 Minimum Charges by each class from the total revenue requirements allocated to each
 11 class. The result is the costs that must be recovered from each class through the volume
 12 charge. For example, the rate for the Residential class is determined by dividing the net
 13 volumetric revenue requirements allocated to the Residential class (\$17.3M) by the
 14 projected wastewater volume discharged by the Residential class (2.7M kgal) to arrive at
 15 the volumetric rate of \$6.34 per kgal. The resulting rates and charges are shown on HJS-
 16 12WW.

17 As a reminder, the metered City accounts will be paying a rate equivalent to the
 18 Commercial class, but the wastewater conveyance rates will be assessed at 60% of the
 19 full rate for FPPTY 2022 per the Cooperation Agreement with the City of Pittsburgh.

20 **Q. AT WHAT LEVEL IS THE DSIC BEING INCORPORATED INTO THE RATE**
 21 **PACKAGE?**

22 A. PWSA is continuing its 5% DSIC approved in its last base rate case, as discussed in Mr.
 23 Barca’s testimony. This is included on Schedule HJS-12WW .

1 **Q. HAVE YOU PROVIDED INFORMATION ON WHAT THE CUSTOMER**
2 **IMPACTS ARE PROJECTED TO BE?**

3 A. Yes, HJS-15WW shows bills under existing and proposed rates and the percentage
4 impacts that are likely to occur for typical residential, commercial, and industrial
5 customers. For a typical residential customer using 3 kgal per month, their monthly
6 wastewater conveyance bill increases from \$24.98 to \$21.30 which represents a 14.7%
7 decrease.

8 **Q. WHAT CONSIDERATION HAS BEEN GIVEN AS TO WHETHER THE**
9 **REVENUES FROM THE WASTEWATER CONVEYANCE RATES AND**
10 **CHARGES ARE SUFFICIENT TO COVER WASTEWATER CONVEYANCE**
11 **REVENUE REQUIREMENTS FOR PWSA?**

12 A. HJS-16WW serves as a revenue proof to determine revenue sufficiency of the proposed
13 rates and charges. The revenues that would be generated under the proposed rate
14 structure are shown along with the anticipated revenue from the DSIC.

15 **Q. ACCORDING TO THE RATE MODEL, ARE THE RATES AND CHARGES**
16 **CALCULATED SUFFICIENT TO MEET REVENUE REQUIREMENTS?**

17 A. Yes. As shown in HJS-16WW, the revenues generated by the proposed rates and charges
18 recovers the full adjusted wastewater conveyance system revenue requirements.

IVIII. STORMWATER COST ALLOCATION

20 **Q. WHAT IS THE LEVEL OF REVENUE REQUIREMENTS TO BE RECOVERED**
21 **BY STORMWATER RATES AND CHARGES?**

22 A. Mr. Barca's testimony supports PWSA's total revenue requirements and HJS-1 and HJS-
23 2 supports the allocation of total revenue requirements for stormwater service. As shown
24 on HJS-1SW, the total stormwater system revenue requirements for the FPFTY is \$36.7
25 million.

1 **Q. WHAT ADJUSTMENTS WERE MADE TO THE ALLOCATED STORMWATER**
2 **COST OF SERVICE BY CUSTOMER CLASS?**

3 A. PWSA has made three adjustments to the cost of service allocated to stormwater, which
4 are shown on Schedule HJS-5SW. The adjustments are described below:

- 5 1. **Bad Debt Expense** – The CCOSS introduces Bad Debt Expense with the other adjustments
6 on Schedule HJS-5SW. Bad Debt Expense is allocated among the customers based the
7 unadjusted cost of service. Please see testimony by Mr. Readling for more information
8 on how the bad debt expense for stormwater was calculated.
- 9 2. **Customer Assistance Program** – The forgone revenue as a result of the Customer
10 Assistance program, estimated at approximately \$250,000 is allocated among customer
11 classes on Schedule HJS-5SW, based on the unadjusted cost of service. Please see the
12 testimony by Ms. Quigley for more information about the proposed level of bill discount
13 for the new stormwater fee.
- 14 3. **Credit Program** – The cost of the Stormwater credit program is estimated to be 5% of
15 non-residential stormwater charges, or approximately \$700,000. This cost is allocated
16 among customer classes on Schedule HJS-5SW. These costs are allocated to classes based
17 on the unadjusted cost of service. Please see testimony by Mr. Readling for more
18 information about the credits and incentives program.

19 **IX. STORMWATER RATE DESIGN**

20 **Q. PLEASE DESCRIBE PWSA’S PROPOSED STORMWATER RATE**
21 **STRUCTURE.**

22 A. The proposed stormwater rate structure and the process used to develop stormwater rates
23 is addressed in the testimony of PWSA witness Mr. Keith Readling. As Mr. Readling
24 discusses, the stormwater rate that would be required to recover all of the revenue
25 requirements allocated to stormwater would be inordinately high and would most likely
26 result in a high level of nonpayment of the stormwater bill. As such, PWSA is proposing
27 to apply gradualism to the stormwater charge such that it does not pose a financial
28 challenge to customers still recovering from the COVID-19 pandemic. The

1 implementation of gradualism for the stormwater charge requires that the difference in
 2 revenue that will be recovered through the proposed stormwater charge and the revenue
 3 that would be recovered through the fully loaded stormwater charge be recovered through
 4 the wastewater conveyance charge. This adjustment is included in Schedule HJS-6SW.
 5 This is accomplished by making a \$12.4 million downward adjustment to the allocated
 6 stormwater cost of service and a commensurate upward adjustment to the allocated
 7 wastewater conveyance cost of service, as shown on HJS-9WW. The mechanism for
 8 affecting gradualism with respect to the stormwater charge is described below.

9 **X. GRADUALISM ADJUSTMENT IN ADDITION TO STORMWATER**

10 **Q. OTHER THAN THE STORMWATER CHARGE, DO PWSA’S PROPOSED**
 11 **RATES INCORPORATE ANY OTHER INSTANCES OF THE**
 12 **IMPLEMENTATION OF GRADUALISM?**

13 A. Yes, we have made gradualism adjustments to both the wastewater conveyance rate for
 14 the Health or Education class and to the water rate for the Industrial class.

15 **Q. PLEASE DESCRIBE ALL INSTANCES OF THE IMPLEMENTATION OF**
 16 **GRADUALISM.**

17 A. The mechanism for affecting each instance of gradualism is described below.

18
 19 • **Stormwater Gradualism Adjustment** – The cost of gradualism between stormwater
 20 and wastewater conveyance (\$12.4 million) is allocated for recovery from all classes
 21 of wastewater conveyance customers as shown on Schedule HJS-9WW. These costs
 22 are allocated to classes based on the unadjusted cost of service for each customer class.

23
 24 • **Health or Education Wastewater Conveyance Gradualism Adjustment** – Based on
 25 a long-standing policy decision, wastewater rates for Health or Education have been
 26 set higher than the estimated cost of service for the Health or Education class. Since
 27 PWSA has increased wastewater conveyance rates “across-the-board” in the previous
 28 two filings, the subsidy has not been corrected. For this rate case, PWSA is proposing

1 to reduce, but not fully remove, this subsidy. The cost of the subsidy is allocated from
 2 Health or Education to Residential as shown on Schedule HJS-9WW.

- 3
- 4 • **Industrial Water Gradualism Adjustment**– In PWSA’s 2020 Rate Case, PWSA and
 5 the parties agreed to impose gradualism adjustments for any customer classes
 6 experiencing a 1.5x increase above the system average increase. PWSA has continued
 7 this convention here and has made such an adjustment for Industrial customers. As
 8 shown on HJS-10W, The gradualism “costs” are assigned proportionally for recovery
 9 to other customer classes based on unadjusted cost of service for each class.

10

11 **XI. TWO YEAR PHASE IN**

12 **Q. ASIDE FROM THE ADJUSTMENTS FOR GRADUALISM IS PWSA**
 13 **PROPOSING ANY OTHER ADJUSTYMENTS TO THE CALCULATED COST**
 14 **OF SERVICE RATES?**

15 A. Yes, as mentioned in Mr. Pickering’s testimony PWSA is proposing to phase in the
 16 proposed rates over a two year period. Proposed water and wastewater conveyance rates
 17 for FY 2022 will be set at a level that will generate 50% of the additional revenue needed
 18 to meet FPFTY revenue requirements as adjusted for gradualism and the stormwater rates
 19 for FY2022 will be set at a level such that they will generate 75% of the additional
 20 revenue needed to FPFTY revenue requirements as adjusted for gradualism. Schedules
 21 HJS-19W, 18WW, and 9SW show the proposed two-year phase-in.

22 I should note that PWSA reserves the right to withdraw this voluntary offer to phase-in
 23 the authorized rate increase if the level of approved increase on a phased in basis would
 24 produce an unreasonably low level of rate increase or would not be sufficient to permit
 25 PWSA to meet its bond covenant requirements in FY 2022.

1 **Q. HOW WILL RATES BE ADJUSTED IN FY 2023?**

2 A. At the beginning of FY 2023, water, wastewater conveyance and stormwater rates will be
3 adjusted such that they are projected to recover PWSA's FPFTY revenue requirements.

4XII. CONCLUSION

5 **Q. MR. SMITH, DOES THAT CONCLUDE YOUR TESTIMONY?**

6 A. Yes; however, I do reserve the right to supplement this testimony as may be appropriate.

VERIFICATION

I, Harold J. Smith, hereby state that: (1) I am a Vice President of Raftelis Financial Consultants, Inc.; (2) I have been retained by The Pittsburgh Water and Sewer Authority (“PWSA”) and am authorized to present testimony on its behalf; (3) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (4) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Dated: 3/21/2021

DocuSigned by:
Harold Smith

3974460998445
Harold J. Smith, Vice President
Raftelis Financial Consultants, Inc.

Consultant to:
The Pittsburgh Water and Sewer Authority

Exhibits HJS-1 to HJS-3 (Combined Utility Schedules)

**Pittsburgh Water and Sewer Authority
 Revenue Requirements by Utility**

	FPPTY 2022			
	Water	Wastewater Conveyance	Stormwater	Total
Base Rate Revenue Requirements				
<u>Operating Expenses</u>				
<i>Direct Operating Expenses</i>				
Administrative Division				
Executive Director	\$ 2,237,558	\$ 468,972	\$ 348,904	\$ 3,055,434
Customer Service	2,551,184	3,203,545	3,032,377	8,787,106
Management Information Systems	3,364,483	705,166	524,626	4,594,275
Finance	5,699,209	1,194,504	888,681	7,782,394
Procurement	-	-	-	-
Human Resources	864,436	181,178	134,792	1,180,406
Legal	4,328,612	907,239	674,963	5,910,814
Public Affairs	939,628	196,938	146,517	1,283,083
Operations Division				
Environmental Compliance	1,392,137	1,292,698	1,292,698	3,977,533
Ops Capital Assets	-	-	-	-
Warehouse	346,692	72,664	54,060	473,416
Water Treatment Plant	22,973,908	-	-	22,973,908
Water Quality (Lab)	1,792,010	-	-	1,792,010
Water Distribution	15,138,386	-	-	15,138,386
Sewer Operations	-	1,718,790	1,718,790	3,437,579
Engineering & Construction Division				
Engineering & Construction	21,574,561	10,164,915	6,790,943	38,530,420
<i>Subtotal: Direct Operating Expenses</i>	\$ 83,202,804	\$ 20,106,610	\$ 15,607,350	\$ 118,916,763
<i>Other Operating Expenses</i>				
Loss / (Gain) on ALCOSAN Billings	\$ -	\$ 1,571,968	\$ -	\$ 1,571,968
City Services	3,500,493	733,673	545,834	4,780,001
Non-City Water Payments	-	-	-	-
<i>Subtotal: Other Operating Expenses</i>	\$ 3,500,493	\$ 2,305,641	\$ 545,834	\$ 6,351,969
<i>Subtotal: Operating Expenses</i>	\$ 86,703,297	\$ 22,412,251	\$ 16,153,184	\$ 125,268,732
<u>Debt Service</u>				
<i>Existing Debt</i>				
Senior Debt Service	\$ 32,928,147	\$ 11,876,756	\$ 11,876,756	\$ 56,681,659
Subordinate Debt Service	5,456,284	1,968,011	1,968,011	9,392,305
<i>Subtotal: Existing Debt</i>	\$ 38,384,431	\$ 13,844,767	\$ 13,844,767	\$ 66,073,964
<i>Proposed Debt</i>				
Revolving Line of Credit Interest	\$ 1,966,166	\$ 1,010,648	\$ 523,186	\$ 3,500,000
Revenue Bonds	9,355,344	3,447,831	2,956,852	15,760,027
SRF Loans	2,413,415	836,765	823,102	4,073,281
<i>Subtotal: Proposed Debt</i>	\$ 13,734,926	\$ 5,295,244	\$ 4,303,139	\$ 23,333,308
<i>Subtotal: Debt Service</i>	\$ 52,119,357	\$ 19,140,010	\$ 18,147,906	\$ 89,407,273
<u>Capital Expenditures & Transfers</u>				
Internally Generated Funds / PAYGO	\$ 1,000,000	\$ -	\$ -	\$ 1,000,000
Other Transfers to Reserves	640,000	250,000	110,000	1,000,000
Reimbursements from Municipalities	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-
Bad Debt Expense	2,977,855	1,148,825	1,591,397	5,718,077
Stormwater Credit Program Cost	-	-	696,685	696,685
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 4,617,855	\$ 1,398,825	\$ 2,398,082	\$ 8,414,762
Total: Base Rate Revenue Requirements	\$ 143,440,509	\$ 42,951,087	\$ 36,699,172	\$ 223,090,767
DSIC Costs	\$ 6,864,558	\$ 2,735,298	\$ -	\$ 9,599,856
Total System Revenue Requirements	\$ 150,305,066	\$ 45,686,384	\$ 36,699,172	\$ 232,690,623

Pittsburgh Water and Sewer Authority
Allocation Factors - Between Utilities

Allocations to Utilities (Revenue Requirements & Assets)				
<i>Code</i>	<i>Description</i>	<i>Water</i>	<i>Sewer</i>	<i>Stormwater</i>
A	Water Only	100.0%	0.0%	0.0%
B	Wastewater Only	0.0%	100.0%	0.0%
C	Stormwater Only	0.0%	0.0%	100.0%
D	Customer Service - Meters	51.2%	48.8%	0.0%
E	Customer Bills	26.8%	35.2%	38.0%
F	Operations Cost	73.2%	15.3%	11.4%
G	Engineering and Construction	65.0%	23.6%	11.4%
H	Environmental Compliance	35.0%	32.5%	32.5%
I	Customer Service - Composite	29.0%	36.5%	34.5%
J	Wastewater - Conveyance	0.0%	50.0%	50.0%
K	Existing Debt Service - Assets	58.1%	21.0%	21.0%

Sewer / Stormwater Allocation Factor Detail

Conveyance
 Debt Service

	Sewer	Stormwater
Conveyance	50.0%	50.0%
Debt Service	50.0%	50.0%

**Pittsburgh Water and Sewer Authority
Allocation Factor Detail**

Factor Derivations - Allocation to Utilities			
<i>Code(s)</i>	<i>Description</i>	<i>Calculations</i>	
D	Customer Service - Meters		
	- This factor uses water and sewer meters to allocate meter costs between utilities	Water Meters Water & Sewer Meters	<u>2022</u> 76,150 <u>72,500</u> 148,650
			<u>Factor</u> 51.23% 48.77%
E	Customer Bills		
	- This factor uses water, sewer, and stormwater bills to allocate billing costs between utilities. Stormwater parcels are used to estimate the number of bills issued.	Water Bills Sewer Bills Stormwater	<u>2022</u> 913,799 1,200,726 <u>1,294,644</u> 3,409,168
			<u>Factor</u> 26.80% 35.22% 37.98%
F	Operations Costs		
	- This factor uses the allocation of the operations budget category as a composite allocation for allocating administrative costs to the utilities	Water Wastewater Stormwater	\$ 63,217,694 13,249,066 <u>9,856,491</u> \$ 86,323,251
			<u>Factor</u> 73.23% 15.35% 11.42%
G	Engineering & Construction		
	- This factor uses the 2022 CIP to allocate engineering and construction costs between utilities.	Water Wastewater Stormwater	\$ 110,747 40,272 <u>19,432</u> \$ 170,450
			<u>Factor</u> 64.97% 23.63% 11.40%
H	Environmental Compliance		
	- This factor is based on PWSA Staff estimates of 35% of Environmental Compliance costs being water-related. The wastewater portion is allocated 50/50 to wastewater/stormwater.	Water Wastewater Stormwater	<u>Factor</u> 35.00% 32.50% 32.50%
I	Customer Service - Composite		
	- This factor is a composite allocation of the allocated Customer Service (911) budget between to allocate Customer Service assets between the utilities.	Water Wastewater Stormwater	<u>2022</u> \$ 2,551,184 3,203,545 <u>3,032,377</u> \$ 8,787,106
			<u>Factor</u> 29.03% 36.46% 34.51%
K	Existing Debt Service - Assets		
	- Existing system debt service is allocated between utilities by using system fixed assets. Non-water assets are allocated to wastewater conveyance.	Water Wastewater Stormwater	<u>Factor</u> 58.09% 20.95% 20.95%

Pittsburgh Water and Sewer Authority
City Services Mapped to Budget Departments (1)

Department	GL Code	GL Name	2022
913 Finance	5491	Vehicle Repairs	\$ 780,000
913 Finance	7015	Permits	650,000
913 Finance	7422	Fuel-Gasses	350,000
913 Finance	8005	City Indirect Costs	<u>3,000,000</u>
			\$ 4,780,000

(1) City Services costs are picked up in the specified budget departments so the individual line items can be allocated with similar costs.

Exhibit HJS-4

(CAP-BDP Bill Frequency)

Pittsburgh Water and Sewer Authority

2020 Water & Sewer CAP-BDP Bill Frequency

Water CAP-BDP Bill Frequency			
Consumption (kgal)	Bills	% of Bills	Cumulative %
0.0	2,644	8.8%	8.8%
1.0	5,036	16.7%	25.5%
2.0	6,202	20.6%	46.1%
3.0	5,064	16.8%	63.0%
4.0	3,741	12.4%	75.4%
5.0	2,618	8.7%	84.1%
6.0	1,766	5.9%	90.0%
7.0	1,029	3.4%	93.4%
8.0	626	2.1%	95.5%
9.0	438	1.5%	96.9%
10.0	259	0.9%	97.8%
11.0	182	0.6%	98.4%
12.0	115	0.4%	98.8%
13.0	78	0.3%	99.0%
14.0	55	0.2%	99.2%
15.0	49	0.2%	99.4%
16.0	30	0.1%	99.5%
17.0	25	0.1%	99.6%
18.0	14	0.0%	99.6%
19.0	19	0.1%	99.7%
20.0	15	0.0%	99.7%
>20	84	0.3%	100.0%

Sewer CAP-BDP Bill Frequency			
Consumption (kgal)	Bills	% of Bills	Cumulative %
0.0	3,872	9.0%	9.0%
1.0	7,055	16.3%	25.3%
2.0	8,270	19.1%	44.4%
3.0	7,051	16.3%	60.7%
4.0	5,394	12.5%	73.1%
5.0	3,836	8.9%	82.0%
6.0	2,660	6.1%	88.2%
7.0	1,671	3.9%	92.0%
8.0	1,056	2.4%	94.5%
9.0	739	1.7%	96.2%
10.0	460	1.1%	97.2%
11.0	331	0.8%	98.0%
12.0	197	0.5%	98.5%
13.0	128	0.3%	98.8%
14.0	93	0.2%	99.0%
15.0	84	0.2%	99.2%
16.0	54	0.1%	99.3%
17.0	53	0.1%	99.4%
18.0	33	0.1%	99.5%
19.0	30	0.1%	99.6%
20.0	26	0.1%	99.6%
>20	164	0.4%	100.0%

Exhibits HJS-1W to HJS-19W
(Water Schedules)

Pittsburgh Water and Sewer Authority
FPPTY 2022 COS & Rate Design
 FPPTY Water Revenue Requirements

HJS-1W

	2022 FPPTY Revenue Requirements
Water System Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 2,237,558
Customer Service	2,551,184
Management Information Systems	3,364,483
Finance	9,199,702
Procurement	-
Human Resources	864,436
Legal	4,328,612
Public Affairs	939,628
Operations Division	
Environmental Compliance	1,392,137
Ops Capital Assets	-
Warehouse	346,692
Water Treatment Plant	22,973,908
Water Quality (Lab)	1,792,010
Water Distribution	15,138,386
Sewer Operations	-
Engineering & Construction	
Engineering & Construction	21,574,561
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	-
Non-City Water Payments	-
<i>Total Operating Expenses</i>	\$ 86,703,297
<u>Debt Service</u>	
Existing Debt	\$ 38,384,431
Future Debt	13,734,926
<i>Subtotal: Debt Service</i>	\$ 52,119,357
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ 1,000,000
Internally Generated Funds / PAYGO (DSIC)	6,864,558
Other Transfers to Reserves	640,000
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	2,977,855
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 11,482,413
Total: Water System Revenue Requirements	\$ 150,305,066
<i>Capital Costs to be Recovered through DSIC</i>	\$ (6,864,558)
Total: Water System Revenue Requirement (Excl DSIC)	\$ 143,440,509

Water Operating Expenses	FY 2022	Allocation	Water Functional Categories									
			Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support	
<i>Direct Operating Expenses</i>												
<i>FPFTY</i>												
Administrative Division												
Executive Director	\$ 2,237,558	W-H	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,237,558	
Customer Service	2,551,184	W-I	-	-	-	-	-	707,845	1,843,339	-	-	
Management Information Systems	3,364,483	W-H	-	-	-	-	-	-	-	-	3,364,483	
Finance	9,199,702	W-H	-	-	-	-	-	-	-	-	9,199,702	
Procurement	-	W-H	-	-	-	-	-	-	-	-	-	
Human Resources	864,436	W-H	-	-	-	-	-	-	-	-	864,436	
Legal	4,328,612	W-H	-	-	-	-	-	-	-	-	4,328,612	
Public Affairs	939,628	W-H	-	-	-	-	-	-	-	-	939,628	
Operations Division												
Environmental Compliance	1,392,137	W-H	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	1,392,137	
Ops Capital Assets	-	W-H	-	-	-	-	-	-	-	-	-	
Warehouse	346,692	W-H	-	-	-	-	-	-	-	-	346,692	
Water Treatment Plant	22,973,908	W-B	-	22,973,908	-	-	-	-	-	-	-	
Water Quality (Lab)	1,792,010	W-B	-	1,792,010	-	-	-	-	-	-	-	
Water Distribution	15,138,386	W-D	-	-	-	5,618,975	9,519,411	-	-	-	-	
Sewer Operations	-	n/a	-	-	-	-	-	-	-	-	-	
Engineering & Construction Division												
Engineering & Construction	21,574,561	W-J	-	2,845,490	12,291,797	6,297,695	-	-	-	-	139,579	
Subtotal: Direct Operating Expenses	\$ 86,703,297		\$ -	\$ 27,611,408	\$ 12,291,797	\$ 11,916,670	\$ 9,519,411	\$ 707,845	\$ 1,843,339	\$ -	\$ 22,812,827	
<i>Other Operating Expenses</i>												
Loss / (Gain) on ALCOSAN Billings	-	n/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Non-City Water Payments	-	W-H	-	-	-	-	-	-	-	-	-	
Placeholder	-		-	-	-	-	-	-	-	-	-	
Subtotal: Other Operating Expenses	\$ -		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Allocated Water Operating Costs	\$ 86,703,297		\$ -	\$ 27,611,408	\$ 12,291,797	\$ 11,916,670	\$ 9,519,411	\$ 707,845	\$ 1,843,339	\$ -	\$ 22,812,827	

Allocated Water Assets			Water Functional Categories										
Row Labels	Allocated Costs	Allocation	Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support	Total	
Structures and Improvements - Source of Supply and Pumping	3,697,265	W-A	100.00%									100.00%	
Structures and Improvements - Water Treatment	18,922,958	W-B		100.00%								100.00%	
Structures and Improvements - Transmission and Distribution Plant	-	W-D				37.12%	62.88%					100.00%	
Pumping Equipment	13,116,686	W-D				37.12%	62.88%					100.00%	
Water Treatment Equipment	77,100,511	W-B		100.00%								100.00%	
Distribution Reservoirs and Standpipes	51,673,176	W-C			100.00%							100.00%	
Transmission and Distribution Mains	235,658,763	W-D				37.12%	62.88%					100.00%	
Meters and Meter Installations	26,514,425	W-E						100.00%				100.00%	
Fire Hydrants	10,050,877	W-G								100.00%		100.00%	
Office Furniture and Equipment	710,137	W-H									100.00%	100.00%	
Office Furniture and Equipment - Computer Hardware	7,639,099	W-H									100.00%	100.00%	
Transportation Equipment	6,010,107	W-H									100.00%	100.00%	
Tools, Shop and Garage Equipment	1,593,135	W-H									100.00%	100.00%	
Laboratory Equipment	149,300	W-B		100.00%								100.00%	
Collection Sewers - Gravity	-	n/a										0.00%	
Manholes	-	n/a										0.00%	
Wastewater Plant	-	n/a										0.00%	
Power Operated Equipment	-	n/a										0.00%	
Total	452,836,438		\$ 3,697,265	\$ 96,172,769	\$ 51,673,176	\$ 92,338,978	\$ 156,436,470	\$ 26,514,425	\$ -	\$ 10,050,877	\$ 15,952,478	\$ 452,836,438	

Allocation Factors for Capital Costs	0.82%	21.24%	11.41%	20.39%	34.55%	5.86%	0.00%	2.22%	3.52%	100.00%
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Allocation of Capital Costs		Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support	Readiness-to-Serve
Debt Service	\$ 52,119,357	\$ 425,538	\$ 11,069,036	\$ 5,947,341	\$ 10,627,785	\$ 18,005,106	\$ 3,051,686	\$ -	\$ 1,156,809	\$ 1,836,056	\$ -
Internally Generated Funds / PAYGO	1,000,000	8,165	212,379	114,110	203,912	345,459	58,552	-	22,195	35,228	-
Other Transfers to Reserves	640,000	5,225	135,922	73,030	130,504	221,094	37,473	-	14,205	22,546	-
Reimbursements from Municipalities	-	-	-	-	-	-	-	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-	-	-	-	-	-	-	-
Bad Debt Expense (1)	-	-	-	-	-	-	-	-	-	-	-
Total: Allocated Capital Costs	\$ 53,759,357	\$ 438,928	\$ 11,417,337	\$ 6,134,481	\$ 10,962,201	\$ 18,571,659	\$ 3,147,711	\$ -	\$ 1,193,209	\$ 1,893,829	\$ -

(1) Bad Debt Expense allocated directly to customer classes based on each classes responsibility for historical bad debt.

			Water Cost Drivers						
			Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection
FY 2022	Allocation								
		<i>FPFTY</i>							
Water Revenue Requirement									
Functional Categories									
Supply	\$ 438,928	W-AA	100.00%						
Treatment	39,028,744	W-BB	73.44%	24.90%					1.66%
Storage	18,426,278	W-CC	54.73%	15.56%	21.94%				7.77%
Transmission	22,878,871	W-BB	73.44%	24.90%					1.66%
Distribution	28,091,070	W-CC	54.73%	15.56%	21.94%				7.77%
Meters	3,855,556	W-DD				100.00%			
Billing	1,843,339	W-EE					100.00%		
Fire Protection	1,193,209	W-FF							100.00%
Admin Support	24,706,656	W-GG	61.65%	19.57%	8.82%	3.33%	1.59%	0.00%	5.04%
Readiness-to-Serve (Debt Service)	-	W-HH						100.00%	
Total: Water Revenue Requirements	\$ 140,462,653								

			Water Cost Drivers						
			Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection
FY 2022	Allocation								
		<i>FPFTY</i>							
Water Revenue Requirement									
Functional Categories									
Supply	\$ 438,928	W-AA	\$ 438,928	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Treatment	39,028,744	W-BB	28,661,775	9,719,264	-	-	-	-	647,705
Storage	18,426,278	W-CC	10,084,124	2,867,916	4,041,938	-	-	-	1,432,300
Transmission	22,878,871	W-BB	16,801,695	5,697,488	-	-	-	-	379,689
Distribution	28,091,070	W-CC	15,373,361	4,372,171	6,161,981	-	-	-	2,183,558
Meters	3,855,556	W-DD	-	-	-	3,855,556	-	-	-
Billing	1,843,339	W-EE	-	-	-	-	1,843,339	-	-
Fire Protection	1,193,209	W-FF	-	-	-	-	-	-	1,193,209
Admin Support	24,706,656	W-GG	15,230,866	4,835,816	2,177,898	822,920	393,437	-	1,245,719
Readiness-to-Serve (Debt Service)	-	W-HH	-	-	-	-	-	-	-
Total: Water Revenue Requirements	\$ 140,462,653		\$ 86,590,749	\$ 27,492,655	\$ 12,381,817	\$ 4,678,476	\$ 2,236,777	\$ -	\$ 7,082,181
Costs to Recover from Water Charges	\$ 140,462,653		\$ 86,590,749	\$ 27,492,655	\$ 12,381,817	\$ 4,678,476	\$ 2,236,777	\$ -	\$ 7,082,181
			61.6%	19.6%	8.8%	3.3%	1.6%	0.0%	5.0%

Cost Functionalization: Water										
Code	Description	Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support
W-A	Supply Only	100.00%								
W-B	Treatment Only		100.00%							
W-C	Storage Only			100.00%						
W-D	Transmission & Distribution Only				37.12%	62.88%				
W-E	Meters Only						100.00%			
W-F	Billing Only							100.00%		
W-G	Fire Protection Only								100.00%	
W-H	Admin Support Only									100.00%
W-I	Customer Service						27.75%	72.25%		
W-J	Engineering & Construction		13.19%	56.97%	29.19%					0.65%

Allocation to Cost Drivers: Water								
Code	Description	Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection
W-AA	Base	100.00%						
W-BB	Maximum Day	73.44%	24.90%					1.66%
W-CC	Peak Hour	54.73%	15.56%	21.94%				7.77%
W-DD	Customer - Meters				100.00%			
W-EE	Customer - Billing					100.00%		
W-FF	Fire Protection							100.00%
W-GG	Admin Support (Composite)	61.65%	19.57%	8.82%	3.33%	1.59%	0.00%	5.04%
W-HH	Readiness-to-Serve						100.00%	

Factor Derivations - Allocation to Functional Categories & Cost Components						
Code(s)	Description	Calculations				
W-I	Customer Service	2022 Customer Service Budget		FPFTY	Meter	Billing
WW-E	- This factor allocates the 2022 customer service budget between meter- and billing-related costs.	Salaries		\$ 4,066,654	28.60%	71.40%
		Benefits		1,137,504	28.60%	71.40%
		Computer & Peripherals		10,000	100.00%	0.00%
		Annual Software Support		134,200	50.00%	50.00%
		Customer CC Fees		392,400	0.00%	100.00%
		Postage		569,500	0.00%	100.00%
		Equip Rental		2,060	100.00%	0.00%
		Billing Contract		837,399	0.00%	100.00%
		Meter Services		801,990	100.00%	0.00%
		Prof Service Other		304,800	20.00%	80.00%
		Water Liens		84,000	50.00%	50.00%
		Office Supplies		6,000	50.00%	50.00%
		TE Airfare		1,400	50.00%	50.00%
		TE Lodging		1,200	50.00%	50.00%
		TE Seminars/Conferences		2,400	50.00%	50.00%
		TE Training		5,000	50.00%	50.00%
		Capital Asset Reclass		(253,000)	0.00%	0.00%
		Customer Refund CSM		550,000	0.00%	100.00%
		One Call		33,600	0.00%	100.00%
		Non.City Water Reimburse		100,000	0.00%	0.00%
	Total		\$ 8,787,106	\$2,480,499	\$6,459,607	
	Allocation Factors			27.75%	72.25%	

W-D Water Pipe Inventory

- Allocate costs between transmission and distribution functional categories. Assumes Pipes less than or equal to 16" are Distribution-related.

Breakdown		
Distribution	35,292,892	62.9%
Transmission	20,832,160	37.1%
Total	56,125,051	100.0%

Inch-Foot Analysis		
Diameter (in)	Linear Feet	Inch-Feet
0.75	799	599
1	1,315	1,315
1.5	983	1,474
2	11,694	23,388
2.5	16	39
3	268	803
4	141,178	564,711
6	2,196,002	13,176,011
8	1,127,975	9,023,802
10	84,170	841,702
12	604,067	7,248,809
14	1,296	18,147
15	15,500	232,496
16	259,975	4,159,594
18	266	4,783
20	209,650	4,192,996
24	85,170	2,044,075
28	104	2,911
30	116,524	3,495,706
36	83,096	2,991,457
42	11,260	472,925
42.5	12,598	535,431
48	16,552	794,500
50	23,682	1,184,096
50.25	12,005	603,231
60	55,175	3,310,516
66	1,492	98,501
72	3,697	266,159
84	3,979	334,248
96	4,560	437,764
120	524	62,860
	5,085,570	56,125,051

Factor Derivations - Allocation to Functional Categories & Cost Components		
Code(s)	Description	Calculations

Code(s)	Description	2022 Water CIP Costs	\$\$ Amount	Allocation
W-J	Engineering & Construction - This factor uses the 2022 Water CIP costs to allocate Engineering & Construction costs to the various functional categories.	Treatment	\$ 16,422,149	13.19%
		Storage	70,939,529	56.97%
		Trans. & Distr.	36,345,826	29.19%
		Admin	805,553	0.65%
		Total Water CIP	\$ 124,513,057	100.00%

Code(s)	Description	Plant Production Data	
W-BB	Maximum Day - Maximum day costs are allocated using a peak day determined using system daily production records. Fire demands are determined in HJS-7W.	2018-2020 Avg Plant Production	69.47 mgd
		2018-2020 Avg. Peak Day	86.77 mgd
		Peak Hour Factor (1.6)	111.15 mgd
		Base	73.44%
		Maximum Day	24.90%
		Fire Protection	1.66%

Code(s)	Description	Plant Production Data	
W-CC	Peak Hour - Peak hour costs are allocated using an estimated peak hour compared to system average and maximum day processed. Fire demands are determined in HJS-7W.	2018-2020 Avg Plant Production	69.47 mgd
		2018-2020 Avg. Peak Day	86.77 mgd
		Peak Hour Factor (1.6)	111.15 mgd
		Peak Hour / Avg	54.73%
		Max Day (Plug)	15.56%
		Peak Hr / Peak Day	21.94%
		Fire Protection	7.77%

Equivalency Flow Ratios	Equivalency Ratios				
- Used to escalate metering and readiness-to-serve costs, these ratios are industry standard and obtained from the American Waterworks Association		Flow	Fire Flow	Fire Equiv	
	5/8"	1.00	1" or Less	2.50	1.00
	3/4"	1.50	1 1/2"-3"	8.00	6.19
	1"	2.50	4"	25.00	38.32
	1 1/2"	5.00	6" or Greater	50.00	111.31
	2"	8.00			
	3"	16.00			
	4"	25.00			
	6"	50.00			
	8"	80.00			
	10"	115.00			
	Unmetered	1.00			

Units of Service	Collection Factor	FY 2022 Consumption	Allocated Consumption	Average Day	Maximum Day		Peak Hour		Equivalent Meters	Total Bills	Fire Equivalents
					Cap. Factor	Total Cap.	Extra Cap.	Cap. Factor			
Retail Service											
Residential (1)	100.0%	2,739,425	2,739,425	7,505	130.0%	9,757	2,252	215.0%	817,855	759,140	-
Residential - CAP	100.0%	170,010	170,010	466	130.0%	606	140	215.0%	49,444	48,920	-
Commercial (1)	100.0%	3,051,832	3,051,832	8,361	135.0%	11,288	2,926	225.0%	369,472	80,855	-
Industrial	100.0%	199,786	199,786	547	165.0%	903	356	220.0%	12,120	965	-
Health or Education	100.0%	1,133,538	1,133,538	3,106	150.0%	4,658	1,553	250.0%	86,166	5,808	-
Municipal - Metered	100.0%	217,323	217,323	595.41	135.0%	804	208	225.0%	11,657	2,422	-
Municipal - Unmetered (2)	100.0%	47,052	47,052	128.91	135.0%	174	45	225.0%	5,070	948	-
Private Fire Systems	100.0%	14,559	14,559	40	225.0%	90	50	375.0%	52,888	15,689	42,123
Public Fire	100.0%	-	-	-	100.0%	-	-	100.0%	-	-	10,028,669
Subtotal: Retail Service		7,573,526	7,573,526	20,749		28,279	7,530		1,404,672	914,747	10,070,792
Wholesale & Bulk											
Wholesale	100.0%	844,205	844,205	2,313	135.0%	3,122	810	225.0%	-	-	-
Bulk	100.0%	-	-	-	0.0%	-	-	0.0%	-	-	-
Subtotal: Wholesale & Bulk		844,205	844,205	2,313		3,122	810		5,204	2,082	-
Total: Water Units of Service		8,417,731	8,417,731	23,062		31,401	8,339		1,404,672	914,747	10,070,792

(1) Includes unmetered units and equivalent usage.
 (2) Assumed usage for unmetered municipal properties

Peaking Factors (1)	Maximum Day			Peak Hour	
	Class MM/AD	System MD/MM	Weekly Use Adjustment	MD Peaking Factor (2)	Estimated MH/MD Peaking Factor (2)
Residential	1.14	1.13	1.00	1.30	1.66
Commercial	1.20	1.13	1.00	1.35	1.66
Industrial	1.47	1.13	1.00	1.65	1.33
Health or Education	1.33	1.13	1.00	1.50	1.66
Fire System	2.00	1.13	1.00	2.25	1.66
Wholesale	1.21	1.13	1.00	1.35	1.66

(1) Peaking factors determined using customer billing information from 2018-2020.
 (2) Maximum Day and Maximum Hour peaking factors are rounded.

Determination of Allocation Factors for Public & Private Fire Costs

Required Fire Flow	6,000	GPM
Required Duration for Fire Flow (Hours)	4	hours
Maximum Day - Fire	1,440,000	gallons
Maximum Day - System	86,770,000	gallons
% of Maximum Day for Fire	1.66%	
Peak Hour - Fire	360,000	gallons
Peak Hour - System	4,631,333	gallons
% of Maximum Day for Fire	7.77%	

Fire Service Units	Connections	Equivalent Factor	Equivalent Units	Percent
<u>Allocation to Public/Private</u>				
Public Hydrants	7,508	111.31	835,722	99.58%
Private Fire				
1" or Less	1,238	1.00	1,238	
1 1/2"-3"	48	6.19	300	
4"	5	38.32	192	
6" or Greater	16	111.31	1,781	
<i>Subtotal: Private Fire</i>	1,307		3,510	0.42%
Total	8,815		839,233	

Pittsburgh Water and Sewer Authority
 FPPTY 2022 COS & Rate Design
 Water Unit Cost of Service

HJS-8W

	FY 2022 FPPTY	Unit Costs							
		Base	Extra Capacity		Meters	Bills	Readiness-to-Serve	Fire Protection	
			Max Day	Peak Hour					
Development of Unit Costs of Service									
<u>Units of Service</u>									
Retail		7,573,526	7,530	18,419	1,404,672	914,747	1,404,672	10,070,792	
Wholesale		844,205	810	2,082	-	-	-	-	
Total System Units		8,417,731	8,339	20,500	1,404,672	914,747	1,404,672	10,070,792	
Units		<i>kgal</i>	<i>kgal/day</i>	<i>kgal/day</i>	<i>Eq. Cost Meter</i>	<i>Total Bills</i>	<i>Eq. Flow Meter</i>	<i>Eq. Fire Cnx</i>	
<u>Allocated Revenue Requirement</u>									
Supply	\$ 438,928	\$ 438,928	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Treatment	39,028,744	28,661,775	9,719,264	-	-	-	-	647,705	
Storage	18,426,278	10,084,124	2,867,916	4,041,938	-	-	-	1,432,300	
Transmission	22,878,871	16,801,695	5,697,488	-	-	-	-	379,689	
Distribution	28,091,070	15,373,361	4,372,171	6,161,981	-	-	-	2,183,558	
Meters	3,855,556	-	-	-	3,855,556	-	-	-	
Billing	1,843,339	-	-	-	-	1,843,339	-	-	
Fire Protection	1,193,209	-	-	-	-	-	-	1,193,209	
Admin Support	24,706,656	15,230,866	4,835,816	2,177,898	822,920	393,437	-	1,245,719	
Readiness-to-Serve (Debt Service)	-	-	-	-	-	-	-	-	
Total: Revenue Requirements	\$ 140,462,653	\$ 86,590,749	\$ 27,492,655	\$ 12,381,817	\$ 4,678,476	\$ 2,236,777	\$ -	\$ 7,082,181	
Revenue Offsets	(1,439,417)	\$(887,355)	\$(281,736)	\$(126,885)	\$(47,944)	\$(22,922)	\$ -	\$(72,576)	
Total: Costs of Service	\$ 139,023,237	\$ 85,703,394	\$ 27,210,919	\$ 12,254,932	\$ 4,630,533	\$ 2,213,855	\$ -	\$ 7,009,605	
Gross Unit Cost		\$ 10.18	\$ 3,263.02	\$ 597.79	\$ 3.30	\$ 2.42	\$ -	\$ 0.70	
<i>Unit Cost - Retail (\$ / Unit) (Includes Distribution)</i>		\$ 10.38	\$ 3,319.38	\$ 631.76	\$ 3.30	\$ 2.42	\$ -	\$ 0.70	
<i>Unit Cost - Wholesale (\$ / Unit) (Excludes Distribution)</i>		\$ 8.35	\$ 2,738.73	\$ 297.21	\$ 3.30	\$ 2.42	\$ -	\$ 0.70	

Customer Class Cost of Service	Unit Costs							Total
	Base	Extra Capacity		Meters	Bills	Readiness-to-Serve	Fire Protection	
		Max Day	Peak Hour					
<u>Residential</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	2,739,425	2,252	6,379	817,855	759,140	817,855	-	
Cost of Service	\$ 28,448,570	\$ 7,473,867	\$ 4,030,299	\$ 2,696,077	\$ 1,837,258	\$ -	\$ -	\$ 44,486,071
<u>Residential - CAP</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	170,010	140	396	49,444	48,920	49,444	-	
Cost of Service	\$ 1,765,534	\$ 463,832	\$ 250,122	\$ 162,992	\$ 118,394	\$ -	\$ -	\$ 2,760,875
<u>Commercial</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	3,051,832	2,926	7,525	369,472	80,855	369,472	-	
Cost of Service	\$ 31,692,878	\$ 9,713,894	\$ 4,754,031	\$ 1,217,974	\$ 195,683	\$ -	\$ -	\$ 47,574,460
<u>Industrial</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	199,786	356	301	12,120	965	12,120	-	
Cost of Service	\$ 2,074,755	\$ 1,180,983	\$ 190,190	\$ 39,955	\$ 2,335	\$ -	\$ -	\$ 3,488,218
<u>Health or Education</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	1,133,538	1,553	3,106	86,166	5,808	86,166	-	
Cost of Service	\$ 11,771,643	\$ 5,154,312	\$ 1,961,982	\$ 284,048	\$ 14,057	\$ -	\$ -	\$ 19,186,042
<u>Municipal - Metered</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	217,323	208	536	11,657	2,422	11,657	-	
Cost of Service	\$ 2,256,873	\$ 691,733	\$ 338,538	\$ 38,428	\$ 5,862	\$ -	\$ -	\$ 3,331,434
<u>Municipal - Unmetered</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	47,052	45	116	5,070	948	5,070	-	
Cost of Service	\$ 488,629	\$ 149,765	\$ 73,296	\$ 16,713	\$ 2,294	\$ -	\$ -	\$ 730,698
<u>Private Fire System</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	14,559	50	60	52,888	15,689	52,888	42,123	
Cost of Service	\$ 151,191	\$ 165,501	\$ 37,799	\$ 174,347	\$ 37,970	\$ -	\$ 29,319	\$ 596,126
<u>Public Fire Protection</u>								
Unit Costs (\$/unit)	\$ 10.385	\$ 3,319.384	\$ 631.759	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service							10,028,669	
Cost of Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,980,285	\$ 6,980,285
<u>Wholesale</u>								
Unit Costs (\$/unit)	\$ 8.355	\$ 2,738.726	\$ 297.211	\$ 3.297	\$ 2.420	\$ -	\$ 0.696	
Units of Service	844,205	810	2,082					
Cost of Service	\$ 7,053,322	\$ 2,217,030	\$ 618,675	\$ -	\$ -	\$ -	\$ -	\$ 9,889,027
Total: Costs of Service	\$ 85,703,394	\$ 27,210,919	\$ 12,254,932	\$ 4,630,533	\$ 2,213,855	\$ -	\$ 7,009,605	\$ 139,023,237

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Adjustments to Allocated Cost of Service

COS Adjustments		Residential	Residential - CAP	Commercial	Industrial	Health or Education	Municipal - Metered	Municipal - Unmetered	Private Fire System	Public Fire Protection	Wholesale	Total
Adjustments to Cost of Service												
Public Fire (Title 66 § 1328)	Equivalent Meters	58.2%	3.5%	26.3%	0.9%	6.1%	0.8%	0.4%	3.8%			100.0%
Wholesale Contracts	Unadj. COS	36.4%	2.3%	38.9%	2.9%	15.7%	2.7%	0.6%	0.5%			100.0%
Add: Bad Debt Expense	Class Contribution	76.3%		17.1%	0.7%	1.3%	3.3%		1.2%	0.0%		100.0%
BDP Forgone Revenue	Unadj. COS	37.3%		39.8%	2.9%	16.1%	2.8%	0.6%	0.5%			100.0%
City of Pittsburgh - Phase-In	Unadj. COS	37.7%	2.3%	40.3%	3.0%	16.2%			0.5%			100.0%
City of Pittsburgh - Unmetered	Unadj. COS	37.7%	2.3%	40.3%	3.0%	16.2%			0.5%			100.0%
Gradualism		37.7%	2.3%	40.3%		16.3%	2.8%		0.5%			100.0%
Cost of Service by Class												
Allocated Cost of Service (Unadjusted)		\$ 44,486,071	\$ 2,760,875	\$ 47,574,460	\$ 3,488,218	\$ 19,186,042	\$ 3,331,434	\$ 730,698	\$ 596,126	\$ 6,980,285	\$ 9,889,027	\$ 139,023,237
% of COS		32.0%	2.0%	34.2%	2.5%	13.8%	2.4%	0.5%	0.4%	5.0%	7.1%	100.0%
Adjustments to Cost of Service												
	<u>Adjustment</u>											
Public Fire (Title 66 § 1328)	5,235,214	3,048,146	184,277	1,377,023	45,173	321,140	43,446	18,896	197,114	(5,235,214)	-	0
Wholesale Contracts	6,198,895	2,257,516	140,105	2,414,242	177,015	973,626	169,059	37,080	30,251	-	(6,198,895)	-
Add: Bad Debt Expense	2,977,855	2,272,039	-	510,332	19,893	39,839	98,515	-	36,983	254	-	2,977,855
BDP Forgone Revenue	1,443,809	537,966	(1,443,809)	575,313	42,183	232,015	40,287	8,836	7,209	-	-	0
City of Pittsburgh - Phase-In	2,171,226	817,917	50,761	874,700	64,134	352,753	(1,473,096)	-	10,960	(698,130)	-	(0)
City of Pittsburgh - Unmetered	795,510	299,675	18,598	320,479	23,498	129,244	-	(795,510)	4,016	-	-	0
Gradualism - Industrial (1)	675,000	254,616	15,802	272,292	(675,000)	109,811	19,067	-	3,412	-	-	(0)
Total: Adjusted Cost of Service		\$53,973,946	\$ 1,726,609	\$53,918,842	\$ 3,185,114	\$ 21,344,471	\$ 2,228,711	\$ -	\$ 886,071	\$ 1,047,195	\$ 3,690,132	\$142,001,092
% of COS		38.0%	1.2%	38.0%	2.2%	15.0%	1.6%	0.0%	0.6%	0.7%	2.6%	100.0%

(1) Gradualism adjusted such that class increase for Industrial does not exceed 1.5x overall water system increase

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Forgone Revenue Cost of the Bill Discount Program

HJS-11W

Units	Bills	BDP Tier 1 Usage	BDP Tier 2 Usage
5/8"	48,295	115,833	7,394
3/4"	395	659	42
1"	218	216	14
Unmetered	12	n/a	n/a
	<u>48,920</u>	<u>116,707</u>	<u>7,449</u>

Forgone Revenue Cost	Revenue At Full Rates	Revenue at CAP Rates	Difference
Fixed Charges	\$ 1,386,001	\$ -	\$ 1,386,001
Volume Charges (1)	<u>115,615</u>	<u>57,807</u>	<u>57,807</u>
Total Forgone Revenue Cost	1,501,616	57,807	1,443,809
Volume Discount	50.0%		

(1) Currently 249 of 4,228 (6%) customers are enrolled in volume discount.

		COS Rate Build-Up - Test Year: 2022									
Water	Min. Usage Proposed	<i>Meter</i>	<i>Billing</i>	<i>Usage</i>	<i>Total COS Rates</i>	<i>Adjustments</i>					
						Public Fire	R. T. S.	City	CAP-BDP	Proposed Rates	
Minimum Charge											
5/8"	1	\$ 3.30	\$ 2.42	\$ 16.51	\$ 22.23	\$ 3.73	\$ 1.86	\$ -	\$ -	\$ -	27.81
3/4"	2	4.94	2.42	33.02	40.38	5.59	2.78	-	-	-	48.76
1"	5	8.24	2.42	82.54	93.20	9.32	4.64	-	-	-	107.16
1 1/2"	10	16.48	2.42	165.08	183.99	18.64	9.28	-	-	-	211.90
2"	17	26.37	2.42	280.64	309.44	29.82	14.84	-	-	-	354.10
3"	40	52.74	2.42	660.34	715.50	59.63	29.68	-	-	-	804.82
4"	70	82.41	2.42	1,155.59	1,240.43	93.18	46.38	-	-	-	1,379.99
6"	175	164.83	2.42	2,888.98	3,056.23	186.35	92.76	-	-	-	3,335.35
8"	325	263.72	2.42	5,365.25	5,631.40	298.16	148.42	-	-	-	6,077.98
10" & Above	548	379.10	2.42	9,046.64	9,428.16	428.61	213.35	-	-	-	10,070.12
Unmetered	1	3.30	2.42	16.51	22.23	3.73	1.86	-	-	-	27.81
Residential - CAP											
5/8"	1	\$ 3.30	\$ 2.42	\$ 16.51	\$ 22.23	\$ 3.73	\$ 1.86	\$ -	(27.81)	\$ -	-
3/4"	2	4.94	2.42	33.02	40.38	5.59	2.78	-	(48.76)	-	-
1"	5	8.24	2.42	82.54	93.20	9.32	4.64	-	(107.16)	-	-
Unmetered	1	3.30	2.42	16.51	22.23	3.73	1.86	-	(27.81)	-	-
Municipal Minimum Charge											
5/8"		\$ 3.30	\$ 2.42	\$ 16.51	\$ 22.23	\$ 3.73	\$ 1.86	\$ (11.12)	\$ -	\$ -	16.69
3/4"		4.94	2.42	33.02	40.38	5.59	2.78	(19.50)	-	-	29.26
1"		8.24	2.42	82.54	93.20	9.32	4.64	(42.86)	-	-	64.30
1 1/2"		16.48	2.42	165.08	183.99	18.64	9.28	(84.76)	-	-	127.14
2"		26.37	2.42	280.64	309.44	29.82	14.84	(141.64)	-	-	212.46
3"		52.74	2.42	660.34	715.50	59.63	29.68	(321.93)	-	-	482.90
4"		82.41	2.42	1,155.59	1,240.43	93.18	46.38	(551.99)	-	-	827.99
6"		164.83	2.42	2,888.98	3,056.23	186.35	92.76	(1,334.14)	-	-	2,001.21
8"		263.72	2.42	5,365.25	5,631.40	298.16	148.42	(2,431.19)	-	-	3,646.79
10" & Above		379.10	2.42	9,046.64	9,428.16	428.61	213.35	(4,028.05)	-	-	6,042.08
Unmetered Municipal Charge											
EMS / Fire / Police Station	5/8"	\$ 3.30	\$ 2.42	\$ 16.51	\$ 22.23	\$ 3.73	\$ 1.86	\$ (27.81)	\$ -	\$ -	-
Public Park or Playground	2"	26.37	2.42	280.64	309.44	29.82	14.84	(354.09)	-	-	-
Swimming Pool	1 1/2"	16.48	2.42	165.08	183.99	18.64	9.28	(211.90)	-	-	-
Municipal Building	5/8"	3.30	2.42	16.51	22.23	3.73	1.86	(27.81)	-	-	-
Municipal Garage	5/8"	3.30	2.42	16.51	22.23	3.73	1.86	(27.81)	-	-	-
Rec Center	2"	26.37	2.42	280.64	309.44	29.82	14.84	(354.09)	-	-	-
Other	1"	8.24	2.42	82.54	93.20	9.32	4.64	(107.16)	-	-	-
Monthly Fire Protection											
<i>Public</i>											
Per Hydrant		\$ -	\$ -	\$ 77.48	\$ 77.48	\$ (58.11)	\$ -	\$ (7.75)	\$ -	\$ -	11.62
<i>Private</i>											
1" or Less		\$ 8.24	\$ 2.42	\$ 0.70	\$ 11.36	\$ -	\$ 4.64	\$ -	\$ -	\$ -	16.00
1 1/2"-3"		26.37	2.42	4.31	33.10	-	14.84	-	-	-	47.95
4"		82.41	2.42	26.67	111.50	-	46.38	-	-	-	157.89
6" or Greater		164.83	2.42	77.48	244.72	-	92.76	-	-	-	337.49

Unadjusted COS-Based Rates					
Unadjusted Revenue Requirement	Fixed Charge Revenue	Total Volumetric Rev Req	Billed Volume	Proposed Rates	
<u>Volume Charge (per kgal)</u>					
Residential	\$ 44,486,071	\$ 19,478,316	\$ 25,007,755	1,919,317	\$ 13.03
Residential - CAP	2,760,875	1,109,624	1,651,251	124,193	13.30
Commercial	47,574,460	15,771,396	31,803,064	2,421,601	13.13
Industrial	3,488,218	736,015	2,752,203	182,939	15.04
Health or Education	19,186,042	4,362,123	14,823,919	958,928	15.46
Municipal - Metered	3,331,434	490,183	2,841,250	197,733	14.37
Municipal - Unmetered	730,698	191,158	539,539	36,624	14.73
Private Fire System	596,126	241,636	354,490	14,559	24.35
Public Fire	6,980,285	6,980,285	-	-	n/a
Wholesale	9,889,027	-	9,889,027	844,205	11.71
Totals	139,023,237	49,360,736	89,662,500	6,700,098	\$ 13.38

Determination of Proposed Rates					
Adjusted Revenue Requirement	Fixed Charge Revenue	Total Volumetric Rev Req	Equivalent Volume (for Ratemaking)	Proposed Rates	
<u>Volume Charge (per kgal)</u>					
Residential + CAP	\$ 55,700,555	\$ 24,045,742	\$ 31,654,813	2,039,785	\$ 15.52
Commercial + Municipal (2)	56,147,554	18,167,263	37,980,291	2,540,241	14.96
Industrial	3,185,114	803,677	2,381,437	182,939	13.02
Health or Education	21,344,471	4,843,144	16,501,327	958,928	17.21
Municipal - Metered					
Municipal - Unmetered					
Private Fire System	886,071	339,826	546,245	14,559	37.52
Public Fire	1,047,195	1,046,916	280	-	n/a
Wholesale	3,690,132	-	3,690,132	n/a	n/a
Totals	\$ 142,001,092	49,246,567	92,754,524	5,736,451	\$ 16.17

Class Increase	Ratio to Total Increase (1)
16.7%	0.85
25.8%	1.31
28.5%	1.45
16.4%	0.83
-1.2%	(0.06)
105.7%	5.38
15.6%	0.79
19.6%	1.00

(1) Gradualism based on maximum of 1.5 class ratio to total increase.
 (2) Assumes 60% of billed volume

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
Proposed Rates

HJS-13W

	2021		2022		
	FTY Prior Tariff Rates		FPFTY Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates					
<u>Minimum Charge</u>					
5/8"	\$ 27.27	\$	27.81	2.0%	\$ 0.54
3/4"	44.37		48.76	9.9%	4.39
1"	89.82		107.16	19.3%	17.34
1 1/2"	175.30		211.90	20.9%	36.60
2"	289.14		354.10	22.5%	64.96
3"	641.48		804.82	25.5%	163.34
4"	1,084.28		1,379.99	27.3%	295.71
6"	2,558.16		3,335.35	30.4%	777.19
8"	4,596.96		6,077.98	32.2%	1,481.02
10" & Above	7,515.81		10,070.12	34.0%	2,554.31
<u>Minimum Charge - CAP (1)</u>					
5/8"	\$ -	\$	-	0.0%	\$ -
3/4"	-		-	0.0%	-
1"	-		-	0.0%	-
<u>Minimum Charges - Municipal</u>					
5/8"	\$ 10.91	\$	16.69	53.0%	\$ 5.78
3/4"	17.75		29.26	64.9%	11.51
1"	35.93		64.30	79.0%	28.37
1 1/2"	70.12		127.14	81.3%	57.02
2"	115.66		212.46	83.7%	96.80
3"	256.59		482.90	88.2%	226.31
4"	433.71		827.99	90.9%	394.28
6"	1,023.26		2,001.21	95.6%	977.95
8"	1,838.78		3,646.79	98.3%	1,808.01
10" & Above	3,006.32		6,042.08	101.0%	3,035.76
<u>Fire System Charges</u>					
Private					
1" or Less	\$ 33.24	\$	16.00	-51.9%	\$ (17.24)
1 1/2"-3"	101.97		47.95	-53.0%	(54.02)
4"	314.42		157.89	-49.8%	(156.53)
6" or Greater	626.83		337.49	-46.2%	(289.34)
Public					
Per Hydrant	\$ 5.65	\$	11.62	105.7%	\$ 5.97
<u>Volume Charge</u>					
Residential	\$ 12.25	\$	15.52	26.7%	\$ 3.27
Residential - CAP	12.25		15.52	26.7%	3.27
Commercial	11.95		14.96	25.2%	3.01
Industrial	10.31		13.02	26.3%	2.71
Health or Education	15.29		17.21	12.6%	1.92
Municipal	4.78		8.98	87.8%	4.20
Fire System	14.01		37.52	167.8%	23.51
Wholesale	9.16		11.71	27.8%	11.71
<u>Unmetered Charges (per Unit)</u>					
Residential	\$ 64.02	\$	74.37	16.2%	\$ 10.35
Residential - CAP	36.75		46.56	26.7%	9.81
Commercial	75.07		87.65	16.8%	12.58
<u>Unmetered - Municipal</u>					
EMS / Fire / Police Station	\$ -	\$	-	0.0%	\$ -
Public Park or Playground	-		-	0.0%	-
Swimming Pool	-		-	0.0%	-
Municipal Building	-		-	0.0%	-
Municipal Garage	-		-	0.0%	-
Rec Center	-		-	0.0%	-
Other	-		-	0.0%	-
DSIC (Applies to all retail customers)	5.0%		5.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Comparison of Base Rate Revenues by Customer Class

HJS-14W

	FPFTY Revenue at Existing Rates	FPFTY Indicated COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 46,544,538	\$ 44,486,071	-4.4%	\$ (2,058,467)
Residential - CAP	1,503,111	2,760,875	83.7%	1,257,763
Commercial	43,394,031	47,574,460	9.6%	4,180,429
Industrial	2,504,864	3,488,218	39.3%	983,354
Health or Education	18,464,668	19,186,042	3.9%	721,374
Municipal (Metered & Unmetered)	1,688,158	4,062,131	140.6%	2,373,973
Private Fire System	896,243	596,126	-33.5%	(300,117)
Public Fire Protection	509,042	6,980,285	100.0%	6,471,243
Wholesale	3,192,713	9,889,027	209.7%	6,696,314
Total: Base Rate Revenues	\$ 118,697,370	\$ 139,023,237	17.1%	\$ 20,325,867

	FPFTY Indicated COS by Customer Class	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 44,486,071	\$ 53,973,946	21.3%	\$ 9,487,875
Residential - CAP	2,760,875	1,726,609	-37.5%	(1,034,266)
Commercial	47,574,460	53,918,842	13.3%	6,344,382
Industrial	3,488,218	3,185,114	-8.7%	(303,104)
Health or Education	19,186,042	21,344,471	11.2%	2,158,429
Municipal (Metered & Unmetered)	4,062,131	2,228,711	-45.1%	(1,833,420)
Private Fire System	596,126	886,071	48.6%	289,944
Public Fire Protection	6,980,285	1,047,195	-85.0%	(5,933,090)
Wholesale	9,889,027	3,690,132	-62.7%	(6,198,895)
Total: Base Rate Revenues	\$ 139,023,237	\$ 142,001,092	2.1%	\$ 2,977,855

	FPFTY Revenue at Existing Rates	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 46,544,538	\$ 53,973,946	16.0%	\$ 7,429,408
Residential - CAP	1,503,111	1,726,609	14.9%	223,498
Commercial	43,394,031	53,918,842	24.3%	10,524,811
Industrial	2,504,864	3,185,114	27.2%	680,250
Health or Education	18,464,668	21,344,471	15.6%	2,879,803
Municipal (Metered & Unmetered)	1,688,158	2,228,711	32.0%	540,553
Private Fire System	896,243	886,071	-1.1%	(10,172)
Public Fire Protection	509,042	1,047,195	100.0%	538,153
Wholesale	3,192,713	3,690,132	15.6%	497,419
Total: Base Rate Revenues	\$ 118,697,370	\$ 142,001,092	19.6%	\$ 23,303,722

	FPFTY Revenue at Existing Rates	FPFTY Revenue at Proposed Rates	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 46,544,538	\$ 53,833,534	15.7%	\$ 7,288,996
Residential - CAP	1,503,111	1,869,666	24.4%	366,554
Commercial	43,394,031	54,061,247	24.6%	10,667,216
Industrial	2,504,864	3,185,547	27.2%	680,683
Health or Education	18,464,668	21,346,292	15.6%	2,881,625
Municipal (Metered & Unmetered)	1,688,158	2,108,805	24.9%	420,646
Private Fire System	896,243	886,072	-1.1%	(10,171)
Public Fire Protection	509,042	1,046,916	100.0%	537,873
Wholesale	3,192,713	3,690,132	15.6%	497,419
Total: Base Rate Revenues	\$ 118,697,370	\$ 142,028,210	19.7%	\$ 23,330,840

	Unadjusted COS (1)		Revenue at Existing Rates		Revenue at Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Base Rate Revenues								
Residential	\$ 44,486,071	32.0%	\$ 46,544,538	39.2%	\$ 53,833,534	37.9%	\$ 7,288,996	15.7%
Residential - CAP	2,760,875	2.0%	1,503,111	1.3%	1,869,666	1.3%	366,554	24.4%
Commercial	47,574,460	34.2%	43,394,031	36.6%	54,061,247	38.1%	10,667,216	24.6%
Industrial	3,488,218	2.5%	2,504,864	2.1%	3,185,547	2.2%	680,683	27.2%
Health or Education	19,186,042	13.8%	18,464,668	15.6%	21,346,292	15.0%	2,881,625	15.6%
Municipal (Metered & Unmetered)	4,062,131	2.9%	1,688,158	1.4%	2,108,805	1.5%	420,646	24.9%
Private Fire System	596,126	0.4%	896,243	0.8%	886,072	0.6%	(10,171)	-1.1%
Public Fire Protection	6,980,285	5.0%	509,042	0.4%	1,046,916	0.7%	537,873	105.7%
Wholesale & Bulk	9,889,027	7.1%	3,192,713	2.7%	3,690,132	2.6%	497,419	15.6%
Subtotal: Base Rate Revenues	\$ 139,023,237	100.0%	\$ 118,697,370	100.0%	\$ 142,028,210	100.0%	\$ 23,330,840	19.7%
DSIC Revenues								
Residential	n/a	n/a	\$ 2,327,227		\$ 2,691,677		\$ 364,450	
Residential - CAP	n/a	n/a	75,156		93,483		18,328	
Commercial	n/a	n/a	2,169,702		2,703,062		533,361	
Industrial	n/a	n/a	125,243		159,277		34,034	
Health or Education	n/a	n/a	923,233		1,067,315		144,081	
Municipal (Metered & Unmetered)	n/a	n/a	84,408		105,440		21,032	
Private Fire System	n/a	n/a	44,812		44,304		(509)	
Public Fire Protection	n/a	n/a	-		-		-	
Subtotal: DSIC Revenues	n/a	n/a	\$ 5,749,781		\$ 6,864,558		\$ 1,114,777	
Total: User Charge Revenues	\$ 139,023,237		\$ 124,447,150		\$ 148,892,768		\$ 24,445,618	19.6%
Other Revenues								
Miscellaneous Revenues	1,439,417		1,439,417		1,439,417		-	0.0%
Total: Water Revenues	\$ 140,462,653		\$ 125,886,567		\$ 150,332,185		\$ 24,445,618	19.4%

(1) Difference between COS & proposed rates is attributed to BDE and rounding

	Customer Usage		FTY Existing Rates		FPPTY Proposed Rates	Percent Difference	Dollar Difference
Customer Impacts (1)							
<u>Residential</u>							
	5/8"	1 kgal	\$ 28.63	\$	29.20	2.0%	\$ 0.57
	5/8"	3 kgal	54.36		61.79	13.7%	7.43
	5/8"	5 kgal	80.08		94.38	17.9%	14.30
	5/8"	7 kgal	105.81		126.98	20.0%	21.17
	5/8"	12 kgal	170.12		208.46	22.5%	38.34
	1"	20 kgal	287.25		356.96	24.3%	69.71
<u>Commercial</u>							
	5/8"	3 kgal	\$ 53.73	\$	60.62	12.8%	\$ 6.89
	5/8"	5 kgal	78.82		92.03	16.8%	13.21
	5/8"	12 kgal	166.66		201.99	21.2%	35.33
	1"	13 kgal	194.69		238.18	22.3%	43.49
	2"	80 kgal	1,094.09		1,361.41	24.4%	267.32
	4"	160 kgal	2,267.77		2,862.71	26.2%	594.94
<u>Industrial</u>							
	1"	30 kgal	\$ 364.95	\$	454.29	24.5%	\$ 89.34
	1"	60 kgal	689.71		864.42	25.3%	174.71
	2"	100 kgal	1,202.11		1,506.50	25.3%	304.38
	4"	680 kgal	7,742.05		9,788.30	26.4%	2,046.25
	6"	400 kgal	5,121.81		6,578.09	28.4%	1,456.29
	8"	800 kgal	9,968.92		12,875.60	29.2%	2,906.68
<u>Health or Education</u>							
	5/8"	5 kgal	\$ 92.85	\$	101.48	9.3%	\$ 8.63
	5/8"	10 kgal	173.12		191.84	10.8%	18.71
	1"	40 kgal	656.22		744.99	13.5%	88.77
	2"	50 kgal	833.40		968.13	16.2%	134.74
	4"	200 kgal	3,225.58		3,798.15	17.8%	572.58
	6"	650 kgal	10,311.96		12,085.61	17.2%	1,773.65

(1) Customer bills at existing and proposed rates include a 5% DSIC.

	2022 Revenue @ Existing Rates			2022 Revenue @ COS Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues									
Minimum Charges									
Residential									
5/8"	695,677	\$ 27.27	\$ 18,971,113	695,677	\$ 22.23	\$ 15,461,548	695,677	\$ 27.81	\$ 19,346,778
3/4"	30,635	44.37	1,359,271	30,635	40.38	1,237,097	30,635	48.76	1,493,759
1"	28,586	89.82	2,567,604	28,586	93.20	2,664,336	28,586	107.16	3,063,287
1 1/2"	84	175.30	14,725	84	183.99	15,455	84	211.90	17,800
2"	26	289.14	7,518	26	309.44	8,045	26	354.10	9,207
Unmetered	4,132	64.02	264,531	4,132	61.32	253,354	4,132	74.37	307,297
Subtotal: Residential	759,140		\$ 23,184,762	759,140		\$ 19,639,836	759,140		\$ 24,238,128
Residential - CAP-BDP									
5/8"	48,295	\$ -	\$ -	48,295	\$ 22.23	\$ 1,073,357	48,295	\$ -	\$ -
3/4"	395	-	-	395	40.38	15,968	395	-	-
1"	218	-	-	218	93.20	20,277	218	-	-
Unmetered	12	36.75	441	12	61.32	736	12	46.56	559
Subtotal: Residential - CAP-BDP	48,920		\$ 441	48,920		\$ 1,110,337	48,920		\$ 559
Commercial									
5/8"	31,349	\$ 27.27	\$ 854,878	31,349	\$ 22.23	\$ 696,730	31,349	\$ 27.81	\$ 871,806
3/4"	7,891	44.37	350,124	7,891	40.38	318,654	7,891	48.76	384,765
1"	15,806	89.82	1,419,695	15,806	93.20	1,473,180	15,806	107.16	1,693,771
1 1/2"	10,131	175.30	1,775,906	10,131	183.99	1,863,917	10,131	211.90	2,146,688
2"	9,421	289.14	2,723,892	9,421	309.44	2,915,098	9,421	354.10	3,335,858
3"	2,908	641.48	1,865,210	2,908	715.50	2,080,446	2,908	804.82	2,340,148
4"	2,209	1,084.28	2,395,536	2,209	1,240.43	2,740,516	2,209	1,379.99	3,048,858
6"	1,012	2,558.16	2,588,858	1,012	3,056.23	3,092,904	1,012	3,335.35	3,375,374
8"	105	4,596.96	481,148	105	5,631.40	589,419	105	6,077.98	636,162
10" & Above	-	7,515.81	-	-	9,428.16	-	-	10,070.12	-
Unmetered	24	75.07	1,802	24	74.75	1,794	24	87.65	2,104
Subtotal: Commercial	80,855		\$ 14,457,048	80,855		\$ 15,772,657	80,855		\$ 17,835,535
Industrial									
5/8"	209	\$ 27.27	\$ 5,699	209	\$ 22.23	\$ 4,645	209	\$ 27.81	\$ 5,812
3/4"	120	44.37	5,339	120	40.38	4,859	120	48.76	5,867
1"	245	89.82	22,006	245	93.20	22,835	245	107.16	26,254
1 1/2"	52	175.30	9,174	52	183.99	9,629	52	211.90	11,089
2"	137	289.14	39,612	137	309.44	42,393	137	354.10	48,512
3"	24	641.48	15,396	24	715.50	17,172	24	804.82	19,316
4"	90	1,084.28	97,585	90	1,240.43	111,638	90	1,379.99	124,199
6"	23	2,558.16	59,690	23	3,056.23	71,312	23	3,335.35	77,825
8"	40	4,596.96	183,878	40	5,631.40	225,256	40	6,077.98	243,119
10" & Above	24	7,515.81	180,379	24	9,428.16	226,276	24	10,070.12	241,683
Subtotal: Industrial	965		\$ 618,760	965		\$ 736,015	965		\$ 803,677
Health or Education									
5/8"	409	\$ 27.27	\$ 11,144	409	\$ 22.23	\$ 9,083	409	\$ 27.81	\$ 11,365
3/4"	102	44.37	4,511	102	40.38	4,105	102	48.76	4,957
1"	293	89.82	26,287	293	93.20	27,278	293	107.16	31,362
1 1/2"	774	175.30	135,624	774	183.99	142,345	774	211.90	163,940
2"	1,736	289.14	501,947	1,736	309.44	537,182	1,736	354.10	614,718
3"	1,160	641.48	744,117	1,160	715.50	829,984	1,160	804.82	933,591
4"	835	1,084.28	905,012	835	1,240.43	1,035,343	835	1,379.99	1,151,832
6"	441	2,558.16	1,128,149	441	3,056.23	1,347,797	441	3,335.35	1,470,889
8"	36	4,596.96	165,491	36	5,631.40	202,730	36	6,077.98	218,807
10" & Above	24	7,515.81	180,379	24	9,428.16	226,276	24	10,070.12	241,683
Subtotal: Health or Education	5,808		\$ 3,802,661	5,808		\$ 4,362,123	5,808		\$ 4,843,144
Municipal									
5/8"	1,094	\$ 16.36	\$ 17,900	1,094	\$ 22.23	\$ 24,314	1,094	\$ 16.69	\$ 18,259
3/4"	71	26.62	1,890	71	40.38	2,867	71	29.26	2,077
1"	321	53.89	17,299	321	93.20	29,918	321	64.30	20,640
1 1/2"	335	105.18	35,235	335	183.99	61,636	335	127.14	42,592
2"	397	173.48	68,873	397	309.44	122,846	397	212.46	84,347
3"	133	384.89	51,190	133	715.50	95,162	133	482.90	64,226
4"	35	650.57	22,770	35	1,240.43	43,415	35	827.99	28,980
6"	36	1,534.90	55,256	36	3,056.23	110,024	36	2,001.21	72,044
8"	-	2,758.18	-	-	5,631.40	-	-	3,646.79	-
10" & Above	-	4,509.49	-	-	9,428.16	-	-	6,042.08	-
Subtotal: Municipal	2,422		\$ 270,414	2,422		\$ 490,183	2,422		\$ 333,164
Municipal - Unmetered									
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ 169.53	\$ 18,309	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	1,163.78	544,647	468	-	-
Swimming Pool	120	-	-	120	508.05	60,966	120	-	-
Municipal Building	48	-	-	48	51.69	2,481	48	-	-
Municipal Garage	48	-	-	48	95.88	4,602	48	-	-
Rec Center	24	-	-	24	2,342.18	56,212	24	-	-
Other	132	-	-	132	328.88	43,413	132	-	-
Subtotal: Municipal - Unmetered	948		\$ -	948		\$ 730,630	948		\$ -
Subtotal: Minimum Charges			\$ 42,334,086			\$ 42,841,780			\$ 48,054,206

	2022 Revenue @ Existing Rates			2022 Revenue @ COS Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Fire Protection Charges									
Public (per Hydrant)	90,096	\$ 5.65	\$ 509,042	90,096	\$ 77.48	\$ 6,980,285	90,096	\$ 11.62	\$ 1,046,916
Private									
1" or Less	14,856	\$ 33.24	\$ 493,813	14,856	\$ 11.36	\$ 168,727	14,856	\$ 16.00	\$ 237,696
1 1/2"-3"	581	101.97	59,245	581	33.10	19,232	581	47.95	27,859
4"	60	314.42	18,865	60	111.50	6,690	60	157.89	9,473
6" or Greater	192	626.83	120,351	192	244.72	46,987	192	337.49	64,798
Subtotal: Fire Protection Charges			\$ 1,201,317			\$ 7,221,921			\$ 1,386,742
Volume Charge									
Residential	1,906,921	\$ 12.25	\$ 23,359,776	1,906,921	\$ 13.03	\$ 24,847,174	1,906,921	\$ 15.52	\$ 29,595,406
Residential - CAP-BDP - Tier 1	116,707	12.25	1,429,666	116,707	13.30	1,552,209	116,707	15.52	1,811,299
Residential - CAP-BDP - Tier 2	7,449	9.80	73,004	7,449	13.13	97,811	7,449	7.76	57,807
Commercial	2,421,505	11.95	28,936,983	2,421,505	13.13	31,794,359	2,421,505	14.96	36,225,712
Industrial	182,939	10.31	1,886,105	182,939	15.04	2,751,408	182,939	13.02	2,381,870
Health or Education	958,928	15.29	14,662,007	958,928	15.46	14,825,024	958,928	17.21	16,503,148
Private Fire System	14,559	14.01	203,969	14,559	24.35	354,507	14,559	37.52	546,246
Municipal	197,733	7.17	1,417,744	197,733	14.37	2,841,420	197,733	8.98	1,775,640
Subtotal: Volume Charge	5,806,741		\$ 71,969,253			\$ 79,063,911	5,806,741		\$ 88,897,130
Wholesale Revenues (Set by Contract)			\$ 3,192,713	844,205	\$ 11.71	\$ 9,885,641			\$ 3,690,132
Total: Base Rate Revenues			\$ 118,697,370			\$ 139,013,253			\$ 142,028,210
DSIC Revenues									
Residential			\$ 2,327,227			\$ 2,224,350			\$ 2,691,677
Residential - CAP-BDP			75,156			133,127			93,483
Commercial			2,169,702			2,378,351			2,703,062
Industrial			125,243			174,371			159,277
Health or Education			923,233			959,357			1,067,315
Private Fire System			44,812			29,807			44,304
Municipal			84,408			203,112			105,440
Public Fire			-			-			-
Total: DSIC Revenues			\$ 5,749,781			\$ 6,102,476			\$ 6,864,558
Other Revenues									
Other Revenues			1,439,417			1,439,417			1,439,417
Total: System Revenues			\$ 125,886,567			\$ 146,555,146			\$ 150,332,185
FPFTY Water System Revenue Requirements									
						\$ 150,305,066			\$ 150,305,066
Difference (1)						\$ (3,749,921)			\$ 27,118

(1) Note difference in COS rates is due to bad debt.

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Projected Units of Service

HJS-18W

	FY 2018 <i>Actual</i>	FY 2019 <i>Actual</i>	HTY FY 2020 <i>Actual</i>	FTY FY 2021 <i>Projected</i>	FPFTY FY 2022 <i>Projected</i>
Units of Service					
<u>Number of Bills</u>					
Residential	781,189	778,119	772,415	766,832	759,140
Residential - CAP	11,077	21,594	30,810	41,228	48,920
Commercial	80,365	80,767	81,432	80,855	80,855
Industrial	1,173	1,158	516	965	965
Health or Education	5,932	5,805	5,688	5,808	5,808
Fire System	14,673	15,222	15,689	15,689	15,689
Municipal	-	-	2,422	2,422	2,422
Municipal - Unmetered	-	-	-	948	948
<i>Total</i>	<u>894,409</u>	<u>902,665</u>	<u>908,972</u>	<u>914,747</u>	<u>914,747</u>
<u>Billable Consumption (kgal)</u>					
Residential	2,041,350	1,874,771	1,951,570	1,951,165	1,906,921
Residential - CAP	31,049	55,055	74,953	98,353	116,707
Residential - CAP Tier 2	-	-	-	6,278	7,449
Commercial	2,723,585	2,517,870	2,023,059	2,053,405	2,421,505
Industrial	183,343	192,645	172,830	175,423	182,939
Health or Education	1,068,428	975,581	832,774	845,266	958,928
Fire System	7,913	21,423	14,340	14,555	14,559
Municipal	-	-	197,733	197,733	197,733
<i>Total</i>	<u>6,055,668</u>	<u>5,637,345</u>	<u>5,267,259</u>	<u>5,342,178</u>	<u>5,806,741</u>
<u>Total Consumption (kgal) (1)</u>					
Residential	2,842,635	2,668,483	2,744,370	2,754,482	2,727,029
Residential - CAP	41,602	75,349	103,594	134,648	159,776
Residential - CAP Tier 2	-	-	-	8,595	10,198
Commercial	3,363,268	3,163,601	2,628,340	2,667,765	3,051,736
Industrial	203,757	209,655	185,839	188,627	199,786
Health or Education	1,253,008	1,158,177	989,429	1,004,270	1,133,538
Fire System	8,887	22,506	15,394	15,625	15,596
Municipal	-	-	217,323	217,323	217,323
<i>Total</i>	<u>7,713,157</u>	<u>7,297,771</u>	<u>6,884,289</u>	<u>6,991,334</u>	<u>7,514,983</u>
<u>Wholesale & Contract Consumption</u>					
Allegheny	7,911	1,030	-	-	-
Aspinwall	81,386	59,842	64,174	64,174	64,174
Bay Valley Foods / Riverbend (2)	462,007	263,171	-	-	-
Fox Chapel	612,616	632,050	674,065	674,065	674,065
Hampton	3,607	2,997	3,346	-	-
PAWC	5,400	2,800	-	-	-
RSRV - 10"	97,405	95,941	92,650	92,650	92,650
RSRV - 6"	14,663	13,532	13,316	13,316	13,316
Sharpsburg	-	-	-	-	-
Westview	6,845	8,410	2,692	-	-
<i>Total</i>	<u>1,291,840</u>	<u>1,079,773</u>	<u>850,243</u>	<u>844,205</u>	<u>844,205</u>

(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

Phased-In Rates		
Existing (2021)	Phase In (2022)	Proposed (2023)

Existing & Proposed Rates

Minimum Charge

5/8"	\$ 27.27	\$ 27.54	\$ 27.81
3/4"	44.37	46.57	48.76
1"	89.82	98.49	107.16
1 1/2"	175.30	193.60	211.90
2"	289.14	321.62	354.10
3"	641.48	723.15	804.82
4"	1,084.28	1,232.14	1,379.99
6"	2,558.16	2,946.76	3,335.35
8"	4,596.96	5,337.47	6,077.98
10" & Above	7,515.81	8,792.97	10,070.12

Minimum Charge - CAP (1)

5/8"	\$ -	-	\$ -
3/4"	-	-	-
1"	-	-	-

Minimum Charges - Municipal

5/8"	\$ 10.91	\$ 16.52	\$ 22.25
3/4"	17.75	27.94	39.01
1"	35.93	59.09	85.73
1 1/2"	70.12	116.16	169.52
2"	115.66	192.97	283.28
3"	256.59	433.89	643.86
4"	433.71	739.28	1,103.99
6"	1,023.26	1,768.06	2,668.28
8"	1,838.78	3,202.48	4,862.38
10" & Above	3,006.32	5,275.78	8,056.10

Fire System Charges

Private

1" or Less	\$ 33.24	\$ 24.62	\$ 16.00
1 1/2"-3"	101.97	74.96	47.95
4"	314.42	236.16	157.89
6" or Greater	626.83	482.16	337.49

Public

Per Hydrant	\$ 5.65	\$ 10.05	\$ 15.50
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Volume Charge

Residential	\$ 12.25	\$ 13.89	\$ 15.52
Residential - CAP	12.25	13.89	15.52
Commercial	11.95	13.46	14.96
Industrial	10.31	11.67	13.02
Health or Education	15.29	16.25	17.21
Municipal	4.78	8.08	11.97
Fire System	14.01	25.77	37.52

Unmetered Charges (per Unit)

Residential	\$ 64.02	\$ 69.20	\$ 74.37
Residential - CAP	36.75	41.66	46.56
Commercial	75.07	81.36	87.65

Unmetered - Municipal

EMS / Fire / Police Station	\$ -	\$ -	\$ -
Public Park or Playground	-	-	-
Swimming Pool	-	-	-
Municipal Building	-	-	-
Municipal Garage	-	-	-
Rec Center	-	-	-
Other	-	-	-

Wholesale

New Customers	9.16	10.44	11.71
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DSIC (Applies to all retail customers)	5.0%	5.0%	5.0%
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(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.

Exhibit HJS-1 WW to HJS-18 WW
(Wastewater Schedules)

Pittsburgh Water and Sewer Authority
 FPPTY 2022 COS & Rate Design
 FPPTY Wastewater Conveyance Revenue Requirements

HJS-1WW

	2022 FPPTY Revenue Requirements
Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 468,972
Customer Service	3,203,545
Management Information Systems	705,166
Finance	1,928,177
Procurement	-
Human Resources	181,178
Legal	907,239
Public Affairs	196,938
Operations Division	
Environmental Compliance	1,292,698
Ops Capital Assets	-
Warehouse	72,664
Water Treatment Plant	-
Water Quality (Lab)	-
Water Distribution	-
Sewer Operations	1,718,790
Engineering & Construction	
Engineering & Construction	10,164,915
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	1,571,968
Non-City Water Payments	-
<i>Total Operating Expenses</i>	<u>\$ 22,412,251</u>
<u>Debt Service</u>	
Existing Debt	\$ 13,844,767
Future Debt	5,295,244
<i>Subtotal: Debt Service</i>	<u>\$ 19,140,010</u>
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ -
Internally Generated Funds / PAYGO (DSIC)	2,735,298
Other Transfers to Reserves	250,000
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	1,148,825
City Bad Debt Expense	-
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 4,134,123</u>
Total: Wastewater Conveyance System Revenue Requirements	\$ 45,686,384
<i>Capital Costs to be Recovered through DSIC</i>	\$ (2,735,298)
Total: Wastewater Conveyance System Base Rate Revenue Requirement	\$ 42,951,086

Wastewater Conveyance Operating Costs	FY 2022	Allocation	Wastewater Conveyance Functional Categories			
			Collection & Conveyance	Meters	Billing	Admin Support
Operating Expenses	FPFTY					
<i>Direct Operating Expenses</i>						
Administrative Division						
Executive Director	\$ 468,972	WW-D				100.0%
Customer Service	3,203,545	WW-E		27.7%	72.3%	
Management Information Systems	705,166	WW-D				100.0%
Finance	1,928,177	WW-D				100.0%
Procurement	-	WW-D				100.0%
Human Resources	181,178	WW-D				100.0%
Legal	907,239	WW-D				100.0%
Public Affairs	196,938	WW-D				100.0%
Operations Division						
Environmental Compliance	1,292,698	WW-D				100.0%
Warehouse	-	WW-D				100.0%
Ops Capital Assets	72,664	WW-D				100.0%
Water Treatment Plant	-	n/a				
Water Quality (Lab)	-	n/a				
Water Distribution	-	n/a				
Sewer Operations	1,718,790	WW-A	100.0%			
Engineering & Construction Division						
Engineering & Construction	10,164,915	WW-A	100.0%			
Subtotal: Direct Operating Expenses	\$ 20,840,282					
<i>Other Operating Expenses</i>						
Loss / (Gain) on ALCOSAN Billings	1,571,968	WW-D				100.0%
Non-City Water Payments	-	WW-D				100.0%
Subtotal: Other Operating Expenses	\$ 1,571,968					
Total: Operating Expenses	\$ 22,412,251					

Pittsburgh Water and Sewer Authority
 FPFTY 2022 COS & Rate Design
 Assignment to Functional Categories

HJS-2WW

Wastewater Conveyance Operating Costs	FY 2022	Allocation	Wastewater Conveyance Functional Categories			
			Collection & Conveyance	Meters	Billing	Admin Support
<u>Operating Expenses</u>	<u>FPFTY</u>					
<i>Direct Operating Expenses</i>						
Administrative Division						
Executive Director	\$ 468,972	WW-D	\$ -	\$ -	\$ -	\$ 468,972
Customer Service	3,203,545	WW-E	-	888,848	2,314,698	-
Management Information Systems	705,166	WW-D	-	-	-	705,166
Finance	1,928,177	WW-D	-	-	-	1,928,177
Procurement	-	WW-D	-	-	-	-
Human Resources	181,178	WW-D	-	-	-	181,178
Legal	907,239	WW-D	-	-	-	907,239
Public Affairs	196,938	WW-D	-	-	-	196,938
Operations Division						
Environmental Compliance	1,292,698	WW-D	-	-	-	1,292,698
Warehouse	-	WW-D	-	-	-	-
Ops Capital Assets	72,664	WW-D	-	-	-	72,664
Water Treatment Plant	-	n/a	-	-	-	-
Water Quality (Lab)	-	n/a	-	-	-	-
Water Distribution	-	n/a	-	-	-	-
Sewer Operations	1,718,790	WW-A	1,718,790	-	-	-
Engineering & Construction Division						
Engineering & Construction	10,164,915	WW-A	10,164,915	-	-	-
<i>Subtotal: Direct Operating Expenses</i>	<u>\$ 20,840,282</u>		<u>\$ 1,718,790</u>	<u>\$ 888,848</u>	<u>\$ 2,314,698</u>	<u>\$ 5,753,032</u>
<i>Other Operating Expenses</i>						
Loss / (Gain) on ALCOSAN Billings	1,571,968	WW-D	-	-	-	1,571,968
Non-City Water Payments	-	WW-D	-	-	-	-
<i>Subtotal: Other Operating Expenses</i>	<u>\$ 1,571,968</u>		<u>\$ 11,883,705</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 2,937,330</u>
Total: Wastewater Conveyance Operating Costs	\$ 22,412,251		\$ 11,883,705	\$ 888,848	\$ 2,314,698	\$ 7,325,000
Allocation Percentage			53.02%	3.97%	10.33%	32.68%

Allocated Wastewater Conveyance Assets			Wastewater Conveyance Functional Categories				
System Fixed Assets	Allocated Costs	Allocation	Collection & Conveyance	Meters	Billing	Admin Support	Readiness-to-Serve
Structures and Improvements - Source of Supply and Pumping	-	n/a					
Structures and Improvements - Water Treatment	-	n/a					
Structures and Improvements - Transmission and Distribution Plant	562,043	WW-A	100.00%				
Pumping Equipment	944,958	WW-A	100.00%				
Water Treatment Equipment	-	n/a					
Distribution Reservoirs and Standpipes	-	n/a					
Transmission and Distribution Mains	-	n/a					
Meters and Meter Installations	-	n/a					
Fire Hydrants	-	n/a					
Office Furniture and Equipment	64,295	WW-D				100.00%	
Office Furniture and Equipment - Computer Hardware	-	n/a					
Transportation Equipment	1,373,279	WW-D				100.00%	
Tools, Shop and Garage Equipment	5,491	WW-D				100.00%	
Laboratory Equipment	-	n/a					
Collection Sewers - Gravity	148,331,475	WW-A	100.00%				
Manholes	9,508,177	WW-A	100.00%				
Wastewater Plant	2,504,102	WW-A	100.00%				
Power Operated Equipment	38,414					100.00%	
Total	163,332,234		\$ 161,850,756	\$ -	\$ -	\$ 1,481,478	\$ -

Allocation Factors for Capital Costs	99.09%	0.00%	0.00%	0.91%	0.00%
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Allocation of Capital Costs	Collection & Conveyance	Meters	Billing	Admin Support	Readiness-to-Serve
Debt Service	\$ 18,966,404	\$ -	\$ -	\$ 173,606	\$ -
Rate-Funded Capital	-	-	-	-	-
Other Transfers to Reserves	247,732	-	-	2,268	-
Reimbursements from Municipalities	-	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-	-
Bad Debt Expense	-	-	-	-	-
Total: Allocated Capital Costs	\$ 19,214,137	\$ -	\$ -	\$ 175,874	\$ -

Pittsburgh Water and Sewer Authority

FPPTY 2022 COS & Rate Design

Allocation to Cost Categories

HJS-3WW

				Wastewater Conveyance Cost Drivers			
				<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>
FY 2022				Allocation			
<i>FPPTY</i>							
Wastewater Conveyance Revenue Requirements							
<u>Functional Categories</u>							
Collection & Conveyance	\$	30,839,341	WW-AA	100.00%			
Meters		888,848	WW-BB		100.00%		
Billing		2,314,698	WW-CC			100.00%	
Admin Support		7,500,874	WW-DD	90.59%	2.61%	6.80%	
Infiltration & Inflow Costs		258,501	WW-EE	33.00%		67.00%	
Readiness-to-Serve (Debt Service)		-	WW-FF				100.00%
Total: Wastewater Conveyance Revenue Requirements	\$	41,802,261					

				<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>
FY 2022				Allocation			
<i>FPPTY</i>							
Wastewater Conveyance Revenue Requirements							
<u>Functional Categories</u>							
Collection & Conveyance	\$	30,839,341	WW-AA	\$ 30,839,341	\$ -	\$ -	\$ -
Meters		888,848	WW-BB	-	888,848	-	-
Billing		2,314,698	WW-CC	-	-	2,314,698	-
Admin Support		7,500,874	WW-DD	6,795,018	195,845	510,011	-
Infiltration & Inflow Costs		258,501	WW-EE	85,305	-	173,195	-
Readiness-to-Serve (Debt Service)		-	WW-FF	-	-	-	-
Total: Wastewater Conveyance Revenue Requirements	\$	41,802,261		\$ 37,719,664	\$ 1,084,693	\$ 2,997,905	\$ -
Costs to Recover from Wastewater Conveyance Charges	\$	41,802,261		\$ 37,719,664	\$ 1,084,693	\$ 2,997,905	\$ -
				90.2%	2.6%	7.2%	0.0%

Cost Functionalization: Wastewater Conveyance					
<i>Code</i>	<i>Description</i>	<i>Coll. & Convey.</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>
WW-A	Collection & Conveyance Only	100.00%			
WW-B	Meters Only		100.00%		
WW-C	Billing Only			100.00%	
WW-D	Admin Support Only				100.00%
WW-E	Customer Service		27.75%	72.25%	

Allocation to Cost Drivers: Wastewater Conveyance					
<i>Code</i>	<i>Description</i>	<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>
WW-AA	Volume	100.00%			
WW-BB	Customer - Meters		100.00%		
WW-CC	Customer - Billing			100.00%	
WW-DD	Admin Support (Composite)	90.59%	2.61%	6.80%	
WW-EE	Infiltration & Inflow Costs	33.00%		67.00%	
WW-FF	Readiness-to-Serve				0.00%

Factor Derivations - Allocation to Functional Categories & Cost Components						
<i>Code(s)</i>	<i>Description</i>	<i>Calculations</i>				
W-I	Customer Service	<u>2022 Customer Service Budget</u>		FPPTY	Meter	Billing
WW-E	- This factor allocates the 2022 customer service budget between meter- and billing-related costs.	Salaries	\$	4,066,654	28.60%	71.40%
		Benefits		1,137,504	28.60%	71.40%
		Computer & Peripherals		10,000	100.00%	0.00%
		Annual Software Support		134,200	50.00%	50.00%
		Customer CC Fees		392,400	0.00%	100.00%
		Postage		569,500	0.00%	100.00%
		Equip Rental		2,060	100.00%	0.00%
		Billing Contract		837,399	0.00%	100.00%
		Meter Services		801,990	100.00%	0.00%
		Prof Service Other		304,800	20.00%	80.00%
		Water Liens		84,000	50.00%	50.00%
		Office Supplies		6,000	50.00%	50.00%
		TE Airfare		1,400	50.00%	50.00%
		TE Lodging		1,200	50.00%	50.00%
		TE Seminars/Conferences		2,400	50.00%	50.00%
		TE Training		5,000	50.00%	50.00%
		Capital Asset Reclass		(253,000)	0.00%	0.00%
		Customer Refund CSM		550,000	0.00%	100.00%
		One Call		33,600	0.00%	100.00%
		Non.City Water Reimburse		100,000	0.00%	0.00%
	Total		\$	8,787,106	\$2,480,499	\$6,459,607
	<i>Allocation Factors</i>				27.75%	72.25%

W-D Water Pipe Inventory

- Allocate costs between transmission and distribution functional categories. Assumes Pipes less than or equal to 16" are Distribution-related.

Breakdown		
Distribution	35,292,892	62.9%
Transmission	20,832,160	37.1%
Total	56,125,051	100.0%

Inch-Foot Analysis		
<i>Diameter (in)</i>	<i>Linear Feet</i>	<i>Inch-Feet</i>
0.75	799	599
1	1,315	1,315
1.5	983	1,474
2	11,694	23,388
2.5	16	39
3	268	803
4	141,178	564,711
6	2,196,002	13,176,011
8	1,127,975	9,023,802
10	84,170	841,702
12	604,067	7,248,809
14	1,296	18,147
15	15,500	232,496
16	259,975	4,159,594
18	266	4,783
20	209,650	4,192,996
24	85,170	2,044,075
28	104	2,911
30	116,524	3,495,706
36	83,096	2,991,457
42	11,260	472,925
42.5	12,598	535,431
48	16,552	794,500
50	23,682	1,184,096
50.25	12,005	603,231
60	55,175	3,310,516
66	1,492	98,501
72	3,697	266,159
84	3,979	334,248
96	4,560	437,764
120	524	62,860
	5,085,570	56,125,051

Factor Derivations - Allocation to Functional Categories & Cost Components		
Code(s)	Description	Calculations

Code	Description	Calculations
W-J	Engineering & Construction	<u>2022 Water CIP Costs</u>
		\$\$ Amount Allocation
		Treatment \$ 16,422,149 13.19%
	- This factor uses the 2022 Water CIP	Storage 70,939,529 56.97%
	costs to allocate Engineering & Construction	Trans. & Distr. 36,345,826 29.19%
	costs to the various functional categories.	Admin 805,553 0.65%
		Total Water CIP \$ 124,513,057 100.00%

Code	Description	Calculations
W-BB	Maximum Day	Plant Production Data
	- Maximum day costs are allocated using a peak day determined using system daily production records. Fire demands are determined in HJS-7W.	2018-2020 Avg Plant Production 69.47 mgd
		2018-2020 Avg. Peak Day 86.77 mgd
		Peak Hour Factor (1.6) 111.15 mgd
		Base 73.44%
		Maximum Day 24.90%
		Fire Protection 1.66%

Code	Description	Calculations
W-CC	Peak Hour	Plant Production Data
	- Peak hour costs are allocated using an estimated peak hour compared to system average and maximum day processed. Fire demands are determined in HJS-7W.	2018-2020 Avg Plant Production 69.47 mgd
		2018-2020 Avg. Peak Day 86.77 mgd
		Peak Hour Factor (1.6) 111.15 mgd
		Peak Hour / Avg 54.73%
		Max Day (Plug) 15.56%
		Peak Hr / Peak Day 21.94%
		Fire Protection 7.77%

Equivalency Flow Ratios	Equivalency Ratios				
	Flow		Fire Flow	Fire Equiv	
- Used to escalate metering and readiness-to-serve costs, these ratios are industry standard and obtained from the American Waterworks Association	5/8"	1.00	1" or Less	2.50	1.00
	3/4"	1.50	1 1/2"-3"	8.00	6.19
	1"	2.50	4"	25.00	38.32
	1 1/2"	5.00	6" or Greater	50.00	111.31
	2"	8.00			
	3"	16.00			
	4"	25.00			
	6"	50.00			
	8"	80.00			
	10"	115.00			
	Unmetered	1.00			

Pittsburgh Water and Sewer Authority

HJS-6WW

FPFTY 2022 COS & Rate Design

Wastewater Conveyance Units of Service

	<u>Collection Factor</u>	FY 2022 Consumption	Allocated Consumption	Average Day	Equivalent Meters	Total Bills
Retail Units of Service						
Residential (1)	100.0%	3,551,983	3,551,983	9,731	1,081,777	1,022,543
Residential - CAP (1)	100.0%	262,713	262,713	720	69,236	68,672
Commercial (1)	100.0%	3,385,736	3,385,736	9,276	424,967	99,420
Industrial	100.0%	209,267	209,267	573	12,592	982
Health or Education	100.0%	1,133,727	1,133,727	3,106	86,166	5,808
Municipal - Metered	100.0%	212,818	212,818	583	13,484	3,288
Municipal - Unmetered (2)	100.0%	47,052	47,052	129	5,070	948
Total: Wastewater Conveyance Units of Service		8,803,297	8,803,297	24,119	1,693,291	1,201,662

(1) Includes unmetered units and equivalent usage.

(2) Assumed usage for unmetered municipal properties

Pittsburgh Water and Sewer Authority
FPPTY 2022 COS & Rate Design
Wastewater Conveyance Unit Cost of Service

HJS-7WW

	FY 2022	Unit Costs				Total
		<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>	
Development of Unit Costs of Service	<i>FPPTY</i>					
<u>Units of Service</u>						
Total System Units		8,803,297	1,693,291	1,201,662	1,693,291	
Units		<i>kgal</i>	<i>Eq. Cost Meters</i>	<i>Total Bills</i>	<i>Eq. Flow Meters</i>	
<u>Revenue Requirements</u>						
Collection & Conveyance	\$ 30,839,341	\$ 30,839,341	\$ -	\$ -	\$ -	\$ 30,839,341
Meters	888,848	-	888,848	-	-	888,848
Billing	2,314,698	-	-	2,314,698	-	2,314,698
Admin Support	7,500,874	6,795,018	195,845	510,011	-	7,500,874
Infiltration & Inflow Costs	258,501	85,305	-	173,195	-	258,501
Readiness-to-Serve (Debt Service)	-	-	-	-	-	-
<i>Total: Revenue Requirements</i>	\$ 41,802,261	\$ 37,719,664	\$ 1,084,693	\$ 2,997,905	\$ -	\$ 41,802,261
Revenue Requirement Unit Costs (\$/unit)		\$ 4.2847	\$ 0.6406	\$ 2.4948	\$ -	
<u>Revenue Offsets</u>						
Wastewater Miscellaneous Revenue	(673,250)	(607,497)	(17,470)	(48,283)	-	(673,250)
<i>Total: Revenue Offsets</i>	\$ (673,250)	\$ (607,497)	\$ (17,470)	\$ (48,283)	\$ -	\$ (673,250)
Offset Unit Costs (\$/unit)		\$ (0.0690)	\$ (0.0103)	\$ (0.0402)	\$ -	
Total Unit Costs (\$/unit)		\$ 4.22	\$ 0.63	\$ 2.45	\$ -	
Total: Costs of Service		\$ 37,112,166	\$ 1,067,223	\$ 2,949,622	\$ -	\$ 41,129,011

Pittsburgh Water and Sewer Authority

FPPTY 2022 COS & Rate Design

Cost Distribution to Customer Classes

HJS-8WW

Customer Class Cost of Service

Residential

Unit Costs (\$/unit)

Units of Service

Cost of Service

Residential - CAP

Unit Costs (\$/unit)

Units of Service

Cost of Service

Commercial

Unit Costs (\$/unit)

Units of Service

Cost of Service

Industrial

Unit Costs (\$/unit)

Units of Service

Cost of Service

Health or Education

Unit Costs (\$/unit)

Units of Service

Cost of Service

Municipal - Metered

Unit Costs (\$/unit)

Units of Service

Cost of Service

Municipal - Unmetered (2)

Unit Costs (\$/unit)

Units of Service

Cost of Service

Total: Wastewater Cost of Service

	Unit Costs				Total
	Volume	Meter	Billing	Readiness-to-Serve	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
3,551,983	1,081,777	1,022,543	1,081,777		
<u>\$ 14,974,139</u>	<u>\$ 681,807</u>	<u>\$ 2,509,954</u>	<u>\$ -</u>	<u>\$ 18,165,900</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
262,713	69,236	68,672	69,236		
<u>\$ 1,107,523</u>	<u>\$ 43,637</u>	<u>\$ 168,564</u>	<u>\$ -</u>	<u>\$ 1,319,723</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
3,385,736	424,967	99,420	424,967		
<u>\$ 14,273,289</u>	<u>\$ 267,842</u>	<u>\$ 244,037</u>	<u>\$ -</u>	<u>\$ 14,785,168</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
209,267	12,592	982	12,592		
<u>\$ 882,210</u>	<u>\$ 7,936</u>	<u>\$ 2,411</u>	<u>\$ -</u>	<u>\$ 892,558</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
1,133,727	86,166	5,808	86,166		
<u>\$ 4,779,468</u>	<u>\$ 54,307</u>	<u>\$ 14,257</u>	<u>\$ -</u>	<u>\$ 4,848,033</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
212,818	13,484	3,288	13,484		
<u>\$ 897,180</u>	<u>\$ 8,498</u>	<u>\$ 8,071</u>	<u>\$ -</u>	<u>\$ 913,749</u>	
\$ 4.216	\$ 0.630	\$ 2.455	\$ -		
47,052	5,070	948	5,070		
<u>\$ 198,358</u>	<u>\$ 3,195</u>	<u>\$ 2,327</u>	<u>\$ -</u>	<u>\$ 203,880</u>	
\$ 37,112,166	\$ 1,067,223	\$ 2,949,622	\$ -	\$ 41,129,011	

Pittsburgh Water and Sewer Authority

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FPPTY 2022 COS & Rate Design

Adjustments to Allocated Cost of Service

COS Adjustments		Allocation Method	Residential	Residential - CAP	Commercial	Industrial	Health or Education	Municipal - Metered	Municipal - Unmetered	Total
<u>Adjustments to Cost of Service</u>										
Add: Bad Debt Expense	Class Contribution		77.3%		17.4%	0.7%	1.4%	3.4%		100.0%
BDP Forgone Revenue	Unadj. COS		45.6%		37.1%	2.2%	12.2%	2.3%	0.5%	100.0%
City of Pittsburgh - Phase-In	Unadj. COS		45.4%	3.3%	37.0%	2.2%	12.1%			100.0%
City of Pittsburgh - Unmetered	Unadj. COS		45.4%	3.3%	37.0%	2.2%	12.1%			100.0%
Gradualism							100.0%			100.0%
Gradualism - Stormwater	Unadj. COS		45.9%		37.3%	2.3%	12.2%	2.3%		100.0%

Cost of Service by Class

Allocated Cost of Service (Unadjusted)	\$	18,165,900	\$	1,319,723	\$	14,785,168	\$	892,558	\$	4,848,033	\$	913,749	\$	203,880	\$	41,129,011
% of COS		44.2%		3.2%		35.9%		2.2%		11.8%		2.2%		0.5%		100.0%

<u>Adjustments to Cost of Service</u>		<u>Adjustment</u>														
Add: Bad Debt Expense	\$	1,148,825	887,628	-	199,374	7,772	15,564	38,487	-	1,148,825						
BDP Forgone Revenue		566,253	258,395	(566,253)	210,307	12,696	68,959	12,997	2,900	0						
City of Pittsburgh - Phase-In		386,093	175,294	12,735	142,671	8,613	46,782	(386,093)	-	0						
City of Pittsburgh - Unmetered		206,780	93,882	6,820	76,410	4,613	25,055	-	(206,780)	-						
Gradualism - Residential (1)		350,000	(350,000)	-	-	-	350,000	-	-	-						
Gradualism - Stormwater (2)		12,400,000	5,687,536	-	4,629,067	279,450	1,517,864	286,084	-	12,400,000						
Total: Adjusted Cost of Service			\$ 24,918,634	\$ 773,025	\$ 20,042,996	\$ 1,205,701	\$ 6,872,256	\$ 865,225	\$ -	\$ 54,677,836						
% of COS			45.6%	1.4%	36.7%	2.2%	12.6%	1.6%	0.0%	100.0%						

- (1) Gradualism adjustment to Residential as Health & Education subsidy is phased out
- (2) Transfer from Stormwater to Wastewater such that new Stormwater fee is phased in

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Forgone Revenue Cost of the Bill Discount Program

HJS-10WW

Units

	Bills	BDP Tier 1 Use	BDP Tier 2 Use
5/8"	68,003	185,242	11,824
3/4"	451	788	50
1"	218	216	14
Unmetered	12	n/a	n/a
	<u>68,684</u>	<u>186,246</u>	<u>11,888</u>

Forgone Revenue Cost

		Revenue At Full Rates	Revenue at CAP Rates	Difference
Fixed Charges		\$ 528,568	\$ -	\$ 528,568
Tier 2 Volume Charges (1)	<input type="text" value="6.0%"/>	<u>75,370</u>	<u>37,685</u>	<u>37,685</u>
Total Forgone Revenue Cost		603,938	37,685	566,253
Volume Discount	<input type="text" value="50.0%"/>			

(1) Currently 249 of 4,228 (6%) customers are enrolled in volume discount.

		COS Rate Build-Up - Test Year: 2022											
		Min. Usage							Adjustments				Proposed Rates
		Existing	Meter	Billing	Usage	Total COS Rates	R.T.S	Stormwater	City	CAP-BDP			
Wastewater Conveyance													
<u>Minimum Charge</u>													
5/8"	1		\$ 0.63	\$ 2.45	\$ 3.95	\$ 7.04	\$ 0.57	\$ -	\$ -	\$ -	\$ -	\$ -	7.61
3/4"	2		0.95	2.45	7.91	11.31	0.85	-	-	-	-	-	12.16
1"	5		1.58	2.45	19.77	23.80	1.41	-	-	-	-	-	25.22
1 1/2"	10		3.15	2.45	39.54	45.14	2.83	-	-	-	-	-	47.97
2"	17		5.04	2.45	67.21	74.71	4.52	-	-	-	-	-	79.24
3"	40		10.08	2.45	158.15	170.69	9.04	-	-	-	-	-	179.74
4"	70		15.76	2.45	276.76	294.97	14.13	-	-	-	-	-	309.11
6"	175		31.51	2.45	691.90	725.87	28.26	-	-	-	-	-	754.13
8"	325		50.42	2.45	1,284.96	1,337.83	45.21	-	-	-	-	-	1,383.05
10" & Above	548		72.48	2.45	2,166.64	2,241.57	64.99	-	-	-	-	-	2,306.57
Unmetered	1		0.63	2.45	3.95	7.04	0.57	-	-	-	-	-	7.61
<u>Residential - CAP</u>													
5/8"	1		\$ 0.63	\$ 2.45	\$ 3.95	\$ 7.04	\$ 0.57	\$ -	\$ -		(7.60)	\$ -	-
3/4"	2		0.95	2.45	7.91	11.31	0.85	-	-		(12.16)	-	-
1"	5		1.58	2.45	19.77	23.80	1.41	-	-		(25.21)	-	-
Unmetered	1		0.63	2.45	3.95	7.04	0.57	-	-		(7.60)	-	-
<u>Municipal Minimum Charge</u>													
5/8"			\$ 0.63	\$ 2.45	\$ 3.95	\$ 7.04	\$ 0.57	\$ -	\$ (3.04)	\$ -	\$ -	\$ -	4.57
3/4"			0.95	2.45	7.91	11.31	0.85	-	(4.86)	-	-	-	7.30
1"			1.58	2.45	19.77	23.80	1.41	-	(10.08)	-	-	-	15.13
1 1/2"			3.15	2.45	39.54	45.14	2.83	-	(19.19)	-	-	-	28.79
2"			5.04	2.45	67.21	74.71	4.52	-	(31.69)	-	-	-	47.54
3"			10.08	2.45	158.15	170.69	9.04	-	(71.89)	-	-	-	107.84
4"			15.76	2.45	276.76	294.97	14.13	-	(123.64)	-	-	-	185.47
6"			31.51	2.45	691.90	725.87	28.26	-	(301.65)	-	-	-	452.48
8"			50.42	2.45	1,284.96	1,337.83	45.21	-	(553.22)	-	-	-	829.83
10" & Above			72.48	2.45	2,166.64	2,241.57	64.99	-	(922.63)	-	-	-	1,383.94
<u>Unmetered City</u>													
EMS / Fire / Police Station	5/8"		\$ 0.63	\$ 2.45	\$ 3.95	\$ 7.04	\$ 0.57	\$ -	\$ (7.60)	\$ -	\$ -	\$ -	-
Public Park or Playground	2"		5.04	2.45	67.21	74.71	4.52	-	(79.23)	-	-	-	-
Swimming Pool	1 1/2"		3.15	2.45	39.54	45.14	2.83	-	(47.97)	-	-	-	-
Municipal Building	5/8"		0.63	2.45	3.95	7.04	0.57	-	(7.60)	-	-	-	-
Municipal Garage	5/8"		0.63	2.45	3.95	7.04	0.57	-	(7.60)	-	-	-	-
Rec Center	2"		5.04	2.45	67.21	74.71	4.52	-	(79.23)	-	-	-	-
Other	1"		1.58	2.45	19.77	23.80	1.41	-	(25.21)	-	-	-	-

Unadjusted COS-Based Rates					
Unadjusted Revenue Requirement	Fixed Charge Revenue	Total Vol Revenue Requirement	Billed Volume	Proposed Rates	
<i>Volume Charge (per kgal)</i>					
Residential	\$ 18,165,900	\$ 7,817,521	\$ 10,348,380	2,531,209	\$ 4.09
Residential - CAP	1,319,723	489,011	830,713	198,170	4.19
Commercial	14,785,168	4,497,289	10,287,879	2,698,718	3.81
Industrial	892,558	181,339	711,219	191,255	3.72
Health or Education	4,848,033	1,041,881	3,806,151	958,980	3.97
Municipal - Metered	913,749	138,513	775,236	193,013	4.02
Municipal - Unmetered	203,880	46,752	157,128	36,624	4.29
<i>Totals</i>	\$ 41,129,011	\$ 14,212,306	\$ 26,916,706	6,807,970	3.95

Determination of Proposed Rates					
Adjusted Revenue Requirement	Fixed Charge Revenue	Total Volumetric Rev Req	Equivalent Volume (for Ratemaking)	Proposed Rates	
<i>Volume Charge (per kgal)</i>					
Residential + CAP	\$ 25,691,659	\$ 8,435,290	\$ 17,256,369	2,723,435	\$ 6.34
Commercial + Municipal	20,908,221	4,825,795	16,082,426	2,814,526	5.72
Industrial	1,205,701	188,462	1,017,238	191,255	5.32
Health or Education	6,872,256	1,090,622	5,781,634	958,980	6.03
Municipal - Metered					
Municipal - Unmetered					
<i>Totals</i>	54,677,836	14,540,169	40,137,667	6,688,197	\$ 6.00

Class Increase	Ratio to Total Increase (1)
-17.2%	0.81
-24.5%	1.15
-20.9%	0.98
-33.1%	1.55
<hr/>	<hr/>
-21.3%	1.00

Pittsburgh Water and Sewer Authority
 FPFTY 2022 COS & Rate Design
 Proposed Rates

HJS-12WW

	2021 FTY Prior Tariff Rates	2022 FPFTY Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates				
<u>Minimum Charge</u>				
5/8"	\$ 8.51	\$ 7.61	-10.6%	\$ (0.90)
3/4"	17.23	12.16	-29.4%	(5.07)
1"	40.92	25.22	-38.4%	(15.70)
1 1/2"	84.51	47.97	-43.2%	(36.54)
2"	143.07	79.24	-44.6%	(63.83)
3"	326.33	179.74	-44.9%	(146.59)
4"	558.31	309.11	-44.6%	(249.20)
6"	1,338.15	754.13	-43.6%	(584.02)
8"	2,424.04	1,383.05	-42.9%	(1,040.99)
10" & Above	3,991.08	2,306.57	-42.2%	(1,684.51)
<u>Minimum Charge - CAP (1)</u>				
5/8"	\$ -	\$ -	0.0%	\$ -
3/4"	-	-	0.0%	-
1"	-	-	0.0%	-
<u>Minimum Charge - Municipal</u>				
5/8"	\$ 3.40	\$ 4.57	34.3%	\$ 1.17
3/4"	6.89	7.30	5.9%	0.41
1"	16.37	15.13	-7.6%	(1.24)
1 1/2"	33.80	28.79	-14.8%	(5.01)
2"	57.23	47.54	-16.9%	(9.69)
3"	130.53	107.84	-17.4%	(22.69)
4"	223.32	185.47	-17.0%	(37.85)
6"	535.26	452.48	-15.5%	(82.78)
8"	969.62	829.83	-14.4%	(139.79)
10" & Above	1,596.43	1,383.94	-13.3%	(212.49)
<u>Volume Charge</u>				
Residential	\$ 7.64	\$ 6.34	-17.0%	\$ (1.30)
Residential - CAP	7.64	6.34	-17.0%	(1.30)
Commercial	6.74	5.72	-15.1%	(1.02)
Industrial	6.15	5.32	-13.5%	(0.83)
Health or Education	8.44	6.03	-28.6%	(2.41)
Municipal	2.70	3.43	27.3%	0.74
<u>Unmetered Charges (per Unit)</u>				
Residential	\$ 31.43	\$ 26.63	-15.3%	\$ (4.80)
Residential - CAP	22.92	19.02	-17.0%	(3.90)
Commercial	35.47	30.49	-14.0%	(4.98)
<u>Unmetered - Municipal</u>				
EMS / Fire / Police Station	-	-	0.0%	\$ -
Public Park or Playground	-	-	0.0%	-
Swimming Pool	-	-	0.0%	-
Municipal Building	-	-	0.0%	-
Municipal Garage	-	-	0.0%	-
Rec Center	-	-	0.0%	-
Other	-	-	0.0%	-
DSIC (Applies to all retail customers)	5.0%	5.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.

Pittsburgh Water and Sewer Authority

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FPFTY 2022 COS & Rate Design

Comparison of Base Rate Revenues by Customer Class

	FPFTY Revenue at Existing Rates	FPFTY Indicated COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 29,254,362	\$ 18,165,900	-37.9%	\$ (11,088,461)
Residential - CAP	1,495,850	1,319,723	-11.8%	(176,127)
Commercial	26,322,087	14,785,168	-43.8%	(11,536,919)
Industrial	1,506,117	892,558	-40.7%	(613,559)
Health or Education	10,042,474	4,848,033	-51.7%	(5,194,441)
Municipal (Metered & Unmetered)	930,878	1,117,629	20.1%	186,751
Total: Base Rate Revenues	\$ 69,551,767	\$ 41,129,011	-40.9%	\$(28,422,756)

	FPFTY Indicated COS by Customer Class	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 18,165,900	\$ 24,918,634	37.2%	\$ 6,752,734
Residential - CAP	1,319,723	773,025	-41.4%	(546,698)
Commercial	14,785,168	20,042,996	35.6%	5,257,828
Industrial	892,558	1,205,701	35.1%	313,143
Health or Education	4,848,033	6,872,256	41.8%	2,024,223
Municipal (Metered & Unmetered)	1,117,629	865,225	-22.6%	(252,405)
Total: Base Rate Revenues	\$ 41,129,011	\$ 54,677,836	32.9%	\$ 13,548,825

	FPFTY Revenue at Existing Rates	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 29,254,362	\$ 24,918,634	-14.8%	\$ (4,335,728)
Residential - CAP	1,495,850	773,025	-48.3%	(722,825)
Commercial	26,322,087	20,042,996	-23.9%	(6,279,090)
Industrial	1,506,117	1,205,701	-19.9%	(300,416)
Health or Education	10,042,474	6,872,256	-31.6%	(3,170,218)
Municipal (Metered & Unmetered)	930,878	865,225	-7.1%	(65,653)
Total: Base Rate Revenues	\$ 69,551,767	\$ 54,677,836	-21.4%	\$(14,873,931)

	FPFTY Revenue at Existing Rates	FPFTY Revenue at Proposed Rates	Percent Difference	Dollar Difference
Base Rate Revenues				
Residential	\$ 29,254,362	\$ 24,483,158	-16.3%	\$ (4,771,204)
Residential - CAP	1,495,850	1,218,710	-18.5%	(277,141)
Commercial	26,322,087	20,174,760	-23.4%	(6,147,327)
Industrial	1,506,117	1,205,941	-19.9%	(300,175)
Health or Education	10,042,474	6,873,274	-31.6%	(3,169,200)
Municipal (Metered & Unmetered)	930,878	750,122	-19.4%	(180,755)
Total: Base Rate Revenues	\$ 69,551,767	\$ 54,705,965	-21.3%	\$(14,845,802)

Pittsburgh Water and Sewer Authority

FPFTY 2022 COS & Rate Design

FPFTY CCOS Comparison - Wastewater Conveyance

HJS-14WW

	Unadjusted COS (1)		Revenue at Existing Rates		Revenue at Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Base Rate Revenues								
Residential	\$ 18,165,900	44.2%	\$ 29,254,362	42.1%	\$ 24,483,158	44.8%	\$ (4,771,204)	-16.3%
Residential - CAP	1,319,723	3.2%	1,495,850	2.2%	1,218,710	2.2%	(277,141)	-18.5%
Commercial	14,785,168	35.9%	26,322,087	37.8%	20,174,760	36.9%	(6,147,327)	-23.4%
Industrial	892,558	2.2%	1,506,117	2.2%	1,205,941	2.2%	(300,175)	-19.9%
Health or Education	4,848,033	11.8%	10,042,474	14.4%	6,873,274	12.6%	(3,169,200)	-31.6%
Municipal (Metered & Unmetered)	1,117,629	2.7%	930,878	1.3%	750,122	1.4%	(180,755)	-19.4%
Subtotal: Base Rate Revenues	\$ 41,129,011	100.0%	\$ 69,551,767	100.0%	\$ 54,705,965	100.0%	\$ (14,845,802)	-21.3%
DSIC Revenues								
Residential	n/a	n/a	\$ 1,462,718	0.0%	\$ 1,224,158	44.8%	\$ (238,560)	
Residential - CAP	n/a	n/a	74,793	0.0%	60,935	2.2%	(13,857)	
Commercial	n/a	n/a	1,316,104	0.0%	1,008,738	36.9%	(307,366)	
Industrial	n/a	n/a	75,306	0.0%	60,297	2.2%	(15,009)	
Health or Education	n/a	n/a	502,124	0.0%	343,664	12.6%	(158,460)	
Municipal (Metered & Unmetered)	n/a	n/a	46,544	0.0%	37,506	1.4%	(9,038)	
Subtotal: DSIC Revenues	n/a	n/a	\$ 3,477,588	100.0%	\$ 2,735,298	100.0%	\$ (742,290)	
Total: User Charge Revenues	\$ 41,129,011		\$ 73,029,355		\$ 57,441,263		\$ (15,588,092)	-21.3%
Other Revenues								
Miscellaneous Revenues	673,250		673,250		673,250		-	0.0%
Total: Wastewater Conveyance Revenues	\$ 41,802,261		\$ 73,702,605		\$ 58,114,513		\$ (15,588,092)	-21.1%

(1) Difference between COS & proposed rates is attributed to BDE and rounding

Pittsburgh Water and Sewer Authority
 FPFTY 2022 COS & Rate Design
 Typical Bill Comparison

HJS-15WW

	Customer Usage	FTY Existing Rates	FPFTY Proposed Rates	Percent Difference	Dollar Difference
Customer Impacts (1)					
<u>Residential</u>					
	1 kgal	\$ 8.94	\$ 7.99	-10.6%	\$ (0.94)
	3 kgal	24.98	21.30	-14.7%	(3.68)
	5 kgal	41.02	34.62	-15.6%	(6.41)
	7 kgal	57.07	47.93	-16.0%	(9.14)
	12 kgal	97.18	81.22	-16.4%	(15.96)
	20 kgal	163.30	126.34	-22.6%	(36.96)
<u>Commercial</u>					
	3 kgal	\$ 23.09	\$ 20.00	-13.4%	\$ (3.09)
	5 kgal	37.24	32.01	-14.0%	(5.23)
	12 kgal	86.78	74.06	-14.7%	(12.73)
	13 kgal	99.58	74.53	-25.2%	(25.05)
	80 kgal	596.07	461.58	-22.6%	(134.49)
	160 kgal	1,223.16	865.11	-29.3%	(358.05)
<u>Industrial</u>					
	30 kgal	\$ 204.40	\$ 166.13	-18.7%	\$ (38.27)
	60 kgal	398.13	333.71	-16.2%	(64.42)
	100 kgal	686.20	546.84	-20.3%	(139.36)
	680 kgal	4,525.30	3,732.03	-17.5%	(793.27)
	400 kgal	2,858.00	2,048.69	-28.3%	(809.31)
	800 kgal	5,612.55	4,105.55	-26.9%	(1,507.00)
<u>Health or Education</u>					
	5 kgal	\$ 44.38	\$ 33.32	-24.9%	\$ (11.07)
	10 kgal	88.69	64.97	-26.7%	(23.72)
	40 kgal	353.14	248.08	-29.7%	(105.05)
	50 kgal	442.67	292.14	-34.0%	(150.53)
	200 kgal	1,738.29	1,147.66	-34.0%	(590.63)
	650 kgal	5,614.51	3,799.30	-32.3%	(1,815.21)

(1) Customer bills at existing and proposed rates include a 5% DSIC.

	2022 Revenue @ Existing Rates			2022 Revenue @ COS Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues									
<u>Minimum Charges</u>									
Residential									
5/8"	958,530	\$ 8.51	\$ 8,157,086	958,530	\$ 7.04	\$ 6,746,707	958,530	\$ 7.61	\$ 7,294,410
3/4"	30,942	17.23	533,125	30,942	11.31	349,871	30,942	12.16	376,251
1"	28,830	40.92	1,179,728	28,830	23.80	686,124	28,830	25.22	727,095
1 1/2"	84	84.51	7,099	84	45.14	3,792	84	47.97	4,029
2"	26	143.07	3,720	26	74.71	1,942	26	79.24	2,060
Unmetered	4,132	31.43	129,869	4,132	19.31	79,783	4,132	26.63	110,035
<i>Subtotal: Residential</i>	<u>1,022,543</u>		<u>\$ 10,010,627</u>	<u>1,022,543</u>		<u>\$ 7,868,220</u>	<u>1,022,543</u>		<u>\$ 8,513,881</u>
Residential - CAP-BDP									
5/8"	68,003	\$ -	\$ -	68,003	\$ 7.04	\$ 478,649	68,003	\$ -	\$ -
3/4"	451	-	-	451	11.31	5,100	451	-	-
1"	218	-	-	218	23.80	5,178	218	-	-
Unmetered	12	22.92	275	12	12.57	151	12	19.02	228
<i>Subtotal: Residential - CAP-BDP</i>	<u>68,684</u>		<u>\$ 275</u>	<u>68,684</u>		<u>\$ 489,077</u>	<u>68,684</u>		<u>\$ 228</u>
Commercial									
5/8"	43,473	\$ 8.51	\$ 369,952	43,473	\$ 7.04	\$ 305,987	43,473	\$ 7.61	\$ 330,827
3/4"	9,306	17.23	160,337	9,306	11.31	105,223	9,306	12.16	113,157
1"	18,776	40.92	768,314	18,776	23.80	446,847	18,776	25.22	473,531
1 1/2"	10,599	84.51	895,721	10,599	45.14	478,472	10,599	47.97	508,434
2"	10,558	143.07	1,510,485	10,558	74.71	788,762	10,558	79.24	836,590
3"	2,890	326.33	943,094	2,890	170.69	493,287	2,890	179.74	519,449
4"	2,410	558.31	1,345,713	2,410	294.97	710,979	2,410	309.11	745,058
6"	1,210	1,338.15	1,619,162	1,210	725.87	878,301	1,210	754.13	912,497
8"	112	2,424.04	272,300	112	1,337.83	150,283	112	1,383.05	155,363
10" & Above	62	3,991.08	247,447	62	2,241.57	138,977	62	2,306.57	143,007
Unmetered	24	35.47	851	24	22.28	535	24	30.49	732
<i>Subtotal: Commercial</i>	<u>99,420</u>		<u>\$ 8,133,377</u>	<u>99,420</u>		<u>\$ 4,497,654</u>	<u>99,420</u>		<u>\$ 4,738,644</u>
Industrial									
5/8"	199	\$ 8.51	\$ 1,691	199	\$ 7.04	\$ 1,398	199	\$ 7.61	\$ 1,512
3/4"	112	17.23	1,924	112	11.31	1,263	112	12.16	1,358
1"	245	40.92	10,025	245	23.80	5,831	245	25.22	6,179
1 1/2"	52	84.51	4,423	52	45.14	2,362	52	47.97	2,510
2"	161	143.07	23,082	161	74.71	12,053	161	79.24	12,784
3"	24	326.33	7,832	24	170.69	4,097	24	179.74	4,314
4"	102	558.31	56,948	102	294.97	30,087	102	309.11	31,529
6"	23	1,338.15	31,224	23	725.87	16,937	23	754.13	17,596
8"	40	2,424.04	96,962	40	1,337.83	53,513	40	1,383.05	55,322
10" & Above	24	3,991.08	95,786	24	2,241.57	53,798	24	2,306.57	55,358
<i>Subtotal: Industrial</i>	<u>982</u>		<u>\$ 329,895</u>	<u>982</u>		<u>\$ 181,339</u>	<u>982</u>		<u>\$ 188,462</u>
Health or Education									
5/8"	409	\$ 8.51	\$ 3,478	409	\$ 7.04	\$ 2,876	409	\$ 7.61	\$ 3,110
3/4"	102	17.23	1,752	102	11.31	1,150	102	12.16	1,236
1"	293	40.92	11,976	293	23.80	6,965	293	25.22	7,381
1 1/2"	774	84.51	65,383	774	45.14	34,926	774	47.97	37,113
2"	1,736	143.07	248,370	1,736	74.71	129,696	1,736	79.24	137,561
3"	1,160	326.33	378,543	1,160	170.69	197,998	1,160	179.74	208,498
4"	835	558.31	466,003	835	294.97	246,203	835	309.11	258,004
6"	441	1,338.15	590,124	441	725.87	320,108	441	754.13	332,571
8"	36	2,424.04	87,265	36	1,337.83	48,162	36	1,383.05	49,790
10" & Above	24	3,991.08	95,786	24	2,241.57	53,798	24	2,306.57	55,358
<i>Subtotal: Health or Education</i>	<u>5,808</u>		<u>\$ 1,948,679</u>	<u>5,808</u>		<u>\$ 1,041,881</u>	<u>5,808</u>		<u>\$ 1,090,622</u>
Municipal									
5/8"	1,786	\$ 5.11	\$ 9,119	1,786	\$ 7.04	\$ 12,571	1,786	\$ 4.57	\$ 8,162
3/4"	134	10.34	1,385	134	11.31	1,515	134	7.30	978
1"	385	24.55	9,453	385	23.80	9,163	385	15.13	5,825
1 1/2"	335	50.71	16,987	335	45.14	15,123	335	28.79	9,645
2"	432	85.84	37,084	432	74.71	32,275	432	47.54	20,537
3"	133	195.80	26,041	133	170.69	22,701	133	107.84	14,343
4"	35	334.99	11,725	35	294.97	10,324	35	185.47	6,491
6"	48	802.89	38,539	48	725.87	34,842	48	452.48	21,719
8"	-	1,454.42	-	-	1,337.83	-	-	829.83	-
10" & Above	-	2,394.65	-	-	2,241.57	-	-	1,383.94	-
<i>Subtotal: Municipal</i>	<u>3,288</u>		<u>\$ 150,332</u>	<u>3,288</u>		<u>\$ 138,513</u>	<u>3,288</u>		<u>\$ 87,700</u>
Municipal - Unmetered									
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ 49.94	\$ 5,393	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	323.53	151,412	468	-	-
Swimming Pool	120	-	-	120	139.52	16,743	120	-	-
Municipal Building	48	-	-	48	15.62	750	48	-	-
Municipal Garage	48	-	-	48	28.49	1,367	48	-	-
Rec Center	24	-	-	24	666.73	16,002	24	-	-
Other	132	-	-	132	92.44	12,202	132	-	-
<i>Subtotal: Municipal - Unmetered</i>	<u>948</u>		<u>\$ -</u>	<u>948</u>		<u>\$ 203,869</u>	<u>948</u>		<u>\$ -</u>
<i>Subtotal: Minimum Charges</i>			<u>\$ 20,573,185</u>			<u>\$ 14,420,554</u>			<u>\$ 14,619,537</u>

	2022 Revenue @ Existing Rates			2022 Revenue @ COS Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Volume Charge									
Residential	2,518,813	\$ 7.64	\$ 19,243,735	2,518,813	\$ 4.09	\$ 10,301,947	2,518,813	\$ 6.34	\$ 15,969,277
Residential - CAP-BDP - Tier 1	186,246	7.64	1,422,916	186,246	4.19	780,369	186,246	6.34	1,180,797
Residential - CAP-BDP - Tier 2	11,888	6.11	72,660	11,888	3.81	45,293	11,888	3.17	37,685
Commercial	2,698,622	6.74	18,188,710	2,698,622	3.81	10,281,748	2,698,622	5.72	15,436,116
Industrial	191,255	6.15	1,176,221	191,255	3.72	711,470	191,255	5.32	1,017,479
Health or Education	958,980	8.44	8,093,795	958,980	3.97	3,807,153	958,980	6.03	5,782,652
Municipal	193,013	4.04	780,546	193,013	4.02	775,914	193,013	3.43	662,422
Subtotal: Volume Charge	6,758,818		\$ 48,978,582			\$ 26,703,894	6,758,818		\$ 40,086,428
Wholesale and Contract Revenues			\$ -			\$ -			\$ -
Total: Base Rate Revenues			\$ 69,551,767			\$ 41,124,448			\$ 54,705,965
DSIC Revenues									
Residential			1,462,718			\$ 908,508			\$ 1,224,158
Residential - CAP-BDP			74,793			63,472			60,935
Commercial			1,316,104			738,970			1,008,738
Industrial			75,306			44,640			60,297
Health or Education			502,124			242,452			343,664
Municipal			46,544			45,721			37,506
Total: DSIC Revenues			\$ 3,477,588			\$ 2,043,764			\$ 2,735,298
Other Revenues									
Other Revenues			673,250			673,250			673,250
Total: System Revenues			\$ 73,702,605			\$ 43,841,462			\$ 58,114,513
FPFTY Wastewater Conveyance Revenue Requirements						\$ 45,686,384			\$ 58,086,384
Difference						\$ (1,844,922)			\$ 28,129

(1) Note difference in COS rates is combination of bad debt and DSIC.

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Projected Units of Service

HJS-17WW

	FY 2018 <i>Actual</i>	FY 2019 <i>Actual</i>	HTY FY 2020 <i>Actual</i>	FTY FY 2021 <i>Projected</i>	FPFTY FY 2022 <i>Projected</i>
Units of Service					
<u>Number of Bills</u>					
Residential	1,057,206	1,047,471	1,039,211	1,033,343	1,022,543
Residential - CAP	20,369	32,883	43,244	57,872	68,672
Commercial	99,279	99,279	99,701	99,420	99,420
Industrial	1,181	1,170	548	982	982
Health or Education	5,932	5,805	5,688	5,808	5,808
Municipal	-	-	3,288	3,288	3,288
<i>Total</i>	<u>1,183,967</u>	<u>1,186,608</u>	<u>1,191,680</u>	<u>1,200,714</u>	<u>1,200,714</u>
<u>Billable Consumption (kgal)</u>					
Residential	2,703,956	2,491,965	2,599,739	2,589,928	2,518,813
Residential - CAP	66,466	93,829	118,166	156,955	186,246
Commercial	3,006,528	2,799,696	2,289,641	2,323,985	2,698,622
Industrial	192,007	199,971	181,789	184,516	191,255
Health or Education	1,068,859	975,430	832,652	845,142	958,980
Municipal	-	-	193,013	195,909	193,013
<i>Total</i>	<u>7,037,816</u>	<u>6,560,891</u>	<u>6,215,001</u>	<u>6,296,435</u>	<u>6,746,930</u>
<u>Total Consumption (kgal) (1)</u>					
Residential	3,758,213	3,531,872	3,639,818	3,631,685	3,539,587
Residential - CAP	85,817	124,641	158,636	208,084	246,916
Commercial	3,706,280	3,502,496	2,948,145	2,992,367	3,385,640
Industrial	213,660	218,160	195,873	198,811	209,267
Health or Education	1,253,574	1,158,179	989,429	1,004,270	1,133,727
Municipal	-	-	212,818	216,010	212,818
<i>Total</i>	<u>9,017,544</u>	<u>8,535,349</u>	<u>8,144,719</u>	<u>8,251,228</u>	<u>8,727,957</u>
<u>Wholesale & Contract Consumption</u>					
Bay Valley Foods / Riverbend (2)	180,000	90,000	-	-	-

(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

Phased-In Rates		
Existing (2021)	Phase In (2022)	Proposed (2023)

Existing & Proposed Rates

Minimum Charge

5/8"	\$ 8.51	\$ 8.06	\$ 7.61
3/4"	17.23	14.70	12.16
1"	40.92	33.07	25.22
1 1/2"	84.51	66.24	47.97
2"	143.07	111.16	79.24
3"	326.33	253.04	179.74
4"	558.31	433.71	309.11
6"	1,338.15	1,046.14	754.13
8"	2,424.04	1,903.55	1,383.05
10" & Above	3,991.08	3,148.83	2,306.57

Minimum Charge - CAP (1)

5/8"	\$ -	\$ -	\$ -
3/4"	-	-	-
1"	-	-	-

Minimum Charge - Municipal

5/8"	\$ 3.40	\$ 4.84	\$ 6.09
3/4"	6.89	8.82	9.73
1"	16.37	19.84	20.18
1 1/2"	33.80	39.74	38.38
2"	57.23	66.70	63.39
3"	130.53	151.82	143.79
4"	223.32	260.23	247.29
6"	535.26	627.68	603.30
8"	969.62	1,142.13	1,106.44
10" & Above	1,596.43	1,889.30	1,845.26

Volume Charge

Residential	\$ 7.64	\$ 6.99	\$ 6.34
Residential - CAP	7.64	6.99	6.34
Commercial	6.74	6.23	5.72
Industrial	6.15	5.74	5.32
Health or Education	8.44	7.24	6.03
Municipal	2.70	3.74	4.58

Unmetered Charges (per Unit)

Residential	\$ 31.43	\$ 29.03	\$ 26.63
Residential - CAP	22.92	20.97	19.02
Commercial	35.47	32.98	30.49

Unmetered - Municipal

EMS / Fire / Police Station	-	\$ -	-
Public Park or Playground	-	-	-
Swimming Pool	-	-	-
Municipal Building	-	-	-
Municipal Garage	-	-	-
Rec Center	-	-	-
Other	-	-	-

DSIC (Applies to all retail customers) 5.0% 5.0% 5.0%

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.

Exhibits HJS-1SW to HJS-9SW (Stormwater Schedules)

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 FPFTY Stormwater Revenue Requirements

HJS-1SW

	2022 FPFTY Revenue Requirements
Stormwater Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 348,904
Customer Service	3,032,377
Management Information Systems	524,626
Finance	1,434,515
Procurement	-
Human Resources	134,792
Legal	674,963
Public Affairs	146,517
Operations Division	
Environmental Compliance	1,292,698
Ops Capital Assets	-
Warehouse	54,060
Water Treatment Plant	-
Water Quality (Lab)	-
Water Distribution	-
Sewer Operations	1,718,790
Engineering & Construction Division	
Engineering & Construction	6,790,943
<i>Subtotal: Direct Operating Expenses</i>	<u>\$ 16,153,184</u>
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	\$ -
Non-City Water Payments	-
<i>Subtotal: Other Operating Expenses</i>	<u>\$ -</u>
<i>Subtotal: Operating Expenses</i>	<u>\$ 16,153,184</u>
<u>Debt Service</u>	
Existing Debt	13,844,767
Proposed Debt	4,303,139
<i>Subtotal: Debt Service</i>	<u>\$ 18,147,906</u>
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ -
Internally Generated Funds / PAYGO - DSIC	-
Other Transfers to Reserves	110,000
Bad Debt Expense	1,591,397
Stormwater Credit Program Cost	696,685
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 1,701,397</u>
Total: Stormwater Revenue Requirements	\$ 36,699,172
<i>Capital Costs to be Recovered through DSIC</i>	-
Total: Stormwater System Base Rate Revenue Requirement	\$ 36,699,172

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Net Revenue Requirements

HJS-2SW

	<u>FY 2022</u> <i>Full COS</i>	<u>FY 2022</u> <i>Proposed</i>
Determination of Revenue Requirement		
Operating Expenses	\$ 16,153,184	\$ 16,153,184
<u>Debt Service</u>		
Existing	\$ 13,844,767	\$ 13,844,767
Proposed	4,303,139	4,303,139
<i>Subtotal: Debt Service</i>	<u>\$ 18,147,906</u>	<u>\$ 18,147,906</u>
<u>Other Capital Costs</u>		
Internally Generated Funds / PAYGO	\$ -	\$ -
Internally Generated Funds / PAYGO - DSIC	-	-
Other Transfers to Reserves	110,000	110,000
Bad Debt Expense (1)	2,510,169	1,591,397
Stormwater Credit Program Cost (1)	1,098,922	696,685
<i>Subtotal: Other Capital Costs</i>	<u>\$ 3,719,092</u>	<u>\$ 2,398,082</u>
<i>Total: Revenue Requirements</i>	<u>\$ 38,020,181</u>	<u>\$36,699,172</u>
<u>Revenue Offsets</u>		
Allocated Offsets	\$ (570,821)	\$ (570,821)
Less: Gradualism Adjustment	-	(12,400,000)
<i>Total: Net Revenue Requirements for Ratemaking</i>	<u>\$ 37,449,360</u>	<u>\$23,728,351</u>

(1) Varies based on level of revenue requirement and fee.

Units of Service

<u>Billable Units - Non Stormwater Only</u>	<u>Parcels</u>	<u>Equivalencies</u>	<u>Equivalent Units</u>
Residential Rate (per ERU)			
Tier 1	12,669	0.5	6,335
Tier 2	57,273	1.0	57,273
Tier 3	13,504	2.0	27,008
Other	10,145	1.0	10,145
<i>Subtotal: Residential Units</i>	<u>93,591</u>		<u>100,761</u>
Residential - CAP			
Tier 1	631	0.5	316
Tier 2	2,636	1.0	2,636
Tier 3	299	2.0	598
Other	142	1.0	142
<i>Subtotal: Residential - CAP Units</i>	<u>3,708</u>		<u>3,692</u>
Commercial	6,395	1.0	85,560
Industrial	22	1.0	1,568
Health or Education	215	1.0	11,739
Municipal	557	1.0	5,784
Other	4,540	1.0	11,588
<i>Subtotal: Billable Units - Non Stormwater Only</i>	<u>109,028</u>		<u>220,692</u>
<u>Stormwater Only</u>			
Residential - SW Only			
Tier 1	305	0.5	153
Tier 2	561	1.0	561
Tier 3	138	2.0	276
Other	1	1.0	3
<i>Subtotal: Residential - SW Only</i>	<u>1,005</u>		<u>993</u>
Non-Residential	3,992	1.0	29,816
<i>Subtotal: Stormwater Only</i>	<u>4,997</u>		<u>30,809</u>
<i>Total: Billable Units</i>	114,025		251,500

Pittsburgh Water and Sewer Authority

HJS-4SW

FPFTY 2022 COS & Rate Design

Stormwater COS by Customer Class

		<u>FY 2022</u>
		COS
Stormwater Revenue Requirements	\$	38,020,181
Less: Allocated Offsets		(570,821)
<i>Net Stormwater Revenue Requirements</i>	\$	<u>37,449,360</u>
Stormwater ERUs		<u>251,500</u>
Annual Stormwater Cost per ERU	\$	148.90

Customer Class Cost of Service	ERUs	Full COS Rate		COS by Class	% by Class
		Unit Rate	Unit Rate (Monthly)		
Residential	101,753	\$ 148.90	\$ 12.41	\$ 15,151,426	40.5%
Residential - CAP	3,692	148.90	12.41	549,679	1.5%
Commercial	115,376	148.90	12.41	17,179,940	45.9%
Industrial	1,568	148.90	12.41	233,409	0.6%
Health or Education	11,739	148.90	12.41	1,748,034	4.7%
Municipal	5,784	148.90	12.41	861,303	2.3%
Other	11,588	148.90	12.41	1,725,568	4.6%
	<u>251,500</u>			<u>\$ 37,449,360</u>	<u>100.0%</u>

Pittsburgh Water and Sewer Authority
FPFTY 2022 COS & Rate Design
 Adjustments to Cost of Service - Stormwater

HJS-5SW

COS Adjustments		Allocation Method	Residential	Residential - CAP	Commercial	Industrial	Health or Education	Municipal	Other	Total
<u>Adjustments to Cost of Service</u>										
Gradualism - Between WW/Storm	Unadj. COS		40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
Add: Bad Debt Expense	Unadj. COS		40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
Add: Bad Debt Expense (SWO)	Unadj. COS (Weighted by SWO)		3.1%	0.1%	76.4%	1.0%	7.8%	3.8%	7.7%	100.0%
Add: Cost of Credits and Incentives	Unadj. COS		40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
BDP Forgone Revenue	Unadj. COS		41.1%		46.6%	0.6%	4.7%	2.3%	4.7%	100.0%
City of Pittsburgh - Phase-In	Unadj. COS		40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
Gradualism - Between Classes	Unadj. COS		40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
Cost of Service by Class										
Allocated Cost of Service (Unadjusted)			\$ 15,151,426	\$ 549,679	\$ 17,179,940	\$ 233,409	\$ 1,748,034	\$ 861,303	\$ 1,725,568	\$ 37,449,360
Exclude: Bad Debt & Credit Program			(1,460,182)	(52,974)	(1,655,675)	(22,494)	(168,463)	(83,006)	(166,297)	(3,609,092)
Net Cost of Service (1)			\$ 13,691,244	\$ 496,705	\$ 15,524,265	\$ 210,915	\$ 1,579,572	\$ 778,297	\$ 1,559,271	\$ 33,840,268
<i>% of COS</i>			40.5%	1.5%	45.9%	0.6%	4.7%	2.3%	4.6%	100.0%
<u>Adjustments to Cost of Service</u>										
	<u>Adjustment</u>									
Gradualism - Between WW/Storm	\$ (12,400,000)		\$ (5,016,846)	\$ (182,006)	\$ (5,688,515)	\$ (77,285)	\$ (578,798)	\$ (285,189)	\$ (571,359)	\$ (12,400,000)
Add: Bad Debt Expense (NSWO)	1,175,583		475,623	17,255	539,300	7,327	54,873	27,037	54,168	1,175,583
Add: Bad Debt Expense (SWO)	415,814		12,927	469	317,888	4,319	32,345	15,937	31,929	415,814
Add: Cost of Credits and Incentives	696,685		281,868	10,226	319,605	4,342	32,519	16,023	32,101	696,685
BDP Forgone Revenue	250,545		102,877	(250,545)	116,650	1,585	11,869	5,848	11,716	-
City of Pittsburgh - Phase-In	-		-	-	-	-	-	-	-	-
Gradualism - Between Classes	-		-	-	-	-	-	-	-	-
Total: Adjusted Cost of Service			\$ 9,547,691	\$ 92,104	\$11,129,194	\$ 151,203	\$ 1,132,380	\$ 557,953	\$ 1,117,826	\$ 23,728,351
<i>% of COS</i>			40.2%	0.4%	46.9%	0.6%	4.8%	2.4%	4.7%	100.0%

(1) Net Cost of Service excludes Bad Debt Expense and Cost of Credits and Incentives since these costs vary based on the amount of the Stormwater fee.

Pittsburgh Water and Sewer Authority

FPFTY 2022 COS & Rate Design

Stormwater Rate Design

HJS-6SW

Unit Cost for Ratemaking

FY 2022

Net Stormwater Revenue Requirements	\$ 23,728,351
Add: Cost of BDP Forgone Revenue	250,545
Net Costs to Recover for Ratemaking	\$ 23,978,896
Stormwater ERUs	251,500
Annual Stormwater Cost per ERU for Ratemaking	\$ 95.34
Monthly Stormwater Charge per ERU	\$ 7.95

Monthly Stormwater Rates

Residential

Tier 1	12,974	\$	3.98	\$	619,638
Tier 2	57,834		7.95		5,517,364
Tier 3	13,642		15.90		2,602,894
Other	10,146		7.95		967,928

Subtotal: Residential

94,596			9,707,824	\$	9,547,691	\$	160,132	1.6%
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Residential - CAP

Tier 1	631	\$	0.99	\$	7,496
Tier 2	2,636		1.99		62,948
Tier 3	299		3.98		14,280
Other	142		1.99		3,391

Subtotal: Residential - CAP

3,708			88,115	\$	92,104	\$	(3,989)	-4.5%
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Non-Residential

Commercial	115,376	\$	7.95	\$	11,006,867
Industrial	1,568		7.95		149,541
Health or Education	11,739		7.95		1,119,933
Municipal	5,784		7.95		551,821
Other	11,588		7.95		1,105,539

Subtotal: Non-Residential

146,056			13,933,702	\$	14,088,555	\$	(154,854)	-1.1%
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Total Stormwater

244,360			23,729,641	\$	23,728,351	\$	1,290	0.0%
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	Unadjusted COS		Revenue at Existing Rates		Revenue at Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Base Rate Revenues								
Residential	\$ 15,151,426	40.5%	\$ -	0.0%	\$ 9,707,824	40.9%	\$ 9,707,824	100.0%
Residential - CAP	549,679	1.5%	-	0.0%	88,115	0.4%	88,115	100.0%
Commercial	17,179,940	45.9%	-	0.0%	11,006,867	46.4%	11,006,867	100.0%
Industrial	233,409	0.6%	-	0.0%	149,541	0.6%	149,541	100.0%
Health or Education	1,748,034	4.7%	-	0.0%	1,119,933	4.7%	1,119,933	100.0%
Municipal (Metered & Unmetered)	861,303	2.3%	-	0.0%	551,821	2.3%	551,821	100.0%
Other	1,725,568	4.6%	-	0.0%	1,105,539	4.7%	1,105,539	100.0%
Subtotal: Base Rate Revenues	\$ 37,449,360	100.0%	\$ -	0.0%	\$ 23,729,641	100.0%	\$ 23,729,641	100.0%
DSIC Revenues								
Residential	n/a	n/a	\$ -	0.0%	\$ -	0.0%	-	0.0%
Residential - CAP	n/a	n/a	-	0.0%	-	0.0%	-	0.0%
Commercial	n/a	n/a	-	0.0%	-	0.0%	-	0.0%
Industrial	n/a	n/a	-	0.0%	-	0.0%	-	0.0%
Health or Education	n/a	n/a	-	0.0%	-	0.0%	-	0.0%
Municipal (Metered & Unmetered)	n/a	n/a	-	0.0%	-	0.0%	-	0.0%
Subtotal: DSIC revenues	\$ -	0.0%	\$ -	0.0%	\$ -	0.0%	\$ -	0.0%
Total: User Charge Revenues	\$ 37,449,360		\$ -		\$ 23,729,641		\$ 23,729,641	100.0%
Other Revenues	570,821				570,821		570,821	
Total: Wastewater Conveyance Revenues	\$ 38,020,181		\$ -		\$ 24,300,462		\$ 24,300,462	100.0%

	2022 Revenue @ Existing Rates			2022 Revenue @ COS Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenue									
<u>Non-Stormwater Only</u>									
Residential									
Tier 1	12,669	\$ -	\$ -	12,669	\$ 6.20	\$ 943,232	12,669	\$ 3.98	\$ 605,071
Tier 2	57,273	-	57,273	57,273	12.41	8,528,177	57,273	7.95	5,463,844
Tier 3	13,504	-	13,504	13,504	24.82	4,021,599	13,504	15.90	2,576,563
Other	10,145	-	10,145	10,145	12.41	1,510,631	10,145	7.95	967,833
<i>Subtotal: Residential</i>	<u>93,591</u>	<u>\$ -</u>	<u>\$ 93,591</u>	<u>93,591</u>		<u>\$ 15,003,639</u>	<u>93,591</u>		<u>\$ 9,613,312</u>
Residential - CAP									
Tier 1	631	\$ -	\$ 631	631	\$ 6.20	\$ 46,979	631	\$ 0.99	\$ 7,496
Tier 2	2,636	-	2,636	2,636	12.41	392,511	2,636	1.99	62,948
Tier 3	299	-	299	299	24.82	89,045	299	3.98	14,280
Other	142	-	142	142	12.41	21,144	142	1.99	3,391
<i>Subtotal: Residential - CAP</i>	<u>3,708</u>	<u>\$ -</u>	<u>\$ 3,708</u>	<u>3,708</u>		<u>\$ 549,679</u>	<u>3,708</u>		<u>\$ 88,115</u>
Non-Residential									
Commercial	85,560	\$ -	\$ 85,560	85,560	\$ 12.41	\$ 12,740,219	85,560	\$ 7.95	\$ 8,162,421
Industrial	1,568	-	1,568	1,568	12.41	233,409	1,568	7.95	149,541
Health or Education	11,739	-	11,739	11,739	12.41	1,748,034	11,739	7.95	1,119,933
Municipal	5,784	-	5,784	5,784	12.41	861,303	5,784	7.95	551,821
Other	11,588	-	11,588	11,588	12.41	1,725,568	11,588	7.95	1,105,539
<i>Subtotal: Non-Residential</i>	<u>116,240</u>	<u>\$ -</u>	<u>\$ 116,240</u>	<u>116,240</u>		<u>\$ 17,308,534</u>	<u>116,240</u>		<u>\$ 11,089,255</u>
<i>Subtotal: Non-Stormwater Only</i>		<u>\$ -</u>				<u>\$ 32,861,852</u>			<u>\$ 20,790,682</u>
<u>Stormwater Only</u>									
Residential - SW Only									
Tier 1	305	\$ -	\$ 305	305	\$ 6.20	\$ 22,708	305	\$ 3.98	\$ 14,567
Tier 2	561	-	561	561	12.41	83,535	561	7.95	53,519
Tier 3	138	-	138	138	24.82	41,097	138	15.90	26,330
Other	1	-	1	1	12.41	149	1	7.95	95
<i>Subtotal: Residential - SW Only</i>	<u>1,005</u>	<u>\$ -</u>	<u>\$ 1,005</u>	<u>1,005</u>		<u>\$ 147,489</u>	<u>1,005</u>		<u>\$ 94,512</u>
Non-Residential	29,816		29,816	29,816	12.41	4,439,721	29,816	7.95	2,844,446
<i>Subtotal: Stormwater Only</i>		<u>\$ -</u>				<u>\$ 4,587,210</u>			<u>\$ 2,938,958</u>
Stormwater User Charge Revenue		\$ -				\$ 37,449,062			\$ 23,729,641
DSIC Revenues									
Residential		\$ -				\$ -			\$ -
Non-Residential		-				-			-
<i>Subtotal: DSIC Revenues</i>		<u>\$ -</u>				<u>\$ -</u>			<u>\$ -</u>
Other Revenues									
Other Revenues			570,821			570,821			570,821
Total: System Revenues		\$ 570,821				\$ 38,019,883			\$ 24,300,462
FPPTY Stormwater Revenue Requirements						\$ 38,020,181	\$ 24,299,172		
Difference						\$ (298)			\$ 1,290

Stormwater

	Phased-In Rates		
	Existing (2021)	Phase In (2022)	Proposed (2023)
Residential (per ERU)			
Tier 1	\$ -	\$ 2.99	\$ 3.98
Tier 2	-	5.96	7.95
Tier 3	-	11.93	15.90
Residential-CAP (per ERU)			
Tier 1	\$ -	\$ 0.74	\$ 0.99
Tier 2	-	1.49	1.99
Tier 3	-	2.99	3.98
Non-Residential Rate (per ERU)			
Commercial	\$ -	\$ 5.96	\$ 7.95
Industrial	-	5.96	7.95
Health or Education	-	5.96	7.95
Municipal	-	5.96	7.95
Other	-	5.96	7.95

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

BARRY KING, PE

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024733 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:
Capital Projects
Updates on Rate Case Commitments

April 13, 2021

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TABLE OF EXHIBITS

BK-1	2019 Consent Order and Agreement
BK-2	DEP COVID Extension Letter

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND POSITION FOR THE RECORD.**

3 A. My name is Barry King and I am the Director of Engineering and Construction for The
4 Pittsburgh Water and Sewer Authority (“PWSA”).

5 **Q. WHEN DID YOU ASSUME THIS ROLE?**

6 A. I assumed this role in June 2016, filling the role of Interim Director of Engineering and
7 Construction for the PWSA, and subsequently selected as the permanent Director of
8 Engineering and Construction in April 2019.

9 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.**

10 A. I received my Bachelor of Science in Environmental Engineering from Rensselaer
11 Polytechnic Institute. I am currently completing my Master of Science in Environmental
12 Engineering from Worcester Polytechnic Institute in 2021.

13 **Q. PLEASE PROVIDE A SUMMARY OF YOUR RELEVANT EXPERIENCE.**

14 A. Over the last 25 years, I have been progressively responsible for engineering, project
15 management, leadership, and administration in the fields of water supply, treatment,
16 storage, and distribution; wastewater conveyance and treatment; and other civil/
17 environmental engineering-related projects and roles within both the public and private
18 sectors. I have served in a range of capacities including Director of Engineering and
19 Construction, Program Manager, Utilities Bureau Chief, Assistant Director of Public
20 Works, Design Manager, Principal Engineer, Project Engineer, Design Engineer, Project
21 Manager, and QA/QC Reviewer. With respect to employment in the public sector, I have
22 over 10 years of experience working directly for water and sewer municipal authorities in
23 primary leadership roles. I am a licensed Professional Engineer in the State of
24 Pennsylvania, as well as current registrations in New York, Maryland, and Delaware.

1 With specific respect to water and sewer infrastructure and facilities, I have performed,
 2 coordinated, managed, and/or supervised technical studies, evaluations, and site
 3 assessments; planning; engineering conceptualization and design; cost estimating;
 4 permitting; bidding; construction project management and contract administration; water
 5 and sewer rate and fee studies and adoption; conducted public hearings and informational
 6 meetings; performed staff management and program administration; supported full
 7 proposal/bid procurement processes; and completed consultant and contractor selections.

8 **Q. WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES WITH PWSA?**

9 A. Since 2016, I have been involved in the daily design and construction of PWSA’s
 10 infrastructure projects, as well as coordinating staff and consultant activities. I utilize my
 11 extensive hands-on experience in the fields of water and wastewater to manage PWSA’s
 12 engineering endeavors.

13 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA**
 14 **PUBLIC UTILITY COMMISSION (“PUC” OR “COMMISSION”)?**

15 A. Yes. In PWSA’s last base rate case at Docket Nos. R-2020-3017951 and R-2020-
 16 3017970, I submitted Direct Testimony on March 6, 2020, Supplemental Direct
 17 Testimony on May 15, 2020 and Rebuttal Testimony on August 18, 2020.

18 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

19 A. The purpose of my testimony is to: (1) describe PWSA’s Capital Improvement Plan
 20 (“CIP”), with an emphasis on the total capital requirements of over \$1.2 billion for fiscal
 21 years 2021-2025; and (2) provide updates regarding the prior rate case settlement
 22 commitments. PWSA’s five-year CIP is organized into three primary project classes,
 23 which consists of water (further broken down under treatment plant, pumping and
 24 storage, and distribution subclasses), wastewater, and stormwater classes. PWSA

1 undertakes the same programmatic approach for the identifying, planning, designing, and
 2 constructing stormwater capital projects as it undertakes for water and wastewater capital
 3 projects. My testimony will primarily focus on the water and wastewater project classes.
 4 Mr. Tony Igwe’s and Mr. Harold Smith’s direct testimonies address the stormwater
 5 program in detail.

6 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

7 A. Yes. I am sponsoring PWSA Exhibit BK-1, which is the 2019 Consent Order and
 8 Agreement issued by the Pennsylvania Department of Environmental Protection
 9 (“DEP”); and PWSA Exhibit BK-2, which is DEP’s COVID Extension Letter.

10 **II. CAPITAL PROJECTS**

11 **Q. PLEASE PROVIDE A GENERAL OVERVIEW OF PWSA’S CIP.**

12 A. As a result of about 30 years of little to no investment in our water, sewer and stormwater
 13 systems, PWSA’s CIP focuses on restoring and sustaining cost-effective operations that
 14 comply with all regulatory requirements, while optimizing the system’s asset
 15 performance and life expectancy in accordance with accepted utility metrics. The 2021-
 16 2025 CIP invests in programs that balance risk and consequence of asset failure and
 17 levels of service benefits, with overall customer affordability.

18 **Q. PLEASE DESCRIBE YOUR OVERALL VISION FOR PWSA’S SYSTEM.**

19 A. My vision for PWSA is to build a sustainable program of operation, maintenance and
 20 capital activities and investments to sustain performance of safe, affordable and
 21 manageable water, sewer and stormwater systems for the City of Pittsburgh and
 22 surrounding populations. PWSA needs to restore full operational resiliency and
 23 redundancy of our water and sewer systems to meet our current and future challenges.
 24 PWSA’s Engineering Department recognizes that we are responsible to provide our

1 customers with safe, reliable, and uninterrupted water, sewer and stormwater services that
2 are in full compliance with quality and regulatory requirements. We will strive to build a
3 team of dedicated Engineers, Scientists, and Project Managers to solidify a strong,
4 competent, effective and stable work force with the requisite education, initiative and
5 innovation to undertake this work either directly or as project managers, and identify
6 projects that balance the cost of the project, ensuring just and reasonable rates, with the
7 scope and outcome of the project. We will embrace technology, where appropriate and
8 cost effective. With a considerable number of significant, complex, and large-scale
9 projects required over the next 5 to 7 years, we will seek to build the necessary technical
10 and skilled workforce to undertake projects, and to complement the responsibilities and
11 actions of other PWSA Departments

12 **Q. PLEASE EXPLAIN PWSA'S PROCESS TO IDENTIFY CAPITAL PROJECTS**
13 **THAT NEED TO BE COMPLETED.**

14 A. PWSA's CIP process begins each year in the second quarter when project nominations
15 are solicited from the entire organization. At the completion of the nomination period,
16 the department group managers (engineering, finance, operations and executive
17 departments) screen and evaluate the nominated projects and recommend which projects
18 should be considered for further planning, design or construction. A Project Sheet is
19 prepared to provide more detailed information on a project's potential scope, risks,
20 schedule and preliminary cost estimate. This process takes several months and
21 culminates with the presentation of the updated CIP to PWSA's Board of Directors.
22 Projects that are not selected for implementation are re-assessed during the next year's
23 CIP process.

1 **Q. WHAT CRITERIA ARE USED TO EVALUATE AND PRIORITIZE CAPITAL**
 2 **PROJECTS?**

3 A. Due to funding limitations and the need to renew or replace a significant amount of aging
 4 infrastructure, PWSA uses the following criteria to evaluate and prioritize capital
 5 projects:

6 1) Safety – Potential health and safety risks to personnel and the public if action is
 7 not taken;

8 2) Regulatory Compliance – Regulatory compliance schedule and potential fines
 9 for non-compliance;

10 3) Reliability/Operational Flexibility – Location, operational importance, age and
 11 condition of infrastructure and risk if action is not taken;

12 4) Capacity – Meets community health needs and growth;

13 5) Operations and Maintenance Efficiency – Potential for operating cost savings;

14 6) Regional Cooperation/Stewardship – Coordination with external stakeholders
 15 or meeting needs of customers and communities;

16 7) Level of Service – Improvements to customer service to comport with national
 17 standards; and

18 8) Sustainability – Ability to optimize facility useful life, energy efficiency and
 19 “green” approach to providing water supply and improving water quality.
 20
 21

22 **Q. WHAT ARE PWSA’S FUNDING SOURCES FOR ITS CIP?**

23 A. PWSA’s CIP is funded through several primary sources to which specific programs and
 24 projects are allocated. These capital project funding sources basically result from
 25 revenues received through rates paid by PWSA’s customers. Capital Funds for Capital
 26 works primarily originate from Authority market-solicited Bond indebtedness from
 27 leading institutions state and federal grants. Subsidized loans are also a component of
 28 our Bond portfolio, as well as cost shares with other utilities and public grants. PWSA is
 29 dedicated to identifying and pursuing funding from all potential sources to offset planned
 30
 31
 32
 33
 34
 35

1 capital investments. More detail about funding is set forth in the direct testimony of Ed
 2 Barca, Director of Finance.

3 **Q. HOW IS PWSA’S CIP ORGANIZED?**

4 A. The CIP is organized into six project classes: 1) Water Treatment Plant; 2) Water
 5 Pumping and Storage; 3) Water Distribution System (including lead service line
 6 replacements); 4) Wastewater System; 5) Stormwater System; and 6) Other. The project
 7 class designated as “Other” consists of Utility Cost Shares, Surface Restoration, and other
 8 miscellaneous projects. Each project class is then made up of individual projects, which
 9 are defined based upon current information and range from annual allowances for asset
 10 renewal and/or replacement activities to major, multiple phase facility renewal projects.

11 **Q. PLEASE DESCRIBE THE INFORMATION THAT IS PROVIDED FOR EACH**
 12 **PROJECT.**

13 A. Each project is identified by type and a descriptive name is given to it. Other information
 14 includes the ward, phase, priority, description, justification, risk, impact on operations,
 15 alternatives to the recommended action, estimated five-year cash flow summary and
 16 proposed funding sources. Once approved and opened in our project management
 17 software, unique project numbers are assigned to track the project from inception to
 18 completion.

19 **Q. FOR THE CAPITAL PROJECTS APPROVED BY THE BOARD, WHAT IS**
 20 **PWSA’S TOTAL CAPITAL REQUIREMENT FOR THE CIP FOR FISCAL**
 21 **YEARS 2021-2025?**

22 A. The total capital requirement for Fiscal Years 2021-2025 is approximately \$1.2 billion.
 23 The 2021-2025 CIP may be electronically accessed on the Finance page of PWSA’s
 24 website by scrolling down to “CIP Budget” where a link is available. The total amount is

1 broken out by project class and by fiscal year, as shown on page 5 of the CIP.¹ As shown
 2 in the table below, the capital requirements for Fiscal Years 2021, 2022 and 2023 are:

	FY 2021	FY 2022	FY 2023
Water Treatment Plant	\$ 15,112,066	16,422,149	45,559,717
Water Pumping and Storage	\$ 56,863,770	70,939,529	106,336,346
Water Distribution	\$ 76,245,552	36,345,826	66,150,837
Wastewater System	\$ 35,741,675	45,109,155	29,580,401
Stormwater	\$ 34,696,272	21,721,607	13,237,377
Other	\$ 14,670,000	1,100,000	2,500,000
<i>Total Capital Requirements</i>	\$ 233,329,335	191,638,266	263,394,678

8
 9 **Q. PLEASE IDENTIFY ALL OF THE PROJECTS THAT HAVE BEEN**
 10 **APPROVED.**

11 A. The entire list of projects approved by the 2021-2025 CIP are listed on pages 7-9 of the
 12 CIP, which is attached to Mr. Barca’s testimony as PSWA Exhibit EB-5, or available
 13 electronically as noted above.

14 **Q. HOW DOES PWSA PRIORITIZE ITS CAPITAL PROJECTS?**

15 A. PWSA uses the aforementioned criteria to evaluate and prioritize capital projects, except
 16 when a legal mandate has been issued. WSA prioritizes its capital projects based on legal
 17 mandates such that it places the highest priority on non-negotiable regulatory
 18 requirements. Three directives issued by DEP have established PWSA’s priorities in
 19 recent years. On October 25, 2017, DEP issued an Administrative Order (“Safe
 20 Drinking Water Order”), requiring PWSA to address the following items: (a) installation

¹ The CIP is a 5-year plan. However, for purposes of determining the needed rate increase, Mr. Barca is employing a different funding method for the same projects.

1 of ultraviolet (UV) disinfection at the Membrane Filtration Plant (“MFP”) as a condition
2 to reinstate operation of Highland No. 1 Reservoir; (b) replace the cover and liner of the
3 Lanpher Reservoir; (c) address reliability deficiencies at the Bruecken Pump Station; (d)
4 install pressure sensors in the distribution system; and (e) establish a schedule for other
5 capital improvements to the system.

6 PWSA has completed all required actions to address the stipulated items. The
7 MFP improvements project was completed in June 2020, having received the Public
8 Water Supply Operating Permit on June 17, 2020. The MFP was restored to full
9 operation on September 14, 2020. The Lanpher Reservoir cover and liner replacement
10 were completed in June 2019, receiving the Public Water Supply Operating Permit on
11 June 19, 2019. The Bruecken Pump Station Standby Power Generators were installed
12 and commissioned on April 21, 2020. The installation of the 24 continuous recording
13 pressure monitors, located throughout the PWSA water distribution system (System) was
14 completed on July 8, 2018. These 24 monitors were located in coordination with the
15 DEP in 10 of PWSA’s total 17 System pressure zones. Finally, the full detailed listing of
16 Capital Improvement Projects (CIP) was provided to PA-DEP on January 23, 2018, with
17 a presentation on the CIP conducted for PA-DEP and EPA staff on January 23, 2018 in
18 Harrisburg PA. All requirements under the Safe Drinking Water Order were completed
19 on or before June 17, 2020.

20 Additionally, to ensure compliance with the Commission’s regulations in Chapter
21 65, ‘Water Service’, Subchapter 6, Pressures, Subsection (b), the PWSA completed the
22 installation of an additional 37 pressure monitors on January 21, 2021, ensuring that there
23 is at least one or more continuous recording pressure monitors in each separate pressure

1 zone throughout the PWSA Distribution System. There is a total of 61 continuous
2 recording pressure monitors now operational in PWSA's system.

3 On November 17, 2017, DEP issued a Consent Order and Agreement ("Lead
4 Consent Order") containing a series of mandates related to lead service line replacement.
5 PWSA has fulfilled all of the requirements of the LCO to date.

6 On September 6, 2019, DEP issued a Consent Order and Agreement ("2019
7 COA"). The 2019 COA, which is attached as Exhibit BK-1, fully resolved a DEP
8 investigation and avoided litigation. On May 13, 2020, DEP issued a COVID Extension
9 Letter, a copy of which is attached as Exhibit BK-2, which provided 90-day extensions of
10 the deadlines for submitting Construction Permit Applications for the following projects:

- 11 • Provision 3.c.i: Rising Main #3 Rehabilitation Project
 - 12 ○ Was due "on or before September 1, 2020", but with the 90-day extension,
13 the revised date was "11/30/20" (which PWSA achieved, submitting on
14 11/30/2020).
- 15 • Provision 3.g: Aspinwall Pump Station to Lanpher Reservoir Rising Main Project:
 - 16 ○ Was due "on or before December 30, 2020", but currently with the 90-day
17 extension, the revised date is "3/31/21". PWSA is currently on track to
18 submit the application by the revised deadline.
- 19 • Provision 3.k.ii: Aspinwall and Bruecken Pump Station Improvements Projects:
 - 20 ○ Was due "on or before January 1, 2021", but currently with the 90 day
21 extension, the revised date is "4/1/21". PWSA is negotiating an extension
22 through 9/30/21.
- 23 • Provision 3.q: Washout Disconnection:

- Was due "on or before June 1, 2020", but with the 90-day extension, the revised date was "8/31/20" (which PWSA achieved, submitting on 8/31/20).

Q. WHAT ARE PWSA’S SPECIFIC OBLIGATIONS UNDER THE COA?

Under the 2019 COA, PWSA is required to construct a bypass system to enable the Authority to remove the existing single cell clearwell from service and replace it with a new multi-celled clearwell. PWSA is obligated to submit a construction permit to DEP on or before January 1, 2023 and to complete construction of a clearwell bypass system within two years of DEP’s issuance of a construction permit.² As a result of the existing single-cell clearwell basin condition and design, a clearwell bypass system is essential to ensure uninterrupted water supply service should the existing clearwell should prematurely fail. PWSA is also required by the 2019 COA to: (i) rehabilitate or replace Rising Main #3 (from the Bruecken Pump Station) to PWSA’s Highland No. 2 Reservoir;³ (ii) rehabilitate or replace Rising Main #4 (from the Bruecken Pump Station) to PWSA’s Highland No. 2 Reservoir;⁴ (iii) construct a new redundant rising main from the Aspinwall Pump Station to the Lanpher Reservoir to replace the existing 100 year old transmission main which has suffered 3 major failures in the past 5 years;⁵ (iv) replace the cover and liner of the Highland No. 2 Reservoir to comply with existing regulatory standards, and facilitate the clearwell bypass system construction;⁶ and (v) replace or rehabilitate the existing Aspinwall and Bruecken pump stations.⁷ With respect to the

² 2019 COA Ordering ¶ 3.a.-b.
³ 2019 COA Ordering ¶ 3.c.-d.
⁴ 2019 COA Ordering ¶ 3.e.-f.
⁵ 2019 COA Ordering ¶ 3.g.-h.
⁶ 2019 COA Ordering ¶ 3.i.-j.
⁷ 2019 COA Ordering ¶ 3.k.

1 completion of the clearwell bypass, assuming that PWSA submits the application on
 2 January 1, 2023, and that DEP approves on an assumed 90-day construction permit
 3 review timeframe, the resultant required construction completion deadline will be March
 4 2025. Under this timing scenario, the clearwell bypass would be the last project to be
 5 completed prior to taking the existing clearwell offline for replacement. PWSA is
 6 proposing to submit the clearwell bypass construction permit application ahead of the
 7 January 1, 2023 submittal deadline date. This will result in the bypass being constructed
 8 concurrent with the pump station rehabilitations, which will allow for cost savings and
 9 limit the site impacts around the perimeter of the Aspinwall Pump Station.

10 **Q. DOES THE 2019 COA ALSO ADDRESS CROSS-CONNECTIONS?**

11 A. Yes. PWSA was required by the 2019 COA to investigate the locations where valves,
 12 blow-offs, or other such appurtenances that connect to the distribution system are found
 13 within chambers, pits or manholes connected directly or indirectly to any storm drain or
 14 sanitary sewer (commonly referred to by PWSA as “washouts”), which it has done.
 15 Further, in September 2020, PWSA submitted to DEP a report detailing the findings
 16 including the number and locations of all such cross-connections within PWSA’s system.
 17 Finally, PWSA submitted a plan and proposed schedule on November 30, 2020 for
 18 eliminating any and all cross-connections and to take the necessary steps to eliminate
 19 them as soon as is practicable.⁸

⁸ 2019 COA Ordering ¶ 3.q.-t.

1 **Q. WHAT ARE THE CONSEQUENCES THAT PWSA WILL FACE IF IT DOES**
 2 **NOT COMPLY WITH THE 2019 COA?**

3 A. If PWSA does not comply in a timely manner with any term or provision of the COA, it
 4 will be required to pay a civil penalty in the amount of \$100.00 per day for each
 5 violation. It is also subject to the imposition of additional penalties.⁹ As Mr. Barca
 6 explains, if PWSA is not permitted to raise its rates as proposed in this proceeding, it will
 7 be unable to fulfill these obligations. The result is that PWSA would be subject to the
 8 payment of these penalties. Since PWSA does not have investors, this burden would be
 9 the responsibility of its ratepayers, which would further exacerbate the PWSA’s ability to
 10 implement the required project improvements.

11 **Q. PLEASE DESCRIBE THE CONSTRUCTION PROJECTS THAT PWSA MUST**
 12 **UNDERTAKE PURSUANT TO THE 2019 COA.**

13 A. PWSA has assigned the following names to the projects that are required by the 2019
 14 COA:

- 15 • Rising Main 3 – Rehabilitation OR
 - 16 ○ Rising Main 3 – Replacement
- 17 • Highland No. 2 Reservoir Improvements (Liner and Cover Replacement)
- 18 • Rising Main 4 – Rehabilitation OR
 - 19 ○ Rising Main 4 – Replacement
- 20 • Aspinwall WTP High Service Pumping OR
 - 21 ○ Aspinwall Pump Station Improvements
 - 22 ○ Bruecken Pump Station Improvements
- 23 • Aspinwall WTP Clearwell Bypass (Emergency Response)
- 24 • Aspinwall WTP Clearwell Improvements (Replacement)
- 25 • Aspinwall Pump Station to Lanpher Reservoir Rising Main

26
 27 These projects are shown in the table below:

⁹ 2019 COA Ordering ¶ 4.

Description	PWSA Project Name	PWSA Project Number	DEP Construction Permit Submittal	DEP COA Requirement: Construction Complete
PROJECTS SPECIFICALLY STATED IN COA				
Aspinwall WTP Clearwell Bypass (Emergency Response)	Clearwell Emergency Response Project	2017-323-100-0	Current extended date 3/3/2023 (was 1/1/2023)	2 years after receipt of construction permit
Rising Main 3 – Rehabilitation	2019 Large Diameter Water Main Improvements (Rising Main 3 & 4)	2019-325-103-0	Extended due date 11/30/2020 (was 9/1/2020) – Completed (submitted 9/1/2020, early) - Permit received 3/10/2021	1 year after receipt of construction permit (Current date 3/10/22, requesting extension)
Rising Main 3 – Replacement	2019 Large Diameter Water Main Improvements (Rising Main 3 & 4)	2019-325-103-0	Due 3/1/2021 – Completed (submitted 9/1/2020, early) - Permit received 3/10/2021	1 year after receipt of construction permit (Current date 3/10/22, requesting extension)
Rising Main 4 – Rehabilitation	2019 Large Diameter Water Main Improvements (Rising Main 3 & 4)	2019-325-103-0	6/1/2021	2 years after receipt of construction permit
Rising Main 4 – Replacement	2019 Large Diameter Water Main Improvements (Rising Main 3 & 4)	2019-325-103-0	6/1/2021	2 years after receipt of construction permit
Aspinwall Pump Station Improvements	Aspinwall Pump Station Improvements	2017-323-104-0	Current extended date 4/1/2021 (was 1/1/2021, negotiating extension to 9/30/2021)	2 years after receipt of construction permit

Description	PWSA Project Name	PWSA Project Number	DEP Construction Permit Submittal	DEP COA Requirement: Construction Complete
Bruecken Pump Station Improvements	Bruecken Pump Station Improvements	2017-323-106-0	Current extended date 4/1/2021 (was 1/1/2021, negotiating extension to 9/30/2021)	2 years after receipt of construction permit
Aspinwall WTP Clearwell Improvements (Replacement)	Clearwell Improvements	Unidentified	1/1/2024	2 years after receipt of construction permit
PROJECTS NECESSARY TO SUPPORT COA PROJECTS (Not Stated in COA)				
Aspinwall Water Treatment Plant Electrical and Backup Power Improvements	Aspinwall Water Treatment Plant Electrical and Backup Power Improvements	2017-322-100-0		
Highland Reservoir Pump Station and Rising Main	Highland Reservoir Pump Station and Rising Main	2017-323-101-0		

1

2 **Q. WHAT ARE THE TOTAL COSTS ASSOCIATED WITH THE CONSTRUCTION**
 3 **PROJECTS THAT ARE NECESSARY TO COMPLY WITH THE COA?**

4 A. PWSA’s total approved budget in the 2021-2025 CIP for the construction projects that
 5 are necessary to comply with the 2019 COA is approximately \$252.3 million. In
 6 addition, even though it is not included in the 2019 COA, the Highland Reservoir Pump
 7 Station and Rising Main and the Aspinwall Water Treatment Plant Electrical and Backup
 8 Power Improvements Projects must be completed in order to replace the clearwell. The
 9 approved budget to complete these projects is approximately \$55.7 million. The
 10 Clearwell Improvements project totals \$57.0 million and the Clearwell Emergency
 11 Response project totals \$27.0 million. As design progress continues to refine the scope

1 of the projects, additional budget may be necessary. As of April 2021, the cumulative
2 commitment for these projects is \$38.2 million.

3 **Q. DO YOU WISH TO HIGHLIGHT ANY OTHER CAPITAL PROJECTS TO**
4 **WHICH PWSA HAS COMMITTED?**

5 A. PWSA is transitioning the 2017 COA Lead Service Line Replacement (“LSLR”)
6 program to our ongoing water main replacement program. The small diameter water
7 main program is being implemented to address the fragile condition and constant failures
8 of these water mains throughout the service areas. These pipes are prematurely failing
9 due to uncontrollable external pipeline corrosion. The corrosion related pipeline failures
10 have become acute in the past several years, which adds substantially to the PWSA
11 operations expenses. Specifically, beginning in April 2020, PWSA transitioned the
12 obligations for 2017 COA-required LSLRs being performed under the LSLR Program to
13 the annual Small Diameter Water Main Replacement Project. This approach will allow
14 PWSA to complete the replacement of the publicly owned portions of the individual lead
15 service lines (“LSLs”) concurrent with the replacement of aging water distribution mains,
16 improving the related costs and efficiency for completion of the 2017 COA-required
17 LSLRs and the resulting surface restoration activities. Additionally, the private portion of
18 identified LSLs will also be replaced, where identified, during the completion of the
19 Small Diameter Water Main Replacement Project.

20 Another critical project is the annual Sewer Rehabilitation Project. This project
21 rehabilitates sewers (combined, sanitary and storm) through the trenchless installation of
22 airtight, watertight cured-in-place pipe lining on the inside of aging sewer pipes. This
23 approach affords PWSA with an approach that minimizes the impact to residents through
24 a more cost-effective way of extending the life of the sewer system than replacing it with

1 new pipe. This sewer lining program improves the reliability and service provided to our
 2 customers. In response to the increasing rate of failure of sewer assets that are located
 3 under or adjacent to structures (e.g., buildings, bridges, railroads, or major utilities) or
 4 located on steep slopes (due to limited accessibility), PWSA has developed a Sewers
 5 Under Structures Program for the proactive replacement, rehabilitation, or realignment
 6 and abandonment of this aging infrastructure.

7 **III. UPDATE REGARDING PRIOR RATE CASE SETTLEMENT ISSUES**

8 **A. Unaccounted for Water**

9 **Q. DID PWSA MAKE A COMMITMENT IN THE SETTLEMENT OF ITS 2020**
 10 **RATE CASE REGARDING UNACCOUNTED FOR WATER?**

11 A. Yes. PWSA agreed to provide its Unaccounted for Water percentages on the
 12 Commission’s Section 500 form starting with the 2020 period. One caveat to this
 13 agreement is that the parties recognized that data will be as complete as possible, given
 14 that PWSA does not have flow meters on Rising Main 1, Rising Main 2 and the
 15 Hydraulic Control Structure.¹⁰

16 **Q. WHAT IS THE STATUS OF PWSA’S COMPLIANCE WITH THIS PROVISION**
 17 **OF THE SETTLEMENT?**

18 A. PWSA plans to file the Section 500 form with the Commission for the 2020 calendar year
 19 on or before the due date of April 30, 2021.

¹⁰ Joint Petition for Settlement, III.H.1., as approved in *Pennsylvania Public Utility Commission v. Pittsburgh Water and Sewer Authority*, Docket Nos. R-2020-3017951 (water) and R-2020-3017970 (wastewater), Opinion and Order entered December 3, 2020.

1 **B. Valve Maintenance**

2 **Q. DID PWSA MAKE A COMMITMENT REGARDING VALVE MAINTENANCE?**

3 A. Yes. PWSA committed to exercising approximately 5,000 isolation valves per year and
4 to repair the isolation valves that are found to be inoperable. Further, PWSA agreed to
5 strive to exercise more isolation valves per year if funding and staffing resources are
6 available.¹¹

7 **Q. WHAT IS THE STATUS OF FULFILLING THAT COMMITMENT?**

8 A. PWSA has made an internal commitment to exercise 1/5 of the valves or approximately
9 5,200 each year. The Authority has implemented the valve maintenance program and
10 year to date, has inspected 1,779 valves in calendar year 2021. PWSA is on track to meet
11 the 2021 annual goal.

12 **C. Meter Replacement**

13 **Q. PLEASE DESCRIBE THE SETTLEMENT'S PROVISION CONCERNING**
14 **METER REPLACEMENT.**

15 A. PWSA agreed to test or replace at least 10,000 meters per year until all of the
16 undocumented meters are either tested or replaced. It was noted in the Settlement that
17 this was dependent on customers being more willing to permit PWSA to access their
18 meters as concerns about social distancing associated with the pandemic subsided.¹²

19 **Q. DO YOU EXPECT PWSA TO FULFILL THE COMMITMENT TO REPLACE**
20 **AT LEAST 10,000 METERS IN 2021 AND GOING FORWARD EACH YEAR?**

21 A. PWSA replaced 10,290 water meters in calendar year 2019 and replaced 5,550 in
22 calendar year 2020 despite having restricted access to meters in customers' homes and
23 businesses due to the COVID-19 pandemic. Year to date in 2021, we have replaced 1,113

¹¹ Joint Petition for Settlement, III.H.2.

¹² Joint Petition for Settlement, III.H.3.

1 water meters and have recently observed an increase in the number of appointments
 2 being scheduled. Having suspended in-property meter appointments in the month of
 3 January due to a rise in virus cases, we have set a more realistic goal of 8,000 meter
 4 replacements this calendar year with the intention of achieving 10,000 in subsequent
 5 years.

6 **D. Flushing Distribution System**

7 **Q. WHAT WAS PWSA’S COMMITMENT REGARDING FLUSHING THE**
 8 **DISTRIBUTION SYSTEM?**

9 A. PWSA agreed that within 90 days after entry of the Commission’s Order approving the
 10 Settlement, it would implement a program to flush one-third of the distribution system
 11 each year so that one-third of the distribution system is flushed during 2021. The 90-day
 12 period ended on March 3, 2021.¹³

13 **Q. HAS PWSA IMPLEMENTED THE FLUSHING PROGRAM?**

14 A. The flushing program has been implemented.

15 **Q. IS PWSA ON TRACK TO FLUSH ONE-THIRD OF THE DISTRIBUTION**
 16 **SYSTEM DURING 2021?**

17 A. PWSA commenced the hydrant inspection and flushing program for 2021, and year to
 18 date, has inspected 459 hydrants and is currently on track to flush and inspect one-third of
 19 the system in calendar year 2021.

20 **E. Wastewater Laterals**

21 **Q. PLEASE DESCRIBE PWSA’S COMMITMENT REGARDING WASTEWATER**
 22 **LATERALS.**

23 A. PWSA agreed to meet with interested parties no later than March 15, 2021 to discuss the
 24 Consultant’s report addressing feasibility of owning and/or maintaining wastewater

¹³ Joint Petition for Partial Settlement, III.H.4.

1 laterals within public easements/rights-of-ways (“ROWs”).¹⁴ PWSA contracted with the
 2 Consultant referenced in the Settlement to comply with the Stage 1 Compliance Plan
 3 Order. The Consultant’s responsibilities were to study and prepare a report that includes
 4 the legal, economic and operational feasibility of owning and/or maintaining wastewater
 5 laterals within public easements/ROWs. The concern sought to be addressed is the
 6 responsibility of customers who own laterals within public ROWs and easements to
 7 maintain them, rather than PWSA having this responsibility.

8 **Q. HAS THE CONSULTANT COMPLETED THE REPORT?**

9 A. Yes, the Consultant’s report was submitted on January 15, 2021 and circulated to the
 10 parties at that time.

11 **Q. WHAT WERE THE CONSULTANT’S FINDINGS?**

12 A. After review of the legal, cost and logistical issues, the present structure whereby the
 13 customer owns and is responsible for operations and maintenance (“O&M”) and/or
 14 replacement of the entire private lateral is currently the most realistic approach for the
 15 PWSA for the near term. Based on the survey of other similarly situated wastewater
 16 conveyance utilities, maintaining the current status quo whereby the customer remains
 17 responsible for the portion of the lateral he or she owns is not unique. From the research
 18 performed, about half (51.5 percent) of the utilities own/are responsible for the
 19 wastewater lateral from the connection at the sewer main up until an actual or assumed
 20 point (property line, easement, curb, assumed curb). In the other half (48.5 percent), the
 21 utility is responsible for no portion of the lateral. Also, PWSA’s current structure of
 22 private ownership of the wastewater laterals up to and including the connection of the

¹⁴ Joint Petition for Partial Settlement, III.H.5.

1 lateral to the sewer main (even where it crosses the ROW) is rooted in City of Pittsburgh
2 Ordinances and has been carried through in PWSA's current Commission approved
3 wastewater tariff

4 It is likewise important to consider that PWSA is in the process of undertaking
5 many other extremely important construction projects including its ambitious lead service
6 line replacement program (now performed as part of the small diameter water main
7 replacement program) and an equally ambitious infrastructure and system modernization
8 upgrade as part of its transition to the Commission's jurisdiction. Requiring PWSA to
9 embark upon taking ownership of its approximately 110,000 wastewater laterals and/or
10 replacing them all will require PWSA to divert a significant amount of staff resources and
11 incur substantial expense.

12 In addition to these realities, Act 120 of 2018 amended the Public Utility Code
13 regarding the accelerated replacement of customer-owned lead water service lines and
14 damaged wastewater laterals. The Commission issued a Notice of Proposed Rulemaking
15 Order on September 17, 2020 at Docket Number L-2020-301952 which was recently
16 published in the *Pennsylvania Bulletin* on April 3, 2021 at 5 Pa. B. 1802, starting a 90-
17 day comment period. The Notice of Proposed Rulemaking proposes a framework that
18 would enable the PWSA to replace damaged customer-owned wastewater laterals
19 (without requiring the PWSA to take over ownership) when replacement would provide
20 benefits to the rest of the wastewater system. The specifics of this framework are subject
21 to the Commission's final rulemaking order and a subsequent plan to be developed by
22 PWSA and submitted to the Commission for approval.

23 Upon consideration of all these factors, the most prudent course at this time is for

1 PWSA to monitor the Commission’s Act 120 rulemaking and actively evaluate the
 2 development of a PWSA-specific Act 120 plan that would be submitted to the
 3 Commission for approval. Ultimately, if PWSA were to embark upon a plan to replace
 4 damaged customer-owned wastewater laterals in accordance with Act 120, the most cost-
 5 effective option for PWSA would be to use full lining as the go-to repair option, but in
 6 practice, the type of repair selected will be based on an assessment of the lateral in
 7 question.

8 **Q. HAS PWSA MET WITH INTERESTED PARTIES TO DISCUSS THE REPORT?**

9 A. Yes, PWSA met with interested parties on March 2, 2021 to discuss the report.

10 **F. Coordination Efforts**

11 **Q. DID PWSA MAKE A COMMITMENT CONCERNING COORDINATION WITH**
 12 **OTHER ENTITIES ON FUTURE PLANNED CAPITAL AND OPERATING**
 13 **PROJECTS?**

14 A. Yes. PWSA agreed to continue its efforts to coordinate with neighboring utilities,
 15 municipalities and the Pennsylvania Department of Transportation (“PennDOT”) on
 16 future planned capital and operating projects, including water, sanitary, or storm sewer
 17 infrastructure replacements and/or improvements.¹⁵

18 **Q. HAS PWSA CONTINUED THESE COORDINATION EFFORTS?**

19 A. Yes. PWSA coordinates and hosts (virtual) monthly capital planning utility coordination
 20 meetings with regular attendance from the following parties Peoples Gas Company LLC,
 21 Columbia Gas of PA, Inc./NiSource, Inc., Duquesne Light Company, Comcast Business
 22 Communications LLC, Pennsylvania-American Water Company, the Department of
 23 Mobility and Infrastructure from the City of Pittsburgh, and the Port Authority of

¹⁵ Joint Petition for Settlement, III.H.6.

1 Allegheny County (“PAT”). PWSA also participates in the “Coordinate PA” System,
2 which is a communication network that facilitates notification and coordination of utility
3 owners, designers, excavators, project owners, and facility owners to improve
4 collaboration on planning and construction activities within the ROW.

5 **G. Minimum Warranty**

6 **Q. PLEASE DESCRIBE PWSA’S OBLIGATION UNDER THE SETTLEMENT**
7 **REGARDING ITS MINIMUM WARRANTY.**

8 A. PWSA agreed as part of the Settlement to revise its minimum warranty on workmanship
9 and material on lead service line replacements to comply with the industry-wide standard
10 that the Commission is expected to establish pursuant to Act 120 of 2018.¹⁶

11 **Q. HAS THE COMMISSION ESTABLISHED THIS INDUSTRY-WIDE**
12 **STANDARD?**

13 A. No. However, as I noted earlier, the Commission has initiated the rulemaking to
14 implement Act 120. The Commission’s proposal is to require an entity to provide a
15 warranty term of not less than two years.¹⁷

16 **IV. CONCLUSION**

17 **Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?**

18 A. Yes; however, I do reserve the right to supplement this testimony as may be appropriate.

¹⁶ Joint Petition for Settlement, III.H.7. *See Implementation of Act 120 of 2018*, Docket No. M-2019-3013286 (Order entered November 1, 2019), at 4-5.

¹⁷ This proposal is in Section 66.38(e) of the proposed regulations.

VERIFICATION

I, Barry King, hereby state that: (1) I am the Director of Engineering for The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Dated 03/22/2021 | 9:28 AM PDT

DocuSigned by:
Barry King
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Barry King
Director of Engineering
The Pittsburgh Water and Sewer Authority

Exhibit BK-1

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

In The Matter Of:

Pittsburgh Water and Sewer Authority	:	Violations of the Pennsylvania Safe
Penn Liberty Plaza 1	:	Drinking Water Act and the Rules and
1200 Penn Avenue	:	Regulations Promulgated Pursuant Thereto
Pittsburgh, PA 15222	:	

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement is entered into this 12th day of SEPTEMBER 2019, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection (“Department”) and the Pittsburgh Water and Sewer Authority (“PWSA”).

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Pennsylvania Safe Drinking Water Act, Act of May 1, 1984, P.L. 206, *as amended*, 35 P.S. §§ 721.1-721.17 (“Safe Drinking Water Act”); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended*, 71 P.S. § 510–17 (“Administrative Code”); and the rules and regulations promulgated thereunder (“Regulations”).

B. PWSA is a municipal authority with a business address of Penn Liberty Plaza 1, 1200 Penn Avenue, Pittsburgh, Pennsylvania 15222. PWSA is a “person,” a “supplier of water” and a “public water supplier,” as those terms are defined in Section 3 of the Safe Drinking Water Act, 35 P.S. § 721.3, and Section 1 of the Regulations, 25 Pa. Code § 109.1.

C. PWSA leases, operates and is the permittee of a “public water system” and, more specifically, a “community water system,” as those terms are defined in Section 3 of the Safe Drinking Water Act, 35 P. S. § 721.3, and Section 1 of the Regulations, 25 Pa. Code § 109.1.

PWSA's public water system consists of water sources, a clearwell and other storage facilities, treatment facilities and a distribution system (collectively, the "System"). PWSA provides drinking water through the System to approximately 520,000 people in the Pittsburgh, Pennsylvania area, including approximately 250,000 residential customers. PWSA operates the System pursuant to multiple public water supply permits issued by the Department and has been assigned Public Water System Identification Number 5020038. The City of Pittsburgh owns the System and leases it to PWSA.

D. Section 4(3) of the Regulations, 25 Pa. Code § 109.4(3), requires public water suppliers to provide and effectively operate and maintain public water system facilities. Section 4(4) of the Regulations, 25 Pa. Code § 109.4(4), requires public water suppliers to take whatever investigative or corrective action is necessary to assure that safe and potable water is continuously supplied to the users of the public water system.

E. PWSA uses a clearwell constructed in approximately 1908 for storage of filtered water prior to the introduction of the water into PWSA's distribution system. In 1998, PWSA contracted Marion Hill Associates to conduct an inspection of the clearwell. The 1998 clearwell inspection found that the structural stability of the clearwell was good overall, but identified several areas of concern including, but not limited to: excessive amounts of sediment that prohibited inspection of the bottom of the tank; debris; infiltrating tree roots; signs of erosion, deterioration and cracks in the concrete walls; leaks in the clearwell equalization chamber; and considerable amounts of rust on the gates for the clearwell and gatehouse, which could make them unmovable. The consultant concluded that the clearwell did not meet current design standards for public water supply finished water storage.

F. PWSA subsequently hired consultants HDR Engineering, Inc. and Malcom Pirnie, Inc. to provide separate but concurrent evaluations and recommendations regarding the clearwell. In November 2008, HDR Engineering, Inc. provided a report to PWSA titled "Pittsburgh Water Treatment Plant Clearwell Improvements, Phase 1- Study". The purpose of the report was to identify available alternatives to address "PWSA's desires to have a clearwell system with the operational flexibility of being able to remove approximately one half of the clearwell from service for cleaning and maintenance while the other half remains in service; and to have the ability to bypass the clearwell and send filtered water directly to the Bruecken Pump Station in emergency situations." In December 2008, Malcom Pirnie, Inc. provided a report to PWSA titled "Clearwell Improvements Phase 1-Study", which also addressed PWSA's expressed need for operational flexibility with the clearwell. Both reports identified viable alternative options and provided cost estimates to PWSA to address the condition of the clearwell as well as the desired operational flexibility.

G. In March 2017, consultant Mott McDonald submitted another report to PWSA entitled "Alternative Evaluation-Clearwell Redundancy Project", which identified additional viable options to remedy the inflexibility of the clearwell with cost estimates.

H. During a three-day inspection in late April 2017, the Department discovered that two access hatches on the clearwell were open and several other hatches were in disrepair, creating possible pathways of surface contamination. The Department required PWSA to take immediate action to secure the manholes on the clearwell with temporary covers. On May 1, 2017, the Department issued a Field Order citing PWSA for failing to effectively operate and maintain its public water facilities and failing to take investigative and corrective action necessary to ensure that safe and potable water is continuously supplied to the users of its system

by, among other things, not adequately responding to the 1998 Marion Hill Associates clearwell inspection report, in violation of 25 Pa. Code §§ 109.4(3) and 109.4(4). In the Field Order, the Department directed PWSA to increase its free chlorine residual, install additional protective and monitoring equipment on the clearwell, and conduct additional monitoring and testing of the clearwell.

I. The violations described in Paragraph H, above, constitute a public nuisance under Section 12 of the Safe Drinking Water Act, 35 P.S. § 721.12, and subject PWSA to a claim for civil penalties under Section 13(g) of the Safe Drinking Water Act, 35 P.S. § 721.13(g).

J. On October 25, 2017, the Department issued an Administrative Order to PWSA directing the Authority to undertake a number of actions including, among other things: to provide to the Department a detailed schedule for the completion of certain longer-term capital improvement projects identified by PWSA to the Department. Two of the identified capital improvement projects were the “Clearwell Emergency Response Project” and the “Washout Disconnection Program”.

K. Pursuant to Section 109.608 of the Regulations, 25 Pa. Code § 109.608, a public water system may not be designed or constructed in a manner which creates a cross-connection. A “cross-connection” is defined in 25 Pa. Code § 109.1 as “[a]n arrangement allowing either a direct or indirect connection through which backflow, including backsiphonage, can occur between the drinking water in a public water system and a system containing a source or potential source of contamination, or allowing treated water to be removed from any public water system, used for any purpose or routed through any device or pipes outside the public water system, and returned to the public water system. The term does not include connections to devices totally within the control of one or more public water systems and connections between

water mains.” A “washout”, as referred to in PWSA’s planned “Washout Disconnection Program”, is a connection between the public water system distribution components and the storm or sanitary sewerage systems utilized for flushing these lines and may indicate the presence of a cross-connection within the public water system. Cross-connections pose a potential threat to public health.

After full and complete negotiation of all matters set forth in this Consent Order and Agreement and upon mutual exchange of covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by PWSA as follows:

1. Authority. This Consent Order and Agreement is an Order of the Department authorized and issued pursuant to Section 5 of the Safe Drinking Water Act, 35 P.S. § 721.5; and Section 1917-A of the Administrative Code, 71 P.S. § 510-17.

2. Findings.

a. PWSA agrees that the findings in Paragraphs A through K are true and correct and, in any matter or proceeding involving PWSA and the Department, PWSA shall not challenge the accuracy or validity of these findings.

b. The parties do not authorize any other persons to use the findings in this Consent Order and Agreement in any matter or proceeding.

3. Corrective Action. PWSA shall complete the following actions in accordance with the following schedule:

Clearwell and Related Projects

a. On or before January 1, 2023, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit for a bypass system that

will enable PWSA to remove the clearwell from service and replace it. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

b. Within two (2) years of the Department's issuance of a construction permit authorizing construction of a clearwell bypass system, PWSA shall complete construction of the bypass system in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of Construction/Modification Completion" form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA's construction of the bypass system, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

c. To facilitate the clearwell bypass system, PWSA shall rehabilitate or replace Rising Main #3 to PWSA's Highland 2 Reservoir as follows:

(i) On or before September 1, 2020, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit to rehabilitate Rising Main #3;

OR

(ii) On or before March 1, 2021, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit to replace Rising Main #3.

In the event the Department makes a written request to PWSA to supplement or modify an application submitted pursuant to Paragraph 3.c.(i) or 3.c.(ii), above, PWSA shall supplement or modify its application as requested by the Department within the time requested.

d. Within one (1) year of the Department's issuance of a construction permit authorizing the rehabilitation or replacement of Rising Main #3, PWSA shall complete the authorized work in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of Construction/Modification Completion" form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA's rehabilitation or replacement of Rising Main #3, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

e. On or before June 1, 2021, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit to rehabilitate or replace Rising Main #4 to PWSA's Highland 2 Reservoir to facilitate the clearwell bypass system. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

f. Within two (2) years of the Department's issuance of a construction permit authorizing the rehabilitation or replacement of Rising Main #4, PWSA shall complete the authorized work in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of Construction/Modification Completion" form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA's rehabilitation

or replacement of Rising Main #4, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

g. On or before December 30, 2020, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit for a new redundant rising main from the Aspinwall Pump Station to the Lanpher Reservoir to facilitate the clearwell bypass system. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

h. Within two (2) years of the Department's issuance of a construction permit authorizing the construction of a new redundant rising main from the Aspinwall Pump Station to the Lanpher Reservoir, PWSA shall complete construction of the rising main in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of Construction/Modification Completion" form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA's construction of the redundant rising main, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

i. On or before June 30, 2020, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit to replace the cover and liner of the Highland 2 Reservoir to facilitate the clearwell bypass system. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

j. Within eighteen (18) months of the Department's issuance of a construction permit authorizing the replacement of the cover and liner of the Highland 2 Reservoir, PWSA shall replace the cover and liner in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of Construction/Modification Completion" form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA's replacement of the cover and/or liner, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

k. On or before January 1, 2021, to facilitate the clearwell bypass system, PWSA shall submit to the Department:

(i) A complete and technically sufficient application for a combined pump station to replace the existing Aspinwall and Breucken pump stations;

OR

(ii) Complete and technically sufficient applications for rehabilitation of the existing Aspinwall and Breucken pump stations.

In the event the Department makes a written request to PWSA to supplement or modify the application(s), PWSA shall supplement or modify its application(s) as requested by the Department within the time requested.

l. Within two (2) years of the Department's issuance of a construction permit authorizing PWSA to conduct a project under either Paragraph 3.k.(i) or 3.k.(ii), above, PWSA shall complete the authorized work in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed "Certificate of

Construction/Modification Completion” form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA’s replacement or rehabilitation of the Aspinwall and Bruecken pump stations, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

m. On or before January 1, 2024, PWSA shall submit to the Department a complete and technically sufficient application for a construction permit to replace the clearwell. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

n. Within two (2) years of the Department’s issuance of a construction permit authorizing the replacement of the clearwell, PWSA shall complete the authorized work in accordance with the terms and conditions of the permit and shall submit to the Department an original, signed “Certificate of Construction/Modification Completion” form (certification of construction) that meets the requirements of 25 Pa. Code § 109.504(a). In the event the Department notifies PWSA in writing of any deficiencies in PWSA’s replacement of the clearwell, PWSA shall correct the deficiencies as requested by the Department within the time requested and submit a new certification of construction.

o. No later than thirty (30) days after the date of the Department’s issuance of an operation permit authorizing the operation of the new clearwell, PWSA shall begin operating the clearwell in accordance with the permit.

p. For as long as PWSA continues to operate the existing clearwell, PWSA shall continue to monitor turbidity, temperature, pH, log inactivation values and specific

conductance from the clearwell effluent, and NOAA precipitation values, as required by the Field Order issued by the Department on May 1, 2017. PWSA shall maintain the monitoring records on-site. PWSA shall notify the Department within one (1) hour if any turbidity reading from the clearwell effluent exceeds 1.0 NTU.

Cross-connections

q. On or before June 1, 2020, PWSA shall complete an investigation of the locations where valves, blow-offs, meters or other such appurtenances to the distribution system are found within chambers, pits or manholes connected directly or indirectly to any storm drain or sanitary sewer (commonly referred to by PWSA as “washouts”) and submit to the Department a report detailing the findings including the number and locations of all such cross-connections within PWSA’s System.

r. Within ninety (90) days of PWSA’s submission of the report required under Paragraph 3.q., above, PWSA shall submit to the Department a plan and proposed schedule to eliminate all of the identified cross-connections and a written request for a determination by the Department as to whether the requested modification to eliminate each cross-connection identified in the report constitutes a major or minor change.

s. For any modification the Department determines to require a permit, PWSA shall submit a complete and technically sufficient application to the Department for a construction permit within sixty (60) days of the date the Department’s written determination is issued to PWSA. In the event the Department makes a written request to PWSA to supplement or modify the application, PWSA shall supplement or modify its application as requested by the Department within the time requested.

t. In accordance with the plan and schedule required under Paragraph 3.r., above, as approved or as modified and approved by the Department, PWSA shall complete the elimination of all identified cross-connections and shall submit to the Department within ninety (90) days of completion a report confirming the elimination of all previously existing cross-connections with confirmatory photographs, dates and details of the corrective work performed.

4. Stipulated Civil Penalties.

a. In the event PWSA fails to comply in a timely manner with any term or provision of this Consent Order and Agreement, PWSA shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty in the amount of One Hundred Dollars (\$100.00) per day for each violation.

b. Stipulated civil penalty payments shall be payable monthly on or before the fifteenth day of each succeeding month. The payment shall be made by corporate check or the like made payable to the "Commonwealth of Pennsylvania – Safe Drinking Water Fund" and sent to Renee Diehl, Program Manager, Safe Drinking Water Program, Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh, PA 15222-4745.

c. Any payment under this paragraph shall neither waive PWSA's duty to meet its obligations under this Consent Order and Agreement nor preclude the Department from commencing an action to compel PWSA's compliance with the terms and conditions of this Consent Order and Agreement. The payment resolves only PWSA's liability for civil penalties arising from the violation of this Consent Order and Agreement for which the payment is made.

d. Stipulated civil penalties shall be due automatically and without notice.

5. Additional Remedies.

a. In the event PWSA fails to comply with any provision of this Consent Order and Agreement, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this Consent Order and Agreement.

b. The remedies provided by this paragraph and Paragraph 4 (Stipulated Civil Penalties) are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy. The payment of a stipulated civil penalty, however, shall preclude any further assessment of civil penalties for the violation for which the stipulated penalty is paid.

6. Reservation of Rights. The Department reserves the right to require additional measures to achieve compliance with applicable law. PWSA reserves the right to challenge any action which the Department may take to require those measures.

7. Liability of PWSA. PWSA shall be liable for any violations of the Consent Order and Agreement, including those caused by, contributed to, or allowed by its officers, agents, employees, consultants or contractors. Except as provided in Paragraph 8.c., PWSA also shall be liable for any violation of this Consent Order and Agreement caused by, contributed to, or allowed by its successors and assigns.

8. Transfer of Site.

a. The duties and obligations under this Consent Order and Agreement shall not be modified, diminished, terminated or otherwise altered by the transfer of any legal or equitable interest in the PWSA public water system or any part thereof.

b. If PWSA intends to transfer any legal or equitable interest in the PWSA public water system which is affected by this Consent Order and Agreement, PWSA shall serve a copy of this Consent Order and Agreement upon the prospective transferee of the legal and equitable interest at least thirty (30) days prior to the contemplated transfer and shall simultaneously inform the Southwest Regional Office of the Department of such intent.

c. The Department in its sole discretion may agree to modify or terminate PWSA's duties and obligations under this Consent Order and Agreement upon transfer of the PWSA System or any part thereof. PWSA waives any right that it may have to challenge the Department's decision in this regard.

9. Correspondence with Department. All correspondence with the Department concerning this Consent Order and Agreement shall be addressed to:

Renee Diehl, Program Manager
Safe Drinking Water Program
Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, Pennsylvania 15222-4745
Telephone: 412.442.4210 Facsimile: 412.442.4242

10. Correspondence with PWSA. All correspondence with PWSA concerning this Consent Order and Agreement shall be addressed to:

Robert Weimar, Executive Director
Pittsburgh Water and Sewer Authority
Penn Liberty Plaza 1
1200 Penn Avenue
Pittsburgh, PA 15222
Telephone: 412.255.2579

PWSA shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this Consent

Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above address.

11. Force Majeure.

a. In the event that PWSA is prevented from complying in a timely manner with any time limit imposed in this Consent Order and Agreement solely because of a strike, fire, flood, act of God, or other circumstance beyond PWSA's control and which PWSA, by the exercise of all reasonable diligence, is unable to prevent, then PWSA may petition the Department for an extension of time. An increase in the cost of performing the obligations set forth in this Consent Order and Agreement shall not constitute circumstances beyond PWSA's control. PWSA's economic inability to comply with any of the obligations of this Consent Order and Agreement shall not be grounds for any extension of time.

b. PWSA shall only be entitled to the benefits of this paragraph if PWSA notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, as well as a notarized affidavit from an authorized individual specifying the reasons for the delay, the expected duration of the delay, and the efforts which have been made and are being made by PWSA to mitigate the effects of the event and to minimize the length of the delay. The initial written submission may be supplemented within ten (10) working days of its submission. PWSA's failure to comply with the requirements of this paragraph specifically and in a timely fashion shall render this paragraph null and of no effect as to the particular incident involved.

c. The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by PWSA and other information available

to the Department. In any subsequent litigation, PWSA shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information then available to it.

12. Severability. The paragraphs of this Consent Order and Agreement shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

13. Entire Agreement. This Consent Order and Agreement shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or extent of any provisions herein in any litigation or any other proceeding.

14. Attorney Fees. The parties shall bear their respective attorney fees, expenses and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this Consent Order and Agreement.

15. Modifications. No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

16. Titles. A title used at the beginning of any paragraph of this Consent Order and Agreement may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

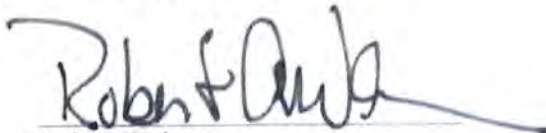
17. Decisions Under Consent Order. Any decision which the Department makes under the provisions of this Consent Order and Agreement, including a notice that stipulated civil penalties are due, is intended to be neither a final action under 25 Pa. Code § 1021.2, nor an

adjudication under 2 Pa. C.S. § 101. Any objection which PWSA may have to the decision will be preserved until the Department enforces this Consent Order and Agreement.

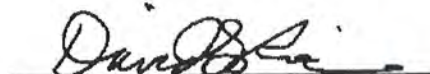
18. Resolution. Attached hereto as Appendix A is a resolution of the Board of PWSA authorizing its signatories below to enter into this Consent Order and Agreement on its behalf.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of PWSA certify under penalty of law, as provided by 18 Pa. C.S. § 4904, that they are authorized to execute this Consent Order and Agreement on behalf of PWSA; that PWSA consents to the entry of this Consent Order and Agreement as a final ORDER of the Department; and that PWSA hereby knowingly waives its right to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, Act of July 13, 1988, P.L. 530, 35 P.S. § 7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a) and Chapters 5A and 7A; or any other provisions of law. Signature by PWSA's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR PITTSBURGH WATER AND SEWER AUTHORITY:



Robert Weimar
Executive Director
Pittsburgh Water and Sewer Authority



David Ries
Attorney for Pittsburgh Water and Sewer Authority

FOR THE COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION:



Rence Diehl
Environmental Program Manager
Bureau of Safe Drinking Water



Gail Guenther
Assistant Counsel
Southwest Office of Chief Counsel

Exhibit BK-2

May 13, 2020

CERTIFIED MAIL NO.

Robert Weimar, Executive Director
Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, PA 15222

Re: Consent Order and Agreements dated November 17, 2017 and September 9, 2019
Extension Request
PWS ID No. 5020038
Allegheny County

Dear Mr. Weimar:

On April 8, 2020, the Department received a request from the Pittsburgh Water and Sewer Authority (PWSA), for an extension of time to complete the following tasks:

November 17, 2017 Consent Order and Agreement

Paragraph 3.c.iii - requiring all monies held aside for the Community Environmental Project to be spent within three years of the execution date of the COA, or by November 16, 2020.

September 6, 2019 Consent Order and Agreement

Paragraph 3.c.i - requiring PWSA must submit a construction permit application for the rehabilitation of Rising Main #3 on or before September 1, 2020.

Paragraph 3.g – requiring submission of a construction permit application for the Aspinwall Pump Station to Lanpher Reservoir Rising main on or before December 30, 2020.

Paragraph 3.k.ii – requiring submission of a construction permit application for the rehabilitation of the existing Aspinwall and Breucken pump stations on or before January 1, 2021.

Paragraph 3.q – requiring completion of investigation of the locations where valves, blow-offs, meters or other appurtenances are directly or indirectly connected to storm drains or sanitary sewers by June 1, 2020.

In response to this request, the Department will exercise its enforcement discretion to allow an **additional 90 days** for PWSA to comply with the provisions of the specific paragraphs listed above of DEP's November 17, 2017 Consent Order and Agreement and September 9, 2019 Consent Order and Agreement. All other requirements and deadlines of the November 17, 2017 Consent Order and Agreement and the September 9, 2019 Consent Order and Agreement remain unchanged.

May 13, 2020

Provided that PWSA complies with the new corrective action deadlines stated above, the Department will exercise its enforcement discretion to forego the collection of stipulated civil penalties otherwise due under the terms of the COAs. If, however, PWSA fails to satisfactorily complete the corrective action obligations required under the provisions listed above in accordance with the new deadlines, then the Department will assess civil penalties beginning from the new deadlines until such time as PWSA complies in full with these obligations under the November 17, 2017 Consent Order and Agreement and the September 9, 2019 Consent Order and Agreement.

Sincerely,

A handwritten signature in cursive script, appearing to read "Renee L. Diehl".

Renee L. Diehl
Environmental Group Manager
Safe Drinking Water Program

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

JULIE A. QUIGLEY

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024773 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:

Compliance Plan Stage 2
Customer Service and Collections Update
Impact of Rate Request on Future Affordability
Public Notice of Rate Filing (Including Stormwater Fee)
Low Income Customer Assistance Program Enhancements
Stormwater Service Customer Service Issues
Tariff Revisions (Including Fee Revisions & Line Extensions)

April 13, 2021

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JAQ-2	PWSA At-Risk Accounts Comparing Q1 2020 with Q1 2021
JAQ-3	Proposed Water Tariff Supplement No. 7 (clean)
JAQ-4	Proposed Water Tariff Supplement No. 7 (red-lined)
JAQ-5	Proposed Wastewater Tariff Supplement No. 6 (clean)
JAQ-6	Proposed Wastewater Tariff Supplement No. 6 (red-lined)

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND CURRENT POSITION WITH PWSA.**

3 A. My name is Julie A. Quigley. My position with The Pittsburgh Water and Sewer
4 Authority (“PWSA” or “Authority”) is Director of Customer Service.

5 **Q. HOW LONG HAVE YOU HELD THIS POSITION?**

6 A. Although my title changed in 2021, I have held this current position for over three years.
7 Previously, I was an employee of PWSA for 22 years. I left for a job opportunity in the
8 private sector from 2011 through 2017.

9 **Q. WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES?**

10 A. In my current position, I am responsible for oversight and management of the Customer
11 Service department; including the day to day operations of AMI and Billing, Collections,
12 Contact Center, Emergency Dispatch, Legal, Permits, PUC Compliance, and Quality
13 Control. I also coordinate inter- and intra-departmental initiatives and innovative
14 partnerships with third party providers.

15 **Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.**

16 A. I obtained a Bachelor of Arts degree at Duquesne University, and I have over 30 years of
17 utility billing experience. My initial role at PWSA was entry level while in college.
18 When I left employment in 2011, I was PWSA’s Customer Services Manager. In the
19 private sector, I processed electronic Earned Income Tax (“EIT”) employer filings. I
20 then designed, developed, launched, and managed monthly/quarterly sewage treatment,
21 stormwater, and refuse billing and collection for 24 municipalities with less than 10
22 employees.

1 **Q. HAVE YOU EVER PROVIDED TESTIMONY BEFORE THIS COMMISSION?**

2 A. Yes. I submitted written Direct and Rebuttal testimony in PWSA’s Initial Tariff and Rate
 3 Case at Docket Numbers R-2018-3002645 (water) and R-2018-3002647 (wastewater). I
 4 also submitted written Direct, Supplemental Direct and Rebuttal testimony in PWSA’s
 5 combined Compliance Plan Stage 1 and Long-Term Infrastructure Improvement Plan
 6 (“LTIIIP”) proceeding at Docket Numbers M-2018-2640802 (water), M-2018-2640803
 7 (wastewater), P-2018-3005037 (water) and P-2018-3005039 (wastewater). I also
 8 submitted written Direct, Supplemental Direct, Rebuttal and Rejoinder Testimony in
 9 support of PWSA’s most recent base rate proceeding at Docket Numbers R-2020-
 10 3017951 (water) and R-2020-3017970 (wastewater).

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

12 A. The purpose of my testimony is to:

- 13 • Provide an update regarding the Compliance Plan Stage 2 and its impact on this
 14 rate case;
- 15 • update the current status of PWSA’s customer service and collections issues,
 16 including the impact of the COVID-19 pandemic;
- 17 • discuss PWSA’s analysis of the impact of the proposed rate increase on future
 18 affordability to include proposed phase-in and other mitigation measures;
- 19 • discuss PWSA’s low income customer assistance programs to include a
 20 description of numerous previous settlement commitments and an explanation of
 21 the execution of those agreed upon enhancements to the programs;
- 22 • discuss proposed customer service issues as they relate to future stormwater
 23 service, including notice of rate case filing to potential new stormwater only
 24 customers, bill presentment, appeal process for stormwater customers to challenge
 25 impervious area designation, and PWSA’s options for unpaid stormwater fees;
 26 and
- 27 • describe proposed tariff revisions including changes to the current wastewater
 28 tariff to recognize new stormwater tariff, explanation of revised fees, explanation
 29 of changes necessitated due to PWSA’s recently filed supplemental compliance
 30 plan regarding line extensions, and proposed new program to provide a one-time
 31 credit for new enrollees in the auto-pay option of PWSA’s eBilling offering.

1 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

2 A. Yes. I am sponsoring the following exhibits:

JAQ-1	After Call Survey data analysis for the first quarter of 2021
JAQ-2	PWSA At-Risk Accounts Comparing Q1 2020 with Q1 2021
JAQ-3	Proposed Water Tariff Supplement No. 7 (clean)
JAQ-4	Proposed Water Tariff Supplement No. 7 (red-lined)
JAQ-5	Proposed Wastewater Tariff Supplement No. 6 (clean)
JAQ-6	Proposed Wastewater Tariff Supplement No. 6 (red-lined)

3

4 **II. COMPLIANCE PLAN STAGE 2**

5 **Q. IS THERE A CURRENTLY PENDING COMMISSION PROCEEDING**
 6 **REVIEWING PWSA’S CUSTOMER SERVICE AND COLLECTIONS PLAN?**

7 A. Yes. Pursuant to 66 Pa. C.S. § 3204(c) and Commission directives, PWSA filed a
 8 Compliance Plan on September 28, 2018.¹ Subsequently, the Commission, established
 9 two stages of review for PWSA’s Compliance Plan.² On February 4, 2021, the
 10 Commission directed the Stage 2 process to commence with the directive to PWSA to file
 11 its Compliance Plan Stage 2 documents within 60 days of entry date of the order.³ Stage
 12 2 includes:

- 13 • PWSA Compliance with Chapter 14 of the Public Utility Code and Chapter 56 of
 14 the Commission’s regulations;
- 15 • PWSA’s compliance with the Discontinuance of Service to Leased Premises Act
 16 (“DSLPA”), 66 Pa.C.S. §§ 1521-1533;

¹ *Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water and Sewer Authority*, Docket No. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Final Implementation Order entered March 15, 2018 (“Final Chapter 32 Implementation Order”).

² Assignment of the Pittsburgh Water and Sewer Authority Compliance Plan to the Office of Administrative Law Judge, Docket No. M-2018-2640802 (water) and M-2018-2640803 (wastewater), dated November 28, 2018 Corrected (“November 28, 2018 Secretarial Letter”).

³ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Opinion and Order entered February 4, 2021 (“Stage 1 February 4, 2021 Order”).

- 1 • PWSA’s plan for collections (to include strategies to reduce overall uncollectibles
- 2 and to ensure collections practices for residential customers are consistent with
- 3 legal requirements);⁴ and,
- 4 • Stormwater service.⁵

5 **Q. DID PWSA FILE ITS STAGE 2 COMPLIANCE PLAN AS DIRECTED?**

6 A. Yes. On April 9, 2021,⁶ PWSA filed two documents in compliance with the *Stage 1*
 7 *February 4, 2021 Order*: (1) Stage 2 Compliance Plan: Chapters 14 & 56, DSLPA and
 8 Collections; and, (2) Stage 2 Compliance Plan: Stormwater.

9 **Q. WHAT IS THE COMMISSION’S CURRENT PLAN FOR PROCESSING PWSA’S**
 10 **STAGE 2 COMPLIANCE PLANS?**

11 A. According to the *Stage 1 February 4, 2021 Order*, with the filing of PWSA’s Stage 2
 12 Compliance Plans on April 9, 2021, interested stakeholders are required to file comments
 13 on April 29, 2020 (20 days from PWSA’s filing). No later than May 24, 2021, the
 14 Commission will, via Secretarial Letter: (1) provide Commission Staff Stage 2 Reports
 15 and Directed Questions; and, (2) assign the Stage 2 Compliance Plans to the Office of
 16 Administrative Law Judge (“OALJ”) for the resolution of “any matters that PWSA or
 17 interested parties seek to develop.”⁷ The Commission has directed that the OALJ issue a
 18 recommended decision on the matters raised in Stage 2 no later than nine months from
 19 the date of assignment of the Stage 2 Compliance Plans to the OALJ.⁸ As such, the

⁴ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Secretarial Letter dated May 15, 2019.

⁵ *Stage 1 February 4, 2021 Order*, Ordering Paragraph 3 at 66.

⁶ On March 23, 2021, the Commission issued a Secretarial Letter granting PWSA an extension of time until April 9, 2021 to file the Stage 2 Compliance Plans.

⁷ *Stage 1 February 4, 2021 Order* at 64 citing *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 2 (Timeline)*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Opinion and Order entered June 18, 2020. (“January 24, 2020 Stage 2 Timeline Secretarial Letter”).

⁸ *January 24, 2020 Stage 2 Timeline Secretarial Letter*.

1 currently anticipated date for an OALJ recommended decision regarding PWSA’s Stage
 2 Compliance Plans is February 24, 2022.

3 **A. PWSA Proposed Procedural Process for Stage 2 Compliance Plan Customer**
 4 **Issues**

5 **Q. HAS PWSA REQUESTED THAT THE COMMISSION REVISE THE**
 6 **PROCEDURAL PROCESS FOR REVIEW OF STAGE 2 COMPLIANCE PLAN**
 7 **CUSTOMER SERVICE ISSUES?**

8 A. Yes. PWSA filed a Petition for Amendment of the Commission’s February 4, 2021 Final
 9 Order on April 9, 2021 requesting that the Commission revise its proposed procedural
 10 schedule to incorporate a period of time for discovery and another workshop to foster
 11 productive communication and understanding among PWSA, staff, and interested parties
 12 prior to the filing of comments from interested stakeholders.

13 **Q. WHY DID PWSA PROPOSE A REVISED PROCESS FOR COMMISSION**
 14 **REVIEW OF ITS STAGE 2 COMPLIANCE PLAN CUSTOMER SERVICE**
 15 **ISSUES?**

16 A. The purpose of the request is to enable the parties and Commission staff time to review
 17 PWSA’s Stage 2 Compliance Plan, engage in informal discovery with PWSA, and
 18 identify issues that could benefit from further discussion among the parties and
 19 Commission staff. In PWSA’s experience, this iterative process is an effective way to
 20 ensure a better understanding of PWSA’s procedures as well as the expectations of
 21 Commission staff and stakeholders regarding PWSA. With a more informed
 22 understanding, interested stakeholders will be able to prepare more useful comments for
 23 the Commission’s consideration. Also, PWSA has been operating under the
 24 Commission’s jurisdiction for three full years now, has litigated three proceedings
 25 involving its operations (two rate cases as well as the Compliance Plan Stage 1
 26 proceeding), and has been processing both formal and informal customer complaints

1 during this time. This experience has well exposed Commission staff and stakeholders to
 2 PWSA's customer service processes and the various evolutions in those processes.
 3 Because these issues have been the subject of considerable discussion by the Commission
 4 and the parties, PWSA believes that its iterative procedural process to work through
 5 compliance issues would be an efficient and effective way to proceed.

6 **Q. WHAT IS PWSA PROPOSING AFTER A PERIOD OF DISCOVERY,**
 7 **WORKSHOPS AND STAKEHOLDER COMMENTS?**

8 A. PWSA proposes that a period of time for informal discovery and workshops be
 9 established as the next procedural step. After conclusion of that time period, comments
 10 could be submitted and then the Commission would issue an order detailing the results of
 11 its initial review of PWSA's Stage 2 Compliance Plan regarding Customer Service
 12 issues. While PWSA recognizes the Commission retains ultimate discretion regarding the
 13 scope of that order, in PWSA's view, the order can seek additional information from
 14 PWSA and provide another comment period (or further workshops) for stakeholders
 15 upon receipt of that information (similar to the process used by the Commission during
 16 the review of a universal service plan). The order could also identify specific areas in
 17 which the Commission tentatively concludes that PWSA is or is not in compliance.
 18 PWSA could be provided with the opportunity to detail how it will come into compliance
 19 without the need to refer the issue to the OALJ. Finally, the order can detail specific
 20 areas that the Commission has determined would be best addressed through the OALJ
 21 process. In PWSA's view, this process presents an efficient manner in which to proceed
 22 that enables PWSA, the Commission and interested stakeholders to work through
 23 compliance issues in an orderly, timely and efficient way.

1 **Q. IS PWSA PROPOSING TO ADDRESS ANY OF THE STAGE 1 COMPLIANCE**
 2 **PLAN CUSTOMER SERVICE ISSUES IN THIS RATE CASE?**

3 A. No. While I will provide updates regarding the current status of various customer service
 4 issues and PWSA’s collections, particularly in light of the current pandemic, I am
 5 advised by counsel that issues related to PWSA’s compliance with the above listed
 6 customer service issues reserved for the Stage 2 process will be addressed in that
 7 proceeding. PWSA’s continued growth and expansion in processes and procedures
 8 related to customer service and collections are important to understand in this proceeding
 9 because they are a factor of supporting PWSA’s requested rate increase.

10 **B. PWSA Proposed Procedural Process for Stage 2 Compliance Plan Stormwater**
 11 **Issues**

12 **Q. HAS PWSA REQUESTED THAT THE COMMISSION REVISE THE**
 13 **PROCEDURAL PROCESS FOR REVIEW OF STAGE 2 STORMWATER**
 14 **ISSUES?**

15 A. Yes. As explained more fully in the testimony of Mr. Igwe, PWSA is simultaneously
 16 with this rate case filing a Motion to Hold in Abeyance the Stage 2 Compliance Plan for
 17 Stormwater until after a final order is issued in this case.

18 **III. CUSTOMER SERVICE AND COLLECTIONS UPDATES**

19 **A. Customer Service Expansions**

20 **Q. HAS PWSA CONTINUED TO EXPAND ITS CUSTOMER SERVICE**
 21 **OPERATIONS SINCE LAST YEAR’S RATE CASE?**

22 A. Yes. PWSA’s commitment to improving customer service and ensuring that the
 23 processes and procedures necessary to support such improvement are in place has not
 24 wavered. Even during the difficulties presented by the pandemic, we have been able to
 25 expand our operations in this area and really focus on developing the staffing,
 26 engagement of our low income customers, and customers’ satisfaction with our service

1 and product, all necessary steps to fulfill our goals of delivering superior service to our
2 customers.

3 **Q. HOW HAS CUSTOMER SERVICE EXPANDED TO BETTER SUPPORT FIELD**
4 **OPERATIONS?**

5 A. Customer Service at PWSA has expanded to include a Quality Control Manager, whose
6 primary responsibilities are: 1) to evaluate the performance of employees working to
7 record corrective and preventative maintenance on horizontal and vertical assets of the
8 Authority in the SpryMobile Work Orders and Asset Management application; 2) provide
9 training and follow-up monitoring to ensure improved consistency and accuracy in data
10 entries; and 3) continue to build out the app with updates to work orders, workflows, and
11 additional assets such as those at the Water Treatment Plant. The Manager is recognizing
12 employee development needs, providing coaching, and arranging on the job site training
13 to promote quality control measures. Further, the Manager will be working with Field
14 Operations management personnel to produce Standard Operating Procedures to
15 document all field processes. To support the Manager in this new role, PWSA has
16 created the SpryMobile Change Control Board, the purpose of which is to review and
17 approve planned changes in the app. The Control Board will work to ensure that they
18 consider whether there are any unintended consequences to suggesting changes, ensure
19 the data being collected can be used effectively by other teams such as GIS, and to think
20 through the training and communication needed for field staff to ensure consistency in
21 app entries.⁹

⁹ Continued improvements regarding the SpryMobile Work orders and Asset management system is an important part of improving PWSA's data collection. Recent improvements will enable PWSA to satisfy its most recent rate case settlement commitments to assist parties in identifying water, sanitary sewer (which includes the combined system), and stormwater when its field operations staff uses the system. *Rate Case Settlement* at III.H.8.

1 **Q. HOW HAS PWSA EVOLVED ITS CURRENT TEAM FOCUSING ON**
 2 **COMPLIANCE WITH COMMISSION CUSTOMER SERVICE**
 3 **REQUIREMENTS?**

4 A. Our PUC Compliance team has grown to include a Paralegal Supervisor and the launch
 5 of the PGH2O Cares Team. Having the Paralegal Supervisor report to the Senior PUC
 6 Compliance Manager will facilitate the accurate preparation and timely filing of legal
 7 documents in response to Commission deadlines, streamline the Formal Complaint
 8 response process at PWSA, including the tracking of reports to Mediators, guarantee
 9 timely filing of monthly and annual Commission reporting requirements, and oversee the
 10 filing of municipal liens to allow PWSA to collect unpaid charges through this non-
 11 Commission regulated collections tool.

12 **Q. PLEASE PROVIDE MORE INFORMATION ABOUT THE PGH20 CARES**
 13 **TEAM.**

14 A. Consistent with our Commission approved proposal from the last rate case, PWSA has
 15 created the PGH2O Cares Team comprised of a PGH2O Cares Coordinator and two
 16 Analysts. The Cares team was formed effective February 15, 2021, and I announced the
 17 team members to the Low Income Assistance Advisory Committee during our quarterly
 18 meeting on February 12, 2021. PWSA was able to promote from within to fill the roles
 19 of PGH2O Cares Coordinator and two PGH2O Cares Analysts. These promotions allow
 20 the Cares team to build on their already extensive knowledge of PWSA’s Water and
 21 Wastewater Tariffs, processes, and procedures. The primary responsibility of the team is
 22 to increase enrollment in PWSA’s customer assistance programs. The team will also
 23 track assistance program enrollment numbers, including confirmed low income, will
 24 work with PWSA’s administrator Dollar Energy Fund to enable the Cares team to enroll

1 customers directly, and will develop productive relationships with community based
 2 organizations to engage low income customers who have yet to enroll.

3 **Q. HAVE OTHER ORGANIZATIONAL CHANGES BEEN MADE TO FURTHER**
 4 **SUPPORT PWSA’S CUSTOMER SERVICE OPERATIONS?**

5 A. Yes. PWSA’s in-house Legal department has recently been placed under the guidance of
 6 Customer Service. Overseeing the processing of Right to Know requests, Claims for
 7 Damages, agreement review, contract review, easements, lien filing and responses to
 8 requests for in-house counsel legal opinion and review will allow PWSA to apply its
 9 highest quality service to the Legal department’s internal and external customers. As part
 10 of the on-boarding of the Risk Coordinator and the Corporate Counsel, we are identifying
 11 together where 1) communication touchpoints with internal/external customers should be
 12 inserted, 2) workflows should be developed for immediate refining and inclusion in the
 13 2022 SAP implementation, and 3) support by existing Customer Service personnel can be
 14 provided. At the same time, we are discerning legal metrics that will be tracked and
 15 reported on monthly for inclusion into Headwaters.¹⁰

16 **B. Collections**

17 **Q. HOW HAS THE PANDEMIC IMPACTED PWSA’S ABILITY TO PURSUE**
 18 **COLLECTIONS ACTIVITIES?**

19 A. On March 13, 2020, the Commission establishing a prohibition on the termination of
 20 public utility service and directed the reconnection of service to customers previously
 21 terminated, to the extent it could be done safely, for the duration of Pennsylvania’s

¹⁰ Headwaters was launched in January 2020 to measure PWSA’s performance regarding five specific goals set forth in PWSA’s 2017 “Focusing on the Future” Report including protecting public health and the environment, maintaining a high performing workforce, ensuring customer and stakeholder satisfaction, improving infrastructure reliability, and being an efficient and effective organization. See <https://headwaters.pgh2o.com/#Goals>

1 Proclamation of Disaster Emergency.¹¹ Consistent with the directive of the *Moratorium*
2 *on Terminations Emergency Order*, PWSA ceased all collection activity that threatened
3 termination of water service. Instead, PWSA Customer Service personnel transitioned to
4 addressing accounts at risk of termination through Friendly Reminder letters via first
5 class mail, payment counseling telephone calls, and Notice of Intent to Lien letters.
6 PWSA also actively promoted its customer assistance programs via virtual group events,
7 inclusion of program flyers in food distribution boxes, and monthly bill messaging.
8 Additionally, PWSA and the Dollar Energy Fund provided payment counseling during
9 every customer interaction.

10 **Q. HAS PWSA BEEN TRACKING THE IMPACT OF THE MORATORIUM**
11 **REGARDING ITS UNCOLLECTIBLES?**

12 A. Yes, as directed by the Commission, PWSA provides monthly reports comparing the
13 status of its uncollectible accounts in the current year with the data from the year prior.¹²
14 These “At-Risk Accounts” report on the total number of residential and non-residential
15 accounts at-risk for termination, the total aggregate dollars of arrears, and accounts
16 disconnected for non-payment. Attached are PWSA’s reports from January, February
17 March comparing status of collectibles for those months from 2020 to 2021. PWSA’s
18 reports comparing the first quarter of 2020 with the first quarter of 2021 are attached as
19 Exhibit JAQ-2. Mr. Barca describes in more detail the impact of our current
20 uncollectible accounts expense on this rate increase request.

¹¹ *Public Utility Service Termination Moratorium Proclamation of Disaster Emergency – COVID-19*, Docket No. M-2020-3019244, Emergency Order dated March 13, 2020. (“*Moratorium on Terminations Emergency Order*”).

¹² *Public Utility Service Termination Moratorium – Modification of March 13th Emergency Order*, Docket No. M-2020-3019244, Order entered October 13, 2020.

1 **Q. HAS PWSA RESUMED ITS COLLECTIONS ACTIVITIES?**

2 A. Yes. On March 18, 2021, the Commission issued an *Order Recommencing Terminations*
 3 “to return to the regular collections process as set forth in the Public Utility Code and the
 4 Commission’s Regulations, with some additional protections” effective April 1, 2021.¹³
 5 PWSA has implemented procedures to be consistent with the *Order Recommencing*
 6 *Terminations* with respect to non-residential customer accounts. Regarding collection of
 7 unpaid charges from residential customers, PWSA has launched a campaign to enroll
 8 customers in its assistance programs and payment plans in an effort to attract hard to
 9 reach delinquent customers and avoid shut off of their water service.

10 **Q. PLEASE PROVIDE A STATUS UPDATE REGARDING HOW DEBTS**
 11 **PREVIOUSLY PLACED WITH JORDAN TAX SERVICE, INC. (“JTS”) ARE**
 12 **BEING PROCESSED.**

13 A. As explained during the last rate case, PWSA has returned all debt that was previously
 14 placed with JTS to its internal process and has been working through that debt on a
 15 manual basis. At this time, all of PWSA’s collections activities are handled in-house and
 16 in compliance with the Commission’s requirements (as detailed more fully in our
 17 Compliance Plan Stage 2 document to be addressed in that proceeding). PWSA plans to
 18 evaluate the need for an external collection agency partnership following the
 19 implementation of its Enterprise Resource Planning (“ERP”) system¹⁴ and the automation
 20 of its Collections process, currently scheduled for go-live in August 2022. Many of
 21 PWSA’s current Collections activities are manual within its existing Customer

¹³ *Public Utility Service Termination Moratorium*, Docket No. M-2020-3019244, Order entered March 18, 2021 (“*Order Recommencing Terminations*”).

¹⁴ ERP will replace PWSA’s current Financial System and Customer Service Management System with a Computerized Maintenance Management System (CMMS) to seamlessly integrate with the existing utilizable and functioning software to provide access to the data and resources needed to streamline processes and, consequently, run more efficient and effective business operations.

Information System, which puts limitations on the volume of accounts that can be included in various stages of its Collections process. By converting from our current Cogsdale utility billing system to SAP as part of the ERP system, PWSA intends to automate its activities such as issuing Friendly Reminder letters, termination notices, and the lien process; thereby efficiently addressing all customers carrying delinquent balances each month. If these automated processes are highly successful, this may eliminate the need for an external collection agency to secure repayment of utility charges.

C. Customer Service Accomplishments and Customer Response

Q. DO YOU HAVE ANY METHOD OF EVALUATING THE EFFECTIVENESS OF THE SERVICE PROVIDED TO PWSA CUSTOMERS?

A. Yes. Consistent with my testimony in PWSA’s two prior Rate Cases, PWSA remains committed to the goal of becoming a highly responsive and trusted public utility that is recognized for excellence and valued by the customers it serves. In support of that statement, I offer the following Customer Service accomplishments for the year of 2020:

Advanced Metering Infrastructure (AMI)	<ul style="list-style-type: none"> ✓ Processed 5,550 meter changes on customer accounts ✓ Achieved an actual read rate of 95%, up from 91% in the prior year ✓ Increased the number of non-residential customers reporting annual backflow test results in SpryBackflow to 3,243
Billing	<ul style="list-style-type: none"> ✓ Billed 110,588 water/wastewater accounts monthly ✓ Maintained zero unbilled accounts each month ✓ Enabled a webform for the collection of Self-Reported Meter Readings ✓ Launched a redesigned PGH2o bill format in June 2020 per the PA PUC Compliance Plan ✓ Created two new promotional positions to build redundancy in the customer billing process ✓ Contributed to weekly project meetings over 5 months to prepare for the KUBRA (bill print/mail/EBPP) go-live in January 2021
Collections	<ul style="list-style-type: none"> ✓ Issued 59,904 Friendly Reminders to customers with past due water/wastewater conveyance charges

	<ul style="list-style-type: none"> ✓ Contacted 9,433 delinquent customers via personal telephone calls to offer payment arrangements and the customer assistance programs ✓ Issued 4,253 notices of intent to lien and collected \$1.5M in aged debt ✓ Created a Personal Contact Services RFP in preparation for PUC Compliance Plan Stage 2
Contact Center	<ul style="list-style-type: none"> ✓ Hired and trained 4 Customer Service Representatives <i>remotely</i> ✓ Handled 130,050 customer calls in 2020 ✓ Secured an average call abandonment rate of 1.1% and an average speed of answer of 23 seconds ✓ Standardized the training documents in the CS Training Binder ✓ Enabled After Call Surveys for all queues to meet a PUC rate case settlement requirement
Emergency Dispatch	<ul style="list-style-type: none"> ✓ Hired and trained 1 Dispatcher <i>remotely</i> ✓ Responded to 1,478 interruptions of service ✓ Designed and created additional work order types in SpryMobile
Permits	<ul style="list-style-type: none"> ✓ Responded to 5,068 dye testing certification requests in 10 days or less ✓ Collected \$5.9M in permitting fees
PUC Compliance	<ul style="list-style-type: none"> ✓ Hired and trained 1 Compliance Analyst <i>remotely</i> ✓ Responded to 1,490 dissatisfied customers (1.4% of our customer base) ✓ Identified and billed previously unbilled service charges totaling \$912K

1

2 **Q. CAN YOU PROVIDE MORE INFORMATION ABOUT THE AFTER CALL**
 3 **SURVEYS LISTED ABOVE IN THE CONTACT CENTER SECTION?**

4 A. Yes. PWSA agreed to develop a program of routine customer service satisfaction
 5 surveys based on input received during our last rate case.¹⁵ PWSA worked with its
 6 telephone system and Automated Call Distribution (ACD) vendor, Mitel, on a project
 7 lasting two months to program survey functionality linked to the ACD queues of AMI,
 8 Billing and Metering, Collections, Emergency Dispatch, Escalation, General, Lead Help,
 9 and Permits. After each call, the Customer Service Representatives (CSR's) have been

¹⁵ Rate Case Settlement Section III.G.1.

1 trained to offer the option of the customer remaining on the line to take a brief survey.
 2 Once the CSR ends the call, the customer is routed directly to the survey, and the prompts
 3 are recorded in the same voice talent as the outgoing messaging when the customer calls
 4 PWSA at 412-255-2423 to achieve familiarity within the customer experience.
 5 Customers taking the survey questions are asked to rate the following:

Your call is now being routed to take a short survey on the quality of PWSA's service. Press 1 to continue, or press 2 to disconnect and end your call.	
1	On a scale of 1 to 5, with 5 being Extremely Satisfied and 1 being Extremely Dissatisfied, please rate your satisfaction with the Customer Service Representative who assisted you today.
2	On a scale of 1 to 5, with 5 being Extremely Satisfied and 1 being Extremely Dissatisfied, please rate your satisfaction with the resolution of your most recent inquiry to PWSA.
3	On a scale of 1 to 5, with 5 being Extremely Satisfied and 1 being Extremely Dissatisfied, please rate your overall satisfaction with PWSA's responsiveness to your questions concerning your water and/or wastewater services.
4	On a scale of 1 to 5, with 5 being Extremely Satisfied and 1 being Extremely Dissatisfied, please rate your overall satisfaction with the quality of the water and/or wastewater services provided to you by PWSA.
5	On a scale of 1 to 5, with 5 being Extremely Satisfied and 1 being Extremely Dissatisfied, please rate PWSA's overall performance as a water and wastewater utility.

6 Following these five questions, the customer is presented with the option to leave a
 7 voicemail message with their feedback. These survey voicemails are reviewed by
 8 members of the Customer Service management team as they are received. The Customer
 9 Service management personnel take one of the following actions:

- 10 • If the customer states in their survey voicemail that there is an unresolved matter,
 11 the voicemail is routed to the responsible party with a copy to the Director of
 12 Customer Service for follow-up. The responsible party is encouraged to
 13 communicate with the customer to resolve the matter on that same day.
- 14 • If the customer speaks well of the service provided by a specific CSR with more
 15 than one comment in their survey voicemail, a "Survey Accolade" email is issued
 16 to the employees answering all queues with a congratulatory message and details
 17 of the customer's comments.
- 18 • If the customer speaks well of the service provided by a specific CSR with only
 19 one comment (e.g., "John was pleasant") in their survey voicemail, or the
 20 customer does not identify the CSR by name, the voicemail is archived.

1 At the end of each month, the survey data is analyzed by the PWSA Management
 2 Information Systems (MIS) department, and that analysis is shared with the Customer
 3 Service management team to identify trends such as:

- 4 • Employees with ample survey responses and high scores in questions #1 and #2
- 5 • Employees with ample survey responses and low scores in questions #1 and #2
- 6 • Employees lacking in ample survey response data
- 7 • High scores in questions #3, #4, and #5
- 8 • Low scores in questions #3, #4, and #5

9 The Customer Service Manager encourages employees with inadequate survey data to
 10 route every caller to the survey at the end of each call. The Senior Customer Service
 11 Training Coordinator schedules live call monitoring and coaching of employees with low
 12 scores on average, giving them tips to improve their call resolution skills in real time.

13 **Q. DO YOU HAVE ANY SURVEY RESULTS AVAILABLE?**

14 A. Yes. The data analysis for the first quarter of February 2021 is included in PWSA
 15 Exhibit JAQ-1. As this analysis illustrates that PWSA’s quality and overall performance
 16 scores are high on the scale of 1 to 5, with 5 being extremely satisfied.

17 **IV. IMPACT OF PROPOSED RATE INCREASE ON FUTURE AFFORDABILITY**

18 **A. Proposed Rate Increases and Phase-In**

19 **Q. HOW IS PWSA PROPOSING TO INCREASE CUSTOMER’S CHARGES IF ITS**
 20 **RATE REQUEST IS APPROVED IN THIS PROCEEDING?**

21 A. As illustrated more fully in the table below, PWSA is proposing that the rates requested
 22 in this proceeding be recovered from customers over a two year period (i.e. “phased-in”).
 23 The table below presents the monthly impact of the planned rate increase phase-in
 24 approach both in dollars and percentage for the Residential customer receiving financial

1 assistance due to participating in the Bill Discount Program (referred to as “CAP”) in the
 2 illustration and the Residential customer not participating in CAP in 2022 and 2023.

Typical Residential Customer Phase In Impacts

(2021-2022)

Class	Minimum Charges	Monthly Usage (1,000 gal)	ERUs	2021 Existing Total	2022 Proposed Total	Monthly Impact \$	Monthly Impact %
Customer Assistance Program	5/8"	3	Tier 2	41.77	45.34	3.57	8.54%
Residential	5/8"	3	Tier 2	79.34	87.19	7.85	9.89%

(2022-2023)

Class	Minimum Charges	Monthly Usage (1,000 gal)	ERUs	2022 Proposed Total	2023 Proposed Total	Monthly Impact \$	Monthly Impact %
Customer Assistance Program	5/8"	3	Tier 2	45.34	47.90	2.56	5.64%
Residential	5/8"	3	Tier 2	87.19	91.05	3.86	4.43%

3
 4 **Q. WHY IS PWSA PROPOSING TO RECOVER THE REVENUE REQUESTED IN**
 5 **THIS PROCEEDING OVER A TWO YEAR PERIOD?**

6 A. PWSA’s proposed phase in is the result of our balancing of the pressures from a number
 7 of different issues. First, as described more fully by Mr. Barca and Mr. King, PWSA
 8 needs the additional revenue sought through this rate case to continue its progress to
 9 modernize its system, comply with numerous regulatory mandates and address years of
 10 deferred maintenance. Second, as described in the testimony of Mr. Igwe, PWSA needs
 11 to implement a stormwater program which results in the introduction of a new fee for
 12 customers . Third, we recognize the impact on customers resulting from the current
 13 pandemic environment, including the restart of our collections activities. Proposing to
 14 recover the full cost of our calculated revenue needs for 2022 through rate increase
 15 installments over two years is, in PWSA’s judgment, the most reasonable way to balance

1 the current needs of our residential customers, the impacts of the pandemic and the need
 2 of PWSA to receive appropriate rates to fund its operations¹⁶. As discussed more below,
 3 we have also considered the impacts of the proposed rate increase on our low income
 4 customers and have reflected various changes and proposals to our existing financial
 5 assistance programs to address them.

6 **B. Rate Increase Mitigation Measures**

7 **1. Maintaining Current Rate Structure**

8 **Q. APART FROM THE PHASE IN OF THE PROPOSED RATE INCREASE, DOES**
 9 **PWSA’S DECISION NOT TO REMOVE THE MINIMUM ALLOWANCE ALSO**
 10 **MITIGATE THE IMPACT OF THE RATE INCREASE ON CUSTOMERS?**

11 **A.** Yes. While I recognize that this has been raised as a concern for some parties in past
 12 cases, as Mr. Smith more fully explains, there are a number of challenges created by
 13 removing the minimum allowance from the rate structure. One such challenge includes
 14 the introduction of the stormwater charge (a fixed charge) at the same time that customers
 15 would be required to pay full volumetric charges for wastewater (because the minimum
 16 allowance is removed). Mr. Smith also specifically explains that participants in PWSA’s
 17 Bill Discount Program would experience a significant increase in their bills due to a
 18 removal of the minimum allowance. Based on Mr. Smith’s analysis, PWSA’s decision
 19 not to remove the minimum allowance at this time is another tool by which to mitigate
 20 the impact of the requested rate increase on our customers.

¹⁶ However, as explained by Mr. Barca, PWSA reserves the right to withdraw the phase-in proposal if the Commission’s rate award is insufficient to meet its financial requirements.

1 **2. Stormwater Specific Mitigation Measures**

2 **Q. HOW IS PWSA PROPOSING TO MITIGATE THE IMPACT OF THE NEW**
3 **STORMWATER FEE FOR EXISTING AND FUTURE CUSTOMERS?**

4 A. As discussed by Mr. Igwe and Mr. Readling, PWSA has spent much time and effort
5 considering stormwater issues and how to calculate a stormwater fee to recover the costs
6 of the program. Upon development of the fee, PWSA then considered the practical
7 impact of assessing the full rate to customers. As described by Mr. Smith, PWSA has
8 determined that applying gradualism to the rate to charge customers as part of this case
9 was the most reasonable approach. First, PWSA recognizes there may be an reluctance
10 to pay a new fee and believes that introducing gradualism is a reasonable way to make
11 customers more comfortable. Second, while PWSA has developed a plan regarding
12 collection activities for unpaid stormwater fees, we recognize that the actual collection of
13 these fees (particularly from stormwater only customers) will be challenging, as
14 discussed more fully by Mr. Readling. Applying gradualism and proposing to recover
15 the fee in two installments over two years (i.e. phase-in) from customers are additional
16 efforts to mitigate the impact of the new stormwater fee.

17 **Q. IN ADDITION TO GRADUALISM AND THE PHASE-IN, ARE THERE OTHER**
18 **WAYS FOR CONSUMERS TO MITIGATE THE STORMWATER FEE?**

19 A. Yes. As described more fully by Mr. Igwe, PWSA is proposing a credit program that
20 will allow customers to reduce their monthly stormwater fee. Ways this may be done are
21 by demonstrating that a customer's true stormwater demand is different than that which
22 has been computed or by taking measures to mitigate stormwater on their property.

1 **3. New Program Regarding First Time Enrollment in eBilling and Establishing**
 2 **Auto-Pay**

3 **Q. ARE YOU OFFERING CUSTOMERS ANY OTHER INCENTIVES INTENDED**
 4 **TO REDUCE COSTS?**

5 A. Yes. As described by Mr. Pickering, effective January 5, 2021, PWSA launched its new
 6 customer eBilling and payment portal to modernize its eBilling platform, provide
 7 customers with an easier way to manage their account, and offer more convenient bill
 8 payment options. Customers electing to enroll in paperless billing can easily view their
 9 bill, make one-time payments, set up recurring payments, and manage notifications. By
 10 enrolling in PWSA’s paperless billing portal, customers will receive their bills via email
 11 instead of by mail; thereby decreasing the postage, paper, envelope, and ink costs to
 12 PWSA ratepayers.

13 **Q. WHAT IS PWSA PROPOSING TO FURTHER INCENTIVIZE CUSTOMERS TO**
 14 **ENROLL IN PAPERLESS BILLING?**

15 A. As a way to incentivize customers to enroll in paperless billing, PWSA is proposing to
 16 provide a one-time bill credit of \$5.00 for all new eBilling enrollees who set up auto-pay
 17 as part of their enrollment. This incentive credit will only apply to new enrollees setting
 18 up auto-pay and will be applied once per PWSA account. Therefore, a combined water
 19 and wastewater customer who enrolls will receive one \$5.00 bill credit. Stormwater only
 20 customers will also be able to avail themselves of this opportunity.

21 **Q. DOES THIS PROPOSAL ALSO ASSIST CUSTOMERS WITH MITIGATING**
 22 **THE IMPACTS OF THE PROPOSED RATE INCREASE?**

23 A. Yes; while I recognize that a one-time bill credit of \$5.00 is not an on-going bill
 24 reduction and may be considered by some to be a modest rate increase mitigation
 25 measure, it does, nonetheless, offer another way to assist customers with mitigating the

1 impacts of the proposed rate increase while also supporting a process that assists in
 2 decreasing overall costs paid by all customers.

3 **V. CUSTOMER NOTICE OF RATE FILING TO EXISTING AND FUTURE**
 4 **CUSTOMERS**

5 **Q. HOW IS PWSA PROVIDING NOTICE OF THIS RATE FILING TO ITS**
 6 **EXISTING CUSTOMERS?**

7 A. A copy of the Notice of Proposed Rate Changes that PWSA is providing to existing
 8 customers is included in Volume 1, Tab 2 of the Rate Filing Package. Simultaneous with
 9 this filing and consistent with past practice and Commission requirements, PWSA will:
 10 (1) include the notice as a bill insert, printed on blue paper, for an entire billing cycle
 11 until all customers receive notice; (2) PWSA’s electronic billing customers will receive a
 12 copy of the same notice via a link to the bill insert; (3) PWSA will post the notice of the
 13 tariff changes in a conspicuous place in the PWSA office where payments are accepted
 14 once PWSA’s offices are re-opened;¹⁷ (4) PWSA will issue a news release to be posted to
 15 its website, distributed to all local news outlets and the various organizations and
 16 individuals who have signed up to receive PWSA press releases; and, (5) publish notice
 17 of the rate increase through paid advertisements in local newspapers.

18 **Q. DOES PWSA’S NOTICE INCLUDE INFORMATION ABOUT THE FILING OF**
 19 **A PROPOSED STORMWATER TARIFF?**

20 A. Yes; in the first sentence of PWSA’s Notice of Proposed Rate Changes, it states that
 21 PWSA has filed a request to “establish a new stormwater fee.” Two paragraphs after
 22 that, more information about the Stormwater Fee is provided. Thus, future stormwater
 23 customers who are already customers of PWSA for water and/or wastewater conveyance
 24 services will receive direct notice through bill inserts.

¹⁷ PWSA’s on-site billing counter has been closed due to the COVID-19 pandemic.

1 **Q. HOW IS PWSA PLANNING TO NOTIFY PERSONS WHO ARE NOT**
 2 **CURRENTLY PWSA CUSTOMERS OF ITS PROPOSAL TO ASSESS A**
 3 **STORMWATER RATE IN THE FUTURE?**

4 A. As explained in the testimony of Mr. Readling, identification of stormwater customers
 5 has been a significant undertaking as part of developing a stormwater program. At this
 6 time, PWSA has identified approximately 6,538 parcels which could not be aggregated
 7 with other parcels that are existing PWSA customers and, thus, will become stormwater
 8 only customers in the future. As PWSA does not have any existing billing relationship
 9 with these future stormwater only customers, we are providing these future customers
 10 with a copy of the Notice of Proposed Rate Changes contained in Volume 1, Tab 2 along
 11 with a cover letter explaining that one or more properties owned by the consumer has
 12 been identified as a potential future stormwater only customer of PWSA. A copy of that
 13 cover letter is also included in Volume 1, Tab 2. Where PWSA has identified common
 14 ownership of several parcels, it is providing just one letter to that owner. As PWSA
 15 continues the process of identifying these stormwater only customers and creating
 16 matching PWSA accounts for them, PWSA plans to continue to reach out to the future
 17 customers to provide them this information as discussed by Mr. Igwe.

18 **Q. HAS PWSA UNDERTAKEN ADDITIONAL PUBLIC EDUCATION**
 19 **REGARDING ITS UPCOMING STORMWATER FEE?**

20 A. Yes; beyond the specific notice we are providing to all customers and future stormwater
 21 only customers about this rate filing, Mr. Igwe describes PWSA efforts since 2018
 22 regarding the development of its stormwater program and PWSA's plans to continue to
 23 engage with customers and community groups about stormwater issues. As Mr. Igwe
 24 describes in more detail, PWSA this includes plans to launch of a stormwater dedicated

1 website and, potentially, a searchable database to enable customers to look up
 2 information about their property to understand how the fee impacts their property.

3 **VI. LOW INCOME CUSTOMER ASSISTANCE PROGRAMS**

4 **Q. PLEASE DESCRIBE THE CURRENT PWSA LOW INCOME CUSTOMER**
 5 **ASSISTANCE PROGRAMS THAT ARE AVAILABLE.**

6 A. PWSA offers the following programs to provide financial assistance to qualifying low-
 7 income residential customers:

- 8 • **Bill Discount Program** – 100% reduction of fixed monthly water and wastewater
 9 conveyance charges for customers \leq 150% of the Federal Poverty Level. There are a
 10 total of 4,530 customers enrolled in the Bill Discount Program as of this filing and
 11 506 of those 4,530 customers are also receiving a 20% reduction of their volumetric
 12 usage charges.
- 13 • **Hardship Program** – Grants up to \$300 per year for customers \leq 150% of the
 14 Federal Poverty Level; 126 customers have applied for grants via the 2020-2021
 15 Hardship Program grant season, which began October 1, 2020, and 219 applicants
 16 were eligible and received grants totaling \$29,502.
- 17 • **Winter Shut Off Moratorium** – December 1st through March 31st for customers \leq
 18 300% of the Federal Poverty Level. This program is currently in effect for *all*
 19 Residential customers, regardless of income.
- 20 • **Replacement of Private-Side Lead Service Line** - PWSA’s Lead Infrastructure
 21 Plan¹⁸ includes an income-based reimbursement program that assists eligible
 22 customers with the cost of replacing a private-side lead service line if the customer
 23 hires a contractor to replace the line. The income-based reimbursement program is
 24 available to eligible customers who replaced their private-side lead service line on or
 25 after January 1, 2019.

¹⁸ PWSA’s Lead Infrastructure Plan is included as part of its Commission-approved Long-Term Infrastructure Improvement Plan. See *Petition of Pittsburgh Water and Sewer Authority for Approval of its Amended Long-Term Infrastructure Improvement Plan for its Water Operations*, Docket No. P-2018-3005037, Opinion and Order entered August 27, 2020.

1 **Q. SETTING ASIDE THE SUBMISSION TO BE PROVIDED IN THIS**
 2 **PROCEEDING, HAS PWSA COMPLIED WITH ALL THE OTHER AGREED-**
 3 **UPON COMMITMENTS RELATED TO LOW INCOME CUSTOMER ISSUES?**

4 A. Yes. In our last rate case, PWSA proposed a number of enhancements to its then-existing
 5 customer assistance programs and, through settlement negotiations with the parties,
 6 agreed to even further enhancements to the programs. Below is a description of all of
 7 these changes which have been implemented this year. ’

- 8 • **Bill Discount Program** – expanded to include (1) increase of the discount on
 9 monthly water/wastewater minimum charges from 75% to 100% for customers ≤
 10 150% of the Federal Poverty Level; (2) A 20% discount of the volumetric usage
 11 charges for customers ≤ 50% of the Federal Poverty Level; (3) Recertification waived
 12 in 2021 and required every other year beginning in 2022; and, (4) A pilot Arrearage
 13 Forgiveness program for eligible Bill Discount customers, which provides for a \$15
 14 reduction of a customer’s arrears for every on-time payment plan payment.
- 15 • **Hardship Program** - Waived the requirements of (1) sincere effort of payment, and
 16 (2) a termination notice to receive an annual \$300 Hardship Grant. In 2022 and
 17 thereafter, the sincere effort of payment will be reduced by 50% (\$75 and \$37.50 for
 18 seniors).
- 19 • **Winter Shut Off Moratorium** - Increased the Winter Moratorium income eligibility
 20 level from 250% to 300% of the Federal Poverty Level.

21 **Q. HOW DID PWSA EXPAND UPON ITS OUTREACH EFFORTS DURING THE**
 22 **COVID-19 PANDEMIC?**

23 A. Following up on suggestions by members of the Low Income Assistance Advisory
 24 Committee (LIAAC), PWSA has employed innovative ways to reach our most vulnerable
 25 customers during the pandemic, including providing our assistance program flyers to the
 26 Allegheny County Health Department Housing and Community Environment Program
 27 (delivery to residents); Greater Pittsburgh Community Food Bank (food donation boxes);
 28 412 Food Rescue (food donation boxes); Oakland Community and Development
 29 Corporation (food donation boxes); Pittsburgh Police (fresh produce delivery to senior
 30 centers); and Citiparks (Grab-n-Go Meal Bags for seniors).

1 **Q. HOW HAS PWSA BEGUN TO ADDRESS THE CURRENT LIMITED FUNDING**
2 **STREAM AVAILABLE FOR ITS HARDSHIP PROGRAM?**

3 A. PWSA's Hardship Grant has been historically funded from the proceeds related to a
4 litigation settlement. As these funds continue to be depleted as Hardship Grants are
5 awarded, PWSA recognizes the need to develop alternative funding sources for this
6 program. Consistent with our agreement in the last rate case settlement, PWSA has
7 engaged our employees and customers in campaigns to fund our Hardship Grant Program
8 in late 2020 through the first quarter of 2021. Through the combined efforts of the
9 Customer Service, Human Resources, and Public Affairs departments, the 12 Days of
10 Giveaways was an internal, employee focused fundraising campaign. Human Resources
11 issued daily emails for 12 days before the Christmas holidays, spurring PWSA employees
12 to donate at least \$25 to help 30 needy families with their water bills. Once a donation
13 was received, the employee's name was entered into a daily drawing to receive an item
14 purchased from a local business in the Strip District. The prizes were purchased with
15 money donated by a senior staff member. At the end of the campaign, \$4,311 was raised
16 to add to the Hardship Grant fund.

17 A second campaign was then conducted beginning in late January 2021 and was
18 geared towards promoting donations from PWSA customers. A letter explaining the
19 fundraising effort was mailed separately from the bill, with both online donation
20 instructions and a section that you could tear off at the bottom and mail to Dollar Energy
21 Fund with your donation. To date, \$18,992 has been donated by PWSA customers to
22 further fund the Hardship Grant Program. Unfortunately, donations in response to this
23 fundraising solicitation have not exceeded the cost of the mailing. To date, there is a
24 shortfall of \$15,076.

1 The following link will take you to PWSA’s web page where you can donate to the
 2 Hardship Grant Program: <https://www.pgh2o.com/give>

3 **Q. IS PWSA PROPOSING FURTHER ENHANCEMENTS TO ITS EXISTING LOW**
 4 **INCOME CUSTOMER ASSISTANCE PROGRAMS IN THIS PROCEEDING?**

5 A. Yes. We are proposing a number of enhancements as part of our rate increase request in
 6 this proceeding.

7 **Q. PLEASE DESCRIBE THE ENHANCEMENTS PWSA IS PROPOSING FOR ITS**
 8 **BILL DISCOUNT PROGRAM.**

9 A. PWSA is proposing to increase the volumetric rate discount from 20% to 50% for Bill
 10 Discount customers \leq 50% of the Federal Poverty Level and to reduce the proposed
 11 stormwater fee by 75% for customers who meet the Bill Discount Program eligibility
 12 guidelines of \leq 150% of the Federal Poverty Level. These enhancements will further
 13 expand the Bill Discount Program to reduce the cost of usage over the minimum
 14 allowance for our most vulnerable customers while also proactively reducing the eligible
 15 customer’s bill impact by offering a stormwater discount.

16 **Q. PLEASE DESCRIBE THE ENHANCEMENTS PWSA IS PROPOSING FOR ITS**
 17 **HARDSHIP GRANT PROGRAM.**

18 A. PWSA is proposing to increase the income eligibility from 150% to 300% of the Federal
 19 Poverty Level. This will build continuity in the income eligibility guidelines of the
 20 Hardship Grant Program and the Winter Moratorium. We are also proposing to include
 21 \$100,000 of ratepayer funding to provide additional financial resources for the Hardship
 22 Grant Program. As I explained previously, PWSA’s current funding stream – the
 23 proceeds related to a litigation settlement – continue to be depleted and while PWSA is
 24 committed to continuing other outreach efforts to seek funding from its employees and

1 voluntarily from other customers, we believe it is important to include an additional
2 allocation from rates for this program.

3 **Q. IS PWSA PROPOSING ENHANCEMENTS FOR ITS WINTER SHUT OFF**
4 **MORATORIUM PROGRAM?**

5 A. Yes, we are proposing to expand the moratorium to senior citizens (65+) regardless of
6 income level. This proposal is a step towards ensuring that no senior on a fixed income
7 has the concern that their water service will be shut off in winter months if they fall
8 behind on their water/wastewater bills. It is also being offered in response to direct
9 engagement from our senior citizens that such a proposal would be a great benefit to
10 them. As of July 2019, approximately 14.7% of the population of the City of Pittsburgh
11 (which largely comprises PWSA's service territory) was 65 years or older.¹⁹

12 **VII. CUSTOMER SERVICE ISSUES SPECIFIC TO FUTURE STORMWATER**
13 **SERVICE**

14 **Q. WHAT CUSTOMER SERVICE ISSUES SPECIFIC TO FUTURE**
15 **STORMWATER SERVICE WILL YOU BE ADDRESSING?**

16 A. The mechanics, costs and purpose for PWSA's proposed Stormwater tariff are being
17 addressed in the direct testimony of Mr. Igwe, Mr. Readling and Mr. Smith. The purpose
18 of my testimony related to stormwater issues is to discuss some of the customer facing
19 issues that will be managed through Customer Service.

20 **A. Appeals of Initial Impervious Area Designations**

21 **Q. CAN YOU GENERALLY DESCRIBE HOW THE STORMWATER RATES**
22 **CUSTOMERS WILL BE CHARGED HAVE BEEN DEVELOPED?**

23 A. Yes. Mr. Readling describes in detail how PWSA's proposed stormwater fee has been
24 developed based on a property's impervious area. Upon evaluation of the properties and

¹⁹ Information from: <https://www.census.gov/quickfacts/pittsburghcitypennsylvania>

1 impervious area data within PWSA's service areas, PWSA is proposing a three tiered rate
2 structure for residential customers. Also, using the impervious area data, PWSA
3 developed a proposal to bill non-residential customers based on their Equivalent
4 Residential Unit ("ERU") of impervious area. Mr. Reading provides an overview of the
5 proposed stormwater fees for each residential tier and per ERU for non-residential
6 properties.

7 **Q. ARE FUTURE STORMWATER CUSTOMERS GOING TO BE ABLE TO**
8 **APPEAL PWSA'S INITIAL DETERMINATION REGARDING THEIR**
9 **IMPERVIOUS AREA CALCULATION OR RESIDENTIAL TIER**
10 **ASSIGNMENT?**

11 A. Yes. Just as existing PWSA water and/or wastewater customers have the ability to
12 dispute PWSA's charges, so too will stormwater customers. PWSA's currently existing
13 dispute processes will be available for stormwater charges just as they are for water
14 and/or wastewater conveyance charges. In addition, PWSA will provide the ability for
15 customers challenging their stormwater charges to have further review of the impervious
16 designation. To effectuate that, once a dispute regarding the basis for PWSA's
17 stormwater charge is received, PWSA will review the impervious area on the parcel and
18 make any changes deemed necessary, which will be reflected on the customer's bill going
19 forward. If a retroactive adjustment on the account is appropriate, PWSA will apply it
20 consistent with current operating procedures. Consistent with existing processes, PWSA
21 will respond to the customer's dispute within 30 days and send a report to the customer.
22 If the issue involves a disagreement between the customer's records and the County of
23 Allegheny's records about the customer's parcel (e.g., location or size), then the customer
24 will be directed to contact the County with any concerns about the results. Like all

1 current customers, stormwater customers maintain their right to pursue their claim with
 2 the Commission either on an informal or formal basis.

3 **B. Collection Activities Regarding Unpaid Stormwater Charges**

4 **Q. WILL THE STORMWATER FEE BE ADDED TO EXISTING PWSA**
 5 **CUSTOMERS' BILLS AS A NEW SEPARATE CHARGE?**

6 A. Yes. As explained more fully by Mr. Igwe, the Stormwater fee will be added to the
 7 monthly bills of existing PWSA customers or will be the only charge on the bill for future
 8 stormwater-only customers. Mr. Igwe also explains how PWSA will ensure that the
 9 stormwater billing source data is updated. Since PWSA will be providing stormwater
 10 service as a regulated stormwater public utility, the fee placed on customers' bills is the
 11 basic charge for this service, and any challenges to the stormwater fee will be processed
 12 by PWSA in the same manner that it addresses customer complaints regarding water
 13 and/or wastewater conveyance charges.

14 **Q. WILL PWSA PURSUE TERMINATION OF SERVICE FOR THE FAILURE OF**
 15 **A CUSTOMER TO PAY HIS OR HER STORMWATER CHARGES?**

16 A. Yes. Currently, for combined PWSA water and wastewater customers, PWSA pursues
 17 termination of water service for a customer's failure to pay his or her bills consistent with
 18 Chapter 14 and Chapter 56 requirements. Currently, for PWSA's wastewater conveyance
 19 only customers, PWSA has agreements in place with the customer's water providers
 20 (mostly Pennsylvania American Water Company) whereby PWSA may direct the water
 21 company to terminate water service for a failure of PWSA's wastewater conveyance
 22 customer to pay his or her charges.²⁰ Consistent with existing processes, PWSA plans to

²⁰ See Pennsylvania Water Services Act, 53 P.S. §§ 3102.501 - 3102.507. I am advised by counsel that the authority to shut off the supply of water to a delinquent customer is found in Section 502(a) of the Water Services Act, 53 P.S. §3102.502(a). See *McCormick v. Dunkard Valley Joint Mun. Auth.*, 218 A.3d 528 See also 23 Summ. Pa. Jur. 2d Municipal and Local Law § 18:63 (2d ed.)

1 work with the customer’s water provider to terminate water service if a customer is
 2 receiving wastewater conveyance and stormwater service from PWSA (but not water
 3 service) and is delinquent regarding payment of combined bill charges. For the new class
 4 of stormwater only customers, PWSA has no ability to pursue termination of service. In
 5 this case, PWSA’s only recourse for nonpayment is the ability to lien the property,
 6 discussed in more detail below.

7 **Q. DOES PWSA PLAN TO REVISE ITS CURRENT PAYMENT ALLOCATION**
 8 **PROCESSES?**

9 A. Yes but not until implementation of the SAP utility billing system which is currently
 10 expected in August 2022. Currently, PWSA allocates customers payments 100% in the
 11 following order: water, wastewater, ALCOSAN.²¹ Upon approval of stormwater charges,
 12 we will add stormwater to this priority list before ALCOSAN. Given the limitations of
 13 our current Cogsdale system, altering the current process would create additional costs
 14 and raise concerns about the changes being successfully implemented. Since PWSA is
 15 moving forward to supplant Cosgdale with a more robust system to be implemented in
 16 approximately seven months after the effective date of the stormwater fee, our proposal is
 17 to implement payment allocation by percentages in the fall of 2022 with implementation
 18 of SAP.

²¹ PWSA’s bills include the charges of the Allegheny County Sanitary Authority (“ALCOSAN”). ALCOSAN treats the wastewater that is conveyed by PWSA to ALCOSAN. PWSA does not have any control or authority over the rates that ALCOSAN charges. Mr. Barca more fully explains the bad debt expense for collections related to ALCOSAN charges.

1 **Q. WHY IS PWSA PROPOSING TO MOVE TOWARD ALLOCATING PAYMENTS**
 2 **BY PERCENTAGES RATHER THAN MAINTAINING THE CURRENT**
 3 **ALLOCATION OF 100%?**

4 A. Since PWSA is providing three Commission-regulated separate utility services and
 5 assessing the basic charges for all three on one bill, we have concluded that allocating
 6 partial payments by percentage based on proportional utility service charges on the
 7 customer’s bill to each of the three Commission-regulated separate utility services, if the
 8 customer has not directed something else, more fairly allocates the payment across the
 9 three different services by PWSA.

10 **Q. WHAT OTHER COLLECTION TOOLS ARE AVAILABLE TO PWSA**
 11 **REGARDING STORMWATER CHARGES?**

12 A. In addition to its ability to terminate water service for a failure of a customer to pay his or
 13 her bill, PWSA is a municipal authority and pursues municipal liens pursuant to the
 14 Municipal Claims and Tax Liens statute (“Municipal Lien Law”) on property where
 15 water and/or wastewater charges remain unpaid.²² PWSA is legally authorized to provide
 16 stormwater planning, management and implementation pursuant to the Municipality
 17 Authorities Act.²³ One of the purposes of PWSA pursuant to its Articles of Incorporation
 18 is to acquire, hold, construct, finance, improve, maintain, operate, own and lease, projects
 19 related to stormwater systems. While I am advised by counsel that the Commission lacks
 20 jurisdiction over issues related to municipal liens themselves, such as the imposition of
 21 the lien, the validity of the lien, and the enforcement or removal of the lien,²⁴ the ability

22 53 P.S. § 7107.

23 53 P.S. § 5607(a)(18).

24 *See, e.g., David Fasone v. Philadelphia Gas Works*, Docket No. C-2012-2322684, Final Order (Act 294) entered November 30, 2012 adopting Initial Decision dated October 12, 2012 (“[A]ny challenges to the validity of the lien and the enforcement of the lien are all within the jurisdiction of the Court of Common Pleas, pursuant to the [MCTLL]. No provision of the [MCTLL] grants the Commission jurisdiction over

1 of PWSA to lien is an important component of its overall collections toolbox and – for
 2 stormwater only customers – will be the only tool available to seek payments of its
 3 stormwater charges.

4 **Q. WHY IS THE ABILITY OF PWSA TO PURSUE THESE COLLECTIONS**
 5 **TOOLS FOR STORMWATER CHARGES SO IMPORTANT?**

6 A. As a cash-flow regulated utility, PWSA provides just and reasonable rates and is
 7 dependent on the revenues received to execute its projects. If we are expending costs that
 8 are not recovered from our ratepayers, then the ability of PWSA to finance its other
 9 projects, including its extensive capital projects, its lead service line replacement project
 10 and its continued modernization upgrades to meet regulatory compliance will be
 11 jeopardized. Stormwater is layering in new additional costs and, for the reasons I
 12 discussed previously as supported by the testimony of Mr. Igwe, Mr. Readling and Mr.
 13 Smith, PWSA is not proposing to require customers to pay a stormwater fee at this time
 14 that covers the full cost related to stormwater management, including all the costs being
 15 incurred to develop the stormwater fee itself. Also, as discussed by Mr. Readling, the
 16 fact that this is a new fee and is being imposed on new customers also places negative
 17 pressures on the Authority’s ability to recover the full fee that is charged to customers.
 18 PWSA has had to factor in these realities and develop an uncollectible accounts expense
 19 factor as a way to recover from all customers the anticipated uncollectible amounts from
 20 the stormwater fee, just as it does for water and wastewater conveyance. If PWSA is
 21 unable to counterbalance the projected uncollectible factor related to stormwater with

any aspect of a municipal lien proceeding. Municipal lien proceedings, pursuant to the [MCTLL], are exclusively within the jurisdiction of the Court of Common Pleas, not the Commission. The Commission simply lacks jurisdiction over any aspect of a municipal lien proceeding, pursuant to either the Public Utility Code or the [MCTLL]”).

1 strong collections tools for stormwater, then PWSA will have to project a higher
2 uncollectible expense factor for stormwater, thus making the overall stormwater fee
3 higher. Such result is directly contrary to a primary goal of the stormwater fee, which is
4 to assess “users” their fair share of the costs of stormwater.

5

1 **VIII. WATER AND WASTEWATER TARIFF REVISIONS**

2 **Q. IS PWSA PROPOSING REVISIONS TO THE WATER AND WASTEWATER**
 3 **TARIFFS AS PART OF THIS RATE CASE?**

4 A. Yes, the revisions we are proposing are shown in PWSA Exhibits JAQ-2 through JAQ-5.

5 **A. Display of Phase-In Rates**

6 **Q. HOW IS PWSA DISPLAYING THE PROPOSE RATE INCREASE FOR YEAR 1**
 7 **AND THE PROPOSED RATE INCREASE FOR YEAR 2?**

8 A. Since PWSA is proposing to recover from customers the revenue requirements needed
 9 for 2022 over a two year period, the rates customers will be charged for the first year will
 10 be different in the second year. In our proposed tariff supplements, both rates are being
 11 displayed on the tariff supplement. This is consistent with the recently approved tariff for
 12 the Pennsylvania American Water Company.²⁵

13 **Q. HOW DOES PWSA PROPOSE TO PROVIDE CUSTOMER NOTICE PRIOR TO**
 14 **THE IMPOSITION OF NEW RATES?**

15 A. Consistent with past practice, upon final approval from the Commission of PWSA's
 16 tariffs, PWSA provides customers with notice through bill messaging, website content,
 17 and press release. Because the year 2 rate change would be part of an already approved
 18 Commission process, PWSA's customer notice process would propose to notify
 19 customers of the two year phase in pursuant to bill notices when it implements the first
 20 year's rates with a reminder notice in the same manner when it implements the second
 21 year's rates.

²⁵ See, e.g., PAWC Tariff Water-PA P.U.C. No. 5, Supplement No. 5, effective March 8, 2021, First Revised Page 16 listing Service Charge per Month for 2021 and 2022. Available at: https://www.amwater.com/paaw/Resources/PDF/Rates/PAWC+WaterTariff+No.+5+Supplement+27+Active.pdf?language_id=1

1 **B. Wastewater Tariff Provisions Moved to New Stormwater Tariff**

2 **Q. DOES PWSA’S CURRENT WASTEWATER TARIFF INCLUDE**
3 **STORMWATER PROVISIONS?**

4 A. Yes. Stormwater is currently addressed in Part VI of PWSA’s Wastewater Tariff.

5 **Q. IS PWSA PROPOSING TO MOVE THESE PROVISIONS TO ITS NEW**
6 **STORMWATER TARIFF?**

7 A. Yes. Mr. Igwe discusses PWSA’s proposed stormwater tariff in detail, but I just wanted
8 to highlight here that the introduction of a separate stormwater tariff necessitates the
9 removal of stormwater related provisions from our wastewater tariff.

10 **C. Revised Fees**

11 **Q. HAS PWSA UNDERTAKEN AN EVALUATION OF THE VARIOUS**
12 **MISCELLANEOUS FEES IN ITS CURRENT WATER AND WASTEWATER**
13 **TARIFFS?**

14 A. Yes. As part of the process of preparing for this rate case, PWSA worked with its
15 financial consultant, Raftelis Financial Consultants, Inc., to engage in a comprehensive
16 examination of all the fees charged to water and wastewater conveyance customers
17 regarding services that they request of PWSA. We were particularly interested in: (1)
18 evaluating whether current charges were consistent with the expenses involved; (2)
19 considering whether new fees were appropriate in consideration of our current
20 operations; and, (3) developing a methodology going forward that would enable PWSA
21 to more easily assess whether the level of charges for these fees remains current with the
22 associated costs.

23 **Q. PLEASE PROVIDE MORE DETAIL ABOUT HOW THE FEES WERE**
24 **EVALUATED.**

25 A. All of PWSA’s currently tariffed fees were identified. PWSA personnel also identified a
26 number of additional fees for consideration of possible implementation in the future. An

1 investigation was made regarding the water, wastewater and other miscellaneous fees
2 assessed by other investor-owned utilities, municipalities and authorities. PWSA
3 representatives worked with its consultants to identify the labor, equipment, and vehicles
4 used to perform or provide each of the activities. We also identified the labor position
5 titles and hourly rates, vehicle and equipment types and hourly rates, and current costs of
6 meters and other appurtenances from multiple contracts to assist in identify the costs for
7 PWSA of the various activities. All of this information was analyzed by our consultant,
8 and an Excel-based Fee Calculator Model was created to input the relevant information
9 from PWSA such as the typical hours per person for each job category, plus equipment
10 and vehicles needed to complete each activity. The results of the analysis were then
11 compared against our existing rates and further evaluated to finalize the final fee that is
12 being proposed as part of this case.

13 **Q. WERE YOU DIRECTLY INVOLVED IN THE EVALUATION OF ALL OF**
14 **THESE FEES?**

15 A. No; the evaluation was a team effort on the part of PWSA with the appropriate
16 departments and staff providing input regarding their specific subject matter areas.

17 **Q. ARE THERE ANY SPECIFIC PROPOSED TARIFF REVISIONS**
18 **INCORPORATING THIS EVALUATION THAT YOU WISH TO HIGHLIGHT?**

19 A. Yes. While I will not address each fee and the specific factors that were used to
20 determine the final recommended fee, I do wish to note two specific changes resulting
21 from this process. First, while PWSA does not charge new customers for the cost of new
22 meters, customers may be charged for new meters in the following three instances: (1)
23 missing meter; (2) damaged by owner; and, (3) upsizing. Tariff revisions to Part III,
24 Section D of the Water Tariff are proposed to clarify this. Second, both the Water and
25 Wastewater Tariffs currently include fees in Part III, Section G related to line/main

1 extension. In both Tariffs, these fees have been moved to Part II, Section H due to their
2 broader applicability and to better organize in one location all our miscellaneous fees.

3 **Q. WHY WAS THIS AN IMPORTANT INITIATIVE FOR PWSA AND HOW DOES**
4 **IT BENEFIT CUSTOMERS?**

5 A. All of the costs to be recovered through the fees examined in this process are incurred
6 due to customer requests from PWSA (there are only a few exceptions related to
7 penalties). The newly identified fees as shown on Exhibit JAQ-6 are a good example of
8 work that was being done previously by PWSA but for which the customer making the
9 request for the work was not directly assessed that cost. Having undertaken this process
10 to ensure that the accurate costs of these activities to PWSA are identified and passed on
11 directly to the customer who is making the request, PWSA is taking reasonable steps to
12 avoid these costs from being borne by all ratepayers through rates. Moreover, the
13 evaluation has resulted in a forward looking process whereby PWSA can more efficiently
14 evaluate these types of tasks in the future to ensure that the fees which are being assessed
15 are accurately aligning with the costs involved.

16 **D. Transition of Line Extension Processes to Commission Requirements**

17 **Q. DOES PWSA'S PROPOSED WATER TARIFF ADDRESS THE TRANSITION**
18 **TO THE COMMISSION'S LINE EXTENSION RULES?**

19 A. Yes. On March 26, 2021, PWSA filed its Supplemental Compliance Plan Regarding
20 Line Extensions with the Commission as directed by the Commission's *March 2020*
21 *Stage 1 Order*.²⁶ The Supplemental Compliance Plan described PWSA's plan to
22 transition to the Commission's line extension regulations, which included submitting

²⁶ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Opinion and Order entered March 26, 2020 at 73-74. (“March 2020 Stage 1 Order”).

1 tariff revisions in this case to achieve ultimate compliance with 52 Pa. Code §§ 65.1,
 2 65.21-65.23 upon approval of PWSA’s water tariff as part of this proceeding.

3 **Q. ARE THE REVISIONS AS DESCRIBED IN PWSA’S SUPPLEMENTAL**
 4 **COMPLIANCE PLAN REGARDING LINE EXTENSIONS INCORPORATED**
 5 **INTO PWSA’S PROPOSED WATER TARIFF?**

6 A. Yes. Part III, Section G include substantial revisions as described in the Supplemental
 7 Compliance Plan. These revisions include: (1) defining a Bona Fide Service Applicant;
 8 (2) setting forth the process through which PWSA will determine whether or not to
 9 request a customer advance from a Bona Fide Service Applicant; (3) providing options to
 10 Bona Fide Service Applicant if he or she is unable to advance the entire amount due; and,
 11 (4) clarifying when PWSA will reimburse a portion of the customer advance if additional
 12 customers attach service lines to the main extension within 10 years. The proposed
 13 revisions make clear that applicants who do not meet the definition of a Bona Fide
 14 Service Applicant will be deemed a Non Bona Fide Service Applicant. PWSA’s prior
 15 tariff language applicable to Non Bona Fide Service Applicants largely remains intact.

16 **Q. HOW IS PWSA PROPOSING TO PERFORM THE CALCULATIONS IN**
 17 **CONSIDERATION OF ITS STATUS AS A CASH FLOW REGULATED**
 18 **UTILITY?**

19 A. As a cash flow regulated utility that does not earn interest on its assets, depreciation does
 20 not factor into PWSA’s costs or rates. Therefore, calculating a “depreciation charge”
 21 associated with the construction, operating and maintenance of the line extension to
 22 develop the annual line extension costs²⁷ is not consistent with PWSA’s operations. As a

²⁷ 52 Pa Code § 65.1 defines annual line extension costs. 52 Pa. Code § 65.21(1) requires a calculation of annual line extension costs to determine whether or not a customer advance may be requested from Bona Fide Applicants.

1 cash flow regulated utility, PWSA's cost of debt includes annual payments and debt
2 service coverage and PWSA both of these costs of debt will be factored into the formulas.

3 **Q. WHAT OTHER SIGNIFICANT CHANGES REGARDING PWSA'S CURRENT**
4 **LINE EXTENSION PROVISIONS ARE BEING PROPOSED TO TRANSITION**
5 **TO THE COMMISSION'S REGULATIONS?**

6 A. As discussed by Mr. Barca, PWSA has elected to completely eliminate tapping fees and
7 will factor in the loss of this revenue as part of its overall revenue requirements. Also, as
8 part of the broader fee evaluation that I described previously, PWSA is proposing to
9 move all current fees in Part III, Section G of its water tariff to Part II, Section H to more
10 accurately reflect the broader applicability of some of these charges beyond the line
11 extension context.

12 **IX. CONCLUSION**

13 **Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?**

14 A. Yes; however, I do reserve the right to supplement this testimony as may be appropriate.

VERIFICATION

I, Julie Quigley, hereby state that: (1) I am the Director of Customer Service for The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 03/22/2021 | 10:16 AM PDT

DocuSigned by:

Julie A. Quigley

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Julie Quigley
Director of Customer Service
The Pittsburgh Water and Sewer Authority

Exhibit JAQ-1

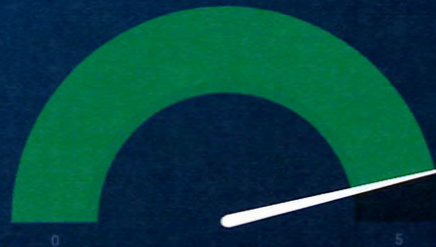
TOTAL SURVEYS
Last Quarter (Jan 1 - Mar 31) ▾

5,162

▲ 622% Compare: 715

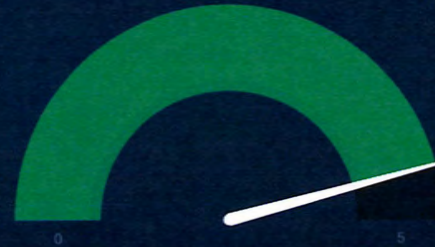
Q1: CSR SATISFACTION
Last Quarter (Jan 1 - Mar 31) ▾

4.63



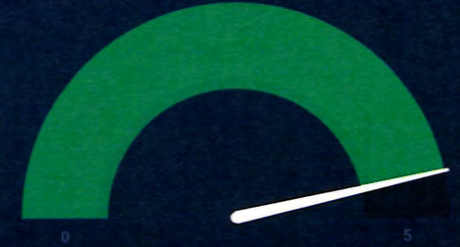
Q2: ISSUE RESOLUTION SATISFACTION
Last Quarter (Jan 1 - Mar 31) ▾

4.59



Q3: RESPONSIVENESS TO QUESTIONS
Last Quarter (Jan 1 - Mar 31) ▾

4.66



Q4: QUALITY OF PWSA SERVICES
Last Quarter (Jan 1 - Mar 31) ▾

4.31



Q5: PWSA OVERALL PERFORMANCE
Last Quarter (Jan 1 - Mar 31) ▾

4.16



Exhibit JAQ-2



SBarkley@pgh2o.com
(412) 676-6685 (Office)
(412) 737-0297 (Business Cell)

February 12, 2021

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120

**Re: Temporary Reporting Requirements: At-Risk Accounts
Docket No. M-2020-3019244**

Dear Secretary Chiavetta:

Enclosed please find The Pittsburgh Water and Sewer Authority's response to the October 1, 2020 Secretarial Letter in the above referenced docket, which requires utilities to submit specific information relating to customers at risk of termination.

Please contact me or Julie Quigley (jquigley@pgh2o.com) with any questions that you may have.

Respectfully Submitted,

/s/ Shannon F. Barkley _____
Shannon F. Barkley
PA Attorney ID # 81501

Enclosures

CC: Sarah Dewey, Bureau of Consumer Services – sdewey@pa.gov

The Pittsburgh Water and Sewer Authority
Re: Temporary Reporting Requirement: At-Risk Accounts
Docket No. M-2020-3019244
January 2020 and January 2021

1. Total number of Residential and Non-Residential accounts at risk of termination at the end of the month and for the same month the year prior.

	Accounts At-Risk of Termination Jan. 2020	Accounts At-Risk of Termination Jan. 2021
Residential	7,464	6,687
Non-Residential	424	492

2. Total aggregate dollars of arrears, broken down by the same account categories, at the end of the month and for the same month the year prior.

	Total Aggregate Dollars of Arrears Jan. 2020	Total Aggregate Dollars of Arrears Jan. 2021
Residential	\$4,756,672.52	\$6,079,667.39
Non-Residential	\$1,154,654.67	\$1,649,087.49

	Accounts Disconnected for Non-Payment with Dollar Amounts Owed Jan. 2020	Accounts Disconnected for Non-Payment with Dollar Amounts Owed Jan. 2021
Residential	21	Zero
Non-Residential	3	36



SBarkley@pgh2o.com
(412) 676-6685 (Office)
(412) 737-0297 (Business Cell)

March 3, 2021

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120

Re: Temporary Reporting Requirements: At-Risk Accounts
Docket No. M-2020-3019244

Dear Secretary Chiavetta:

Enclosed please find The Pittsburgh Water and Sewer Authority's response to the October 1, 2020 Secretarial Letter in the above referenced docket, which requires utilities to submit specific information relating to customers at risk of termination.

Please contact me or Julie Quigley (jquigley@pgh2o.com) with any questions that you may have.

Respectfully Submitted,

/s/ Shannon F. Barkley
Shannon F. Barkley
PA Attorney ID # 81501

Enclosures

CC: Sarah Dewey, Bureau of Consumer Services – sdewey@pa.gov

The Pittsburgh Water and Sewer Authority
Re: Temporary Reporting Requirement: At-Risk Accounts
Docket No. M-2020-3019244
February 2020 and February 2021

1. Total number of Residential and Non-Residential accounts at risk of termination at the end of the month and for the same month the year prior.

	Accounts At-Risk of Termination Feb. 2020	Accounts At-Risk of Termination Feb. 2021
Residential	5,399	6,893
Non-Residential	333	520

2. Total aggregate dollars of arrears, broken down by the same account categories, at the end of the month and for the same month the year prior.

	Total Aggregate Dollars of Arrears Feb. 2020	Total Aggregate Dollars of Arrears Feb. 2021
Residential	\$4,637,713.32	\$6,407,599.88
Non-Residential	\$1,487,388.55	\$1,320,005.70

	Accounts Disconnected for Non-Payment with Dollar Amounts Owed Feb. 2020	Accounts Disconnected for Non-Payment with Dollar Amounts Owed Feb. 2021
Residential	141	Zero
Non-Residential	8	Zero



SBarkley@pgh2o.com
(412) 676-6685 (Office)
(412) 737-0297 (Business Cell)

April 7, 2021

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120

**Re: Temporary Reporting Requirements: At-Risk Accounts
Docket No. M-2020-3019244**

Dear Secretary Chiavetta:

Enclosed please find The Pittsburgh Water and Sewer Authority's response to the October 1, 2020 Secretarial Letter in the above referenced docket, which requires utilities to submit specific information relating to customers at risk of termination.

Please contact me or Julie Quigley (jquigley@pgh2o.com) with any questions that you may have.

Respectfully Submitted,

/s/ Shannon F. Barkley
Shannon F. Barkley
PA Attorney ID # 81501

Enclosures

CC: Sarah Dewey, Bureau of Consumer Services – sdewey@pa.gov

The Pittsburgh Water and Sewer Authority
Re: Temporary Reporting Requirement: At-Risk Accounts
Docket No. M-2020-3019244
March 2020 and March 2021

1. Total number of Residential and Non-Residential accounts at risk of termination at the end of the month and for the same month the year prior.

	Accounts At-Risk of Termination March 2020	Accounts At-Risk of Termination March 2021
Residential	6,713	10,059
Non-Residential	475	665

2. Total aggregate dollars of arrears, broken down by the same account categories, at the end of the month and for the same month the year prior.

	Total Aggregate Dollars of Arrears March 2020	Total Aggregate Dollars of Arrears March 2021
Residential	\$5,378,580.82	\$9,471,127.27
Non-Residential	\$1,543,539.22	\$1,724,751.47

	Accounts Disconnected for Non-Payment with Dollar Amounts Owed March 2020	Accounts Disconnected for Non-Payment with Dollar Amounts Owed March 2021
Residential	7	Zero
Non-Residential	1	8

Exhibit JAQ-3

Supplement No. 7
Tariff Water - Pa. P.U.C. No. 1

THE PITTSBURGH WATER AND SEWER AUTHORITY
RATES, RULES AND REGULATIONS GOVERNING
THE PROVISION OF WATER SERVICE
TO THE PUBLIC IN THE TERRITORY DESCRIBED HEREIN

Issued: April 13, 2021

Effective: June 12, 2021

BY: William J. Pickering, Chief Executive Officer
1200 Penn Avenue, Pittsburgh, PA 15222
Tel: 412-255-8800

NOTICE

This tariff makes increases and changes in
existing rates, rules, and regulations.

LIST OF CHANGES

TABLE OF CONTENTS (PAGE No. 3)

Updated to reflect additional language for Section H Miscellaneous Charges and addition of Part I, Section J.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A - RATES FOR METERED SERVICE (PAGE No. 8)

Rates for Minimum Charges and Consumption Charges increased for all customer classes effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A.1 - RATES FOR UNMETERED SERVICE (PAGE No. 9)

Rates for the Customer Charge for Residential and Commercial customers increased effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION B.1 - FIRE PROTECTION RATES (PAGE No. 10)

For Private Fire Protection, Customer Charge per month decreased for all meter sizes, and Consumption Charge increased effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION B.2 - FIRE PROTECTION RATES (PAGE No. 11)

Public Fire Protection per hydrant charge per month increased effective January 12, 2022 and January 12, 2023. Revised language regarding permitted usage of hydrants.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION C - RETURNED CHECK CHARGE (PAGE No. 12)

Updated to reflect new rates for Returned Checks, Service Termination and Service Resumption. Also revised to state that Returned Check Charge will not be assessed more than once per returned check under PWSA's tariffs, including under the Storm Water Tariff.

PART I: SCHEDULE OF RATES AND CHARGES, SECTIONS F AND G (PAGE No. 13)

Text Moved from page 12 to page 13.

LIST OF CHANGES (con't)

PART I: SCHEDULE OF RATES AND CHARGES, SECTION H - MISCELLANEOUS FEES (PAGE NOS. 14, 15 AND 15A-15F)

Various fees revised and new fees added related to requests to the Authority from customers or penalties.

PART I: SCHEDULE OF RATES AND CHARGES (PAGE NO. 16)

Sales for Resale (Wholesale) Rates increased effective January 12, 2022 and January 12, 2023.

Added new section J to reflect a one-time credit for new enrollments in paperless billing and establishing automatic bill payment.

RIDER BDP - BILL DISCOUNT PROGRAM (RESIDENTIAL) (PAGE NO. 19)

Increased the discount for participants with incomes at or below 50% of the Federal Poverty Level to receive a 50% discount on the Consumption Charge.

PART II DEFINITIONS (PAGE NO. 21)

Added definition for Non Bona Fide Service Applicant.

PART III: RULES AND REGULATIONS, SECTION B CONSTRUCTION AND MAINTENANCE OF FACILITIES (PAGE NO. 36 AND 37)

Removed tapping fees.

PART III: RULES AND REGULATIONS, SECTION D METERS (PAGE NOS. 42 AND 43)

Removed reference to fees for new meters, added meter upsizing option.

PART III: RULES AND REGULATIONS, SECTION E, BILLING AND COLLECTION, PARAGRAPH No. 5 - APPLICATION OF PAYMENT (PAGE NO. 44)

Revised to include stormwater charges.

PART III: RULES AND REGULATIONS, SECTION G, LINE EXTENSIONS (PAGE NOS. 48-51, 51A-51C)

Revised to comply with Commission line extension regulations.

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PART I: SCHEDULE OF RATES AND CHARGES

Section A - Rates for Metered Service

1. Minimum Charge*: Each customer will be assessed a service charge based upon the size of the customer's meter as follows:

<u>Meter Size</u>	<u>Minimum Gallons</u>	<u>Per Month Rate (Effective January 12, 2022)</u>	<u>Per Month Rate (Effective January 12, 2023)</u>	
5/8"	1,000	\$27.54	\$27.81	(I)/(I)
3/4"	2,000	\$46.57	\$48.76	(I)/(I)
1"	5,000	\$98.49	\$107.16	(I)/(I)
1 1/2"	10,000	\$193.60	\$211.90	(I)/(I)
2"	17,000	\$321.62	\$354.10	(I)/(I)
3"	40,000	\$723.15	\$804.82	(I)/(I)
4"	70,000	\$1,232.14	\$1,379.99	(I)/(I)
6"	175,000	\$2,946.76	\$3,335.35	(I)/(I)
8"	325,000	\$5,337.47	\$6,077.98	(I)/(I)
10" or Larger	548,000	\$8,792.97	\$10,070.12	(I)/(I)

2. Consumption Charge: In addition to the Minimum Charge, the following water consumption charges will apply for each 1,000 gallons above the Minimum Gallons for each meter size:

<u>Customer Class</u>	<u>Consumption Charge Rate per 1000 Gals.</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential	\$13.89	\$15.52	(I)/(I)
Commercial*	\$13.46	\$14.96	(I)/(I)
Industrial**	\$11.67	\$13.02	(I)/(I)
Health or Education	\$16.25	\$17.21	(I)/(I)

The rate under this schedule applies to all customers, except public fire protection and private fire protection customers, unless otherwise specifically identified in this tariff.

* Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213.

** Rate applies to any new bulk water customers.

(I) = Increase

Section A.1 - Rates for Unmetered Service

As of September 1, 2018, enrollment for Unmetered Service will be closed and no new Unmetered Service customers will be accepted by the Authority. Customers who are receiving unmetered service will be assessed a monthly customer charge per unmetered connection as follows:

<u>Customer Class</u>	<u>Customer Charge Per Month</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential (per unit)	\$69.20	\$74.37	(I) / (I)
Commercial*	\$81.36	\$87.65	(I) / (I)

*Rate does not apply to City of Pittsburgh Municipal Accounts pursuant to 71 P.S. §§ 720.211 to 720.213.

~~(C)~~

(I)= Increase

Section B - Fire Protection Rates

1. Private Fire Protection: A customer charge for non-residential private fire protection service will be assessed as follows:

<u>Meter Size</u>	<u>Line Size (if unmetered)</u>	<u>Customer Charge Per Month (effective January 12, 2022)</u>	<u>Customer Charge Per Month (effective January 12, 2023)</u>	
1" or Less	2"	\$24.62	\$16.00	(D) / (D)
1 1/2"-3"	3"	\$74.96	\$47.95	(D) / (D)
4"	4"	\$236.16	\$157.89	(D) / (D)
6" or Greater	6" or Greater	\$482.16	\$337.49	(D) / (D)

In addition to any customer charge as applicable above, all customers shall be charged for consumption pursuant to the following terms:

- a. In the event of a confirmed fire, no charge shall be made for the use of water to fight the fire using private fire hydrants or fire abatement equipment. Customers whose fire equipment has been activated to fight a fire should notify the Authority to assure that the associated water use will not be billed.
- b. For consumption of water related to testing, training on, and maintenance of private fire hydrants and fire abatement equipment, consumption charges shall be billed in accordance with the following rates for water consumption. Water used from private fire protection for these purposes should be based on meter readings where possible. If a meter cannot be used, the Authority will estimate the usage.

Consumption Charge
Rate per 1,000 Gals.

	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Private Fire Protection	\$25.77	\$37.52	(I) / (I)

(I)= Increase, (D)= Decrease

The Pittsburgh Water
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2. Public Fire Protection: For public fire protection, the charges will be assessed as follows:

**Per Hydrant Charge
Per Month**

	<u>Effective</u> <u>January 12, 2022</u>	<u>Effective</u> <u>January 12, 2022</u>	
Public Fire Protection*	\$16.35	\$19.37	(I)/(I)

**Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213.*

No charge shall be made for the use of water to fight a confirmed fire or for reasonable testing, training on, and maintenance of public fire hydrants and abatement equipment.

For use other than public fire protection, charges based on metered usage of a hydrant as set forth in Part II, Section H.3. (C)

(C)

(I)= Increase, (C)= Change

Section C - Returned Check Charge

A charge of \$40.00 will be assessed any time where a check which has been presented to the Authority for payment on account has been returned by the payor bank for any reason if the customer has not paid a returned check charge under PWSA's wastewater or storm water tariff. (I) (C)

Section D - Construction Rates

Metered service may be provided for construction purposes by way of a Hydrant permit. The rates, fees and charges for Hydrant permits are in Part I, Section H.3 of this Tariff. (C)

Section E - Service Termination or Resumption Rates

Activity		Fee	
Service Termination (Shut-Off at Curb Stop)		\$50.00	(D)
Service Resumption (Turn-On at the Curb Stop)	Normal Business hours (Standard Time)	\$50.00	(I)
	After Normal Business Hours (Standard Time)	\$80.00	(C)
	Same Day - Normal Business Hours	\$100.00	(I)
	Same Day - After Normal Business Hours	\$150.00	(C)

[text previously on this page moved to next page] (C)

(D) Decrease, (I) Increase, (C) Change

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Section F - Meter Test Rates

Consistent with Commission regulation at 52 Pa. Code §65.8(h), the fee schedule for testing of meters shall be as follows:

<u>Size of Meter</u>	<u>Fee for Test</u>
1 inch or less	\$10 *
1 1/4 inch - 2 inch	\$20 *
Larger than 2"	As approved by the Commission, pursuant to 52 Pa. Code § 65.8 (h)

* These amounts may vary without revision of this tariff so as to be consistent with Commission regulations.

Section G - Collection Expenses and Fees described in the
Authority's Supplemental Service Conditions

[text on this page moved from prior page]

Section H - Miscellaneous Charges, Fees, and Penalties (includes processing fees, permits, connections and meter fees)

The following charges and fees will be adjusted annually for increases in the annual Consumer Price Index for the Pittsburgh area most recently published by the Bureau of Labor Statistics or any successor organization prior to such anniversary. If the change in the Consumer Price Index is 0% or is a decrease, there will be no automatic adjustment.

1. Processing Fees

<u>Item</u>	<u>Charge or Fee</u>	
Certified mailing	\$20.00	(I)
History retrieval	\$10.00	(D)
Final bill	\$20.00	(D)
Map and Record Requests	\$40.00	(C)
Easement Recording	\$3,700.00	(C)
Inspection Fee	\$120 for first 2 hours + \$60 per hour after two hours	(C)
Non-Residential Properties Only:		
Administrative charge Processing of backflow device tests	\$10.00	(D)
Late fee, back flow device tests	\$60.90	

2. Penalties

<u>Item</u>	<u>Penalty</u>	
Illegal Connection - Residential	\$130.00	(C)
Illegal Connection - Commercial	\$160.00	(C)

(
I) Increase, (D) Decrease, (C) Change

3. Metered Usage of a Hydrant

a. There will be a meter fee for each hydrant as follows:

(C)
(C)
(C)
(C)

<u>Size</u>	<u>Type</u>	<u>Fee</u>	
5/8"	Pitt - Positive Displacement Meter	\$250.00	(D)
5/8"	Non-pitt - Positive Displacement Meter	\$250.00	(D)
5/8" x 3/4"	Pitt - Positive Displacement Meter	\$250.00	(D)
5/8" by 3/4"	Non-pitt- Positive Displacement Meter	\$250.00	(D)
3/4"	Pitt-Positive Displacement Meter	\$270.00	(D)
3/4"	Non-pitt - Positive Displacement Meter	\$270.00	(D)
3/4"	Pitt - Electromagnetic or Ultrasonic Meter	\$280.00	(D)
3/4"	Non-pitt -Electromagnetic or Ultrasonic Meter	\$280.00	(D)
1"	Pitt - Positive Displacement Meter	\$300.00	(D)
1"	Non-pitt -Positive Displacement Meter	\$300.00	(D)
1"	Pitt - Electromagnetic or Ultrasonic Meter	\$310.00	(D)
1"	Non-pitt - Electromagnetic or Ultrasonic Meter	\$310.00	(D)
	Fire Hydrant Meter	\$970.00	(D)

b. In addition to a meter fee for each metered hydrant, all water used (except for fighting fires) under a hydrant permit shall be subject to a water consumption charge for each 1,000 gallons at the consumption charge schedule in Part I, Section A for Commercial Customers.

(C) Change, (D) Decrease

4. Activities Related to Permits/Approvals Issued by PWSA

a. Development Permits - required for constructing or renovating a structure larger than a single-family home including single-family homes with a fire service line or multi-family homes

<u>Activity</u>	<u>Fee</u>
Developer Fee - Water and Sewer Availability Letter	\$40.00
Developer Fee - Water and Sewer Use Review Letter	\$320.00
Developer Fee - Water and Sewer Use Review Letter - Expedited*	\$550.00
Tap-in Plan Review	\$420.00
Tap-In Plan Review - Expedited*	\$740.00
Developer Permit Revisions Review	\$140.00
Developer Permit Revisions Review - Expedited*	\$250.00
Private Construction of Public Facilities Plan Review	\$680.00
Private Construction of Public Facilities Plan Review - Expedited*	\$1,190.00

*Expedited = guaranteed review within 15 business days

b. Residential Permit - for new water and/or sewer taps or reconnecting to existing water and/or sewer service (includes party line separations)

<u>Activity</u>	<u>Fee</u>
Residential Permit	\$40.00

c. Other Permits (for any customer wanting to schedule an operation of a PWSA facility such as a fire hydrant or waterline shut)

<u>Activity</u>	<u>Fee</u>
Hydrant Flow Test Permit Review	\$60.00
Hydrant Permit Review	\$20.00
Hydrant Flow Test	\$350.00
Water Shut Permit Review	\$40.00
Termination Only Permit	\$250.00

d. Land Operations Permits (may be required for construction project, administered by City of Pittsburgh but requires review by PWSA before permit will be issued)

<u>Activity</u>	<u>Fee</u>
Review of City Land Operation Permit	\$80.00

e. City of Pittsburgh Department of Mobility and Infrastructure (DOMI) Approvals (PWSA required to submit approval letter if affected)

<u>Activity</u>	<u>Fee</u>
Review of City Street Vacation Permits	\$100.00
Review of City Encroachment Permits	\$100.00

5. Connection Fees and Service Fees for Valve Operation

<u>Type of Fee</u>	<u>Meter Size</u>	<u>Fee</u>	
Connection Fee	1"	\$340.00	(I)
			(D)
	4"	\$400.00	(D)
	6"	\$400.00	(D)
	8"	\$400.00	(D)
	10"	\$400.00	(D)
	12"	\$400.00	(D)
Connection Fee - After Normal Business Hours	Fees at 1.5x for work performed outside business hrs.		(D)
	1"	\$510.00	(I)
	4"	\$600.00	(D)
	6"	\$600.00	(D)
	8"	\$600.00	(D)
	10"	\$600.00	(D)
	12"	\$600.00	(D)

<u>Type of Fee</u>	<u>Meter Size</u>	<u>Fee</u>	
Service Fees for Valve Operations Based on Waterline Diameter, Normal Business Hours	4" - 12"	\$260.00	(D)
	16" - 24"	\$370.00	(D)
	30" - 48"	\$370.00	(D)
Service Fees for Valve Operations Based on Waterline Diameter, After Normal Business Hours	Fees at 1.5x for work performed outside business hrs.		
	4" - 12"	\$390.00	
	16" - 24"	\$560.00	
	30" - 48"	\$560.00	

[these fees moved from page 48]

(I) Increase, (D) Decrease, (C) Change

6. Meter Fees

a. Water Meters, Domestic

<u>Size</u>	<u>Type</u>	<u>Fee</u>	
5/8"	Pitt Positive Displacement Meter	\$190.00	(D)
5/8"	Non-pitt - Positive Displacement Meter	\$190.00	(D)
5/8" x 3/4"	Pitt - Positive Displacement Meter	\$190.00	(D)
5/8" by 3/4"	Non-pitt- Positive Displacement Meter	\$190.00	(D)
3/4"	Pitt-Positive Displacement Meter	\$210.00	(D)
3/4"	Non-pitt - Positive Displacement Meter	\$210.00	(D)
3/4"	Pitt - Electromagnetic or Ultrasonic Meter	\$220.00	(D)
3/4"	Non-pitt -Electromagnetic or Ultrasonic Meter	\$220.00	(D)
1"	Pitt - Positive Displacement Meter	\$240.00	(D)
1"	Non-pitt -Positive Displacement Meter	\$240.00	(D)
1"	Pitt - Electromagnetic or Ultrasonic Meter	\$250.00	(D)
1"	Non-pitt - Electromagnetic or Ultrasonic Meter	\$250.00	(D)
1-1/2"	Badger Meter E-series Ultrasonic Meter, Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$660.00	(C)
1-1/2"	Badger Meter E-series Ultrasonic Meter-HEX, including all meter couplings, bushings, & leather gaskets	\$720.00	(C)
1-1/2"	Badger Meter Record all Disc Meters - Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$500.00	(C)
2"	Badger Meter E-Series Ultrasonic Meter - Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$840.00	(C)
2"	Badger Meter E-Series Ultrasonic Meter - HEX, including all meter couplings, bushings, & leather gaskets	\$850.00	(C)
2"	Badger Meter Record all Disc Meters - HEX, including all meter couplings, bushings, & leather gaskets	\$700.00	(C)

[these fees were moved from pages 49-50]

(I) Increase, (D) Decrease, (C) Change

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b. Water Meters, Turbine Domestic Vault

<u>Size</u>	<u>Fee</u>	
3"	\$1,480.00	(C)
4"	\$1,600.00	(I)
6"	\$2,550.00	(I)
8"	\$3,850.00	(I)
10"	\$5,560.00	(I)
12"	\$6,490.00	(D)
16"	\$9,090.00	(D)

c. Water Meters, Turbine Domestic (Non Vault)

<u>Size</u>	<u>Fee</u>	
3":	\$1,430.00	(C)
4":	\$1,550.00	(I)
6"	\$2,500.00	(I)
8"	\$3,990.00	(I)
10"	\$5,700.00	(I)
12"	\$6,630.00	(D)
16"	\$9,220.00	(D)

d. Water Meters, Compound Domestic

<u>Size</u>	<u>Fee</u>	
3"	\$1,540.00	(D)
4"	\$1,730.00	(D)
6"	\$2,900.00	(D)
8"	\$9,580.00	(I)

[these fees were moved from pages 49-50]

(I) Increase, (D) Decrease, (C) Change

e. Fire Systems Meters, Turbine

<u>Size</u>	<u>Fee</u>	
3"	\$2,320.00	(I)
4"	\$2,670.00	(I)
6"	\$3,420.00	(I)
8"	\$6,120.00	(I)
10"	\$10,740.00	(I)

f. Fire Systems Meters, Compound

<u>Size</u>	<u>Fee</u>	
4"	\$4,460.00	(I)
6"	\$5,990.00	(I)
8"	\$9,370.00	(I)
10"	\$10,570.00	(I)

[these fees were moved from pages 49-50]

(I) Increase

Section I - Sales for Resale (Wholesale)

1. Application: This schedule applies to all new sales of water to other water utilities or public authorities for resale.
2. Rates and Terms of Service: A customer consumption charge per 1,000 gallons of usage will be assessed as follows:

	<u>Consumption Charge</u>		
	<u>Rate per 1000 Gals.</u>		
	<u>(effective</u>	<u>(effective</u>	
	<u>January 12, 2022</u>	<u>January 12, 2023)</u>	
Sales for Resale	\$9.16\$10.44	\$11.71	(I) / (I)

3. Contracts stipulating the negotiated rate and negotiated terms of Sale for Resale Service may be renegotiated and/or entered into between the Authority and Customer or Applicant when the Authority, in its sole discretion, deems such offering to be economically advantageous to the Authority. Service under this rate is interruptible, and the Authority reserves the right to interrupt service at Authority's discretion.

Section J - New Automatic Payment Enrollment Credit (C)

Customers enrolling in paperless billing and establishing automatic bill payments for the first time will receive a one-time credit of \$5.00. For customers receiving water, wastewater, and/or storm water service from PWSA, this credit will only be applied once per PWSA account.

(C)= Change; (I) Increase

Rider BDP - Bill Discount Program (Residential)

1. Bill Discount Program: This rider is a program designed to enroll residential ratepayers who satisfy the criteria set forth below in a monthly discounted rate program.
2. Availability: This rider is available for a Residential customer that meets the low-income criteria of annual household gross income at or below 150% of the Federal Poverty Level.
 - a. A residential ratepayer who meets the eligibility criteria should complete an application for the Bill Discount Program.
 - b. Eligible customers may be asked to verify income every two years.
3. Rate (Minimum Charge): The Minimum Charge for residential service pursuant to Rider BDP will be 0% of the prevailing Minimum Service Charge under Part I, Section A. Any other rates, fees and charges will be at the prevailing amounts under this tariff.
4. Rate (Consumption Charge): The Consumption Charge for residential service pursuant to Rider BDP for participants with income at or below 50% of the Federal Poverty Level will pay 50% of the prevailing Consumption Charge under Part I, Section A (which represents a 50% discount off the charge). Any other rates, fees and charges will be at the prevailing amounts under this tariff. (D)

(D) = Decrease

6. Bona Fide Service Applicant: (For Line Extension Purposes) A person or entity applying for water service to an existing or proposed structure within the Authority's certificated service territory for which a valid occupancy or building permit has been issued if the structure is either a primary residence of the applicant or a place of business. An applicant shall not be deemed a bona fide service applicant if:
- a. applicant is requesting water service to a building lot, subdivision or a secondary residence;
 - b. the request for service is part of a plan for the development of a residential dwelling or subdivision; or
 - c. the applicant is requesting special utility service.
- 6a. Non Bona Fide Service Applicants: Applicants that do not meet the definition of Bona Fide Service Applicants, shall be deemed a Non Bona Fide Service Applicant.
7. Capital Lease Agreement: The agreement bearing that title between the City and the Authority on July 15, 1995, effective July 27, 1995, and includes any amendments thereto.
8. City: The City of Pittsburgh, Pennsylvania.
9. Commercial or Commercial Property: Any property used, acquired or leased for purposes of carrying on a trade, business, profession, vocation, or any commercial, service, financial, or utility business or activity including, but not limited to, hotels, office buildings, gas service stations, laundries, commercial establishments, stores, malls, car washes, and parking lots.
10. Commission or PUC: The Pennsylvania Public Utility Commission.
11. Corporation Stop: The valve placed on a Water Service Line at or near the junction with the Water Main.
12. Curb Box: The casting or enclosure that houses or permits access to the Curb Stop.
13. Curb Stop: The valve, typically installed on or near the property line, to turn water service on and off to a building or facility.
-

could impair access to the Curb Box, they shall contact the Authority for repair or replacement of the Curb Box.

- g. Customers and property Owners may not cover, obscure, damage, tamper, or interfere with the Curb Stop or Curb Box. Customers and property Owners shall not interfere in any way with the Authority's access to or use of the Curb Stop. If the Curb Box or Curb Stop is damaged by the Customer and/or Property Owner, or the Curb Box or Curb Stop is covered so as to preclude or interfere with access, the Customer or property Owner, as applicable, is responsible for the cost of the Authority's work in uncovering, repairing, or replacing the Curb Stop and/or Curb Box, and for the cost of restoring adjacent landscaping, sidewalks, or other property affected by the work.

13. Conversion of Party Water Service Lines and Converting Flat Rate or Unmetered Customers to Metered Customers:

- a. Non-Municipal Residential Property Owners whose properties are served by a Party Water Service Line must install separate services lines to each individual property. Each Customer shall have an individual Water Service Line and Meter of a size, type, location, and setting approved by the Authority. The cost of installation of the Water Service Line from the residence to the Curb Stop is the responsibility of the property Owner. Installation and the cost of installation of the Meter and the Water Service Line from the Water Main to and including the Curb Stop is the responsibility of the Authority. No connections fees or service fees will be imposed. All plans for installation of the Water Service Lines and the scheduling of such work is subject to the permitting process and the prior approval of the Authority. (C)

(C) = Change

- b. Non-Residential Property Owners whose properties are provided with water under a flat rate or are served by a Party Service Water Line are required to have a Meter of a size, type, and setting approved by the Authority and a Backflow prevention device approved by the Authority. The installation and the cost of installing the entire Water Service Line, including the Corporation Stop or mechanical joint tee, is the responsibility of the property Owner. No connections fees or service fees will be imposed. All plans for installation of the Water Service Lines and the scheduling of such work shall be subject to the permitting process and the prior approval of the Authority. (C)
- c. Notwithstanding (a) and (b) above, the installation, costs and subsequent responsibilities for converting City of Pittsburgh properties to metered service shall be in accordance with 71 P.S. §§ 720.211 to 720.213.

(C) = Change

Section D - Meters and Meter Reading Equipment

1. Ownership: All meters and meter reading equipment shall be owned, installed, tested, and maintained by the Authority.
2. Requirement for Metered Service: All service provided by the Authority shall be metered except as authorized by this tariff.
3. Location of Meters and Meter Reading Equipment: The meter will be set after the customer has had the plumbing arranged to receive the meter at a convenient point approved by the Authority so as to measure all water being supplied to the customer's premise. The meter reading equipment shall be set by the Authority in a location sufficient to provide adequate signal transmission. Protection for the meter and meter reading equipment shall be provided by the customer. In cases where it is not practical to place the meter indoors, or if the customer so desires and the Authority approves, an outside setting will be installed at the customer's expense at a position selected by the Authority. The Authority shall establish standards for outside meter settings. Relocation of meters for the customer's convenience shall be at the customer's expense.
4. Access for Automated Meter Reading Devices: Upon reasonable notice, the customer shall permit the Authority access and space for the purpose of installing and utilizing a telemetering or other automated meter reading device. Where applicable, the customer must provide the Authority with the telephone number of the line to which the equipment will be connected and immediately advise the Authority of any changes in the telephone number. Where the use of the customer's facilities results in a utility charge, the Authority will compensate the customer.
5. Fees for New Meters: New Meters, meter equipment and associated Remote Reading Devices are supplied and installed by the Authority.

(C)

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(C) Change

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6. Damages to Meters: Meters shall be maintained by the Authority so far as ordinary wear and tear is concerned. Where damage to a meter results from the negligent or willful act of the customer, the actual cost of removing, replacing, repairing or testing a damaged meter shall be paid by the customer.
7. Notification to Authority of Non-Working or Damaged Meter: The customer shall notify the Authority of a non-working or damaged meter as soon as the customer has notice of either condition.
8. Fees for Meter Tests: Fees for testing meters shall be as specified under Part I, Section F, of this tariff. Testing fees shall be refunded pursuant to Commission regulation at 52 Pa. Code §65.8(g) where the meter is found not operating within the allowable accuracy range specified at 52 Pa. Code §65.8(a).
9. New Meters: If a Property is set up for individual metering, but no operational Meter is in place, a Meter must be installed before the applicant will be accepted as a Customer.
- a. If the Property is not separately metered or set up for separate metering, the Property must be set up for separate metering, to the Authority's satisfaction, by a Registered Plumber at the cost of the Property Owner, and a Meter and Remote Reading Device must be installed before the applicant will be accepted as a Customer. Installation charges must be paid before water service will be provided.
10. Meter Upsizing: Single-family homeowners may apply to upsize their domestic water meter up to one inch without requiring any additional permits. Meters larger than one inch may be subject to additional requirement. Other property owners must request upsizing of their domestic water meter through the development process. Applicant will pay the full cost of the meter if an upsizing request is granted.

(C)

(C) Change

Section E - Billing and Collection

1. Issuance of Bills: The Authority will bill each customer within fifteen (15) days of the last day of each billing period.
2. Billing Due Date: The due date for payment of a bill for nonresidential service shall be no less than fifteen (15) days from the date of transmittal. The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the Authority are not open to the general public, the due date shall be extended to the next business day. The Authority may not impose a late-payment charge unless payment is received more than five (5) days after the stated due date.
3. Late Payment Charge: All amounts not paid when due shall accrue a late payment charge at the rate of 0.83 percent per billing period, not to exceed ten percent (10%) per year when not paid as prescribed in Rule 2 of this Section.
4. Change in Billing Address: Where a customer fails to notify the Authority of a change in billing address, the customer shall remain responsible to remit payment by the billing due date.
5. Application of Payment: Utility bills rendered by the Authority shall include only the amount due for water service. Where a customer remittance to the Authority includes payment for any non-utility services, proceeds will be applied first to pay all outstanding regulated utility charges. For customers receiving any combination of water, wastewater, and stormwater services, any partial remittance will be applied in following order: water, wastewater and stormwater charges. (C)
6. Return Check Charges: The customer will be responsible for the payment of a charge for each time a check presented to the Authority for payment on that customer's utility bill is returned by the payor bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date, account garnished, or unauthorized signature. This charge is in addition to any charge which may be assessed against the

(C) = Change

Section G - Line Extensions

Bona Fide Service Applicant(s) and/or Non-Bona Fide Service Applicant(s) who desire to or are required to connect to the Authority's Water distribution system (a "Line Extension Applicant") must comply with the following conditions:

1. A Line Extension Applicant shall provide prior notice to the Authority. Notice shall be written and made on the application and permit forms contained in the Authority's Procedures Manual for Developers, which is located on the Authority's website. The appropriate forms can be completed and any applicable fees paid at the Authority's permit counter, First Floor, Penn Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, PA 15222.
2. A Line Extension Applicant shall pay all applicable fees set forth in Part I, Section H at the time of application for connection or at a time to which the property owner and the Authority agree. 53 Pa.C.S. § 5607(d)(24).

(C)

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(C) Change

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and Sewer Authority

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[text on this page moved to pages 15C-15F]

Reserved for future use.

Issued: April 13, 2021

Effective:

June 12, 2021

[some text on this page moved to page 15F]

- (C)
3. Consistent with 53 Pa.C.S. § 5607(d)(30), where the Authority's system is to be extended at the expense of the owner of properties or where the authority otherwise would construct customer facilities (other than water meter installation), a Line Extension Applicant shall have the right to self construct the extension or install the customer facilities or through a subcontractor approved by the authority, which approval shall not be unreasonably withheld. The Authority shall have the right, at its option, to perform the construction itself only if the Authority provides the extension or customer facilities at a lower cost and within the same timetable specified or proposed by the property owner or his approved subcontractor. Construction by the Line Extension Applicant shall be in accordance with an agreement for the extension of the Authority's system and plans and

(C)

(C)

specifications approved by the authority and shall be undertaken only pursuant to the existing regulations, requirements, rules and standards of the authority applicable to such construction. Construction shall be subject to inspection by an inspector authorized to approve similar construction and employed by the Authority during construction. (C)

4. Upon completion of construction, the Line Extension Applicant shall dedicate and the authority shall accept the extension of the authority's system if dedication of facilities and the installation complies with the plans, specifications, regulations of the authority and the agreement. 53 Pa.C.S. § 5607(d) (30).

3. Where a Line Extension Applicant constructs or causes to be constructed at his expense (in whole or in part) any extension of a sewer or water system of an authority, the Authority shall provide for the reimbursement to the Line Extension Applicant when the owner of another property connects a service line directly to the extension within ten years of the date of the dedication of the extension to the authority in accordance with 52 Pa. Code § 65.22 The Customer Refund Amount shall be the Company contribution divided by the number of customers connected to the initial main extension. For Non Bona Fide Service Applicants, this provision shall only apply if the owner of the property connecting to the service line is not in the development for which the extension was constructed. (C)

(C)

(C) Change

For Non Bona Fide Service Applicants:

6. The above-described fees shall be in addition to any charges assessed against the property in the construction of a sewer or water main by the Authority under 53 Pa.C.S. § 5607(d) (21), (22) as well as any other user charges imposed by the Authority. See 53 Pa.C.S. § 5607(d) (24). The Authority may charge the cost of construction of a sewer or water main constructed by the Authority against the properties benefited, improved or accommodated by the construction in accordance with 53 Pa.C.S. § 5607(d) (21), (22).
7. The Authority may, in its exercise of its sole discretion, require that construction shall not commence until the Non Bona Fide Service Applicant has posted appropriate financial security in accordance with 53 Pa.C.S. § 5607(d) (23), (30).
8. The Authority may, in its exercise of its sole discretion, require the Non Bona Fide Service Applicant to reimburse the Authority for reasonable and necessary expenses the Authority incurs as a result of the extension. 53 Pa.C.S. § 5607(d) (30).
9. When a main is to be extended at the expense of the Non Bona Fide Service Applicant, the Non Bona Fide Service Applicant may be required to deposit with the Authority, in advance of construction, the Authority's estimated reasonable and necessary cost of reviewing plans, construction inspections, administrative, legal and engineering services.

For Bona Fide Service Applicants:

- 10. Line extensions to Bona Fide Service Applicants shall be funded without customer advance if the annual revenue from line extension will equal or exceed the Authority's annual line extension costs. The Authority's calculation of annual line extension costs will be consistent with 52 Pa. Code §65.1 but for depreciation costs. As a cash flow regulated company, the Authority does not earn interest on its assets. Calculation of debt costs will include annual payments on the debt and debt service coverage.

- 11. If the annual revenue from the line extension will not equal or exceed the Authority's annual line extension costs, a Bona Fide Service Applicant may be required to provide a customer advance to the Authority's cost of construction for the line extension. The Authority's investment for the line extension shall be the portion of the total construction costs which generate annual line extension costs equal to annual revenue from the line extension. The customer advance amount shall be determined by subtracting the Authority's investment for the line extension from the total construction costs.

- 12. The Authority's investment for the line extension shall be based on the following formula:

Average Annual Revenue	\$ _____
<i>Minus</i>	
Operation and Maintenance Expenses*	\$ _____
Subtotal	\$ _____
<i>Divided by</i>	
Weighted Cost of Debt plus Depreciation	_____ %
Company Investment	\$ _____

*The Authority will calculate Operation and Maintenance Expenses by multiplying the Operations and Maintenance Expenses per thousand gallons, as determined annually using the AWWA Water Audit methodology and that is submitted annually to the Commission, by the anticipated consumption from the customer.

13. If a customer advance is required from a Bona Fide Service Applicant and the Bona Fide Applicant is unable to advance the entire amount due, the Authority shall do one of the following: (1) Allow the applicant to pay the advance over a period of not less than 3 years, with the utility recovering financing costs equal to the utility's weighted cost of long term debt. The utility may require the applicant to deposit up to one-third of the total customer advance prior to extending service, or (2) Provide information to the customer on financial institutions that may offer financing to the customer for the line extension.

14. A Bona Fide Service Applicant will be required to pay, in advance, a reasonable charge for service lines and equipment installed on private property for the exclusive use of the customer.

Exhibit JAQ-4

Supplement No. 7
Tariff Water - Pa. P.U.C. No. 1

THE PITTSBURGH WATER AND SEWER AUTHORITY

RATES, RULES AND REGULATIONS GOVERNING

THE PROVISION OF WATER SERVICE

TO THE PUBLIC IN THE TERRITORY DESCRIBED HEREIN

Issued: April 13, 2021

Effective: June 12, 2021

BY: William J. Pickering, Chief Executive Officer
1200 Penn Avenue, Pittsburgh, PA 15222
Tel: 412-255-8800

NOTICE

This tariff makes increases and changes in
existing rates, rules, and regulations.

LIST OF CHANGES

TABLE OF CONTENTS (PAGE No. 3)

Updated to reflect additional language for Section H Miscellaneous Charges and addition of Part I, Section J.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A - RATES FOR METERED SERVICE (PAGE No. 8)

Rates for Minimum Charges and Consumption Charges increased for all customer classes effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A.1 - RATES FOR UNMETERED SERVICE (PAGE No. 9)

Rates for the Customer Charge for Residential and Commercial customers increased effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION B.1 - FIRE PROTECTION RATES (PAGE No. 10)

For Private Fire Protection, Customer Charge per month decreased for all meter sizes, and Consumption Charge increased effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION B.2 - FIRE PROTECTION RATES (PAGE No. 11)

Public Fire Protection per hydrant charge per month increased effective January 12, 2022 and January 12, 2023. Revised language regarding permitted usage of hydrants.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION C - RETURNED CHECK CHARGE (PAGE No. 12)

Updated to reflect new rates for Returned Checks, Service Termination and Service Resumption. Also revised to state that Returned Check Charge will not be assessed more than once per returned check under PWSA's tariffs, including under the Storm Water Tariff.

PART I: SCHEDULE OF RATES AND CHARGES, SECTIONS F AND G (PAGE No. 13)

Text Moved from page 12 to page 13.

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and Sewer Authority

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Canceling First Revised Page No. 2A

LIST OF CHANGES (con't)

PART I: SCHEDULE OF RATES AND CHARGES, SECTION H - MISCELLANEOUS FEES (PAGE NOS. 14, 15 AND 15A-15F)

Various fees revised and new fees added related to requests to the Authority from customers or penalties.

PART I: SCHEDULE OF RATES AND CHARGES (PAGE NO. 16)

Sales for Resale (Wholesale) Rates increased effective January 12, 2022 and January 12, 2023.

Added new section J to reflect a one-time credit for new enrollments in paperless billing and establishing automatic bill payment.

RIDER BDP - BILL DISCOUNT PROGRAM (RESIDENTIAL) (PAGE NO. 19)

Increased the discount for participants with incomes at or below 50% of the Federal Poverty Level to receive a 50% discount on the Consumption Charge.

PART II DEFINITIONS (PAGE NO. 21)

Added definition for Non Bona Fide Service Applicant.

PART III: RULES AND REGULATIONS, SECTION B CONSTRUCTION AND MAINTENANCE OF FACILITIES (PAGE NO. 36 AND 37)

Removed tapping fees.

PART III: RULES AND REGULATIONS, SECTION D METERS (PAGE NOS. 42 AND 43)

Removed reference to fees for new meters, added meter upsizing option.

PART III: RULES AND REGULATIONS, SECTION E, BILLING AND COLLECTION, PARAGRAPH NO. 5 - APPLICATION OF PAYMENT (PAGE NO. 44)

Revised to include stormwater charges.

PART III: RULES AND REGULATIONS, SECTION G, LINE EXTENSIONS (PAGE NOS. 48-51, 51A-51C)

Revised to comply with Commission line extension regulations.

Issued: April 13, 2021
~~December 16, 2020~~

Effective: June 12, 2021
~~January 14, 2021~~

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PART I: SCHEDULE OF RATES AND CHARGES

Section A - Rates for Metered Service

1. Minimum Charge*: Each customer will be assessed a service charge based upon the size of the customer's meter as follows:

<u>Meter Size</u>	<u>Minimum Gallons</u>	<u>Per Month Rate (Effective January 12, 2022)</u>	<u>Per Month Rate (Effective January 12, 2023)</u>	
5/8"	1,000	\$27.27 27.54	\$27.81	(I)/(I)
3/4"	2,000	\$44.37 46.57	\$48.76	(I)/(I)
1"	5,000	\$89.82 98.49	\$107.16	(I)/(I)
1 1/2"	10,000	\$175.30 193.60	\$211.90	(I)/(I)
2"	17,000	\$289.14 321.62	\$354.10	(I)/(I)
3"	40,000	\$641.48 723.15	\$804.82	(I)/(I)
4"	70,000	\$1,084.28 1,232.14	\$1,379.99	(I)/(I)
6"	175,000	\$2,558.16 2,946.76	\$3,335.35	(I)/(I)
8"	325,000	\$4,596.96 5,337.47	\$6,077.98	(I)/(I)
10" or Larger	548,000	\$7,515.81 8,792.97	\$10,070.12	(I)/(I)

2. Consumption Charge: In addition to the Minimum Charge, the following water consumption charges will apply for each 1,000 gallons above the Minimum Gallons for each meter size:

<u>Customer Class</u>	<u>Consumption Charge Rate per 1000 Gals.</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential	\$12.25 13.89	\$15.52	(I)/(I)
Commercial*	\$11.95 13.46	\$14.96	(I)/(I)
Industrial**	\$10.31 11.67	\$13.02	(I)/(I)
Health or Education	\$15.29 16.25	\$17.21	(I)/(I)

The rate under this schedule applies to all customers, except public fire protection and private fire protection customers, unless otherwise specifically identified in this tariff.

* Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213.

** Rate applies to any new bulk water customers.

(I)= Increase

Issued: April 13, 2021
~~December 16, 2020~~

Effective: June 12, 2021
January 14, 2021

The Pittsburgh Water
and Sewer Authority

Tariff Water - Pa. P.U.C. No. 1
~~First~~ ~~Second~~ Revised Page No. 9
Cancelling ~~Original~~ ~~First~~ Page No. 9

Section A.1 - Rates for Unmetered Service

As of September 1, 2018, enrollment for Unmetered Service will be closed and no new Unmetered Service customers will be accepted by the Authority. Customers who are receiving unmetered service will be assessed a monthly customer charge per unmetered connection as follows:

<u>Customer Class</u>	<u>Customer Charge Per Month</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential (per unit)	\$64.02 69.20	\$74.37	(I) / (I)
Commercial*	\$75.07 81.36	\$87.65	(I) / (I)

*Rate does not apply to City of Pittsburgh Municipal Accounts pursuant to 71 P.S. §§ 720.211 to 720.213.

(c)

(I) = Increase

Issued: April 13, 2021
~~December 16, 2020~~

Effective: June 12, 2021
January 14, 2021

Section B - Fire Protection Rates

1. Private Fire Protection: A customer charge for non-residential private fire protection service will be assessed as follows:

<u>Meter Size</u>	<u>Line Size (if unmetered)</u>	<u>Customer Charge Per Month (effective January 12, 2022)</u>	<u>Customer Charge Per Month (effective January 12, 2023)</u>	
1" or Less	2"	\$ 33.24 24.62	\$16.00	(D) / (D)
1 1/2"-3"	3"	\$ 101.97 74.96	\$47.95	(D) / (D)
4"	4"	\$ 314.42 236.16	\$157.89	(D) / (D)
6" or Greater	6" or Greater	\$ 626.83 482.16	\$337.49	(D) / (D)

In addition to any customer charge as applicable above, all customers shall be charged for consumption pursuant to the following terms:

- a. In the event of a confirmed fire, no charge shall be made for the use of water to fight the fire using private fire hydrants or fire abatement equipment. Customers whose fire equipment has been activated to fight a fire should notify the Authority to assure that the associated water use will not be billed.
- b. For consumption of water related to testing, training on, and maintenance of private fire hydrants and fire abatement equipment, consumption charges shall be billed in accordance with the following rates for water consumption. Water used from private fire protection for these purposes should be based on meter readings where possible. If a meter cannot be used, the Authority will estimate the usage.

Consumption Charge
Rate per 1,000 Gals.

	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Private Fire Protection	\$ 14.01 25.77	\$37.52	(I) / (I)

(I)= Increase, (D)= Decrease

The Pittsburgh Water and Sewer Authority

Tariff Water - Pa. P.U.C. No. 1
~~First~~ ~~Second~~ Revised Page No. 11
~~Canceling Original~~ ~~First~~ Page No. 11

- 2. Public Fire Protection: For public fire protection, the charges will be assessed as follows: (C)

Per Hydrant Charge
Per Month

	<u>Effective</u> <u>January 12, 2022</u>	<u>Effective</u> <u>January 12, 2022</u>	
Public Fire Protection*	\$14.13 16.35	\$19.37	(I) / (I)

**Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213.* (C)

No charge shall be made for the use of water to fight a confirmed fire or for reasonable testing, training on, and maintenance of public fire hydrants and abatement equipment.

For use other than public fire protection, charges based on metered usage of a hydrant as set forth in Part II, Section H.3. (C)

~~Note that the use of public fire hydrants and abatement equipment for other purposes will be billed at the consumption charge for private fire protection. Water used from public fire hydrants for these purposes will be based on meter readings where possible. If a meter is not used, the Authority will estimate the usage.~~ (C)

(I) = Increase, (C) = Change

Issued: April 13, 2021
~~December 16, 2020~~

Effective: June 12, 2021
January 14, 2021

The Pittsburgh Water
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First Revised Page No. 12
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Section C - Returned Check Charge

A charge of ~~\$30.45~~\$40.00 will be assessed any time where a check (I)
which has been presented to the Authority for payment on account
has been returned by the payor bank for any reason if the customer
has not paid a returned check charge under PWSA's wastewater or (C)
storm water tariff.

Section D - Construction Rates

Metered and unmetered service may be provided for construction (C)
purposes by way of a Hydrant permit. The rates, fees and charges
for Hydrant permits are in Part I, Section H.3 of this Tariff.

Section E - Service Termination or Resumption Rates

Activity	Fee	
Service Termination (Shut-Off at Curb Stop)	\$75.12 50.00	(D)
Service Resumption (Turn-On at the Curb Stop)	Normal Business hours (Standard Time)	\$25.38 50.00 (I)
	After Normal Business Hours (Standard Time)	\$80.00 (C)
	Same Day - Normal Business Hours	\$45.68 100.00 (I)
	Same Day - After Normal Business Hours	\$150.00 (C)

The fee for turn-on of service at the curb stop shall be ~~\$25.38~~.
Provided that the fee for same day turn-on of service at the curb (C)
stop is ~~\$45.68~~.

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(D) Decrease, (I) Increase, (C) Change

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Section F - Meter Test Rates

Consistent with Commission regulation at 52 Pa. Code §65.8(h), the fee schedule for testing of meters shall be as follows:

<u>Size of Meter</u>	<u>Fee for Test</u>
1 inch or less	\$10 *
1 1/4 inch - 2 inch	\$20 *
Larger than 2"	As approved by the Commission, pursuant to 52 Pa. Code § 65.8 (h)

* These amounts may vary without revision of this tariff so as to be consistent with Commission regulations.

Section G - Collection Expenses and Fees described in the
Authority's Supplemental Service Conditions

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Issued: April 13, 2021
~~February 28, 2019~~

Effective: June 12, 2021 ~~March~~
~~1, 2019~~

Section H - Miscellaneous Charges, Fees, and Penalties (includes processing fees, permits, connections and meter fees)

The following charges and fees will be adjusted annually for increases in the annual Consumer Price Index for the Pittsburgh area most recently published by the Bureau of Labor Statistics or any successor organization prior to such anniversary. If the change in the Consumer Price Index is 0% or is a decrease, there will be no automatic adjustment.

1. Processing Fees

<u>Item</u>	<u>Charge or Fee</u>	
Certified mailing	\$11.28 20.00	(I)
History retrieval	\$15.23 10.00	(D)
Final bill	\$20.30 20.00	(D)
Map and Record Requests	\$40.00	(C)
Easement Recording	\$3,700.00	(C)
Inspection Fee	\$120 for first 2 hours + \$60 per hour after two hours	(C)
Non-Residential Properties Only:		
Administrative charge Processing of backflow device tests	\$25.38 10.00	(D)
Late fee, back flow device tests	\$60.90	

2. Penalties

<u>Item</u>	<u>Penalty</u>	
Illegal Connection - Residential	\$130.00	(C)
Illegal Connection - Commercial	\$160.00	(C)

(I) Increase, (D) Decrease, (C) Change

The Pittsburgh Water
and Sewer Authority

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First Revised Page No 15
Canceling Original Page No. 15

3. Metered Usage of a Hydrant

<u>Item</u>	<u>Charge or Fee</u>	
Hydrant Permit		
<u>For unmetered usage of a hydrant:</u>		
Flat fee Per day per Hydrant	\$500.00	(D)
<u>For metered usage of a hydrant:</u>		
a. There will be a meter fee for each hydrant as follows:		
5/8" or 5/8" x 3/4"	\$680.00	(C)
3/4"	\$780.00	(C)
1"	\$960.00	(C)
2 1/2" (Fire Hydrant Meter)	\$1,039.50	(C)

<u>Size</u>	<u>Type</u>	<u>Fee</u>	
5/8"	Pitt - Positive Displacement Meter	\$250.00	(D)
5/8"	Non-pitt - Positive Displacement Meter	\$250.00	(D)
5/8" x 3/4"	Pitt - Positive Displacement Meter	\$250.00	(D)
5/8" by 3/4"	Non-pitt- Positive Displacement Meter	\$250.00	(D)
3/4"	Pitt-Positive Displacement Meter	\$270.00	(D)
3/4"	Non-pitt - Positive Displacement Meter	\$270.00	(D)
3/4"	Pitt - Electromagnetic or Ultrasonic Meter	\$280.00	(D)
3/4"	Non-pitt -Electromagnetic or Ultrasonic Meter	\$280.00	(D)
1"	Pitt - Positive Displacement Meter	\$300.00	(D)
1"	Non-pitt -Positive Displacement Meter	\$300.00	(D)
1"	Pitt - Electromagnetic or Ultrasonic Meter	\$310.00	(D)
1"	Non-pitt - Electromagnetic or Ultrasonic Meter	\$310.00	(D)
	Fire Hydrant Meter	\$970.00	(D)

b. In addition to a meter fee for each metered hydrant, all water used (except for fighting fires) under a hydrant permit shall be subject to a water consumption charge for each 1,000 gallons at the consumption charge schedule in Part I, Section A for Commercial Customers.

(C) Change, (D) Decrease

Issued: April 13, 2021
December 16, 2020

Effective: June 12, 2021
January 14, 2021

4. Activities Related to Permits/Approvals Issued by PWSA

a. Development Permits - required for constructing or renovating a structure larger than a single-family home including single-family homes with a fire service line or multi-family homes

<u>Activity</u>	<u>Fee</u>
Developer Fee - Water and Sewer Availability Letter	\$40.00
Developer Fee - Water and Sewer Use Review Letter	\$320.00
Developer Fee - Water and Sewer Use Review Letter - Expedited*	\$550.00
Tap-in Plan Review	\$420.00
Tap-In Plan Review - Expedited*	\$740.00
Developer Permit Revisions Review	\$140.00
Developer Permit Revisions Review - Expedited*	\$250.00
Private Construction of Public Facilities Plan Review	\$680.00
Private Construction of Public Facilities Plan Review - Expedited*	\$1,190.00

*Expedited = guaranteed review within 15 business days

b. Residential Permit - for new water and/or sewer taps or reconnecting to existing water and/or sewer service (includes party line separations)

<u>Activity</u>	<u>Fee</u>
Residential Permit	\$40.00

The Pittsburgh Water
and Sewer Authority

c. Other Permits (for any customer wanting to schedule an operation of a PWSA facility such as a fire hydrant or waterline shut)

<u>Activity</u>	<u>Fee</u>
Hydrant Flow Test Permit Review	\$60.00
Hydrant Permit Review	\$20.00
Hydrant Flow Test	\$350.00
Water Shut Permit Review	\$40.00
Termination Only Permit	\$250.00

d. Land Operations Permits (may be required for construction project, administered by City of Pittsburgh but requires review by PWSA before permit will be issued)

<u>Activity</u>	<u>Fee</u>
Review of City Land Operation Permit	\$80.00

e. City of Pittsburgh Department of Mobility and Infrastructure (DOMI) Approvals (PWSA required to submit approval letter if affected)

<u>Activity</u>	<u>Fee</u>
Review of City Street Vacation Permits	\$100.00
Review of City Encroachment Permits	\$100.00

5. Connection Fees and Service Fees for Valve Operation

Type of Fee	Meter Size	Fee	
Connection Fee	1"	\$177.63 \$340.00	(I)
	1 1/2"	\$329.88	(D)
	4"	\$1,106.35 \$400.00	(D)
	6"	\$1,314.43 \$400.00	(D)
	8"	\$1,349.95 \$400.00	(D)
	10"	\$1,415.93 \$400.00	(D)
	12"	\$1,481.90 \$400.00	(D)
Connection Fee - After Normal Business Hours	Fees doubled for work performed outside normal business hrs. Fees at 1.5x for work performed outside business hrs.		(D)
	1"	\$355.26 \$510.00	(I)
	1 1/2"	\$659.76	
	4"	\$2,212.70 \$600.00	(D)
	6"	\$2,628.86 \$600.00	(D)
	8"	\$2,699.90 \$600.00	(D)
	10"	\$2,831.86 \$600.00	(D)
	12"	\$2,963.80 \$600.00	(D)

Type of Fee	Meter Size	Fee	
Service Fees for Valve Operations Based on Waterline Diameter, Normal Business Hours	4" - 12"	\$1,233.23 \$260.00	(D)
	16" - 24"	\$2,009.70 \$370.00	(D)
	30" - 48"	\$3,283.53 \$370.00	(D)
Service Fees for Valve Operations Based on Waterline Diameter, After Normal Business Hours	Fees doubled for work performed outside business hrs. Fees at 1.5x for work performed outside business hrs.		
	4" - 12"	\$2,466.46 \$390.00	
	16" - 24"	\$4,019.40 \$560.00	
	30" - 48"	\$6,567.06 \$560.00	

[these fees moved from page 48]

(I) Increase, (D) Decrease, (C) Change

The Pittsburgh Water
and Sewer Authority

6. Meter Fees

a. Water Meters, Domestic

<u>Size</u>	<u>Type</u>	<u>Fee</u>	
5/8"	Pitt Positive Displacement Meter	\$235 \$190.00	(D)
5/8"	Non-pitt - Positive Displacement Meter	\$235 \$190.00	(D)
5/8" x 3/4"	Pitt - Positive Displacement Meter	\$235 \$190.00	(D)
5/8" by 3/4"	Non-pitt- Positive Displacement Meter	\$235 \$190.00	(D)
3/4"	Pitt-Positive Displacement Meter	\$252 \$210.00	(D)
3/4"	Non-pitt - Positive Displacement Meter	\$252 \$210.00	(D)
3/4"	Pitt - Electromagnetic or Ultrasonic Meter	\$252 \$220.00	(D)
3/4"	Non-pitt -Electromagnetic or Ultrasonic Meter	\$252 \$220.00	(D)
1"	Pitt - Positive Displacement Meter	\$289 \$240.00	(D)
1"	Non-pitt -Positive Displacement Meter	\$289 \$240.00	(D)
1"	Pitt - Electromagnetic or Ultrasonic Meter	\$289 \$250.00	(D)
1"	Non-pitt - Electromagnetic or Ultrasonic Meter	\$289 \$250.00	(D)
1-1/2"	Badger Meter E-series Ultrasonic Meter, Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$660.00	(C)
1-1/2"	Badger Meter E-series Ultrasonic Meter-HEX, including all meter couplings, bushings, & leather gaskets	\$720.00	(C)
1-1/2"	Badger Meter Record all Disc Meters - Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$500.00	(C)
2"	Badger Meter E-Series Ultrasonic Meter - Elliptical, including all oval companion flanges, gaskets, bolts, and nuts	\$840.00	(C)
2"	Badger Meter E-Series Ultrasonic Meter - HEX, including all meter couplings, bushings, & leather gaskets	\$850.00	(C)
2"	Badger Meter Record all Disc Meters - HEX, including all meter couplings, bushings, & leather gaskets	\$700.00	(C)

[these fees were moved from pages 49-50]

(I) Increase, (D) Decrease, (C) Change

b. Water Meters, Turbine Domestic Vault

<u>Size</u>	<u>Fee</u>	
2"	\$771.50	(C)
3"	\$1,045.50	\$1,480.00 (I)
4"	\$1,334.00	\$1,600.00 (I)
6"	\$2,189.50	\$2,550.00 (I)
8"	\$3,144.50	\$3,850.00 (I)
10"	\$5,068.00	\$5,560.00 (I)
12"	\$9,286.50	\$6,490.00 (D)
16"	\$10,468.00	\$9,090.00 (D)

c. Water Meters, Turbine Domestic (Non Vault)

<u>Size</u>	<u>Fee</u>	
2"	\$771.50	(C)
3":	\$1,045.50	\$1,430.00 (I)
4":	\$1,334.00	\$1,550.00 (I)
6"	\$2,189.50	\$2,500.00 (I)
8"	\$3,144.50	\$3,990.00 (I)
10"	\$5,068.00	\$5,700.00 (I)
12"	\$9,286.50	\$6,630.00 (D)
16"	\$10,468.00	\$9,220.00 (D)

d. Water Meters, Compound Domestic

<u>Size</u>	<u>Fee</u>	
3"	\$1,688.00	\$1,540.00 (D)
4"	\$1,970.50	\$1,730.00 (D)
6"	\$2,961.00	\$2,900.00 (D)
8"	\$4,881.00	\$9,580.00 (I)

[these fees were moved from pages 49-50]

(I) Increase, (D) Decrease, (C) Change

e. Fire Systems Meters, Turbine

<u>Size</u>	<u>Fee</u>	
3"	\$1,997.50 \$2,320.00	(I)
4"	\$2,268.00 \$2,670.00	(I)
6"	\$3,041.00 \$3,420.00	(I)
8"	\$3,593.50 \$6,120.00	(I)
10"	\$4,761.50 \$10,740.00	(I)

f. Fire Systems Meters, Compound

<u>Size</u>	<u>Fee</u>	
4"	\$2,362.00 \$4,460.00	(I)
6"	\$4,433.50 \$5,990.00	(I)
8"	\$7,173.50 \$9,370.00	(I)
10"	\$11,219.00 \$10,570.00	(I)

[these fees were moved from pages 49-50]

(I) Increase

Section I - Sales for Resale (Wholesale)

1. Application: This schedule applies to all new sales of water to other water utilities or public authorities for resale.
2. Rates and Terms of Service: A customer consumption charge per 1,000 gallons of usage will be assessed as follows:

	<u>Consumption Charge</u>		
	<u>Rate per 1000 Gals.</u>		
	<u>(effective</u>	<u>(effective</u>	
	<u>January 12, 2022</u>	<u>January 12, 2023)</u>	
Sales for Resale	\$9.16 \$10.44	\$11.71	(I) / (I)

3. Contracts stipulating the negotiated rate and negotiated terms of Sale for Resale Service may be renegotiated and/or entered into between the Authority and Customer or Applicant when the Authority, in its sole discretion, deems such offering to be economically advantageous to the Authority. Service under this rate is interruptible, and the Authority reserves the right to interrupt service at Authority's discretion.

Section J - New Automatic Payment Enrollment Credit (C)

Customers enrolling in paperless billing and establishing automatic bill payments for the first time will receive a one-time credit of \$5.00. For customers receiving water, wastewater, and/or storm water service from PWSA, this credit will only be applied once per PWSA account.

(C)= Change; (I) Increase

Rider BDP - Bill Discount Program (Residential)

1. Bill Discount Program: This rider is a program designed to enroll residential ratepayers who satisfy the criteria set forth below in a monthly discounted rate program.
2. Availability: This rider is available for a Residential customer that meets the low-income criteria of annual household gross income at or below 150% of the Federal Poverty Level.
 - a. A residential ratepayer who meets the eligibility criteria should complete an application for the Bill Discount Program.
 - b. Eligible customers may be asked to verify income every two years. (C)
3. Rate (Minimum Charge): The Minimum Charge for residential service pursuant to Rider BDP will be 0% of the prevailing Minimum Service Charge under Part I, Section A. Any other rates, fees and charges will be at the prevailing amounts under this tariff. (D)
4. Rate (Consumption Charge): The Consumption Charge for residential service pursuant to Rider BDP for participants with income at or below 50% of the Federal Poverty Level will pay ~~80%~~50% of the prevailing Consumption Charge under Part I, Section A (which represents a ~~20%~~50% discount off the charge). Any other rates, fees and charges will be at the prevailing amounts under this tariff. (D)

(D) = Decrease

6. Bona Fide Service Applicant: (For Line Extension Purposes) A person or entity applying for water service to an existing or proposed structure within the Authority's certificated service territory for which a valid occupancy or building permit has been issued if the structure is either a primary residence of the applicant or a place of business. An applicant shall not be deemed a bona fide service applicant if:
 - a. applicant is requesting water service to a building lot, subdivision or a secondary residence;
 - b. the request for service is part of a plan for the development of a residential dwelling or subdivision; or
 - c. the applicant is requesting special utility service.
 - 6a. Non Bona Fide Service Applicants: Applicants that do not meet the definition of Bona Fide Service Applicants, shall be deemed Non Bona Fide Service Applicants.
 7. Capital Lease Agreement: The agreement bearing that title between the City and the Authority on July 15, 1995, effective July 27, 1995, and includes any amendments thereto.
 8. City: The City of Pittsburgh, Pennsylvania.
 9. Commercial or Commercial Property: Any property used, acquired or leased for purposes of carrying on a trade, business, profession, vocation, or any commercial, service, financial, or utility business or activity including, but not limited to, hotels, office buildings, gas service stations, laundries, commercial establishments, stores, malls, car washes, and parking lots.
 10. Commission or PUC: The Pennsylvania Public Utility Commission.
 11. Corporation Stop: The valve placed on a Water Service Line at or near the junction with the Water Main.
 12. Curb Box: The casting or enclosure that houses or permits access to the Curb Stop.
 13. Curb Stop: The valve, typically installed on or near the property line, to turn water service on and off to a building or facility.
-

could impair access to the Curb Box, they shall contact the Authority for repair or replacement of the Curb Box.

- g. Customers and property Owners may not cover, obscure, damage, tamper, or interfere with the Curb Stop or Curb Box. Customers and property Owners shall not interfere in any way with the Authority's access to or use of the Curb Stop. If the Curb Box or Curb Stop is damaged by the Customer and/or Property Owner, or the Curb Box or Curb Stop is covered so as to preclude or interfere with access, the Customer or property Owner, as applicable, is responsible for the cost of the Authority's work in uncovering, repairing, or replacing the Curb Stop and/or Curb Box, and for the cost of restoring adjacent landscaping, sidewalks, or other property affected by the work.

13. Conversion of Party Water Service Lines and Converting Flat Rate or Unmetered Customers to Metered Customers: ~~(C)~~

- a. Non-Municipal Residential Property Owners whose properties are served by a Party Water Service Line must install separate services lines to each individual property. Each Customer shall have an individual Water Service Line and Meter of a size, type, location, and setting approved by the Authority. The cost of installation of the Water Service Line from the residence to the Curb Stop is the responsibility of the property Owner. Installation and the cost of installation of the Meter and the Water Service Line from the Water Main to and including the Curb Stop is the responsibility of the Authority. ~~Only the tapping fee (under Part III, Section G.2 of this Tariff regarding Line Extensions) will be imposed under these circumstances.~~ No connections fees or service fees ~~and/or customer facilities fee (under Part III Section G.2 of this Tariff regarding Line Extensions)~~ will be imposed. All plans for installation of the Water Service Lines and the scheduling of such work is subject to the permitting process and the prior approval of the Authority. (C)

~~{Note: text previously on this page moved to next page}~~

(C) = Change

The Pittsburgh Water
and Sewer Authority

Tariff Water - Pa. P.U.C. No. 1
~~First~~ Second Revised Page No. 37
Canceling First ~~Original~~ Page No. 37

- b. Non-Residential Property Owners whose properties are provided with water under a flat rate or are served by a Party Service Water Line are required to have a Meter of a size, type, and setting approved by the Authority and a Backflow prevention device approved by the Authority. The installation and the cost of installing the entire Water Service Line, including the Corporation Stop or mechanical joint tee, is the responsibility of the property Owner. ~~Only the tapping fee (under Part III, Section G.2 of this Tariff regarding Line Extensions) will be imposed under these circumstances. No connections fees or, service fees and/or customer facilities fee (under Part III, Section G.2 of this Tariff regarding Line Extensions) will be imposed.~~ All plans for installation of the Water Service Lines and the scheduling of such work shall be subject to the permitting process and the prior approval of the Authority. (C)
- c. Notwithstanding (a) and (b) above, the installation, costs and subsequent responsibilities for converting City of Pittsburgh properties to metered service shall be in accordance with 71 P.S. §§ 720.211 to 720.213. (C)

(C) = Change

Issued: April 13, 2021
~~December 16, 2020~~

Effective:

June 12, 2021 ~~January~~
~~14, 2021~~

Section D - Meters and Meter Reading Equipment

1. Ownership: All meters and meter reading equipment shall be owned, installed, tested, and maintained by the Authority.
2. Requirement for Metered Service: All service provided by the Authority shall be metered except as authorized by this tariff.
3. Location of Meters and Meter Reading Equipment: The meter will be set after the customer has had the plumbing arranged to receive the meter at a convenient point approved by the Authority so as to measure all water being supplied to the customer's premise. The meter reading equipment shall be set by the Authority in a location sufficient to provide adequate signal transmission. Protection for the meter and meter reading equipment shall be provided by the customer. In cases where it is not practical to place the meter indoors, or if the customer so desires and the Authority approves, an outside setting will be installed at the customer's expense at a position selected by the Authority. The Authority shall establish standards for outside meter settings. Relocation of meters for the customer's convenience shall be at the customer's expense.
4. Access for Automated Meter Reading Devices: Upon reasonable notice, the customer shall permit the Authority access and space for the purpose of installing and utilizing a telemetering or other automated meter reading device. Where applicable, the customer must provide the Authority with the telephone number of the line to which the equipment will be connected and immediately advise the Authority of any changes in the telephone number. Where the use of the customer's facilities results in a utility charge, the Authority will compensate the customer.
5. Fees for New Meters: New Meters, meter equipment and associated Remote Reading Devices are supplied and installed by the Authority. ~~A list of charges for the Meters, the Remote Reading Devices, and their installation is set forth in Part III, Section G.2 as the Customer Facilities Fee.~~ (C)

[text moved to next page]

(C) Change

6. Damages to Meters: Meters shall be maintained by the Authority so far as ordinary wear and tear is concerned. Where damage to a meter results from the negligent or willful act of the customer, the actual cost of removing, replacing, repairing or testing a damaged meter shall be paid by the customer.
7. Notification to Authority of Non-Working or Damaged Meter: The customer shall notify the Authority of a non-working or damaged meter as soon as the customer has notice of either condition.
8. Fees for Meter Tests: Fees for testing meters shall be as specified under Part I, Section F, of this tariff. Testing fees shall be refunded pursuant to Commission regulation at 52 Pa. Code §65.8(g) where the meter is found not operating within the allowable accuracy range specified at 52 Pa. Code §65.8(a).
9. New Meters: If a Property is set up for individual metering, but no operational Meter is in place, a Meter must be installed before the applicant will be accepted as a Customer.
 - a. If the Property is not separately metered or set up for separate metering, the Property must be set up for separate metering, to the Authority's satisfaction, by a Registered Plumber at the cost of the Property Owner, and a Meter and Remote Reading Device must be installed before the applicant will be accepted as a Customer. Installation charges must be paid before water service will be provided.
10. Meter Upsizing: Single-family homeowners may apply to upsize their domestic water meter up to one inch without requiring any additional permits. Meters larger than one inch may be subject to additional requirement. Other property owners must request upsizing of their domestic water meter through the development process. Applicant will pay the full cost of the meter if an upsizing request is granted. (C)

(C) Change

Section E - Billing and Collection

1. Issuance of Bills: The Authority will bill each customer within fifteen (15) days of the last day of each billing period.
2. Billing Due Date: The due date for payment of a bill for nonresidential service shall be no less than fifteen (15) days from the date of transmittal. The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the Authority are not open to the general public, the due date shall be extended to the next business day. The Authority may not impose a late-payment charge unless payment is received more than five (5) days after the stated due date.
3. Late Payment Charge: All amounts not paid when due shall accrue a late payment charge at the rate of 0.83 percent per billing period, not to exceed ten percent (10%) per year when not paid as prescribed in Rule 2 of this Section. (C)
4. Change in Billing Address: Where a customer fails to notify the Authority of a change in billing address, the customer shall remain responsible to remit payment by the billing due date.
5. Application of Payment: Utility bills rendered by the Authority shall include only the amount due for water service. Where a customer remittance to the Authority includes payment for any non-utility services, proceeds will be applied first to pay all outstanding regulated utility charges. For customers receiving any combination of water, wastewater, and stormwater services, any partial remittance will be applied in following order: ~~to the water, bill first and any remaining remittance will be applied to the wastewater bill~~ and stormwater charges. (C)
6. Return Check Charges: The customer will be responsible for the payment of a charge for each time a check presented to the Authority for payment on that customer's utility bill is returned by the payor bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date, account garnished, or unauthorized signature. This charge is in addition to any charge which may be assessed against the

(C) = Change

Section G - Line Extensions

Bona Fide Service Applicant(s) and/or Non-Bona Fide Service Applicant(s) who desire to or are required to connect to the Authority's Water distribution system (a "Line Extension Applicant") must comply with the following conditions:

1. A Line Extension Applicant shall provide prior notice to the Authority. Notice shall be written and made on the application and permit forms contained in the Authority's Procedures Manual for Developers, which is located on the Authority's website. The appropriate forms can be completed and any applicable fees paid at the Authority's permit counter, First Floor, Penn Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, PA 15222.
2. A Line Extension Applicant shall pay all applicable fees set forth in Part I, Section H ~~enumerated fees to the Authority. Fees shall be based upon the duly adopted fee schedule which is in effect at the time of payment and shall be payable at the time of application for connection or at a time to which the property owner and the Authority agree.~~ 53 Pa.C.S. § 5607(d)(24).

Tapping Fee

(C)

Distribution Fee	\$842	Per EDU*
Capacity Fee	\$1,382	Per EDU*

~~* 300 gpd/EDU~~

[remaining text on this page moved to page 15C]

Connection Fee

1"	\$177.63
1 1/2"	\$329.88
4"	\$1,106.35
6"	\$1,314.43
8"	\$1,349.95
10"	\$1,415.93
12"	\$1,481.90

~~Fees are double the listed amounts for work performed outside normal business hours.~~

Service Fees for Valve Operations

(C) Change

~~(if required; based on PWSA main size):~~

4" — 12" Diameter Waterlines	\$1,233.23
16" — 24" Diameter Waterlines	\$2,009.70
30" — 48" Diameter Waterlines	\$3,283.53

~~Fees are double the listed amounts for work performed
outside normal business hours.~~

[text on this page moved to pages 15C-15F]

Customer Facilities Fee

~~All new Meters, meter equipment and associated
Remote Reading Devices will be purchased from PWSA
and installed by PWSA as follows:~~

5/8" or 5/8" x 3/4"	\$235.00	(Badger)
3/4"	\$252.00	(Badger)
1"	\$289.00	(Sensus)
1 1/2"	\$492.00	(Sensus)
2"	\$592.00	(Sensus)
5/8" or 5/8" x 3/4"	\$235.00	(Deduct Meter)

(Turbine Domestic Meters)

2"	\$771.50
3"	\$1,045.50
4"	\$1,334.00
6"	\$2,189.50
8"	\$3,144.50
10"	\$5,068.00
12"	\$9,286.50
16"	\$10,468.00

(Compound Meters)

3" compound	\$1,668.00	(Sensus Omni C2)
4" compound	\$1,970.50	(Sensus Omni C2)
6" compound	\$2,961.00	(Sensus Omni C2)
8" compound	\$4,881.00	(Neptune)

Reserved for future use.

Issued: April 13, 2021
~~December 16, 2020~~

Effective: June 12, 2021
~~January 14, 2021~~

[some text on this page moved to page 15F]

~~(Fire System Meters - Turbine)~~

3"	\$1,997.50	(Badger)
4"	\$2,268.00	(Neptune)
6"	\$3,041.00	(Neptune)
8"	\$3,593.50	(Badger)
10"	\$4,761.50	(Neptune)

~~(Fire System Meters - Compound)~~

4"	\$2,362.00	(Sensus)
6"	\$4,433.50	(Badger)
8"	\$7,173.50	(Neptune)
10"	\$11,219.00	(Neptune)

~~The above described fees shall be in addition to any charges assessed against the property in the construction of a sewer or water main by the Authority under 53 Pa.C.S. § 5607(d) (21), (22) [as well as any other user charges imposed by the Authority. See 53 Pa.C.S. § 5607(d) (24)].~~

(C)

~~3. The Authority may, in its exercise of its sole discretion, require that construction shall not commence until the Line Extension Applicant has posted appropriate financial security in accordance with 53 Pa.C.S. § 5607(d) (23), (30).~~

~~4. The Authority may, in its exercise of its sole discretion, require the Line Extension Applicant reimburse the Authority for reasonable and necessary expenses the Authority incurred as a result of the extension. 53 Pa.C.S. § 5607(d) (30).~~

3. Consistent with 53 Pa.C.S. § 5607(d) (30), where the Authority's system is to be extended at the expense of the owner of properties or where the authority otherwise would construct customer facilities (other than water meter installation), a Line Extension Applicant shall have the right to self construct the extension or install the customer facilities himself or through a subcontractor approved by the authority, which approval shall not be unreasonably withheld. The Authority shall have the right, at its option, to perform the construction itself only if the Authority provides the extension or customer facilities at a lower cost and within the same timetable specified or proposed by the property owner or his approved subcontractor. Construction by the Line Extension Applicant shall be in accordance with an agreement for the extension of the Authority's system and plans and

(C)

specifications approved by the authority and shall be undertaken only pursuant to the existing regulations, requirements, rules and standards of the authority applicable to such construction. Construction shall be subject to inspection by an inspector authorized to approve similar construction and employed by the Authority during construction. ~~When a main is to be extended at the expense of the Line Extension Applicant, the Line Extension Applicant may be required to deposit with the Authority, in advance of construction, the Authority's estimated reasonable and necessary cost of reviewing plans, construction inspections, administrative, legal and engineering services.~~

(C)

4. Upon completion of construction, the Line Extension Applicant shall dedicate and the authority shall accept the extension of the authority's system if dedication of facilities and the installation complies with the plans, specifications, regulations of the authority and the agreement. 53 Pa.C.S. § 5607(d) (30).

5. Where a Line Extension Applicant constructs or causes to be constructed at his expense (in whole or in part) any extension of a sewer or water system of an authority, the Authority shall provide for the reimbursement to the Line Extension Applicant when the owner of another property ~~not in the development for which the extension was constructed~~ connects a service line directly to the extension within ten years of the date of the dedication of the extension to the authority in accordance with ~~53 Pa.C.S. § 5607(d)(31)~~ 52 Pa. Code § 65.22 The Customer Refund Amount shall be the Company contribution divided by the number of customers connected to the initial main extension. For Non Bona Fide Service Applicants, this provision shall only apply if the owner of the property connecting to the service line is not in the development for which the extension was constructed.

(C)

~~6. The Authority may charge the cost of construction of a sewer or water main constructed by the Authority against the properties benefited, improved or accommodated by the construction in accordance with 53 Pa.C.S. § 5607(d)(21), (22).~~

(C)

~~The rates, fees and charges under Part III, Section C of this tariff are subject to change based on the Authority's compliance plan.~~ (C) Change

(C)

For Non Bona Fide Service Applicants:

6. The above-described fees shall be in addition to any charges assessed against the property in the construction of a sewer or water main by the Authority under 53 Pa.C.S. § 5607(d) (21), (22) as well as any other user charges imposed by the Authority. See 53 Pa.C.S. § 5607(d) (24). The Authority may charge the cost of construction of a sewer or water main constructed by the Authority against the properties benefited, improved or accommodated by the construction in accordance with 53 Pa.C.S. § 5607(d) (21), (22).
7. The Authority may, in its exercise of its sole discretion, require that construction shall not commence until the Non Bona Fide Service Applicant has posted appropriate financial security in accordance with 53 Pa.C.S. § 5607(d) (23), (30).
8. The Authority may, in its exercise of its sole discretion, require the Non Bona Fide Service Applicant to reimburse the Authority for reasonable and necessary expenses the Authority incurs as a result of the extension. 53 Pa.C.S. § 5607(d) (30).
9. When a main is to be extended at the expense of the Non Bona Fide Service Applicant, the Non Bona Fide Service Applicant may be required to deposit with the Authority, in advance of construction, the Authority's estimated reasonable and necessary cost of reviewing plans, construction inspections, administrative, legal and engineering services.

The Pittsburgh Water
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For Bona Fide Service Applicants:

10. Line extensions to Bona Fide Service Applicants shall be funded without customer advance if the annual revenue from line extension will equal or exceed the Authority's annual line extension costs. The Authority's calculation of annual line extension costs will be consistent with 52 Pa. Code §65.1 but for depreciation costs. As a cash flow regulated company, the Authority does not earn interest on its assets. Calculation of debt costs will include annual payments on the debt and debt service coverage.

11. If the annual revenue from the line extension will not equal or exceed the Authority's annual line extension costs, a Bona Fide Service Applicant may be required to provide a customer advance to the Authority's cost of construction for the line extension. The Authority's investment for the line extension shall be the portion of the total construction costs which generate annual line extension costs equal to annual revenue from the line extension. The customer advance amount shall be determined by subtracting the Authority's investment for the line extension from the total construction costs.

12. The Authority's investment for the line extension shall be based on the following formula:

Average Annual Revenue	\$ _____
<i>Minus</i>	
Operation and Maintenance Expenses*	\$ _____
Subtotal	\$ _____
<i>Divided by</i>	
Weighted Cost of Debt plus Depreciation	_____ %
Company Investment	\$ _____

*The Authority will calculate Operation and Maintenance Expenses by multiplying the Operations and Maintenance Expenses per thousand gallons, as determined annually using the AWWA Water Audit methodology and that is submitted annually to the Commission, by the anticipated consumption from the customer.

13. If a customer advance is required from a Bona Fide Service Applicant and the Bona Fide Applicant is unable to advance the entire amount due, the Authority shall do one of the following: (1) Allow the applicant to pay the advance over a period of not less than 3 years, with the utility recovering financing costs equal to the utility's weighted cost of long term debt. The utility may require the applicant to deposit up to one-third of the total customer advance prior to extending service, or (2) Provide information to the customer on financial institutions that may offer financing to the customer for the line extension.
14. A Bona Fide Service Applicant will be required to pay, in advance, a reasonable charge for service lines and equipment installed on private property for the exclusive use of the customer.

Exhibit JAQ-5

Supplement No. 6
Tariff Wastewater - Pa. P.U.C. No. 1

THE PITTSBURGH WATER AND SEWER AUTHORITY

RATES, RULES AND REGULATIONS GOVERNING

THE PROVISION OF WASTEWATER CONVEYANCE SERVICE

TO THE PUBLIC IN THE TERRITORY DESCRIBED HEREIN

Issued: April 13, 2021

Effective:

June 12, 2021

BY: William J. Pickering, Chief Executive Officer
1200 Penn Avenue, Pittsburgh, PA 15222
Tel: 412-255-8800

NOTICE

This tariff makes increases and changes in existing rates,
rules, and regulations.

LIST OF CHANGES

TABLE OF CONTENTS (PAGE NO. 3 AND 6)

Updated to reflect the additional language for Section H Miscellaneous Charge and addition of Part I, Section J, and the deletion of Part VI: Storm Water.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A - WASTEWATER CONVEYANCE (PAGE NO. 9)

Decreasing the Minimum Charge per month for all meter sizes and the Conveyance Charge for all customer classes effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION A.1 - WASTEWATER CONVEYANCE (UNMETERED SERVICE) (PAGE NO. 11)

Rates for the per month customer charge decreased for Residential and Commercial customer classes effective January 12, 2022 and January 12, 2023.

PART I: SCHEDULE OF RATES AND CHARGES, SECTION C - RETURNED CHECK CHARGE (PAGE NO. 12)

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PART I: SCHEDULE OF RATES AND CHARGES, SECTION H - MISCELLANEOUS FEES (PAGE NOS 14, 14A-14C)

Various fees revised and new fees added related to requests to the Authority from customers or penalties.

Added new section J to reflect a one-time credit for new enrollments in paperless billing and establishing automatic bill payment.

RIDER BDP - BILL DISCOUNT PROGRAM (RESIDENTIAL) (PAGE NO. 17)

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PART II: DEFINITIONS (PAGE NO. 21)

Updated to remove definitions that relate only to storm water that are now reflected in PWSA Storm Water Tariff.

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**PART III: RULES AND REGULATIONS, SECTION E, BILLING AND COLLECTION, PARAGRAPH
NO. 5 - APPLICATION OF PAYMENT (PAGE NO. 42)**

Revised to include storm water charges

PART VI: STORM WATER (PAGE NOS. 68 THROUGH 71)

Removed Part IV effective June 12, 2021 as this section is now reflected
in PWSA's Tariff Storm Water - Pa. P.U.C. No. 1.

Issued: April 13, 2021

Effective:

June 12, 2021

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Reserved for Future Use.

Issued: April 13, 2021

Effective: June 12, 2021

Supplement No. 6

The Pittsburgh Water and Sewer Authority Tariff Wastewater - Pa. P.U.C. No. 1
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PART I: SCHEDULE OF RATES AND CHARGES

Section A - Wastewater Conveyance

1. Minimum Charge*: Each customer will be assessed a service charge based upon the size of the customer's water meter as follows:

<u>Meter Size</u>	<u>Minimum Gallons</u>	<u>Minimum Charge Per Month</u>		
		<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
5/8"	1,000	\$8.06	\$7.61	(D) / (D)
3/4"	2,000	\$14.70	\$12.16	(D) / (D)
1"	5,000	\$33.07	\$25.22	(D) / (D)
1 1/2"	10,000	\$66.24	\$47.97	(D) / (D)
2"	17,000	\$111.16	\$79.24	(D) / (D)
3"	40,000	\$253.04	\$179.74	(D) / (D)
4"	70,000	\$433.71	\$309.11	(D) / (D)
6"	175,000	\$1,046.14	\$754.13	(D) / (D)
8"	325,000	\$1,903.55	\$1,383.05	(D) / (D)
10" or Larger	548,000	\$3,148.83	\$2,306.57	(D) / (D)

2. Conveyance Charge: In addition to the Minimum Charge, the following wastewater conveyance charges (based on water consumption/usage or wastewater flows, at the Authority's discretion) will apply for each 1,000 gallons above the Minimum Gallons for each meter size:

<u>Customer Class</u>	<u>Conveyance Charge Rate Per 1000 Gals.</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential	\$6.99	\$6.34	(D) / (D)
Commercial*	\$6.23	\$5.72	(D) / (D)
Industrial	\$5.74	\$5.32	(D) / (D)
Health or Education	\$7.24	\$6.03	(D) / (D)

* Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213.

(D) = Decrease

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and Sewer Authority

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Section A.1 - Wastewater Conveyance (Unmetered Service)

1. Customer Charge. As of September 1, 2018 enrollment for Unmetered Service will be closed and no new Unmetered Service customers will be accepted by the Authority. Customers who are receiving unmetered service will be assessed a monthly customer charge per unmetered connection as follows:

Customer Class	Customer Charge		
	Effective January 12, 2022	Effective January 12, 2023	
Residential (per unit)	\$29.03	\$26.63	(D) / (D)
Commercial*	\$32.98	\$30.49	(D) / (D)

*Rate does not apply to City of Pittsburgh Municipal Accounts pursuant to 71 P.S. §§ 720.211 to 720.213.

2. Treatment Rate: In addition to the Customer Charge, Customers who are receiving unmetered service will be required to pay rates for Wastewater/Sewage treatment to Premises, as set forth in Section A.3.

Section B - Bulk Wastewater Conveyance

1. Application: This schedule applies to all bulk wastewater conveyance for other wastewater utilities or public authorities.
2. Rates and Terms of Service: Contracts stipulating the negotiated rate and negotiated terms of Bulk Wastewater Conveyance may be entered into between the Authority and Customer or Applicant when the Authority, in its sole discretion, deems such offering to be economically advantageous to the Authority.

~~(I) = Increase,~~ (D) = Decrease, ~~(C) = Change~~

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Section C - Returned Check Charge

A charge of \$40.00 will be assessed any time where a check which has been presented to the Authority for payment on account has been returned by the payor bank for any reason if the customer has not paid a returned check charge under PWSA's water or storm water tariff.

(I)

(C)

Section D - Reserved

Section E - Service Termination or Resumption Rates

The fee for service termination shall be \$50.00. The fee for resumption of service shall be \$50.00. These termination and resumption fees will be waived if a customer has paid these fees under the water tariff.

(D)

(I)

Section F - Reserved

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Section H - Miscellaneous Charges, Fees, and Penalties (includes processing fees, and permits)

(C)

The following charges and fees will be adjusted annually for increases in the annual Consumer Price Index for the Pittsburgh area most recently published by the Bureau of Labor Statistics or any successor organization prior to such anniversary. If the change in the Consumer Price Index is 0% or is a decrease, there will be no automatic adjustment.

1. Processing Fees

<u>Item</u>	<u>Charge or Fee*</u>	
Certified mailing	\$20.00	(I)
History retrieval	\$10.00	(D)
Final bill	\$20.00	(D)
Map and Record Requests	\$40.00	
Easement Recording	\$3,700.00	
*Assessed per account.		
Dye Test Application Processing Fees		
Evidence of Compliance Statement	\$20.00	(D)
Temporary Evidence of Compliance Statement	\$30.00	(I)
Inspection	\$120.00 for first 2 hours + \$60 per hr after 2 hrs	(I)
Duplicate Evidence of Compliance Statement	\$20.00	(D)

2. Penalties

<u>Item</u>	<u>Penalty</u>
Illegal Connection - Residential	\$60.00
Illegal Connection - Commercial	\$110.00

(I) Increase, (D) Decrease

4. Activities Related to Permits/Approvals Issued by PWSA
a. Development Permits - required for constructing or renovating a structure larger than a single-family home including single-family homes with a fire service line or multi-family homes

<u>Activity</u>	<u>Fee</u>
Developer Fee - Water and Sewer Availability Letter	\$40.00
Developer Fee - Water and Sewer Use Review Letter	\$320.00
Developer Fee - Water and Sewer Use Review Letter - Expedited*	\$550.00
Tap-in Plan Review	\$420.00
Tap-In Plan Review - Expedited*	\$740.00
Developer Permit Revisions Review	\$140.00
Developer Permit Revisions Review - Expedited*	\$250.00
Private Construction of Public Facilities Plan Review	\$680.00
Private Construction of Public Facilities Plan Review - Expedited*	\$1,190.00
DEP Sewage Facilities Planning Review	\$240.00
DEP Sewage Facilities Planning Review - Expedited*	\$410.00

*Expedited = guaranteed review within 15 business days

- b. Residential Permit - for new water and/or sewer taps or reconnecting to existing water and/or sewer service (includes party line separations)

<u>Activity</u>	<u>Fee</u>
Residential Permit	\$40.00

- c. Other Permits (for any customer wanting to schedule an operation of a PWSA facility such as a fire hydrant or waterline shut)

<u>Activity</u>	<u>Fee</u>
Termination Only Permit	\$250.00

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d. Land Operations Permits (may be required for construction project, administered by City of Pittsburgh but requires review by PWSA before permit will be issued)

Activity	Fee
Review of City Land Operation Permit	\$80.00

e. City of Pittsburgh Department of Mobility and Infrastructure (DOMI) Approvals (PWSA required to submit approval letter if affected)

Activity	Fee
Review of City Street Vacation Permits	\$100.00
Review of City Encroachment Permits	\$100.00

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Section I - Reserved for Future Use

Section J - New Automatic Payment Enrollment Credit

Customers enrolling in paperless billing and establishing automatic bill payments for the first time will receive a one-time credit of \$5.00. For customers receiving water, wastewater, and/or storm water service from PWSA, this credit will only be applied once per PWSA account.

Issued: April 13, 2021

Effective: June 12, 2021

The Pittsburgh Water
and Sewer Authority

Supplement No. 6
Tariff Wastewater - Pa. P.U.C. No. 1
Second Revised Page No. 17
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Rider BDP - Bill Discount Program (Residential)

1. Bill Discount Program: This rider is a program designed to enroll residential ratepayers who satisfy the criteria set forth below in a monthly discounted rate program

2. Availability: This rider is available for a Residential customer that meets the low-income criteria of annual household gross income at or below 150% based on the Federal Poverty Level.
 - a. A residential ratepayer who meets the eligibility criteria should complete an application for the Bill Discount Program.
 - b. Eligible customers may be asked to verify income every two years.

3. Rate (Minimum Charge): The Minimum Charge for residential service pursuant to Rider BDP will be 0% of the prevailing Minimum Service Charge under Part I, Section A. Any other rates, fees and charges will be at the prevailing amounts under this tariff.

4. Rate (Consumption Charge): The Consumption Charge for residential service pursuant to Rider BDP for participants with income at or below 50% of the Federal Poverty Level will pay 50% of the prevailing Consumption Charge under Part I, Section A (which represents a 50% discount off the charge). Any other rates, fees and charges will be at the prevailing amounts under this tariff. (D)

(D)= Decrease

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20. Ground Water: Water located beneath the ground surface that emanates from sources other than the Authority's water or wastewater systems.
21. Guaranteed Lessee: A Tenant to whom a Property Owner has made an assignment of possessory rights by agreement, thereby making the Tenant primarily responsible for the payment of water charges.
22. Guarantor: A Property Owner who guarantees payment of water by a Guaranteed Lessee.
23. Health or Education Property: Any hospital, clinic, or other human health care facility other than private physician or dentist offices, and any school, college, university, or other educational facility, whether public or private.
24. Health Department: The Allegheny County Health Department, Allegheny County, Pennsylvania.
25. Illegal Surface Storm Water Connection: Any connection to the Authority's Sanitary Sewers that allows surface storm water to be discharged into the separate Sanitary Sewer system from sources including, but not limited to, downspout drainage, roof drainage, and areaway drainage.
26. Reserved for future use.

(C)

26. Industrial Property: Any property, the principal use of which is for manufacturing, processing, or otherwise producing products or goods for sale.
27. Lateral, Customer Lateral or Sewer Lateral: Wastewater or sewer lines that connect a property to the Authority's Collection Mains and carry sewage and/or Storm Water from one or more buildings or Premises to the Authority's Collection Mains.

(c) Change

The Pittsburgh Water
and Sewer Authority

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Canceling First Revised Page No. 42

Section E - Billing and Collection

1. Issuance of Bills: The Authority will bill each customer within fifteen (15) days of the last day of each billing period.
2. Billing Due Date: The due date for payment of a bill for nonresidential service shall be no less than fifteen (15) days from the date of transmittal. The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the Authority are not open to the general public, the due date shall be extended to the next business day. The Authority may not impose a late-payment charge unless payment is received more than five (5) days after the stated due date.
3. Late Payment Charge: All amounts not paid when due shall accrue a late payment charge at the rate of 0.83 percent per billing period, not to exceed ten percent (10%) per year when not paid as prescribed in Rule 2 of this Section.
4. Change in Billing Address: Where a customer fails to notify the Authority of a change in billing address, the customer shall remain responsible to remit payment by the billing due date.
5. Application of Payment: Utility bills rendered by the Authority shall include only the amount due for water service. Where a customer remittance to the Authority includes payment for any non-utility services, proceeds will be applied first to pay all outstanding regulated utility charges. For customers receiving any combination of water, wastewater, and stormwater services, any partial remittance will be applied in the following order: water wastewater bill and stormwater charges. (C)
6. Return Check Charges: The customer will be responsible for the payment of a charge for each time a check presented to the Authority for payment on that customer's utility bill is returned by the payor bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date,

(C) = Change

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Section G - Main Extensions

Bona Fide Service Applicant(s) and/or Non-Bona Fide Service Applicant(s) who desire to or are required to connect to the Authority's Wastewater conveyance system (a "Main Extension Applicant") must comply with the following conditions:

1. A Main Extension Applicant shall provide prior notice to the Authority. Notice shall be written and made on the application and permit forms contained in the Authority's Procedures Manual for Developers, which is located on the Authority's website. The appropriate forms can be completed and any applicable fees paid at the Authority's permit counter, First Floor, Penn Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, PA 15222.
2. A Main Extension Applicant shall pay all applicable fees set forth in Part I, Section H at the time of payment and shall be payable at the time of application for connection or at a time to which the property owner and the Authority agree. 53 Pa.C.S. § 5607(d) (24). (C)

The above-described fees shall be in addition to any charges assessed against the property in the construction of a sewer or water main by the Authority under 53 Pa.C.S. § 5607(d) (21), (22) as well as any other user charges imposed by the Authority. See 53 Pa.C.S. § 5607(d) (24).

3. The Authority may, in its exercise of its sole discretion, require that construction shall not commence until the Main Extension Applicant has posted appropriate financial security in accordance with 53 Pa.C.S. § 5607(d) (23), (30). (C)

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Supplement No. 6
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Exhibit JAQ-6

Supplement No. 56
Tariff Wastewater - Pa. P.U.C. No. 1

THE PITTSBURGH WATER AND SEWER AUTHORITY

RATES, RULES AND REGULATIONS GOVERNING

THE PROVISION OF WASTEWATER CONVEYANCE SERVICE

TO THE PUBLIC IN THE TERRITORY DESCRIBED HEREIN

Issued: ~~December 16,~~
~~2020~~April 13, 2021

Effective: ~~January 14,~~
~~2021~~June 12, 2021

BY: William J. Pickering, Chief Executive Officer ~~Director~~
1200 Penn Avenue, Pittsburgh, PA 15222
Tel: 412-255-8800

NOTICE

This tariff makes increases and changes in existing rates,
rules, and regulations.

The Pittsburgh Water
and Sewer Authority

PWSA Exh. JAQ-6
Supplement No. 56
Tariff Water - Pa. P.U.C. No. 1
~~Third~~ ~~Fourth~~ Revised Page No. 2
Canceling ~~Third~~ ~~Second~~ Revised Page No. 2

LIST OF CHANGES

TABLE OF CONTENTS (PAGE NO. 3 AND 6)

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Issued: April 13, 2021

Effective:

June 12, 2021

The Pittsburgh Water
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PART III: RULES AND REGULATIONS, SECTION E, BILLING AND COLLECTION, PARAGRAPH
No. 5 - APPLICATION OF PAYMENT (PAGE No. 42)

Revised to include storm water charges

PART VI: STORM WATER (PAGE NOS. 68 THROUGH 71)

Removed Part IV effective June 12, 2021 as this section is now reflected
in PWSA's Tariff Storm Water - Pa. P.U.C. No. 1.

Issued: April 13, 2021

Effective:

June 12, 2021

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Issued: ~~February 28, 2019~~ April 13, 2021 Effective: ~~March 1, 2019~~ June 12, 2021

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Issued: February 28, 2019 April	Effective: March 1,
13, 2021	2019June 12,
	2021

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Supplement No. 56

PART I: SCHEDULE OF RATES AND CHARGES

Section A - Wastewater Conveyance

1. Minimum Charge*: Each customer will be assessed a service charge based upon the size of the customer's water meter as follows:

<u>Meter Size</u>	<u>Minimum Gallons</u>	<u>Minimum Charge Per Month</u>		
		<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
5/8"	1,000	\$8.518.06	\$7.61	(D) / (D)
3/4"	2,000	\$17.2314.70	\$12.16	(D) / (D)
1"	5,000	\$40.9233.07	\$25.22	(D) / (D)
1 1/2"	10,000	\$84.5166.24	\$47.97	(D) / (D)
2"	17,000	\$143.07111.16	\$79.24	(D) / (D)
3"	40,000	\$326.33253.04	\$179.74	(D) / (D)
4"	70,000	\$558.31433.71	\$309.11	(D) / (D)
6"	175,000	\$1,338.151,046.14	\$754.13	(D) / (D)
8"	325,000	\$2,424.041,903.55	\$1,383.05	(D) / (D)
10" or Larger	548,000	\$3,991.083,148.83	\$2,306.57	(D) / (D)

2. Conveyance Charge: In addition to the Minimum Charge, the following wastewater conveyance charges (based on water consumption/usage or wastewater flows, at the Authority's discretion) will apply for each 1,000 gallons above the Minimum Gallons for each meter size:

<u>Customer Class</u>	<u>Conveyance Charge Rate Per 1000 Gals.</u>		
	<u>Effective January 12, 2022</u>	<u>Effective January 12, 2023</u>	
Residential	\$7.646.99	\$6.34	(D) / (D)
Commercial*	\$6.746.23	\$5.72	(D) / (D)
Industrial	\$6.155.74	\$5.32	(D) / (D)
Health or Education	\$8.447.24	\$6.03	(D) / (D)

* Rate applies to City of Pittsburgh Municipal Accounts but bills will be calculated based on a phase-in factor pursuant to 71 P.S. §§ 720.211 to 720.213. (C)

(D) = Decrease

Issued: ~~December 16,~~ Effective: ~~January 14, 2021~~ June
2020 April 13, 2021 12, 2021

The Pittsburgh Water
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Supplement No. ~~5~~6

Section A.1 - Wastewater Conveyance (Unmetered Service)

1. Customer Charge. As of September 1, 2018 enrollment for Unmetered Service will be closed and no new Unmetered Service customers will be accepted by the Authority. Customers who are receiving unmetered service will be assessed a monthly customer charge per unmetered connection as follows:

Customer Class	Customer Charge		
	Effective January 12, 2022	Effective January 12, 2023	
Residential (per unit)	\$31.43 29.03	\$26.63	(D) / (D)
Commercial*	\$35.47 32.98	\$30.49	(D) / (D)

*Rate does not apply to City of Pittsburgh Municipal Accounts pursuant to 71 P.S. §§ 720.211 to 720.213.

(c)

2. Treatment Rate: In addition to the Customer Charge, Customers who are receiving unmetered service will be required to pay rates for Wastewater/Sewage treatment to Premises, as set forth in Section A.3.

Section B - Bulk Wastewater Conveyance

1. Application: This schedule applies to all bulk wastewater conveyance for other wastewater utilities or public authorities.
2. Rates and Terms of Service: Contracts stipulating the negotiated rate and negotiated terms of Bulk Wastewater Conveyance may be entered into between the Authority and Customer or Applicant when the Authority, in its sole discretion, deems such offering to be economically advantageous to the Authority.

~~(I) = Increase, (D) = Decrease, (C) = Change~~

Issued: ~~December 16, 2020~~ **April 13, 2021** Effective:

~~January 14, 2021~~ **June 12, 2021**

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Section C - Returned Check Charge

A charge of ~~\$30.45~~\$40.00 will be assessed any time where a check which has been presented to the Authority for payment on account has been returned by the payor bank for any reason if the customer has not paid a returned check charge under PWSA's water or storm water tariff.

(I)

(C)

Section D - Reserved

Section E - Service Termination or Resumption Rates

The fee for service termination shall be ~~\$75.13~~\$50.00. The fee for resumption of service shall be ~~\$25.38~~\$50.00, ~~provided that the fee for the same day resumption of service is \$45.68.~~ These termination and resumption fees will be waived if a customer has paid these fees under the water tariff.

(D)

(I)

Section F - Reserved

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Section H - Miscellaneous Charges, Fees, and Penalties (includes processing fees, and permits)

(C)

The following charges and fees will be adjusted annually for increases in the annual Consumer Price Index for the Pittsburgh area most recently published by the Bureau of Labor Statistics or any successor organization prior to such anniversary. If the change in the Consumer Price Index is 0% or is a decrease, there will be no automatic adjustment.

1. Processing Fees

<u>Item</u>	<u>Charge or Fee*</u>	
Certified mailing	\$11.28 20.00	(I)
History retrieval	\$15.23 10.00	(D)
Final bill	\$20.30 20.00	(D)
Map and Record Requests	\$40.00	
Easement Recording	\$3,700.00	
*Assessed per account.		
Dye Test Application Processing Fees		
Evidence of Compliance Statement	\$25.38 20.00	(D)
Temporary Evidence of Compliance Statement	\$25.38 30.00	(I)
Visual Inspection	\$75.00 120.00 for first 2 hours + \$60 per hr after 2 hrs	(I)
Duplicate Evidence of Compliance Statement	\$25.38 20.00	(D)

2. Penalties

<u>Item</u>	<u>Penalty</u>
Illegal Connection - Residential	\$60.00
Illegal Connection - Commercial	\$110.00

(I) Increase, (D) Decrease

Issued: ~~February 28, 2019~~ April 13, 2021

Effective:

~~March 1, 2019~~ June 12, 2021

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4. Activities Related to Permits/Approvals Issued by PWSA
a. Development Permits - required for constructing or renovating a structure larger than a single-family home including single-family homes with a fire service line or multi-family homes

<u>Activity</u>	<u>Fee</u>
Developer Fee - Water and Sewer Availability Letter	\$40.00
Developer Fee - Water and Sewer Use Review Letter	\$320.00
Developer Fee - Water and Sewer Use Review Letter - Expedited*	\$550.00
Tap-in Plan Review	\$420.00
Tap-In Plan Review - Expedited*	\$740.00
Developer Permit Revisions Review	\$140.00
Developer Permit Revisions Review - Expedited*	\$250.00
Private Construction of Public Facilities Plan Review	\$680.00
Private Construction of Public Facilities Plan Review - Expedited*	\$1,190.00
DEP Sewage Facilities Planning Review	\$240.00
DEP Sewage Facilities Planning Review - Expedited*	\$410.00

*Expedited = guaranteed review within 15 business days

- b. Residential Permit - for new water and/or sewer taps or reconnecting to existing water and/or sewer service (includes party line separations)

<u>Activity</u>	<u>Fee</u>
Residential Permit	\$40.00

- c. Other Permits (for any customer wanting to schedule an operation of a PWSA facility such as a fire hydrant or waterline shut)

<u>Activity</u>	<u>Fee</u>
Termination Only Permit	\$250.00

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d. Land Operations Permits (may be required for construction project, administered by City of Pittsburgh but requires review by PWSA before permit will be issued)

<u>Activity</u>	<u>Fee</u>
Review of City Land Operation Permit	\$80.00

e. City of Pittsburgh Department of Mobility and Infrastructure (DOMI) Approvals (PWSA required to submit approval letter if affected)

<u>Activity</u>	<u>Fee</u>
Review of City Street Vacation Permits	\$100.00
Review of City Encroachment Permits	\$100.00

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Section I - Reserved for Future Use

Section J - New Automatic Payment Enrollment Credit

Customers enrolling in paperless billing and establishing automatic bill payments for the first time will receive a one-time credit of \$5.00. For customers receiving water, wastewater, and/or storm water service from PWSA, this credit will only be applied once per PWSA account.

Issued: April 13, 2021

Effective: June 12, 2021

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Rider BDP - Bill Discount Program (Residential)

1. Bill Discount Program: This rider is a program designed to enroll residential ratepayers who satisfy the criteria set forth below in a monthly discounted rate program

2. Availability: This rider is available for a Residential customer that meets the low-income criteria of annual household gross income at or below 150% based on the Federal Poverty Level.
 - a. A residential ratepayer who meets the eligibility criteria should complete an application for the Bill Discount Program.
 - b. Eligible customers may be asked to verify income every two years. (C)

3. Rate (Minimum Charge): The Minimum Charge for residential service pursuant to Rider BDP will be 0% of the prevailing Minimum Service Charge under Part I, Section A. Any other rates, fees and charges will be at the prevailing amounts under this tariff. (C)
(D)

4. Rate (Consumption Charge): The Consumption Charge for residential service pursuant to Rider BDP for participants with income at or below 50% of the Federal Poverty Level will pay ~~80%~~50% of the prevailing Consumption Charge under Part I, Section A (which represents a ~~20%~~50% discount off the charge). Any other rates, fees and charges will be at the prevailing amounts under this tariff. (D)

(D) = Decrease, (C) = Change

Issued: ~~December 16, 2020~~ April 13, 2021 Effective: ~~January 14, 2021~~ June 12, 2021

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- 20. Ground Water: Water located beneath the ground surface that emanates from sources other than the Authority's water or wastewater systems.
- 21. Guaranteed Lessee: A Tenant to whom a Property Owner has made an assignment of possessory rights by agreement, thereby making the Tenant primarily responsible for the payment of water charges.
- 22. Guarantor: A Property Owner who guarantees payment of water by a Guaranteed Lessee.
- 23. Health or Education Property: Any hospital, clinic, or other human health care facility other than private physician or dentist offices, and any school, college, university, or other educational facility, whether public or private.
- 24. Health Department: The Allegheny County Health Department, Allegheny County, Pennsylvania.
- 25. Illegal Surface Storm Water Connection: Any connection to the Authority's Sanitary Sewers that allows surface storm water to be discharged into the separate Sanitary Sewer system from sources including, but not limited to, downspout drainage, roof drainage, and areaway drainage.
- 26. Reserved for future use.
- ~~26. Impervious Surface: A surface that prevents the infiltration of water into the ground, including, but not limited to, any roof, paved parking or driveway areas, and any streets and sidewalks. Surface areas constructed with gravel or crushed stone shall be assumed not to be impervious surfaces.~~
- 27. Industrial Property: Any property, the principal use of which is for manufacturing, processing, or otherwise producing products or goods for sale.
- 28. Lateral, Customer Lateral or Sewer Lateral: Wastewater or sewer lines that connect a property to the Authority's Collection Mains and carry sewage and/or Storm Water from one or more buildings or Premises to the Authority's Collection Mains.

(C)

(c) Change

Issued: ~~February 28, 2019~~ April
13, 2021

Effective: ~~March 1, 2019~~ June
12, 2021

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Section E - Billing and Collection

1. Issuance of Bills: The Authority will bill each customer within fifteen (15) days of the last day of each billing period.
2. Billing Due Date: The due date for payment of a bill for nonresidential service shall be no less than fifteen (15) days from the date of transmittal. The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the Authority are not open to the general public, the due date shall be extended to the next business day. The Authority may not impose a late-payment charge unless payment is received more than five (5) days after the stated due date.
3. Late Payment Charge: All amounts not paid when due shall accrue a late payment charge at the rate of 0.83 percent per billing period, not to exceed ten percent (10%) per year when not paid as prescribed in Rule 2 of this Section. (C)
4. Change in Billing Address: Where a customer fails to notify the Authority of a change in billing address, the customer shall remain responsible to remit payment by the billing due date.
5. Application of Payment: Utility bills rendered by the Authority shall include only the amount due for water service. Where a customer remittance to the Authority includes payment for any non-utility services, proceeds will be applied first to pay all outstanding regulated utility charges. For customers receiving any combination of water, wastewater, and stormwater services ~~combined water/wastewater customers~~, any partial remittance will be applied in the following order: ~~to the water bill first and any remaining remittance will be applied to the wastewater bill~~ and stormwater charges. (C)
6. Return Check Charges: The customer will be responsible for the payment of a charge for each time a check presented to the Authority for payment on that customer's utility bill is returned by the payor bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date,

(C) = Change

Issued: ~~December 16, 2020~~
April 13, 2021

Effective: ~~January 14, 2021~~ June
12, 2021

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Section G - Main Extensions

Bona Fide Service Applicant(s) and/or Non-Bona Fide Service Applicant(s) who desire to or are required to connect to the Authority's Wastewater conveyance system (a "Main Extension Applicant") must comply with the following conditions:

1. A Main Extension Applicant shall provide prior notice to the Authority. Notice shall be written and made on the application and permit forms contained in the Authority's Procedures Manual for Developers, which is located on the Authority's website. The appropriate forms can be completed and any applicable fees paid at the Authority's permit counter, First Floor, Penn Liberty Plaza I, 1200 Penn Avenue, Pittsburgh, PA 15222.
2. A Main Extension Applicant shall pay all applicable fees set forth in Part I, Section H ~~enumerated fees to the Authority. Fees shall be based upon the duly adopted fee schedule which is in effect~~ at the time of payment and shall be payable at the time of application for connection or at a time to which the property owner and the Authority agree. 53 Pa.C.S. § 5607(d) (24).

(C)

~~Tapping Fee~~

Collection Fee	\$1,701 Per EDU*	
Capacity Fee	\$1,277 Per EDU*	
Total Tapping Fee	\$2,978 Per EDU*	

(C)

~~* 300 gpd/EDU~~

The above-described fees shall be in addition to any charges assessed against the property in the construction of a sewer or water main by the Authority under 53 Pa.C.S. § 5607(d) (21), (22) as well as any other user charges imposed by the Authority. See 53 Pa.C.S. § 5607(d) (24).

3. The Authority may, in its exercise of its sole discretion, require that construction shall not commence until the Main Extension Applicant has posted appropriate financial security in accordance with 53 Pa.C.S. § 5607(d) (23), (30).

Issued: ~~February 28, 2019~~ April
13, 2021

Effective: ~~March 1, 2019~~ June
12, 2021

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PART VI: Storm Water

Section A - Ownership and maintenance of Storm Sewers

1. ~~The Authority has a duty to operate, maintain, inspect, repair, replace or abandon only those Storm Sewers that are a part of or connected to the public Sewer System and that fall into one of the following classifications:~~
 - a. ~~Storm Sewers leased to the Authority by the City under the Capital Lease Agreement effective July 27, 1995, as amended;~~
 - b. ~~Storm Sewers constructed by the City or the Authority for public use since July 27, 1995; and~~
 - e. ~~Storm Sewers dedicated to public use and accepted by the Authority on or after July 27, 1995.~~

2. ~~Storm sewers that have been created or constructed by parties other than the City or the Authority, that have never been dedicated to or accepted for public use, or that do not connect to any of the Authority's Sewer Mains are not owned by the City or the Authority, and neither the City nor the Authority has any responsibility for their condition, operation, maintenance, inspection, repair, replacement, or abandonment. Responsibility for such private or common storm sewers lies with the Owners of the property or properties served by them.~~

[this page is canceled]

Section B - Illegal Surface Storm Water Connections

~~No Person shall construct, install, maintain, repair, operate, use or allow an Illegal Surface Storm Water Connection on real estate that Person owns. This prohibition expressly includes, without limitation, illegal Surface Storm Water Connections made prior to the effective date of the Dye Testing Ordinance and prior to the effective date of these Rules and Regulations.~~

Issued: ~~February 28, 2019~~ April
13, 2021

Effective:

~~March 1,~~
2019 June 12,
2021

~~Section C - Permit requirements of other government entities~~

~~Prior to the commencement of any remedial work on the Illegal Surface Storm Water Connection, all necessary and required building permits, street opening permits, sidewalk opening permits, tap-in permits and fees, and other approvals and permits that may be necessary to accomplish the disconnection and redirection of the Storm Water shall be obtained.~~

~~Section D - Methods of Illegal Surface Storm Water
disconnections~~

- ~~1. Acceptable remediation of an Illegal Storm Water Connection to the Sanitary Sewer shall mean that the Illegal Storm Water Connection Is disconnected from the Sanitary Sewer, the access point to the Sanitary Sewer is capped and sealed, and the private storm Sewer Lateral redirected as directed by the Health Department.~~
- ~~2. In no event is Storm Water to be collected and discharged upon or across public sidewalks or upon public streets, or discharged upon adjacent property owned by another person.~~

[this page is canceled]

~~Section E - Completion of illegal Surface Storm Water
disconnections~~

- ~~3. After disconnection of the illegal Surface Storm Water Connection to the Sanitary Sewer and the redirection of the Storm Water, the real property shall be Dye Tested again to demonstrate that all Illegal Surface Storm Water Connections have been remedied.~~
- ~~4. The disconnection and the successful repeat Dye Test shall be certified by a Registered Plumber on a Dye Testing Results Form submitted to the Authority.~~
- ~~5. The Authority shall issue an Evidence of Compliance Statement within 7 business days of the submission of the appropriately completed Dye Testing Results Form.~~

Section F - Illegal connections to public Storm Sewers

~~6. No Person shall construct, Install, maintain, repair, operate, or use any drain or conveyance, whether on or below the surface, that allows any non-Storm Water discharge, including the discharge of Sewage, process Wastewater, or wash water, to enter the public Storm Sewers operated and maintained by the Authority. This prohibition expressly includes, without limitation, connections made prior to the effective date of the Dye Testing Ordinance and/or prior to the effective date of these Rules and Regulations.~~

[this page is canceled]

~~7. Provided they do not significantly contribute to pollution of the waters of the Commonwealth, the following discharges may enter the Storm Sewers:~~

- ~~a. discharges from firefighting activities;~~
- ~~b. potable water from sources such as de-chlorinated water lines and fire hydrant flushing;~~
- ~~c. air conditioning condensate~~
- ~~d. pavement wash waters, unless contaminated by toxic or hazardous materials or detergents;~~
- ~~e. flow from watering of lawns, unless contaminated by fertilizers or by toxic or hazardous materials;~~
- ~~f. dechlorinated swimming pool discharges;~~
- ~~g. water from car washing on Residential Property, unless contaminated by detergents or toxic or hazardous materials;~~
- ~~h. water from external washing of Residential or Non-Residential Properties, unless contaminated by detergents or toxic or hazardous materials;~~
- ~~i. Irrigation drainage, unless contaminated by fertilizers or by toxic or hazardous materials;~~
- ~~j. water from crawl space pumps, unless contaminated by toxic or hazardous materials;~~
- ~~k. uncontaminated water from foundations or from footing drains;~~
- ~~l. uncontaminated springs;~~
- ~~m. uncontaminated flows from riparian habitats or wetlands;~~
- ~~n. uncontaminated groundwater; and~~
- ~~o. any activity authorized by a valid Pennsylvania permit for discharge to the waters of the Commonwealth.~~

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~~8. Should the Authority, the City, or the Commonwealth Department of Environmental Protection determine that any of the discharges otherwise permitted by section G.2 significantly contribute to the pollution of the waters of the Commonwealth, then the Authority, the City or the Department of Environmental Protection will notify the responsible Person to cease the discharge.~~

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Issued: ~~February 28, 2019~~ April 13, 2021 Effective: ~~March 1, 2019~~ June 12, 2021

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

TONY IGWE

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024773 (Water)

R-2021-3024774 (Wastewater)

R-2021-3924779 (Stormwater)

TOPICS:

STORMWATER

April 13, 2021

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TABLE OF EXHIBITS

Appendix A	Resume of T. Igwe
TI-1	PWSA and City of Pittsburgh Stormwater Outfalls and Storm Sewershed Drainage Areas Overview Map (dated March 18, 2021)
TI-2	January 26, 2021 U.S. EPA Administrative Order on Consent
TI-3	Findings from the Stormwater Advisory Group to PWSA
TI-4	PWSA Proposed Stormwater Tariff
TI-5	Pennsylvania Public Utility Commission’s Model Stormwater Tariff

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND POSITION FOR THE RECORD.**

3 A. My name is Tony Igwe. I am the Senior Group Manager, Stormwater for The Pittsburgh
4 Water and Sewer Authority (“PWSA”), a position that I assumed in January 2021. I
5 previously held this position on an interim basis beginning in September 2020.

6 **Q. WHAT ARE YOUR JOB RESPONSIBILITIES IN THAT POSITION?**

7 A. My responsibilities include planning, design, implementation, and maintenance of
8 stormwater-related projects that reduce localized flooding and combined sewer overflows
9 while improving the water quality and health of streams and waterways.

10 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND**
11 **RELEVANT EXPERIENCE.**

12 A. I am a civil and environmental engineer with nearly three decades of experience helping
13 municipalities and authorities solve wet weather control issues. I hold a Bachelor of
14 Science in Civil Engineering from Mississippi State University, and a Masters Degree
15 and PhDe in Environmental Engineering from Wayne State University. I am also a
16 registered professional engineer in Pennsylvania and Michigan. Prior to joining PWSA, I
17 worked on projects that covered wastewater, combined sewer overflow, and stormwater
18 issues for cities such as Detroit, Michigan and Cleveland, Ohio. In 2002, I established
19 the Pittsburgh office of Wade Trim, a leading engineering firm. During my time at Wade
20 Trim, I worked with 3 Rivers Wet Weather, Inc., PWSA and the 83 municipalities and
21 municipal authorities in the Allegheny County Sanitary Authority (“ALCOSAN”) service
22 area to develop a regional flow monitoring plan and wet weather feasibility study reports.
23 I also supported PWSA as a consultant on the Four Mile Run Stormwater Improvement
24 Project.

1 A complete description of my background and experience is set forth in Appendix

2 A to this testimony.

3 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA**
4 **PUBLIC UTILITY COMMISSION (“PUC” OR “COMMISSION”)?**

5 A. No.

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

7 A. The purpose of my testimony is to describe PWSA’s stormwater fee proposal. I am also
8 sponsoring PWSA’s proposed stormwater tariff. Additionally, I will describe the
9 Authority’s stormwater conveyance facilities, the related regulatory requirements and
10 PWSA’s stormwater management program.

11 **Q. ARE OTHER WITNESSES PROVIDING TESTIMONY REGARDING THE**
12 **STORMWATER PROGRAM AND PROPOSED FEE?**

13 A. Yes. Mr. Readling’s testimony describes the development of PWSA’s proposed
14 stormwater fee and credit program. Additionally, Ms. Quigley discusses customer
15 service-related aspects of the stormwater fee.

16 **Q. OTHER THAN THE PROPOSED TARIFF, ARE YOU SPONSORING ANY**
17 **EXHIBITS?**

18 A. Yes. I am sponsoring the following exhibits:

- 19 • **Exh. TI-1:** Exhibit TI-1 is a map providing an overview of the PWSA and City of
20 Pittsburgh storm sewershed drainage areas and outfalls as of March 18, 2021.
- 21 • **Exh. TI-2:** Exhibit TI-2 is a copy of the January 26, 2021 U.S. EPA Administrative
22 Order on Consent with PWSA and the City of Pittsburgh.
- 23 • **Exh. TI-3:** Exhibit TI-3 describes the findings of PWSA’s Stormwater Advisory Group.
- 24 • **Exh. TI-4:** Exhibit TI-4 is PWSA’s proposed Stormwater Tariff.

- 1 • **Exh. TI-5:** Exhibit TI-5 is the Pennsylvania Public Utility Commission’s Draft Model
2 Stormwater Tariff. The Commission provided this document to PWSA for guidance in
3 the fall of 2019.

4 **Q. WHY IS PWSA ADDRESSING STORMWATER AS PART OF THIS**
5 **PROCEEDING?**

- 6 A. PWSA currently uses the fees generated from customer charges for sewer conveyance to
7 fund stormwater management. A sewer conveyance fee (based on a PWSA customer’s
8 water usage) is not an equitable way to charge customers for stormwater management.
9 This is because the volume of stormwater that a property generates is a function of hard
10 surface (impervious area) on that property, not water usage. The universal measure used
11 by governments across the United States to charge for costs related to stormwater
12 services is impervious surface area. Therefore, PWSA is developing a stormwater fee to
13 more equitably charge for stormwater management services in order to meet water
14 quality and regulatory requirements.

15 Additionally, the Commission’s Final Implementation Order (FIO) directed
16 PWSA to file a stormwater tariff and a compliance plan no later than the next wastewater
17 base rate filing after its July 2018 base rate filing.¹ In order to satisfy the FIO’s
18 requirement, PWSA submitted a stormwater tariff as part of its 2020 base rate proceeding
19 but did not propose a stormwater fee at that time. The settlement in the 2020 rate case
20 provided that development of the stormwater tariff would be deferred to PWSA’s next

¹ Implementation of Chapter 32 of the Public Utility Code Re Pittsburgh Water and Sewer Authority, Final Implementation Order (entered Mar. 15, 2018), Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), at 31.

1 combined water, wastewater and stormwater base rate case.² PWSA is now filing the
 2 stormwater tariff and proposing a stormwater fee as part of the current proceeding.

3 **II. OVERVIEW OF STORMWATER ISSUES**

4 **Q. WHAT IS STORMWATER?**

5 A. Stormwater is rain or snowmelt that does not infiltrate into the ground. When
 6 precipitation falls on an impervious area, it runs off the property rather than being
 7 absorbed. Figure 1 below illustrates the stormwater cycle in a separate sanitary sewer
 8 system, where stormwater runoff is conveyed to a nearby water body, such as a stream or
 9 a river. Note that in a combined sewer system, stormwater is conveyed to a pipe that
 10 carries a combination of both sanitary sewer flow and stormwater.

11 **Figure 1:**

Stormwater Basics

The Stormwater Cycle

Stormwater isn't hard to spot and chances are, you have already been impacted by its effects. This simple example shows the stormwater cycle for a typical single family home.

How it Works

- Rain Falls:** water collects on an impervious/paved surfaces
- Run Off Collects:** run off collects pollutants along its way
- Run Off Flows:** water moves over impervious/paved surfaces
- Run Off Grows:** water your yard can't absorb combines into run off
- Stormwater Drains:** pollutant-heavy water now flows into storm drains
- Streams and Rivers Impacted:** pollutants enter water



12
 13 Source: <https://www.conservationcenter.org/solution-center/stormwater/what-is-stormwater#>

² See *Pa. P.U.C. v. Pittsburgh Water and Sewer Authority*, Docket Nos. R-2020-3017951 and R-2020-3017970, Recommended Decision (dated Oct. 29, 2020) at 24-26 (approved without modification in the Order entered Dec. 3, 2020).

1 **Q. IS STORMWATER A PROBLEM?**

2 A. Yes. When precipitation falls on undeveloped areas, it is primarily absorbed into the
3 ground or slowly runs off into streams, rivers or other water bodies. However, developed
4 areas that are impervious, such as rooftops and paved areas, prevent water from being
5 absorbed and create a faster rate of runoff. This development often causes localized
6 flooding or other water quantity or quality issues. In addition, stormwater can carry
7 harmful pollutants (such as such as oil, dirt, chemicals, and lawn fertilizers) that
8 adversely affect water quality. Stormwater can cause flooding, erode topsoil and stream
9 banks, and destroy habitats. PWSA's service territory has densely developed areas with a
10 lot of impervious surfaces.

11 **Q. WHO PRODUCES STORMWATER?**

12 A. All properties receive precipitation in the form of rain or snow. Accordingly, all
13 properties produce stormwater runoff that must be managed. Even if a property has
14 never flooded and there is no nearby stormwater infrastructure, the stormwater that flows
15 off of a property must be managed so that it does not contribute to pollution and flooding
16 downstream. This also applies to cases in which the majority of stormwater is managed
17 onsite; property owners should contribute for services provided that are beyond their
18 property lines, such as permit compliance, municipal separate storm sewer system (MS4)
19 maintenance, and stormwater infrastructure improvements throughout the City of
20 Pittsburgh. Stormwater management is a community-wide service and the costs should be
21 funded by all residents in a fair and equitable manner.

1 **Q. ARE THERE DIFFERENT REGULATORY CATEGORIES OF**
2 **STORMWATER?**

3 A. Yes. Under the Clean Water Act, a permit is required for any discharge to waters such as
4 rivers or streams. There are two types of permits that address stormwater discharges: (1)
5 National Pollutant Discharge Elimination System (NPDES) permits that apply to
6 discharges from a combined sewer system, including stormwater flow which is due to
7 groundwater infiltration and stormwater inflow that mix with other wastewater in
8 combined sewer pipes; and (2) NPDES permits for Municipal Separate Storm Sewer
9 Systems (MS4), relating to stormwater that is collected, conveyed, and discharged to
10 local waterbodies via stormwater-only pipes.

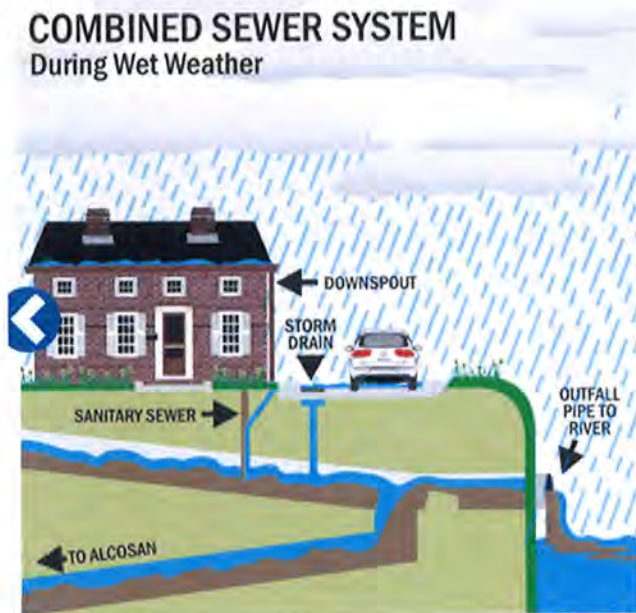
11 **Q. PLEASE PROVIDE AN OVERVIEW OF THE AUTHORITY'S STORMWATER**
12 **AND/OR WASTEWATER INFRASTRUCTURE.**

13 A. PWSA's overall wastewater conveyance system is composed of over 1,200 miles of
14 sewer lines, 4 pump stations, and approximately 25,000 catch basins. PWSA has two
15 types of wastewater conveyance systems – a combined system, and separated sanitary
16 and storm sewer systems. Stormwater is conveyed in different ways by each type of
17 system.

18 First, approximately 75% of the PWSA system, or approximately 900 miles of
19 sewer lines, is the combined sewer system. This is generally the older areas of the system
20 where wastewater and stormwater are conveyed in the same pipe. During times of dry
21 weather, all flow is conveyed to ALCOSAN for treatment. When it rains, the capacity of
22 the system to convey flow can be limited, which causes localized flooding, basement
23 sewer backups, and overflows to streams and rivers. Figure 2 below illustrates the
24 operation of a combined sewer system.

1

Figure 2:



WASTEWATER COLLECTION

Combined Sewer System

In a combined sewer system, wastewater and storm water both flow into a common sewer line. Older communities built before 1940s may have combined sewer systems.

2

3

Source: <https://www.alcosan.org/what-we-do/wastewater-treatment>

4

Second, newer or more recently redeveloped communities have separated sanitary and storm sewer systems.³ In a separated system, wastewater is conveyed to ALCOSAN for treatment, and when it rains stormwater is discharged directly to a nearby stream or river. The separate stormwater conveyance system (“MS4”)⁴ is not connected to either the combined wastewater system or the sanitary sewer system, and only carries stormwater. A map providing an overview of stormwater outfalls in the City of Pittsburgh, including those served by an MS4, is attached as Exhibit TI-1.

10

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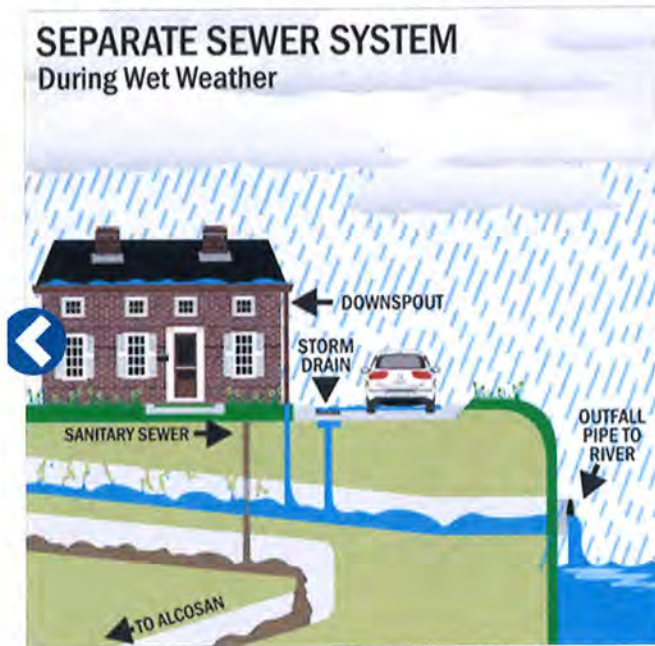
Approximately 25% of the PWSA system is separated. The separated system has

³ Due to uneven patterns and timelines of real estate development, some areas have been built as separated systems, but must connect to an older combined system downstream because they do not have direct access to ALCOSAN sanitary sewer lines (for sanitary flow) or a body of water (for stormwater flow), resulting in a patchwork of infrastructure types.

⁴ “MS4” stands for Municipal Separate Storm Sewer System. See 25 Pa. Code § 92a.2. Municipalities and other entities that meet certain standards must obtain National Pollutant Discharge Elimination System (“NPDES”) permit coverage for discharges of storm water from their MS4s. See, e.g., the Storm Water Management Act, 32 P.S. §§ 680.1, *et seq.* See also 40 CFR 122.26(b) (relating to definitions).

1 approximately 172 miles of sanitary sewer and 140 miles of stormwater pipes. Figure 3
 2 below illustrates the operation of a separate sanitary sewer system.

3 Figure 3:



WASTEWATER COLLECTION
 Separate Sewer System

In a separate sewer system, wastewater and stormwater flow into separate sewer lines. Starting in the 1940s only separate sewer systems could be built.

4
 5 Source: <https://www.alcosan.org/what-we-do/wastewater-treatment>

6 The combined sewer system and MS4 will each be discussed in greater detail
 7 below.

8 **A. Combined Sewer System**

9 **Q. PLEASE BRIEFLY DESCRIBE PWSA’S COMBINED WASTEWATER**
 10 **SYSTEM.**

11 A. The PWSA system, as was common industry practice at the time of installation, was
 12 designed as a “combined system,” meaning that there is one pipe underground that
 13 transports both wastewater and stormwater, all of which is then conveyed to treatment
 14 facilities. Our first sewer lines were built as early as 1840 in present-day Shadyside and
 15 Oakland. By 1908, more than 390 miles of underground sewer lines were in place,

1 establishing the start of the combined sewer system that is still used today. About 75%
2 (about 900 miles) of PWSA's wastewater conveyance system is the combined system.

3 **Q. HOW DOES STORMWATER ENTER THE PWSA COMBINED WASTEWATER**
4 **SYSTEM?**

5 A. Principally, through storm grates or inlets located in the streets, then into the sump or
6 well below, called a catch basin. There are, however, other sources of inflow, such as
7 roof stormwater downspouts and area drains as required by existing Municipal Building
8 Code, that were designed to feed this stormwater into the combined wastewater
9 conveyance system. Finally, groundwater can enter the piping system via aging or
10 defective infrastructure. This is termed "infiltration."

11 **Q. HOW IS STORMWATER HANDLED BY THE COMBINED WASTEWATER**
12 **SYSTEM?**

13 A. PWSA sends the combined flow of wastewater and stormwater to ALCOSAN, the
14 regional wastewater treatment plant along the Ohio River. ALCOSAN treats wastewater
15 (together with any stormwater collected by combined systems) for 83 municipalities in
16 Allegheny County, including the City of Pittsburgh.

17 **Q. WHAT IS A COMBINED SEWER OVERFLOW (CSO)?**

18 A. Normally, during dry periods or low intensity rainfalls, PWSA's combined system sends
19 all wastewater and stormwater flow to the ALCOSAN treatment facility. However, if
20 there is a large rainfall event, the system can become overloaded beyond its capacity.
21 When this occurs, the system is designed to allow excess stormwater and untreated
22 sewage to be discharged into rivers and streams. This means that combined sewers can
23 cause water pollution problems when the volume of sewage and stormwater exceed the
24 capacity of the conveyance system.

1 **Q. HAVE COMBINED SEWER OVERFLOW EVENTS BEEN AN ISSUE IN THE**
2 **CITY OF PITTSBURGH?**

3 A. Yes, CSOs are a significant issue in City of Pittsburgh. Approximately 5.5 billion
4 gallons of untreated sewage overflows each year from the PWSA combined sewer system
5 into local streams and rivers.⁵ The frequency of CSO events is driven by weather,⁶ and in
6 recent years Pittsburgh has experienced increased amounts of total annual rainfall as well
7 as the frequency of large rainfall events. As an illustration, 2018 was the wettest year on
8 record for Pittsburgh, with a total of 57.83 inches of rain. Similarly, 2019 was the third
9 wettest year on record with a total of 52.46 inches of rain. By comparison, the 30-year
10 mean rainfall for Pittsburgh is just over 38 inches of rain.⁷ See Figures 4 and 5 below to
11 note that the trend of precipitation amounts and event frequency appears to be increasing,
12 which will result in more frequent CSO events and an even greater need to adequately
13 manage stormwater.

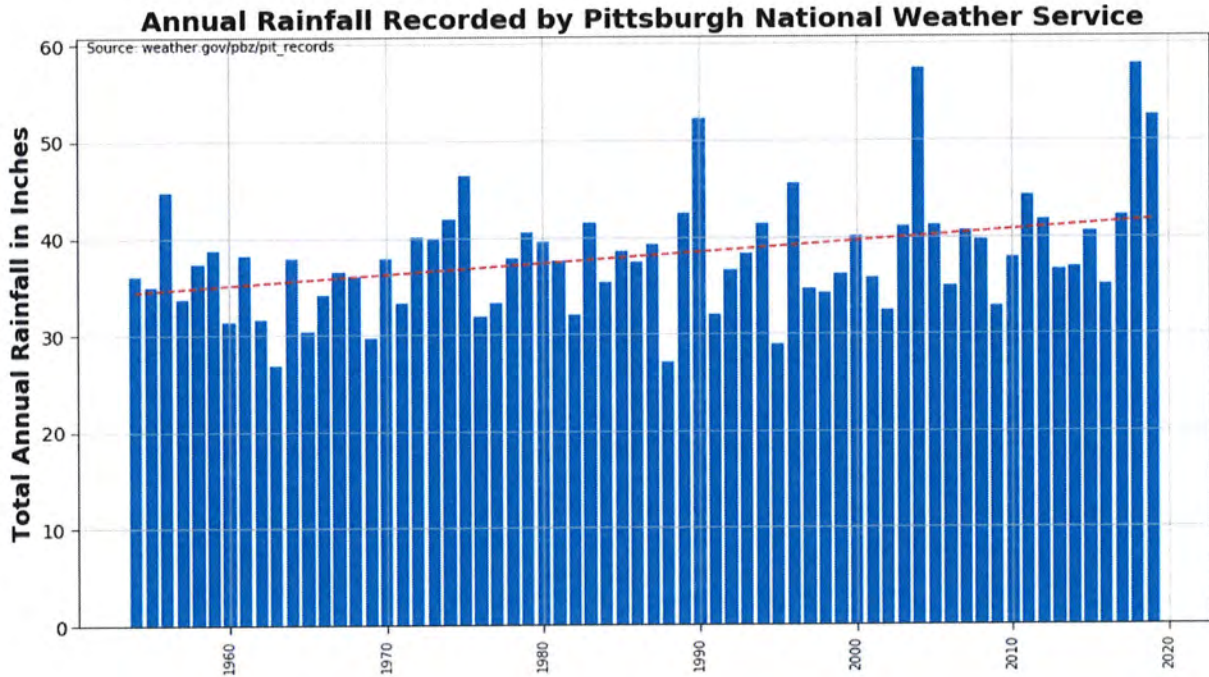
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⁵ As per the PWSA SWMM Model, 2003 Typical Year.

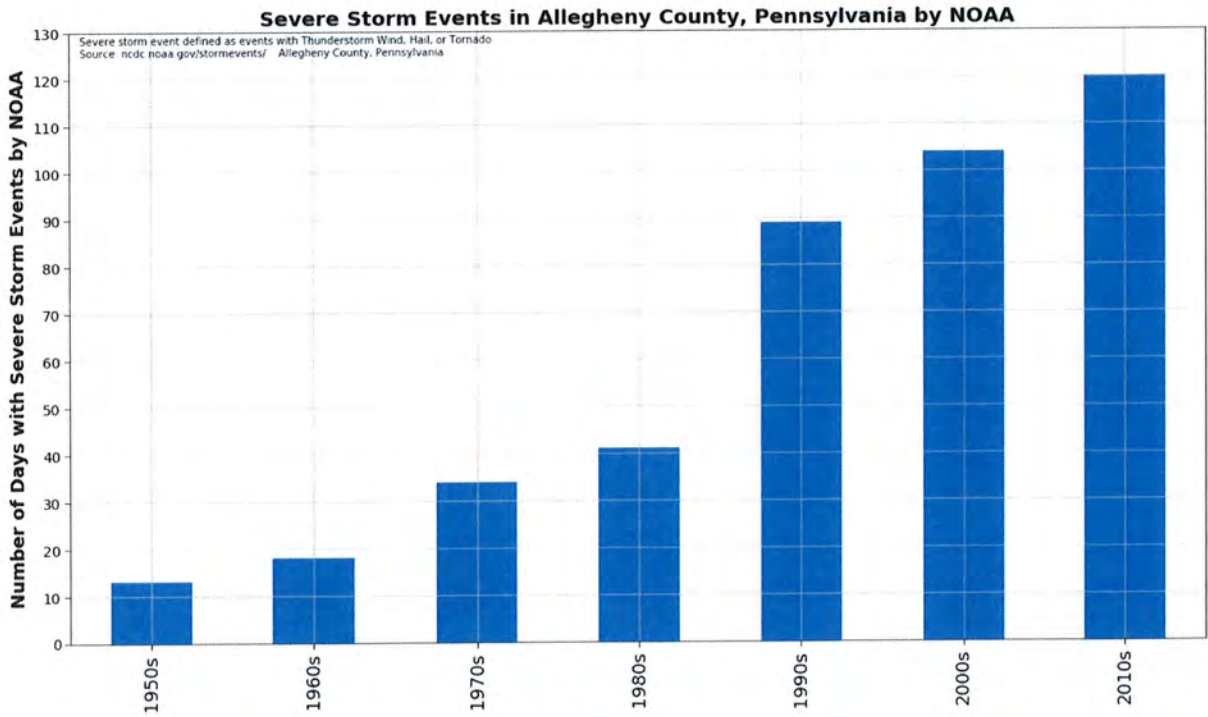
⁶ See the ALCOSAN website for data on CSO Alerts issued by year since 1993:
<https://www.alcosan.org/our-plan/sewer-overflow-advisories>.

⁷ https://www.weather.gov/pbz/pit_records.

1 Figure 4:



2
3 Figure 5:



4
5
6

1 **Q. HOW ARE COMBINED SEWER OVERFLOWS BEING ADDRESSED?**

2 A. In 2004, the Pennsylvania Department of Environmental Protection (PA DEP) issued a
3 Consent Order to the City of Pittsburgh and other municipalities in Allegheny County.⁸
4 The order directed the parties to reduce the volume of CSOs and basement backups.

5 In 2013, PWSA prepared a *Wet Weather Feasibility Study*⁹ in accordance with the
6 PA DEP Consent Order. In this document, PWSA discussed green infrastructure and
7 integrated watershed management and indicated its intent to further analyze and evaluate
8 how these methods could be utilized to address CSOs in Pittsburgh and the region. The
9 study also described how green infrastructure can help to address chronic surface
10 flooding and sewage basement backups experienced across Pittsburgh.

11 In November 2016, PWSA completed the *Green First Plan*,¹⁰ which presented the
12 results of these analyses and evaluations. PWSA's *Green First Plan* identified the use of
13 green infrastructure, stormwater source control, and stream removal as an alternate plan
14 to the current ALCOSAN *Clean Water Plan* (CWP).¹¹ It also indicated that using these
15 alternate methods could lead to improved efficiencies for ALCOSAN's planned
16 wastewater treatment plant (WWTP) upgrades and operations of the existing collection
17 system, as well as greater reduction of sediment levels in the existing deep tunnel
18 interceptor sewers. PWSA's *Green First Plan* estimated that it could reduce the region's
19 overflow volume by a comparable amount (6 billion gallons or more) to ALCOSAN's

8 Available at:
<https://www.3riverswetweather.org/sites/default/files/Consent%20Order%20and%20Agreement%20final%202004.pdf>.

9 Available at: <https://www.pgh2o.com/your-water/stormwater>.

10 Available at: <https://www.pgh2o.com/your-water/stormwater>.

11 Available at: <https://www.alcosan.org/our-plan/plan-documents/clean-water-plan>.

1 WWTP, while also providing a higher level of protection against surface flooding and
2 basement sewage backups.

3 PWSA also identified that the costs to provide this same level of protection
4 against surface flooding and sewage basement backups were not included in
5 ALCOSAN's CWP, as ALCOSAN is only charged with addressing CSOs. ALCOSAN's
6 CWP does not address surface flooding, sewage basement backups, or PWSA's MS4
7 permit requirements. These issues are subject to further negotiation between PWSA and
8 U.S. Environmental Protection Agency (EPA) Region 3. These negotiations started in
9 earnest in January 2021.

10 **Q. ARE THERE SPECIFIC PROJECTS RELATED TO COMBINED SEWER**
11 **OVERFLOWS THAT YOU WOULD LIKE TO HIGHLIGHT?**

12 A. Yes. In addition to the above work, PWSA is also developing an Integrated Watershed
13 Management (IWM) Plan for the Saw Mill Run (SMR) watershed by working with the
14 eleven other municipalities in the watershed, the Watersheds of South Pittsburgh
15 organization, the U.S. Army Corps of Engineers, and PA DEP. The implementation of
16 this integrated planning approach is in accordance with the provisions in the Water
17 Infrastructure and Improvement Act (WIIA) (HR 7279), which was signed into law on
18 January 14, 2019.

19 The SMR watershed is plagued with a range of in-stream water quality pollution
20 problems, sewer overflows, chronic surface flooding, and basement backups. The IWM
21 Plan identified that dry weather sources are the largest source of bacteria pollution, which
22 are most likely from failing sanitary and storm sewer infrastructure and illicit discharges,
23 which are left uncontrolled in any of the current regional wet weather plans. Also,
24 stormwater runoff was found to be the largest source of pollution in the watershed. In

1 addition, it was found that if CSOs were eliminated, without addressing the other
2 pollution sources, there would be no improvement in the number of days of water quality
3 standard compliance achieved.

4 PWSA has finalized the IWM implementation plan report which has identified a
5 combination of dry weather sources, stormwater runoff, and acid mine drainage control
6 projects recommended to be implemented over the next five to ten years to maximize in-
7 stream water quality improvement and reduce CSOs, surface flooding, and sewage
8 basement backups to meet PWSA's and the other 11 municipalities' regulatory
9 obligations. Implementation of the initial phases of the report cannot start until PWSA
10 and the 11 municipalities involved are able to work out a suitable framework for
11 implementation. This framework would include project cost sharing issues for planning,
12 design and eventual construction of any recommended project. Given the number of
13 municipalities involved, this framework will take some time to develop.

14 **B. Municipal Separate Storm Sewer System**

15 **Q. WHAT HAPPENS TO STORMWATER IN SEPARATED SANITARY SEWER**
16 **AREAS?**

17 A. Stormwater in separated sanitary sewer areas is subject to management under local
18 ordinances and/or an NPDES permit for municipal separate storm sewer systems
19 (otherwise known as an MS4 Permit).

20 There are approximately 200 known stormwater discharge points (or outfalls) that
21 are part of PWSA's MS4 system. These are locations where stormwater exits a property,
22 including pipes, ditches, swales, and other structures that transport stormwater. Each
23 outfall location is given a unique identifier to differentiate them from other mapped

1 outfall locations. Under the MS4 Permit, PWSA is required to monitor all known outfalls
2 (subject to impaired waters monitoring requirements).

3 **Q. WHAT IS AN MS4 PERMIT?**

4 A. Municipalities and other entities (such as universities) that meet certain standards must
5 obtain an NPDES permit for discharges of stormwater from their MS4s.

6 In Pennsylvania, the MS4 program is managed by PA DEP. The Clean Water Act
7 requires cities serving a population of over 100,000 people to obtain an NPDES permit
8 for their discharges. EPA has delegated oversight of the NPDES program in
9 Pennsylvania to PA DEP. The Pennsylvania Clean Streams Law of 1937 also provides
10 additional authority to PA DEP.

11 **Q. DOES PWSA HAVE AN MS4 PERMIT?**

12 A. Yes. PWSA and the City of Pittsburgh were issued an MS4 NPDES Permit in 2004 that
13 was administratively extended through June 30, 2020. PA DEP recently issued a new
14 MS4 Permit to PWSA and the City effective as of July 1, 2020, with an expiration date of
15 June 30, 2025.

16 **Q. WHAT ARE SOME OF THE STORMWATER SERVICES AND ACTIVITIES**
17 **THAT PWSA MUST PROVIDE UNDER THE MS4 PERMIT?**

18 A. PWSA's obligations under the MS4 NPDES Permit include reducing the amount of
19 sediment, nutrients, and other pollution from entering rivers, streams, creeks, waterways
20 and water bodies that have significant direct and indirect impacts on water supply and
21 water quality in the area. Some examples of "water quality" services include:

- 22 • GIS mapping;
- 23 • Public education and outreach; and
- 24 • Project design construction and management (e.g. projects in Pollutant Reduction
25 Plans and Total Maximum Daily Load Plans)
- 26

1 Both PWSA and the City must implement Six Minimum Control Measures (MCMs) in
 2 order to comply with our MS4 NPDES Permit. These include:

- 3 • Public Education and Outreach
- 4 • Public Participation
- 5 • Illicit Discharge Detection and Elimination
- 6 • Pre-Construction Runoff Control
- 7 • Post-Construction Runoff Control
- 8 • Good Housekeeping

9
 10 **Q. ARE THERE ANY STORMWATER ORDINANCES WITHIN THE CITY?**

11 A. Yes. Within the City of Pittsburgh, all new development is required to separate their
 12 sanitary and stormwater flows on-site in a way that would be compatible with a separated
 13 system.¹² However, those that are in a combined sewer area then convey those separated
 14 flows into an older combined system downstream because they do not have direct access
 15 to ALCOSAN sanitary sewer lines (for sanitary flow) or a body of water (for stormwater
 16 flow). New development (or redevelopment) is required to use structural and non-
 17 structural practices to manage stormwater.¹³ Such structures and practices are
 18 implemented and based on “design” storms (the first one inch of runoff for privately
 19 funded projects, and the 95th percentile storm event for publically funded projects).¹⁴ The

¹² The City’s subdivision and land development ordinance addresses storm water and drainage control. *See* Pittsburgh Code of Ordinances, Zoning Code, Title 13 (Storm water Management) and Pittsburgh Code of Ordinances, Title 4 (public places), Article III (Sewers) at Chapter 433 (Illegal Surface Storm water Connections).

¹³ *Id.* The City’s Department of City Planning (“DCP”) reviews storm water management plans for compliance with the Zoning and Building Codes. *See* PWSA PROCEDURE MANUAL FOR DEVELOPERS (2018) at 9-7, which is available at <http://www.pgh2o.com/developer-manual>. The City of Pittsburgh Department of Permits, Licenses, and Inspections (“PLI”) has the authority to inspect storm water management structures provided by private development and to enforce any violations. *Id.*

¹⁴ The City’s Ordinances require the onsite retention of the 2-year 24 hour storm volume. *See* Pittsburgh, Pennsylvania Code of Ordinances at § 1303.03(a)(1). *See also* Pittsburgh Code of Ordinances § 1303.01(k) — which incorporates, *inter alia*, Appendix 7A of Pennsylvania Department of Transportation’s DRAINAGE MANUAL, PennDOT Publication 584. That Publication is available at: <https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20584.pdf>.

1 City of Pittsburgh has also devised a “credit” program by which property unable to
 2 perform on-site stormwater management will provide funding for offsite practices to
 3 address stormwater flood abatement.

4 The *Pennsylvania Stormwater Best Management Practices Manual* provides
 5 guidance, but otherwise no predetermined set of stormwater structures or practices is
 6 required, since the application of management structures or practices varies with each
 7 location.¹⁵ BMPs may be designed and implemented based on the design storm method,
 8 the simplified method, or criteria as allowed by regulation.¹⁶

9 **Q. IS THE CITY OF PITTSBURGH UPDATING ITS STORMWATER CODE?**

10 A. Yes. Pursuant to EPA’s January 26, 2021 Administrative Order on Consent with PWSA
 11 and the City of Pittsburgh, PWSA and the City are required to submit an amended unified
 12 Stormwater Code to City Council by July 1, 2021.¹⁷ The goals of this project include
 13 developing an implementable revised Code, supporting policy and process
 14 recommendations, and guidance materials that align with other City initiatives regarding
 15 green stormwater infrastructure, complete streets, and resiliency, as well as clarifying
 16 development requirements and improving efficiency of stormwater project review and
 17 approval processes. By improving ordinances, review processes, policies, and guidance
 18 material, this will create clearer, more a user-friendly stormwater code.¹⁸

15 See PWSA PROCEDURE MANUAL FOR DEVELOPERS (2018) at Section 9 (storm water); Pennsylvania Department of Environmental Protection, STORM WATER BMP MANUAL (December 30, 2006), DEP Document No. 363-0300-002, at Forward — which is available at: <https://pecpa.org/wp-content/uploads/Stormwater-BMP-Manual.pdf>.

16 See 25 Pa. Code Chapter 102; City Code 1303.03 Volume Controls.

17 The January 26, 2021 Administrative Order on Consent is attached as Exhibit TI-2.

18 Additional information regarding the Stormwater Code Updates is available at: <https://pittsburghpa.gov/dcp/stormwater-code-update>.

1 **C. Stormwater Management and Mitigation**

2 **Q. ON A SYSTEM-WIDE SCALE, WHAT CAN BE DONE TO REDUCE THE**
3 **AMOUNT OF STORMWATER ENTERING THE WASTEWATER SYSTEM?**

4 A. Broadly, there are a wide variety of steps that a community can take to reduce the amount
5 of stormwater runoff entering the wastewater system. Many of these are aimed at
6 reducing the amount of impervious area and improving the ability of precipitation to be
7 absorbed or held where it falls. Examples can include replacing impervious pavement
8 with pervious materials, stream removal projects, and large scale green infrastructure
9 projects.

10 **Q. PLEASE HIGHLIGHT SOME OF THE AUTHORITY'S RECENT**
11 **STORMWATER MANAGEMENT AND MITIGATION PROJECTS.**

12 A. As of March 2021, PWSA has constructed (or partnered with) thirteen green
13 infrastructure projects in the City of Pittsburgh. In addition, fourteen projects are
14 currently in various stages of planning and design, and three are in construction. Projects
15 are strategically sited to collect stormwater in high priority sheds where projects would
16 have a significant impact on reducing combined sewer overflows, as mandated by the
17 U.S. EPA and PA DEP. These projects featured bioretention (rain gardens and “bump
18 outs” along roadways), underground retention tanks to hold back the peak flows of
19 stormwater during rainfall events, and many were partially funded by ALCOSAN’s
20 GROW (Green Revitalization of our Waterways) grant program. ALCOSAN’s GROW
21 program funds municipal green infrastructure projects in their service area that they
22 determine will provide cost-effective management of stormwater to reduce sewer
23 overflows. The total value of the grants awarded to PWSA to date is over \$9 million. It
24 should be noted that the GROW grants are reimbursement grants. As a result, PWSA is
25 required to budget for and spend the funds before it can be reimbursed for these projects.

1 **Q. WHAT CAN INDIVIDUAL PROPERTY OWNERS DO TO REDUCE**
 2 **STORMWATER RUNOFF FROM THEIR PROPERTIES OR OTHERWISE**
 3 **IMPROVE WATER QUALITY?**

4 A. Individual homeowners and other property owners also play an important role in reducing
 5 stormwater runoff or improving water quality in other ways. Homeowners can do this by
 6 reducing impervious areas (hard surfaces like roofs and paved areas) so that rain soaks
 7 into the ground; disconnecting downspouts so that the stormwater from their roof can
 8 infiltrate into the ground in areas away from structures; maintaining the lawn and
 9 landscaped areas to prevent erosion, planting native trees and plants which help infiltrate
 10 stormwater and increase evaporation and transpiration; or managing stormwater on-site
 11 with rain gardens, rain barrels, and similar practices. Other stormwater-mitigation
 12 practices at home include:

- 13 • Keeping drains, gutters, and downspouts clean and free of debris.
- 14 • Disposing of trash properly.
- 15 • Don't hand wash your car. Bring it to a carwash.
- 16 • Properly dispose of pet waste.
- 17 • Use fertilizer sparingly, and do not fertilize when rain is forecasted within 24
 18 hours.
- 19 • Stop oil or chemical leaks immediately.¹⁹

20 As I will discuss below, PWSA's proposed stormwater tariff includes incentives for
 21 property owners to install certain stormwater mitigation measures and earn credits to
 22 reduce their stormwater fee.

¹⁹ Refer to the *Southwestern Pennsylvania's Homeowner's Guide to Stormwater*. -
<http://www.acc.dpa.org/wp-content/uploads/2015/04/Homeowners-Stormwater-Guide.pdf>.

1 **Q. HOW DO PWSA AND THE CITY OF PITTSBURGH DETERMINE**
2 **RESPONSIBILITY FOR STORMWATER-RELATED ACTIVITIES?**

3 A. PWSA and the City are taking a number of steps to further define their respective
4 responsibilities for stormwater-related activities.

5 For activities related to compliance with the joint MS4 NPDES permit, PA DEP
6 required PWSA and the City to define their roles and responsibilities to ensure
7 compliance with the permit (which went into effect on July 1, 2020). PWSA and the City
8 have an MS4 compliance agreement that primarily addresses responsibility for the six
9 Minimum Control Measures included in the permit.

10 Additionally, as a result of the January 26, 2021 Administrative Order on Consent
11 (AOC) with EPA (and coordinated with PA DEP) on MS4 Permit requirements and
12 stormwater inspection and enforcement, the City of Pittsburgh and PWSA have
13 committed to a timeline for implementing a full stormwater inspection and enforcement
14 program that consists of:

- 15 • submitting an updated stormwater code for approval to the Pittsburgh City
16 Council by July 2021;
 - 17 • hiring additional inspectors and enforcement staff for 2022;
 - 18 • putting management partnership procedures in place by the end of January 2022;
 - 19 • achieving full compliance with the requirements by March 31, 2022; and
- 20 submitting quarterly progress reports to EPA. More broadly, PWSA and the City
21 are developing a detailed agreement to negotiate and resolve any issues outside of MS4
22 requirements. The focus of this agreement will be other stormwater management
23 responsibilities of PWSA's Stormwater Division and the required coordination and cost-
24 sharing with the City. This will include the planning, design, implementation, and

1 maintenance of stormwater-related capital projects that may reduce localized flooding
 2 and CSOs at the rivers while improving water quality and the health of streams and
 3 waterways. The content and timeline for the additional agreement is still being
 4 determined.

5 **Q. PLEASE DISCUSS STREET SWEEPING PRACTICES IN THE CITY OF**
 6 **PITTSBURGH AND HOW STREET SWEEPING RELATES TO STORMWATER**
 7 **MANAGEMENT.**

8 A. Street sweeping is done by the City of Pittsburgh using their equipment. Street sweeping,
 9 as a method of pollution prevention and general good housekeeping, is important because
 10 it helps to reduce the amount of pollution, sediment, and litter collected on municipally-
 11 owned and maintained facilities (e.g. streets, parking lots, and vehicle maintenance areas)
 12 from discharging into local waterways. The City of Pittsburgh is responsible for street
 13 sweeping in accordance with the Cooperation Agreement. The City of Pittsburgh will
 14 comply with the current MS4 NPDES permit requirements and submit records monthly to
 15 PWSA (such as weight of debris collected, miles swept in the MS4 area, or any other
 16 information as required by the current permit cycle). PWSA will include this information
 17 in the MS4 annual report and submit it to PA DEP in accordance with the MS4 NPDES
 18 permit requirements.

19 **Q. WHO MAINTAINS THE STORMWATER CATCH BASINS IN THE CITY OF**
 20 **PITTSBURGH?**

21 A. Stormwater runoff from roadways flows into storm grates or inlets, then into the sump or
 22 well below called a catch basin. PWSA has taken responsibility for maintaining
 23 approximately 25,000 stormwater catch basins and inlets.²⁰ The catch basins and inlets

²⁰ On State roads, however, the Pennsylvania Department of Transportation (PENNDOT) is responsible for inlet maintenance.

1 need to remove stormwater runoff from the streets as quickly as possible. In order for
2 them to function properly, they require regular maintenance to remove sediment, litter
3 and other debris as well as contaminants that get picked up along the way.

4 Catch basins are designed to handle flows from specific rainfall events (i.e., a
5 design storm). It is neither feasible nor cost effective to build catch basins (and combined
6 sewer systems) to handle the largest or heaviest rains. In doing so, they would never be
7 used to their full capacity if designed to manage storms with a frequency of 25, 100, or
8 200 years. Even with proper design and installation, catch basins may not be able to
9 handle all heavy drainage, runoff, or high intensity precipitation, but can manage our
10 most common sized storms.

11 The below-ground (or internal) cleaning of a catch basin requires the use of a
12 vacuum truck to suck up leaves, sediment and debris from the catch basin. After the basin
13 is vacuumed, other work needs to be done inside the basin to ensure that the subsurface
14 connections to the combined sewer lines or separate storm water lines are clear before the
15 job is complete. This other work often includes spraying, flushing and/or “jetting” the
16 catch basin. “Jetting” means that high pressure water runs through the lines to remove
17 any accumulated material such as sediment, leaves, or trash. Right now, PWSA acts as an
18 agent of the City of Pittsburgh to perform maintenance of all publicly owned catch
19 basins.

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23

1 **III. PWSA'S STORMWATER PLAN**

2 **Q. PLEASE DESCRIBE PWSA'S APPROACH TO THE STORMWATER ISSUE.**

3 A. PWSA's *Green First Plan*²¹ outlines projects which will reduce pollution and minimize
 4 flooding caused by stormwater. On a macro level, PWSA has sought to create a
 5 comprehensive plan that provides a unified, long-term approach toward regulatory
 6 compliance. As a matter of cost effectiveness, PWSA is seeking to address multiple
 7 issues: poor water quality, CSOs and SSOs, illicit discharges, surface flooding, basement
 8 flooding, older sewer systems, and regulatory requirements.

9 System integration and resiliency are an important part of system design. We are
 10 working on a citywide solution that improves all stormwater and sewersheds. The final
 11 objective is a set of solutions that maximize a triple bottom line of environmental,
 12 economic, and societal benefits. There have been many layers of public participation to
 13 this design phase, including a Stormwater Advisory Group composed of a diverse group
 14 of twenty stakeholders from the public and private sectors. The Stormwater Advisory
 15 Group's Findings are attached as Exhibit TI-3.

16 **Q. WHAT ARE THE SPECIFIC GOALS OF THE PROGRAM?**

17 A. There are several goals of PWSA's stormwater program, including to:
 18
 19 1. Demonstrate that stormwater source management and stream removal projects
 20 can reduce CSO volume;
 21 2. Develop and implement a stormwater asset management program;
 22 3. Evaluate the system capacity and define a publicly accepted level of stormwater
 23 management capacity to mitigate surface and basement sewage flooding;²²

²¹ Available at: <https://www.pgh2o.com/your-water/stormwater>.

²² Note that sewerage backups into building basements is not permissible under the federal Clean Water Act, and must be abated.

- 1 4. Achieve regulatory compliance and implement pollution reduction projects as
- 2 required by the state and federal agencies;
- 3 5. Develop partnerships with government and philanthropic agencies to access
- 4 eligible funds for flood protection and water quality projects; and
- 5 6. Establish an affordable stormwater utility fee structure.
- 6

7 **Q. PLEASE DESCRIBE THE GREEN ASPECTS OF PWSA’S APPROACH TO**
 8 **STORMWATER CONTROL.**

9 A. Rain gardens, green roofs, tree plantings, and permeable pavements are examples of
 10 some practices that can be used to soak up the rain. Often called green infrastructure,
 11 these practices rely on soil, plants and natural processes such as infiltration, evaporation,
 12 and transpiration to mimic the natural water cycle and manage rain water, rather than
 13 sending it directly into a series of pipes to convey it for treatment at ALCOSAN’s Woods
 14 Run Wastewater Treatment Plant. Green infrastructure is a cost-effective and resilient
 15 approach to managing stormwater that can bring many additional social, economic,
 16 public health, and environmental benefits to communities.

17 PWSA’s process has focused on analyzing the City of Pittsburgh’s top 30 surface
 18 watersheds by several criteria, including risk, opportunity, activity, and benefits. We then
 19 identified the priority projects. Consulting firms with international expertise are
 20 contracted by PWSA to identify the most cost-effective locations for green infrastructure
 21 that will manage the first 1.5 inches of rainfall using the metric of \$250,000 per
 22 impervious acre managed.²³

23 In 2016 the City of Pittsburgh and PWSA finalized the Citywide Green First
 24 Plan,²⁴ which outlines how Pittsburgh intends to use green infrastructure solutions to

²³ This metric is based upon comparisons to the cost of piped solutions.

²⁴ Available at <https://www.pgh20.com/your-water/stormwater>.

1 manage stormwater. Implementing the plan will reduce local street flooding and sewer
2 backups caused by large rainstorms, as well as reduce regional CSOs. These innovative
3 practices will also help the City of Pittsburgh and the region comply with the EPA's
4 sewer overflow mandates and improve the quality of local waterways.

5 **Q. PLEASE IDENTIFY PWSA'S CURRENT PRIORITY CAPITAL PROJECTS IN**
6 **THE AREA OF STORMWATER MANAGEMENT.**

7 A. With a plan now in place, work has begun and is ongoing. Much of the current work is
8 designed to confirm the application of various project approaches to abate stormwater
9 overflows or flooding. For example, in August 2020, PWSA completed construction on
10 two new green infrastructure projects to help manage stormwater within Four Mile Run,
11 which consists of building two engineered drainage channels in Schenley Park along
12 Overlook Drive and next to the Bridle Trail. Without these improvements, stormwater is
13 mostly unmanaged, flowing off the steep hillside from Overlook Drive to the Bridle Trail
14 below and further downhill, where it causes the combined sewer system to overflow into,
15 and flood, downstream neighborhoods and properties. The channels will create a path
16 where water can flow. These two "Early Action Projects" were part of the larger Four
17 Mile Run Stormwater Project that has a total project cost of approximately \$28 million
18 and encompasses Schenley Park and several City of Pittsburgh neighborhoods, including
19 Greenfield, Hazelwood, Oakland, Squirrel Hill, and the Run.

20 As of March 2021, PWSA has constructed (or partnered with) thirteen green
21 infrastructure projects in the City of Pittsburgh. In addition, fourteen projects are
22 currently in various stages of planning and design, and three are in construction.
23
24

1 **Q. WHAT ARE THE CAPITAL COSTS ASSOCIATED WITH THESE PROJECTS?**

2 A. PWSA has made a significant investment in green infrastructure over the past several
 3 years in order to manage stormwater, reduce sewer overflows, and comply with
 4 regulatory requirements, as shown in Table 1:

Table 1 - PWSA Green Infrastructure Capital Expenditures from 2017-2019	
<u>Year</u>	<u>Capital Expenditure</u>
2017	\$953,033
2018	\$3,156,175
2019	\$6,691,152

5
 6 Going forward, PWSA’s Capital Improvement Plan includes the capital requirements
 7 shown in Table 2:

Table 2 – PWSA Stormwater Capital Budget		
<u>Year</u>	<u>Green Infrastructure + Other Stormwater Projects²⁵</u>	<u>Green Infrastructure Only</u>
2020	\$26,927,774	\$21,794,901
2021	\$34,696,272	\$24,930,611
2022	\$21,721,607	\$19,398,522
Total	\$83,345,653	\$66,124,034

8
 9 PWSA’s Capital Improvement Plan Budget allocates a significant amount of green
 10 infrastructure monies as shown above. However, these allocated funds are only to meet
 11 the minimum requirements for regulatory compliance based on how much PWSA can
 12 currently afford within its sewer budget. These budgeted amounts are anticipated to

²⁵ Other stormwater projects include catch basin replacements and stormwater asset renewal.

1 change once the stormwater fee is established, which is anticipated to be implemented in
 2 2022. Beginning in 2023, PWSA is anticipating the phase-in of stormwater fee revenues,
 3 which will help fund green infrastructure projects and partially offset the sewer fee
 4 revenues. The stormwater fee will allow PWSA to follow the Green First Plan of
 5 addressing 1,800 impervious acres over 20 years to reduce combined sewer overflows
 6 and mitigate basement backups and localized flooding. The plan estimates the
 7 construction of these impervious acres at approximately \$250,000 per impervious acre
 8 (2016 dollars) not accounting for inflation, which is approximately \$450 million.

9 Currently, PWSA’s most pressing stormwater funding shortfalls include:

- 10 • Construction of solutions to stormwater flooding problem areas;
- 11 • Construction of CSO abatement projects to comply with EPA and PA DEP
- 12 requirements;
- 13 • Projects to comply with MS4 requirements; and
- 14 • Expanded green infrastructure maintenance.

16 **Q. ARE ALL COSTS RELATED TO PWSA’S STORMWATER OBLIGATIONS**
 17 **KNOWN AT THIS TIME?**

18 A. No, the total costs are currently unknown. PWSA and the City of Pittsburgh are currently
 19 developing a stormwater agreement to outline the roles and responsibilities related to
 20 managing stormwater within the City. This includes the responsibilities for MS4 permit
 21 compliance and the planning, design, construction, operation and maintenance of
 22 stormwater-related capital projects intended to reduce localized flooding and CSOs while
 23 improving the water quality of streams and waterways.

24 In addition, the proposed plan must be based upon a level of “stormwater service”
 25 to appropriately mitigate flooding within the City of Pittsburgh. The stormwater tariff and
 26 associated fee will allow PWSA to more accurately charge customers for stormwater

1 service based on the cost to serve their property, and will improve PWSA's ability to
2 adequately fund important stormwater management activities.

3 **Q. IS PWSA DEVELOPING A STORMWATER MASTER PLAN?**

4 A. Yes. A Request for Proposals was issued on October 29, 2020 to develop a stormwater
5 master plan that will provide a comprehensive approach for PWSA and the City of
6 Pittsburgh in managing stormwater. PWSA has selected a consultant team that will assist
7 in developing a strategic plan for stormwater management that provides the logic for a
8 level of service that is achievable. The plan will also take into consideration climate
9 change issues that impact stormwater and provide a strategic approach to developing a
10 resilient stormwater management program. The PWSA Board approved the selected
11 team in March 2021, with a project kickoff date to follow soon after.

12
13 **IV. PROPOSED STORMWATER TARIFF**

14 **Q. DOES PWSA'S CURRENT WASTEWATER TARIFF ADDRESS**
15 **STORMWATER RUNOFF COSTS?**

16 A. No. As part of this case, PWSA is proposing a stormwater tariff, which is attached as
17 Exhibit TI-4. Historically, the costs of stormwater have been included in the wastewater
18 rates assessed based upon water consumption, and funds have been expended to primarily
19 address CSO abatement. There are several problems with this approach:

- 20 1. Basing stormwater rates on consumption does not account for runoff.
- 21 2. Lessens responsiveness to manage stormwater runoff and wet weather incidents.
- 22 3. Limits ability to address CSO and stormwater overflow water quality impairment.
- 23 4. Exposure to regulatory violations.
- 24 5. Lost opportunity to realize significant city-wide economic, social, and
25 environmental benefits.

1 **Q. WHAT PROCESS DID YOU GO THROUGH TO DRAFT A STORMWATER**
2 **TARIFF?**

3 A. PWSA reviewed the PUC Staff's model stormwater tariff, which is attached as Exhibit
4 TI-5, as well as the effective tariffs/ordinances of other municipal entities. We considered
5 the challenges of creating a new tariff, both in terms of customer acceptance and
6 understanding, as well as our own administration of it. Additionally, we needed to
7 separate out the costs of stormwater from wastewater.

8 PWSA further considered generally how stormwater costs are incurred and
9 imposed, as well as ways to incentivize the public to reduce the amount of stormwater
10 runoff into the sewer system.

11 **Q. PLEASE DESCRIBE THE OVERALL RATE DESIGN OF THE PROPOSED**
12 **TARIFF.**

13 A. Our cost-based approach takes the position that customers for stormwater service should
14 pay in relation to the demands they impose on PWSA's facilities and the costs incurred to
15 serve them. The stormwater fee for residential customers will be comprised of three flat
16 rates, or "tiers," that will be based on the parcel's impervious area. For all nonresidential
17 customers, the stormwater fee will be calculated based on the impervious area on the
18 parcel. Additionally, the proposed tariff includes a system of credits to incentivize
19 customers to reduce stormwater runoff from their properties by reducing impervious area
20 or by improving the capture or absorption of precipitation, which would lessen their
21 monthly stormwater fees. The development of the stormwater fee and the credit program
22 will be discussed further in Mr. Readling's testimony.

23 The tariff also addresses the typical billing and collection issues associated with
24 tariffed service. This generally aligns with PWSA's existing water and wastewater tariffs.
25 Issues related to customer service and billing are addressed in Ms. Quigley's testimony.

1 **Q. HOW DID PWSA DEVELOP ITS PROPOSED STORMWATER TARIFF?**

2 A. In order to ensure symmetry among all of PWSA's tariffs, PWSA used its wastewater
3 tariff format as the working outline. By doing this, PWSA is ensuring that all of its
4 Rates, Definitions and other common tariff sections are located in the same place across
5 all three tariffs. PWSA also considered the existing definitions and structure contained in
6 its wastewater tariff to determine whether or not the same language could be utilized in
7 the stormwater tariff. Again, to the extent the terms reasonably carried over from the
8 wastewater tariff to the stormwater tariff, we elected to do so. Where terms needed to be
9 altered or were not appropriate for the stormwater tariff, they were not utilized. Having
10 outlined the stormwater tariff consistent with PWSA's existing tariffs, we then looked to
11 the Commission's model tariff which was shared with PWSA on November 7, 2019 to
12 help inform the stormwater specific terms that we would propose to include in our tariff.
13 We also looked to stormwater tariffs and/or ordinances utilized by other entities assessing
14 a stormwater fee to further inform us about what terms and conditions to consider
15 including in our proposed tariff. Some of the other stormwater tariffs or ordinances we
16 reviewed include: Philadelphia Water Department;²⁶ Northeast Ohio Regional Sewer
17 District;²⁷ the Metropolitan Sewer District of Greater Cincinnati;²⁸ Charlotte, North
18 Carolina;²⁹ Carlisle Borough, Pennsylvania;³⁰ and Dallas, Texas,³¹ among others.

²⁶ See <https://www.phila.gov/water/wu/stormwater/Pages/default.aspx>.

²⁷ See <https://www.neorsd.org/>.

²⁸ See <http://www.msdcg.org/>.

²⁹ See <https://charlottenc.gov/StormWater/Pages/default.aspx>.

³⁰ See https://www.carlislepa.org/residents/stormwater_management/index.php.

³¹ See <https://dallascityhall.com/departments/trinitywatershedmanagement/wheredoesitgo/Pages/default.aspx>.

1 Through our outreach and engagement efforts, our Stormwater Advisory Group
2 developed a series of recommended findings to help guide the development of the
3 stormwater fee (see Exhibit TI-3). We continue to meet with various stakeholders and
4 have considered and incorporated their feedback throughout the process. The knowledge
5 and experience of our stormwater group has helped to share the development of the tariff
6 as it evolved and we have bolstered our internal capabilities with the experience of
7 consultants and legal experts that have expertise in establishing stormwater utilities and
8 tariff experience with the PUC.

9 **Q. ARE YOU INTENDING TO EXPLAIN ALL THE DECISIONS MADE**
10 **REGARDING PWSA'S PROPOSED STORMWATER TARIFF IN THIS**
11 **TESTIMONY?**

12 A. No, many of the choices made by PWSA should be self-explanatory. I do, however,
13 intend to address here some of the more significant decisions that we made so to provide
14 some context about why we chose the language that we did for the proposed tariff.
15 Recognizing that no other Commission-regulated utility has an approved stormwater
16 tariff and that – as a municipal authority – PWSA's stormwater responsibilities differ
17 from those that may exist for other investor-owned public utilities under the
18 Commission's jurisdiction, I believe it is important to provide additional PWSA-specific
19 information to support some of the terms and conditions included in the proposed tariff.
20 Additionally, while I provide an overview, Mr. Readling's testimony provides
21 justification for how the stormwater rates are structured and explains how they were
22 developed.

23

24

1 **Q. PLEASE DESCRIBE HOW PWSA PROPOSES TO STRUCTURE THE**
 2 **STORMWATER FEE FOR RESIDENTIAL CUSTOMERS.**

3 A. Single family residential customers will be charged one of three flat rates (commonly
 4 referred to as tiers). A customer’s tier will be based on the impervious surface area found
 5 on the residential lot. PWSA proposes the following monthly stormwater fees for each
 6 residential tier:

Proposed Residential Stormwater Fee	Tier 1	Tier 2	Tier 3
2022	\$2.99	\$5.96	\$11.93
2023	\$3.98	\$7.95	\$15.90

7

8 **Q. WHY IS PWSA PROPOSING A THREE TIERED FEE AS OPPOSED TO A**
 9 **SINGLE STORMWATER FEE FOR ALL RESIDENTIAL CUSTOMERS?**

10 A. PWSA has measured the impervious surface area found on each residential lot and found
 11 substantial variability in impervious area – from properties with less than 1,000 square
 12 feet of impervious area to properties with more than 4,000 square feet of impervious area.
 13 This large variability and the availability of the data on impervious area made us feel the
 14 tiered approach was more equitable to the individual ratepayer. This approach also is
 15 more supportive of a credits program that could grant fee credits to residential ratepayers
 16 who undertake measures on their lots to reduce their stormwater demand. Mr. Readling’s
 17 testimony discusses development of the tiered stormwater fee in greater detail.

18 **Q. PLEASE DESCRIBE HOW PWSA PROPOSES TO STRUCTURE THE**
 19 **STORMWATER FEE FOR NON-RESIDENTIAL CUSTOMERS.**

20 A. The impervious area found on a typical residential property in the service area is called
 21 the Equivalent Residential Unit of impervious area, or ERU. PWSA proposes to bill non-
 22 residential customers a fee based on the rate per ERU times the number of ERUs found

1 on the property. PWSA is proposing a rate per ERU of \$5.96 in 2022, and \$7.95 in 2023.

2 PWSA also proposes that one ERU is 1,650 square feet of impervious area.

3 **Q. WHY IS PWSA PROPOSING TO CALCULATE THE NON-RESIDENTIAL**
4 **STORMWATER FEE IN THIS WAY?**

5 A. ERU-based rate structures that charge for impervious surfaces are by far the most
6 common across the United States and balance fairness with simplicity. Impervious
7 surface relates to runoff volume, peak runoff rate, and pollution. These factors most
8 closely relate to demand in the service area. This is discussed in more detail in Mr.
9 Readling's testimony.

10 **Q. THE COMMISSION'S MODEL TARIFF INCLUDED A RATE FOR**
11 **CONTRIBUTING MUNICIPALITY SERVICE. IS PWSA PROPOSING SUCH A**
12 **RATE?**

13 A. No. PWSA considered such a rate and does not believe it would serve our ratepayers
14 well.

15 **Q. IS PWSA PROPOSING TO ALLOW CUSTOMERS TO EARN CREDITS TO**
16 **REDUCE THEIR STORMWATER FEES?**

17 A. Yes. For non-residential customers, PWSA is proposing a credit program consisting of
18 credits for customers who capture and detain runoff on-site, meeting or exceeding recent
19 development standards in place in Pittsburgh. For residential customers, we are
20 proposing a similar credit as well as one for downspout disconnection. The non-
21 residential credit will be a percentage discount of up to 60% for meeting the 2019 City of
22 Pittsburgh stormwater standards, and up to 45% for meeting the 2016 City of Pittsburgh
23 stormwater standards. In both situations, only the portion of the property that meets the
24 requirement will be used to compute the credit.

25 For residential customers, a 50% residential credit for downspout disconnection
26 or drainage rerouting to street planters will be offered. A minimum of 50% of roof area

1 must be disconnected in order for the property to be eligible for credit. The
2 disconnection must be verified to be functioning properly, including not causing new
3 drainage or flooding issues. For rerouting drainage to street planters, this practice will
4 only be allowed in targeted areas where planters are available, but the targeted areas may
5 change over time and will be selected based on the infrastructure capacity and need for
6 improvement. Single family residential properties can also get a 50% credit by capturing
7 and slowly releasing the runoff from 3/4-inch of rain from the impervious surfaces on the
8 property. Finally, though not technically a credit, single family residential customers can
9 also reduce their stormwater fees by removing impervious area from their property.
10 Residents in Tiers 2 and 3 can drop to the next lower tier if they sufficiently reduce their
11 impervious area to qualify for a lower tier.

12 A credit application must be made to get a credit, and applications will be made as
13 simple as possible and available by the time the stormwater fee is implemented.

14 **Q. WHY IS PWSA PROPOSING THIS TYPE OF CREDIT PROGRAM?**

15 A. PWSA carefully considered many credits approaches and sought to take the simplest
16 approach that met the Stormwater Advisory Group's interests and staff's desire to be fair
17 and keep administrative burdens low. We propose this type of credits approach because
18 almost all BMPs in Pittsburgh currently or expected to be built relatively soon are
19 designed to reduce peak runoff rate through detention. This type of BMP can help stop
20 basement backups and reduce flooding and CSOs, which are core program goals for
21 PWSA. Rather than creating a new program of technical submittals and reviews, we
22 wanted to participate in the processes for BMP design construction and maintenance that
23 already exists through existing regulation. This keeps administrative burdens at a

1 minimum and should encourage more participation. Additionally, for residential
 2 customers, PWSA sought to propose a credit program that is both accessible to customers
 3 and that also makes a meaningful reduction in stormwater runoff. Mr. Readling's
 4 testimony describes the development of the credit program in greater detail.

5 **Q. IS PWSA PROPOSING A PROCESS FOR CUSTOMERS TO APPEAL THEIR**
 6 **IMPERVIOUS AREA DESIGNATION?**

7 A. Yes, PWSA has developed a process for customers to challenge their property's
 8 impervious area calculation if they believe the calculation is incorrect or if the
 9 impervious area on their property has changed. This is discussed in Ms. Quigley's
 10 testimony. If the customer follows this process and is still unsatisfied with their
 11 impervious area calculation, customers have the Commission's informal and formal
 12 complaint processes available to them.

13 **Q. DOES PWSA PLAN TO REASSESS IMPERVIOUS AREA ON A REGULAR**
 14 **BASIS?**

15 A. Yes, PWSA intends to review and reassess impervious area approximately every five (5)
 16 years. We recognize that impervious area may change over time as a result of
 17 construction, redevelopment, changing uses for a property, etc. A periodic reassessment
 18 is appropriate to account for these changes over time and increase or decrease a
 19 customer's stormwater fee or residential tier to reflect those changes.

20 **Q. HAS PWSA PROVIDED NOTICE OF ITS STORMWATER TARIFF AND FEE**
 21 **PROPOSAL?**

22 A. Yes. Ms. Quigley describes both the notice to existing customers of this rate filing as
 23 well as the notice provided to future stormwater only customers of this filing. In
 24 addition, PWSA convened a Stormwater Advisory Group in 2018 to develop
 25 recommendations regarding the stormwater fee. The group, comprised of 20 high level

1 stakeholders from the public and private sectors developed a series of recommendations
 2 that served as the basis for developing the stormwater fee. We have also met with
 3 individual stakeholder and community groups to discuss the need for the fee, the
 4 mechanics of how it is proposed to be structured, and how it will support our stormwater
 5 program. We have drafted a website and other collateral material that will be accessible
 6 to the public. Social media is also regularly used to provide ongoing educational
 7 information about the impacts of stormwater in Pittsburgh.

8 **Q. HOW DOES PWSA PLAN TO EDUCATE CUSTOMERS ABOUT THE**
 9 **STORMWATER TARIFF AND FEE?**

10 A. PWSA has been engaging with customers and community groups about stormwater
 11 issues and a potential fee in recent years, including numerous community presentations
 12 and convening the Stormwater Advisory Group. PWSA plans to continue conducting
 13 outreach and educating customers about stormwater and the proposed fee during the
 14 pendency of the rate case as well as in 2022 when the fee is first implemented.

15 PWSA is currently beginning to schedule meetings to reconvene the Stormwater
 16 Advisory Group and to meet with individual stakeholders. The stakeholder meetings are
 17 a critical component of the outreach campaign. They provide an opportunity to have a
 18 conversation with the groups that will be most most impacted by the fee. They are
 19 structured as listening and learning sessions providing an opportunity to hear stakeholder
 20 concerns and answer questions they may have about their properties.

21 PWSA will also launch the website and informational materials about the
 22 stormwater fee to ensure that members of the public have easy access to information
 23 about the fee. Social media, ongoing media relations, and presentations to community
 24 groups are an ongoing part of the communications campaign. This is an essential way to

1 reach the broader public and provides an opportunity to share information about the ways
2 the stormwater fee will support our stormwater program.

3 Finally, as explained by Ms. Quigley, we are beginning the communication with
4 future stormwater only customers by providing them notice of the filing of this rate case.
5 As we fine tune information about individual properties, we will send a second letter
6 notifying them of which properties will be assessed the fee, additional information
7 specific to their properties, and more detail about the stormwater program. When the fee
8 is approved, a third letter will be sent to inform them that they will soon receive their first
9 bill from PWSA for the stormwater fee.

10 Now that PWSA has made this stormwater filing, we can share more technical
11 information about the fee to ensure that people are aware of the proposed fee amount, the
12 credit and incentive program, and opportunities for customer assistance. It is also
13 important to let them know of the appeals process if they need to question or dispute our
14 calculations of impervious surface on their property. We are considering providing a
15 searchable database so customers can look up specific information about their property to
16 understand how the fee impacts their property.

17 **V. COMPLIANCE PLAN STAGE 2 STORMWATER**

18 **Q. DID PWSA FILE A COMPLIANCE PLAN STAGE 2 REGARDING**
19 **STORMWATER ISSUES?**

20 A. Yes. Consistent with the Commission's directive in its February 4, 2021 Order, PWSA
21 filed its Compliance Plan Stage 2: Stormwater on April 9, 2021.³² On April 13, 2021,

³² *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1*, Docket Nos. M-2018-2640802 (water) and M-2018-2640803 (wastewater), Opinion and Order entered February 4, 2021 (“*Stage 1 February 4, 2021 Order*”). At the same time, PWSA filed Compliance Plan Stage 2: Chapters 14 & 56, DSLPA and Collections which is discussed in more detail by Ms. Quigley.

1 PWSA filed a Motion to Hold Stormwater Compliance Plan Issues In Abeyance while
2 this current rate case is pending.

3 **Q. WHAT WAS PWSA'S PURPOSE IN MAKING THE REQUEST TO HOLD**
4 **STAGE 2 STORMWATER ISSUES IN ABEYANCE?**

5 A. The primary goal for PWSA regarding Stormwater is to be able to implement its new
6 proposed fee and to receive Commission approval of its tariff to do so. During PWSA's
7 most recent rate case, PWSA's attempt to segregate the review of stormwater issues
8 (tariff and fee) was not well received based on the view that all stormwater issues should
9 be addressed in the same proceeding. This, in part, is why the parties of the last rate case
10 settlement agreed to recommend that, as approval of that settlement, all stormwater issues
11 – including Compliance Plan Stage 2 issues – be consolidated with this rate case. In that
12 way, the parties hoped to assure that all interrelated rate issues and stormwater issues
13 would be comprehensively reviewed and addressed in the litigation proceeding
14 establishing the fee and the tariff. Upon review of the *Stage 1 February 4, 2021 Order*,
15 however, the Commission's desire for a separate Stage 2 Compliance Plan document for
16 stormwater was made clear. As such, PWSA prepared and filed the Stage 2 Compliance
17 Plan: Stormwater document on April 9, 2021. As PWSA prepared that document (along
18 with its continued preparation for this rate case), the clear separation between
19 Compliance Plan and rate case stormwater issues continued to be elusive. PWSA was
20 also guided by past experience with the Stage 1 Compliance Plan and its Initial Rate
21 Case, wherein the parties were able during the Initial Rate Case litigation to more easily
22 identify issues that would be better referred to the Stage 2 Compliance Plan proceeding
23 and identified those issues at that time. Thus, rather than attempting to make these
24 decisions at this time, and without the benefit of litigation (and the views of interested

1 stakeholders), PWSA has elected to recommend that the Stage 2 Compliance Plan
2 Stormwater issues be held in abeyance until after a final order is issued in this matter. At
3 that time, the Commission will have approved a stormwater tariff and will have a better
4 evaluation about what stormwater compliance issues may be made to inform the
5 stormwater compliance plan process.

6 **Q. IS PWSA PROPOSING TO FORECLOSE DISCUSSION OR REVIEW OF ANY**
7 **STORMWATER COMPLIANCE PLAN ISSUES IN THIS PROCEEDING?**

8 A. No. PWSA desires to implement a stormwater fee and to have a Commission approved
9 stormwater tariff as part of this proceeding. PWSA is willing to address any stormwater
10 issues that may overlap with Compliance Plan stormwater issues in this proceeding as
11 may be raised by the parties.

12 **VI. CONCLUSION**

13 **Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?**

14 A. Yes.

VERIFICATION

I, Tony Igwe, hereby state that: (1) I am the Senior Group Manager, Stormwater for The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 04/06/2021 | 4:45 PM EDT

DocuSigned by:
Tony Igwe
404A1978E88C410...
Tony Igwe
Senior Group Manager, Stormwater
The Pittsburgh Water and Sewer Authority

Appendix A

/// Anthony C. Igwe, PE

Senior Group Manager Stormwater,
Pittsburgh Water & Sewer Authority



Tony Igwe, PE, has built his 30-year career around the development of engineering solutions to control wet weather pollution. He has extensive experience planning, designing, and evaluating numerous wet weather

combined sewer overflow (CSO), sanitary sewer overflow (SSO) control facilities and integrated planning projects. These activities include hydrologic/hydraulic evaluations including flow monitoring and modeling, evaluating, selecting, and implementing wet weather control alternatives, and pilot programs that include proof of concept for green stormwater infrastructure projects and enhanced high rate treatment facilities.

Tony's experience has included working with various municipal engineers within the ALCOSAN Service Area to implement projects that meet various consent orders for separate and combined sewer systems. Tony's role on these projects included developing the flow monitoring approaches, data review and calibration of H/H models as well as alternative evaluation assisting in the 30% design of the facility. The projects included coordination with various stakeholders and working with the PADEP.

Tony's experience also includes evaluating the effectiveness of control methods relative to performance and water quality and documenting lessons learned for more than \$600 million of constructed wet weather facilities as part of a National Wet Weather Demonstration Program in Michigan, that clarified the role of internal basin hydraulics in effective treatment. Results of these activities have been used in discussions with both regulatory and client communities in development and acceptance of affordable solutions.

Tony thoroughly understands the operational characteristics of watersheds, the interrelationships of subwatersheds and sewersheds and how they impact the entire watershed.

He has managed projects ranging in scope from hydraulic evaluations to in-system storage design to CSO Alternative Evaluations and a Long Term CSO Control Plan Update. He scrutinizes specific problems and considers how the solution will impact downstream areas and the entire watershed. He understands that many factors impact water quality in a watershed and that control efforts must be coordinated to gain an environmental benefit. He seeks solutions that are cost-effective for the client and environmentally effective for the watershed.

Tony has a keen understanding of regulatory requirements and how to address regulatory agency concerns during project development and can assist PWSA in other areas that require interface with regulatory agencies, if needed. Prior to joining Wade-Trim, he worked with the Michigan Department of Environmental Quality Surface Water Quality Division for five years where he helped set the technical direction for the State's wet weather control requirements. He has successfully used these insights to help clients target negotiations to address underlying regulatory concerns and develop cost-effective solutions.

ANTHONY IGWE, PE

EDUCATION

- » PhDc, Environmental Engineering, Wayne State University
- » MS, Environmental Engineering, Wayne State University
- » BS, Civil Engineering, Mississippi State University
- » BS, Construction Technology, Eastern Michigan University

REGISTRATION

- » Professional Engineer: PA, MI

YEARS OF EXPERIENCE

- » Total years: 35

AREA OF EXPERTISE

- » Urban Wet Weather Controls

RELEVANT PRESENTATIONS

- » "NEORSRD Approach to Clean Water Act Integrated Planning" with Devona Marshall, Andrea Remias, Imad Salim, and Joe Pavlick. WEF Collection Systems 2016
- » "Green Infrastructure Opportunities in Gray Wet Weather Plans" with Lawrence J. Lennon, Uzair Shamsi, John Schombert and John Maslanik. WEF Collection Systems, 2013
- » "Seasonal Precipitation Frequency and Distribution Analysis" with Imad Salim, Jerry Brown, James Sherrill, Tarun Sonkhya and Anass Jerrari. WEF Collection Systems, 2011

QUALIFICATIONS

- » 35 years of experience developing engineering solutions to control wet weather pollution and improve treatment efficiency
- » Evaluated and applied innovative and new technologies in the treatment of CSO including the swirl concentrator, fine screening, conventional and high-rate disinfection, dechlorination, odor control, and flow control
- » Experienced in every aspect of CSO control from metering and modeling to alternative evaluation to facility design, implementation, and operational evaluation
- » Former state regulator with compliance experience

REPRESENTATIVE PROJECT EXPERIENCE

- Advanced Facilities Plan Integrated Planning, NEORSRD, Cleveland, OH. Regulatory and Water Quality Technical Lead for evaluation of District's entire service area to identify and prioritize local community Clean Water Act (CWA) issues. Reviewed historical District and localized sewer SSES data studies, District and Cuyahoga County GIS data, CSO Phase II Water Quality Reports, CSO Phase II Dry Weather Overflow surveys, WQIS investigation reports, community record drawings, temporary flow and level monitoring data, TMDL reports, NOACA and Cuyahoga County septic systems survey data, community basement flooding records, District collection system models, Affordability CSO LTCP Negotiations, Cuyahoga County Sanitary Engineer data, Region V C-MOM Initiative, and targeted field inspection. This information was used to evaluate local community CWA issues including SSO, CSO, and stormwater discharge and their impacts on public health and water quality, estimate cost of improvements, and develop District-wide IP alternatives. Collaborated with Michigan Technological University to develop a 3D, linked hydrodynamic water quality model for Lake Erie and nine tributary stream models to evaluate environmental benefits of selected alternatives. Conducted integrated watershed planning to determine which project investments provide the highest impact on water quality throughout the service area.
- Green Stormwater Infrastructure (GSI) Opportunities Evaluation, Pittsburgh, PA. 3Rivers Wet Weather, Inc. Senior Engineer. Leading evaluation of green stormwater infrastructure (GSI) opportunities with 83 municipalities within the ALCOSAN service area that make up 3Rivers Wet Weather. The USEPA SUSTAIN model was used to identify potential areas based on criteria developed by the Project Team and vetted by major stakeholders. Projects were consolidated and optimized prior to cost and performance evaluation. A suite of cost-effective GSI projects identified can be used to augment or replace grey infrastructure.

- Program Management of Municipal Activities in Response to Administrative Consent Orders Regarding CSO and SSO Abatement, 3RWW, Pittsburgh, PA. Provided technical assistance to 83 municipalities within the ALCOSAN service district conducting consent order activities including manhole inspections, sewer line cleaning and CCTV, sewer system mapping, dye testing, hydraulic design capacity analysis, flow monitoring, and development of feasibility and O&M program plan reports.
- Great Lakes Water Authority (GLWA) Embedded Staff Related Projects, Detroit, MI. Worked directly with Water Resources Recovery Facility (WRRF) Staff in developing and implementing the Risk and Process Safety Management Program (RPSMP) SOW. The project was split into three phases. Tony led all three phases which were: Phase 1- Establish Current Condition through a Baseline Compliance Audit, Phase 2-Update/Revise RPSMP, Phase 3-Conduct a Compliance Audit utilizing the new RPSMP. This project required working in the GLWA WRRF three days a week to coordinate, plan and execute tasks while working with various GLWA staff engineers, chemists, and operators.
- City of Detroit Long Term CSO Control Plan, Detroit and Rouge Rivers, MI. Technical Project Manager to prepare update for Detroit's Long Term CSO Control Plan that includes results of completed demonstrative projects including three CSO basins, six in-system storage gates and a Rain Water Control Pilot Program. The plan update also addressed the status of projects under design or in construction including in-system storage improvements at 27 locations; three screening and disinfection facilities; a 7.5 mile, 22.5-foot diameter deep rock tunnel; a 30 MG CSO basin; and wastewater treatment plant improvements. Managed Rain Water Control Pilot Program in the City that demonstrated that up to 3 billion gallons of wet weather flow could be eliminated in the system through downspout disconnection, cisterns, restricted catch basin covers and tree plantings. Conducted in four neighborhoods, the pilot program measured the flow removal efficiency of the different control methods. Led Water Quality Work Group efforts that established CSO control facility alternatives to MDEQ's presumptive criteria sizing. Resulted in 66% reduction in the size of control facilities. Led Treatment Efficiency Work Group responsible for evaluating effectiveness of pilot/demonstration projects. The work group developed performance criteria and identified evaluation parameters for pilot/demonstration projects. Detroit's Long Term CSO Control Plan was recognized for its innovative approach with an Honorable Conceptor Award from the Michigan Chapter of the American Council of Engineering Companies.
- Wayne County CSO Basin Evaluation, MI. Project Manager for collection and analysis of CSO basin data to determine the efficiency and effectiveness of the three Wayne County CSO Basins (Dearborn Heights, Redford Township and Inkster). Results of this project were incorporated into the Rouge River National Wet Weather Demonstration Program database and were used to form the basis for future CSO control in Southeast Michigan. The Redford and Inkster Basins received state and national engineering excellence awards from the American Council of Engineering Companies, and the Dearborn Heights Basin received a state engineering excellence award.
- High Rate Treatment (HRT) Program Development, Metropolitan Sewer District of Greater Cincinnati (MSDGC), OH. Task Lead on the HRT Technology Alternative Analysis that evaluated the various HRT approaches and recommended which should be used by MSDGC as the WWIP moves forward over the next 20 years. Also, part of the MSDGC Wet Weather HRT Facility Base Design team that outlined the development of a treatment facility base template design used to evaluate various sites for being suitable for the next MSDGC HRT Demonstration Facility. The template included facility layouts as well as recommendations for each process component including headworks/screening, mixing, settling tanks, disinfection/dechlorination, solids handling, odor control, flow monitoring, sampling system, HVAC, power, I&C and ancillary systems for sizing purposes.

Exhibit TI-1

Exhibit TI-2

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III**

Philadelphia, Pennsylvania 19103-2029

In the Matter of:	:
	:
City of Pittsburgh	: U.S. EPA Docket No. CWA-03-2021-0039DN
414 Grant Street	:
Pittsburgh, Pennsylvania 15219	: Proceeding under Section 309(a)
	: of the Clean Water Act
AND	:
	:
Pittsburgh Water and Sewer Authority	: ADMINISTRATIVE ORDER ON CONSENT
1200 Penn Avenue	:
Pittsburgh, Pennsylvania 15222	:
	:
Respondents	:
	:

I. PRELIMINARY STATEMENT

1. The United States Environmental Protection Agency (“EPA”) has made the following findings of fact and issues this Administrative Order on Consent (“AOC”) pursuant to the authority vested in the Administrator of EPA under Section 309(a) of the Clean Water Act (“CWA” or “Act”), 33 U.S.C. § 1319(a). This authority has been delegated by the Administrator to the Regional Administrator of EPA Region III, and further delegated to the Director, Enforcement & Compliance Assurance Division, Region III.
2. Section 309(a) of the CWA, 33 U.S.C. § 1319(a), provides, *inter alia*, that whenever on the basis of any information available to him the Administrator finds that any person is in violation of any permit condition or limitation implementing certain sections of the CWA, in a permit issued under Section 402 of the CWA, 33 U.S.C. § 1342, he shall issue an order requiring such person to comply with such section or requirement.
3. The City of Pittsburgh (“City”) and the Pittsburgh Water and Sewer Authority (“PWSA”) (collectively, “Respondents”) have agreed to the issuance of this AOC.

II. STATUTORY AND REGULATORY BACKGROUND

4. Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits the discharge of any pollutant (other than dredged or fill material) from a point source into waters of the United States except in compliance with a permit issued pursuant to the National Pollutant Discharge Elimination System (“NPDES”) program under Section 402 of the CWA, 33 U.S.C. § 1342.

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5. Section 402 of the CWA, 33 U.S.C. § 1342(a), provides that the Administrator of EPA, or a state upon approval by EPA, may issue permits under the NPDES program for the discharge of pollutants from point sources to waters of the United States. The discharges are subject to specific terms and conditions as prescribed in the permit.
6. Pursuant to Section 402(b) of the CWA, 33 U.S.C. § 1342(b), EPA authorized the Pennsylvania Department of the Environment Protection (“PADEP”) to issue NPDES permits in the Commonwealth of Pennsylvania.
7. Section 402(p) of the CWA, 33 U.S.C. § 1342(p), and 40 C.F.R. §§ 122.2 and 122.26 provide that, with some exceptions not relevant here, storm water discharges are “point sources” subject to NPDES permitting requirements under Section 402(a) of the CWA, 33 U.S.C. § 1342(a).
8. 40 C.F.R. § 122.2 states, in relevant part: “Discharge of a pollutant means: a) any addition of any ‘pollutant’ or combination of pollutants to waters of the United States from any point source. . . . This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. . . .”
9. “Storm water” (or “stormwater”) is defined as “storm water runoff, snow melt runoff and surface runoff and drainage.” 40 C.F.R. § 122.26(b)(13).
10. 40 C.F.R. § 122.26(b)(8)(i) defines the term “municipal separate storm sewer system” or “MS4” as including, *inter alia*, “a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.”
11. 40 C.F.R. § 122.26(b)(16) defines the term “small municipal separate storm sewer system” as “all separate storm sewers that are: (i) Owned or operated by the United States, a State, city, town, borough . . . or other public body (created by or pursuant to State law) having jurisdiction over disposal of . . . storm water. . . .; [and] (ii) Not defined as ‘large’ or ‘medium’ municipal separate storm sewer systems.”

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12. 40 C.F.R. § 122.26(b)(17) defines the term “Small MS4” as “a small municipal separate storm sewer system.”
13. Small MS4s are regulated pursuant to Section 402(p) of the CWA, 33 U.S.C. § 1342(p) and the regulations promulgated thereunder.
14. Pursuant to 40 C.F.R. § 122.26(a)(9)(i), small MS4s require an NPDES permit if they are required to be regulated pursuant to 40 C.F.R. § 122.32.
15. 40 C.F.R. § 122.32(a)(1) states: “(a) Unless you qualify for a waiver under paragraph (c) of this section, you are regulated if you operate a small MS4, including but not limited to systems operated by federal, State, Tribal, and local governments, including State departments of transportation; and: (1) Your small MS4 is located in an urbanized area as determined by the latest Decennial Census by the Bureau of the Census. (If your small MS4 is not located entirely within an urbanized area, only the portion that is within the urbanized area is regulated). . . .”
16. 40 C.F.R. § 122.34(a) provides: “*General requirements.* For any permit issued to a regulated small MS4, the NPDES permitting authority must include permit terms and conditions to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Terms and conditions that satisfy the requirements of this section must be expressed in clear, specific, and measurable terms. Such terms and conditions may include narrative, numeric, or other types of requirements (*e.g.*, implementation of specific tasks or best management practices (BMPs), BMP design requirements, performance requirements, adaptive management requirements, schedules for implementation and maintenance, and frequency of actions).”
17. Pursuant to its authority under the CWA and the NPDES program approval, PADEP issued to the Respondents NPDES Permit No. PAI136133, an Individual Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (“the 2004 Permit”). The effective date of the 2004 Permit was September 29, 2004, with an expiration date of March 9, 2008.
18. PADEP administratively extended the 2004 Permit until June 30, 2020.
19. Pursuant to its authority under the CWA and the NPDES program approval, the PADEP issued to Respondents NPDES Permit No. PAI136133, Individual Permit to Discharge Stormwater from Small Municipal Separate Storm Sewer Systems (“the 2020 Permit”). The effective date of the Permit was July 1, 2020 with an expiration date of June 30, 2025.
20. NPDES Permit No. PAI136133 authorizes discharges from a regulated small MS4, when in accordance with the conditions and terms of the Permit.

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21. The City and PWSA are “municipalities” within the meaning of Section 502(4) of the CWA, 33 U.S.C. § 1362(4).
22. Respondents are “persons” within the meaning of Section 502(5) of the CWA, 33 U.S.C. § 1362(5) and 40 C.F.R. § 122.2.
23. At all times relevant herein, upon information and belief, Respondents owned or operated a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) that discharges to waters of the United States.
24. At all times relevant herein, upon information and belief, Respondents owned or operated a “municipal separate storm sewer system” or “MS4”, as that term is defined at 40 C.F.R. § 122.26(b)(8)(i), located in the City of Pittsburgh, Allegheny County, Pennsylvania.
25. At all times relevant to this AOC, the Respondents have discharged stormwater from the MS4 to the Monongahela River, Thompson Run, Chartiers Creek, Ohio River, Allegheny River, Glass Run, Streets Run, Sawmill Run, and Nine Mile Run.
26. The Monongahela River, Thompson Run, Chartiers Creek, Ohio River, Allegheny River, Glass Run, Streets Run, Sawmill Run, and Nine Mile Run are “water[s] of the United States” within the meaning of Section 502(7) of the CWA, 33 U.S.C. § 1362(7).
27. On December 6 and 7, 2016, representatives of EPA Region III and EPA contractors from Eastern Research Group, Inc. (jointly “the Inspection Team” or “the inspectors”) conducted an inspection of the MS4 (hereinafter, “the Inspection”) to assess compliance with the 2004 NPDES Permit No. PAI136133.
28. Following the Inspection, the Inspection Team prepared an inspection report, dated January 2017 (“the Inspection Report”), which included multiple observations regarding Respondents’ compliance with the requirements of the 2004 Permit. EPA sent a copy of the Inspection Report to the Respondents on February 27, 2017.
29. Respondents were presented with the opportunity to provide to EPA a response to the Inspection Report by March 20, 2017. EPA received no response from Respondents.
30. On May 19, 2017, EPA sent an Opportunity to Confer letter to the Respondents, communicating alleged violations of the CWA and the 2004 Permit observed during the Inspection.
31. EPA received the Respondents’ response to the Opportunity to Confer letter on June 5, 2017. This response indicated that the Respondents were developing and/or implementing new procedures to address the alleged violations communicated in the May 2017 Opportunity to Confer letter.

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32. On September 6, 2017, EPA sent to Respondents a follow-up letter to the Opportunity to Confer letter. In this letter, EPA requested documentation of the procedures referenced in Respondents' June 2017 response, to evaluate whether the new procedures had been implemented and whether these practices satisfied the Permit requirements. EPA also requested documentation related to Respondents' NPDES Permit renewal application that was due September 16, 2017.
33. EPA received Respondents' response to the follow up letter on October 2, 2017. This response provided documentation that indicated Respondents had addressed some, but not all, of the violations communicated in the May 2017 Opportunity to Confer letter.
34. On February 26, 2020, pursuant to its authority under Section 308 of the CWA, 33 U.S.C. § 1318, EPA issued an Information Requirement Letter to the Respondents. This Information Requirement Letter requested updates on eight components of the Respondents' MS4 program.
35. EPA received a partial response to the Information Requirement Letter from Respondents on April 2, 2020, and a complete response on May 2, 2020.
36. On June 30, 2020, EPA issued a Notice of Noncompliance to the Respondents for violations of the 2004 Permit that were previously identified as potential violations in the Opportunity to Confer letter. The Notice of Noncompliance requested, among other things, that the Respondents (1) submit to EPA within 45 days of receipt of the letter a plan and schedule for developing and implementing a program for conducting inspections and enforcement regarding construction erosion and sediment ("E&S") controls and post-construction BMPs and (2) develop and implement the program within 180 days of receipt of the letter.
37. On August 17, 2020, EPA received the Respondents' response to the Notice of Noncompliance. In the response, Respondents provided a schedule of activities to develop and implement a program for conducting inspections of construction E&S controls and post-construction BMPs. The schedule extended from February 7, 2020 through July 31, 2021. However, the schedule did not include implementation of an enforcement program.

III. PERMIT REQUIREMENTS

38. Part A. Stormwater Management Program, 2. Minimum Control Measures of the 2004 Permit requires, among other requirements, Permittees to (1) implement procedures for site inspection and enforcement of construction E&S control measures and (2) enforce a program that addresses post-construction runoff and ensures the long-term operations and maintenance of post-construction stormwater controls.

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39. Part A. Stormwater Management Program, 3. Use of the DEP Stormwater Management *Protocol* to Meet the Minimum Control Measure Requirements of the 2004 Permit states that “Permittees may elect to implement the *Protocol* to meet the 6 Minimum Control Measure requirements. The *Protocol* becomes a part of the Individual Permit coverage for those permittees who elect to do so.” In the Individual Permit application submitted by Respondents on September 5, 2003, the Respondents elected to use the DEP Stormwater Management *Protocol* (“the Protocol”) for all six minimum control measures. Therefore, implementation of the Protocol is part of the 2004 Permit requirements.
40. In the Construction Stormwater Management Minimum Control Measure section of the Protocol, Permittees are required, among other things, to “Enact, implement, and enforce a stormwater control ordinance using DEP model language.”
41. In the Post-Construction Stormwater Runoff Management Minimum Control Measure section of the Protocol, Permittees are required, among other things, to “Enact, implement, and enforce a stormwater control ordinance,” using DEP model language
42. Part C.I.B.4.c of the 2020 Permit requires, among other requirements, Permittees to “Enact, implement and enforce an ordinance or SOP to require the implementation and maintenance of E&S control BMPs, including sanctions for non-compliance, as applicable.”
43. Part C.I.B.5.a of the 2020 Permit requires, among other requirements, Permittees to “Enact, implement and enforce an ordinance or SOP to require post-construction stormwater management from new development and redevelopment projects, including sanctions for non-compliance.”
44. Part C.I.B.5.c of the 2020 Permit requires, among other requirements, Permittees to “Ensure adequate O&M of all post-construction stormwater management BMPs that have been installed at development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.”
45. Title Thirteen: Stormwater Ordinance for the City of Pittsburgh, Pennsylvania Code of Ordinances (“Stormwater Ordinance”), Section §1304.07 states that “the City or its designated representative may conduct inspections during construction as it deems appropriate. If inspections performed by the City reveal deficiencies from the submitted and approved SWM site plan, the City may request corrective actions. Any corrective action shall be at the cost of the stormwater facility owner,” and “After receipt of the completion certification by the City, the City will conduct a final inspection, and may conduct inspections thereafter to ensure proper functioning and compliance with approved plans.”

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46. Section §1305.03 of the Stormwater Ordinance states, “The landowner or the owner's designee (including the City for dedicated and owned facilities) shall inspect [stormwater management] SWM BMPs, facilities and/or structures installed under this Ordinance according to the following frequencies, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended: annually for the first five (5) years, once every three (3) years thereafter, and during or immediately after the cessation of a ten-year or greater storm. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed the inspection, the location of the BMP, facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable. Inspection reports shall be kept onsite and furnished to City/PWSA inspectors upon request.”

IV. FINDINGS OF FACT AND CONCLUSIONS OF LAW

Count I

Failure to Conduct Inspections and Enforcement of Construction E&S Control Measures and Post-Construction Stormwater Management BMPs

47. The information and allegations in the Paragraphs above are incorporated herein by reference.
48. At the time of the Inspection on December 6 and 7, 2016, representatives from the City of Pittsburgh stated that the City relied on Allegheny County Conservation District to conduct reviews of E&S control plans and E&S control inspections during active construction. This agreement was initially formalized under a Memorandum of Understanding (“MOU”). The MOU had expired prior to the time of Inspection.
49. At the time of Inspection on December 6 and 7, 2016, representatives from the City stated:
- a. There was no protocol established or entity identified to conduct regular inspections, or system in place to monitor privately-owned stormwater management BMPs following construction.
 - b. The City was not inspecting municipally-owned stormwater control facilities at least annually.
 - c. The City did not have a detailed schedule for inspection and maintenance of all stormwater facilities, and instead performed this work on an as-needed basis.
50. In their June 5, 2017 response to the Opportunity to Confer Letter, the Respondents stated:
- a. The City’s Department of Public Works budgeted for an Environmental Enforcement Inspector position within the City’s Department of Permits, Licenses, and Inspections.

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- b. The City was seeking a qualified individual for the position and expected to start operation and maintenance inspections as soon as possible.
 - c. PWSA conducts multiple inspections of its drainage facilities, but informal inspections of other municipally owned stormwater facilities are not documented.
 - d. The City planned to implement a formal stormwater facility documentation process for incorporation into the NPDES Permit renewal application due September 16, 2017.
51. In its September 6, 2017 follow-up letter to the Opportunity to Confer Letter, EPA requested verification that the Environmental Enforcement Inspector position within the City's Department of Permits, Licenses, and Inspections had been filled.
52. In their October 2, 2017 response letter, Respondents stated that the Environmental Enforcement Inspector position was budgeted for in the 2017 budget but had not yet been filled by the City of Pittsburgh.
53. In its Information Requirement Letter dated February 26, 2020, EPA requested documentation from Respondents to confirm that the Environmental Enforcement Inspector position has been filled.
54. In their May 2, 2020 response to the Information Requirement Letter, Respondents stated:
- a. They determined that the Environmental Enforcement Inspector position was not suited to be within the Departments of Permits, Licenses and Inspections because this Department could not enforce the plumbing code and stormwater permitting requirements. Therefore, the funding for the position was removed from the City of Pittsburgh's budget.
 - b. The legal authority to enforce stormwater management falls under Allegheny County Health Department Plumbing Code. Respondents stated that they were working with Allegheny County Health Department and Allegheny County Conservation District to define agency responsibilities in stormwater enforcement.
55. On June 30, 2020, EPA issued a Notice of Noncompliance to the Respondents for their failure to conduct inspections and enforcement of construction E&S control measures and post-construction stormwater management BMPs.
56. In their August 17, 2020 response to the Notice of Noncompliance, the Respondents stated that they were in the process of addressing the violations set forth in the Notice of Noncompliance, and provided a schedule of activities to develop and implement a program for conducting inspections of construction E&S controls and post-construction BMPs. The schedule extended from February 7, 2020 through July 31, 2021. However, the schedule did not include ultimate implementation of an enforcement program.

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57. Based upon the information described above, Respondents failed to implement the Stormwater Ordinance in accordance with the requirements of the Protocol of the 2004 Permit and Parts C.I.B.4.c and C.I.B.5.a of the 2020 Permit.
58. Based upon the information described above, Respondents failed to conduct inspections and enforcement of construction E&S controls and post-construction stormwater management BMPs in accordance with Part A. Stormwater Management Program, 2. Minimum Control Measures of the 2004 Permit and Parts C.I.B.4.c, C.I.B.5.a, and C.I.B.5.c of the 2020 Permit.
59. Respondents' failure to conduct inspections and enforcement of construction E&S controls and post-construction stormwater management BMPs in accordance Part A. Stormwater Management Program, 2. Minimum Control Measures of the 2004 Permit and Parts C.I.B.4.c, C.I.B.5.a, and C.I.B.5.c of the 2020 Permit constitutes a violation of the Permit and Sections 301 and 402 of the CWA, 33 U.S.C. §§ 1311 and 1342.

V. ORDER

AND NOW, Pursuant to Section 309(a) of the CWA, 33 U.S.C. § 1319(a), Respondents are hereby ORDERED to do the following:

60. Respondents shall develop and implement a program for conducting inspections and enforcement of (1) construction erosion and sediment controls and (2) post-construction BMPs, in accordance with the schedule attached to this AOC as Attachment A.
61. Respondents shall achieve the following milestones by the deadlines specified below:
 - a. Submission of amended unified Stormwater Code to City Council by July 1, 2021.
 - b. City administration submission of the budget request to City Council to increase capacity for inspections and enforcement by December 31, 2021.
 - c. Implementation of procedures with the capability to implement an inspection and enforcement program in accordance with Permit requirements by January 28, 2022. This may include implementation of MOUs with Allegheny County Conservation District, Allegheny County Health Department, and other agencies, as necessary, to ensure the Respondents retain oversight and responsibility of the programs.
 - d. Complete implementation of the inspection and enforcement program and staff in place for construction E&S controls and post-construction stormwater management BMPs by March 31, 2022.
62. Respondents shall submit quarterly progress reports to EPA for a period of two years after the effective date of this AOC. These reports shall be due on March 31, June 30, September 30, and December 31 each year. These reports shall be submitted in accordance with Paragraphs 68 and 69. These reports shall include, at a minimum:
 - a. Activities completed during the reporting period;
 - b. Dates by which the activities were completed;

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- c. Any barriers to the timely completion of activities encountered; and
 - d. Activities currently in progress.
63. Any notice, submission, certification, data presentation, or other document submitted by Respondents to EPA pursuant to this AOC which discusses, describes, demonstrates, or supports any finding or makes any representation concerning Respondents' compliance or non-compliance with any requirements of this AOC shall be certified by either a principal executive officer or ranking elected official. The aforesaid certification shall provide the following statement above the signature of the responsible corporate officer signing the certification on behalf of Respondent:

I certify under penalty of law that this document and all attachments are true, accurate and complete. As to [the/those] identified portions of this [type of submission] for which I cannot personally verify [its/their] accuracy, I certify under penalty of law that this [type of submission] and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____
 Name: _____
 Title: _____

64. Any notice, submission, certification, data presentation, or other document submitted by Respondents to EPA pursuant to this AOC shall be sent via-email transmission to the attention of:

Shane McAleer (3ED32)
 Environmental Engineer / Inspector
 NPDES Section, Water Branch
 Enforcement and Compliance Assurance Division
 U.S. Environmental Protection Agency
 1650 Arch Street
 Philadelphia, PA 19103-2029
 mcaleer.shane@epa.gov

and

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Natalie Katz (3RC40)
Sr. Asst. Regional Counsel
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029
katz.natalie@epa.gov

VI. GENERAL PROVISIONS

65. Issuance of this AOC is intended to address the violations described herein. EPA reserves the right to commence action against any person, including Respondent, in response to any condition which EPA determines may present an imminent and substantial endangerment to the public health, public welfare, or the environment. Further, EPA reserves any rights and remedies available to it under the CWA, 33 U.S.C. §§ 1251-1388, the regulations promulgated thereunder, and any other federal laws or regulations for which EPA has jurisdiction, to enforce the provisions of this AOC, following its effective date (as defined below).
66. This AOC does not constitute a waiver or modification of the terms or conditions of the Respondents' Permit. Compliance with the terms and conditions of this AOC does not relieve Respondents of their obligations to comply with any applicable federal, state, or local law, regulation or permit.
67. By signing this AOC, Respondents neither admit nor deny the specific factual allegations set forth in this AOC.
68. Respondents waive any and all remedies, claims for relief and otherwise available rights to judicial or administrative review that Respondents may have with respect to any issue of fact or law set forth in this AOC, including any right of judicial review pursuant to Chapter 7 of the Administrative Procedure Act, 5 U.S.C. §§ 701-706.
69. EPA reserves all existing inspection authority otherwise available to EPA pursuant to Section 308 of the CWA, 33 U.S.C. § 1318, or pursuant to any other statute or law.
70. The undersigned representative of each Respondent certifies that he or she is fully authorized by the party represented to enter into the terms and conditions of this AOC and to execute and legally bind the party.
71. The provisions of this AOC shall apply to and be binding upon each Respondent and its officers, directors, employees, contractors, agents, trustees, successors and assigns of that Respondent.
72. Each Respondent certifies that any information or representation it has supplied or made to EPA concerning this matter was, at the time of submission true, accurate, and complete

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and that there has been no material change regarding the truthfulness, accuracy or completeness of such information or representation. EPA shall have the right to institute further actions to recover appropriate relief if EPA obtains evidence that any information provided and/or representations made by a Respondent to the EPA regarding matters relevant to this AOC are false or, in any material respect, inaccurate. This right shall be in addition to all other rights and causes of action that EPA may have, civil or criminal, under law or equity in such event. Each Respondent and its officers, directors and agents are aware that the submission of false or misleading information to the United States government may subject a person to separate civil and/or criminal liability.

- 73. Respondents may assert a business confidentiality claim covering part or all of the information which this AOC requires it to submit to EPA, but only to the extent and only in the manner described in Part 2 Subpart B of Title 40 of the C.F.R. The EPA will disclose information submitted under a confidentiality claim only as provided in Part 2 Subpart B of Title 40 of the C.F.R. If Respondents do not assert a confidentiality claim, EPA may make the submitted information available to the public without further notice to Respondent.

VI. EFFECTIVE DATE

This AOC is effective after receipt by Respondents of a fully executed document.

SO ORDERED:

U.S. ENVIRONMENTAL PROTECTION AGENCY

Date: 01/26/2021

By: KAREN MELVIN
Digitally signed by
KAREN MELVIN
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Karen Melvin
Director, Enforcement & Compliance Assurance
Division
U.S. EPA – Region III

AOC with City of Pittsburgh and PWSA

Docket No. CWA-03-2021-0039DN

AGREED TO:

For Respondent: CITY OF PITTSBURGH

Date: 1/20/2021

By: 

William Peduto
Mayor

AOC with City of Pittsburgh and PWSA

Docket No. CWA-03-2021-0039DN

AGREED TO:

For Respondent: PITTSBURGH WATER AND SEWER AUTHORITY

Date: 1/20/2021

By: William J. Pickering
William J. Pickering
Chief Executive Officer

ATTACHMENT A

Pittsburgh Water and Sewer Authority - Stormwater Code and Ordinance Review and Update
Project Schedule - Updated: 12/22/2020

Task Description	Start Date	End Date	Meeting Date
Task 1 Technical Analysis			
1.1 Kickoff and Discovery Meeting			2/7/2020
1.2 Evaluation of Policy and Regulation Changes	2/10/2020	2/26/2021	
<i>Internal AKRF Team - Policy Alternatives Exploration Workshop</i>			3/4/2020
<i>PWSA/City/AKRF Meeting to Discuss Policy Priorities</i>			7/31/2020
<i>Detailed Scoping of Additional Technical Analyses for Priority Policies</i>	8/3/2020	8/25/2020	
<i>Additional Technical Analyses for Priority Policies</i>	8/26/2020	2/26/2021	
1.3 Technical Analysis: BMP Applicability	3/2/2020	7/31/2020	
1.4 Technical Analysis: Variability in SWM Requirements	7/20/2020	12/4/2020	
1.5 Analysis and Recommendations Report	10/19/2020	2/26/2021	
1.6 Updated PWSA Developer Manual Chapters	2/1/2021	5/31/2021	
1.7 Design Manual	2/1/2021	5/31/2021	
Task 2 Creation of Unified Stormwater Code			
2.1 Kickoff and Discovery Meeting			2/7/2020
2.2 Review Existing Code and Identify Conflicts and Overlap	2/10/2020	4/24/2020	
2.3 Identify Plan Review Thresholds and Applicability Triggers	3/2/2020	7/31/2020	
2.4 Evaluate Opportunities for Enhanced Co-benefits/Resiliency	8/26/2020	12/4/2020	
2.5 Evaluate Opportunities for Integration into ROW Policy	8/26/2020	12/4/2020	
2.6 Review of Regulatory Compliance Goals and Enhancement Options	8/26/2020	12/4/2020	
2.7 Develop Updated Stormwater Management Code	2/1/2021	7/31/2021	
<i>Development of recommended code revisions for executive review</i>	2/1/2021	3/15/2021	
<i>Public notice of proposed amended code (21 days in advance of Planning Commission)</i>	4/27/2021	5/18/2021	
<i>Submission of amended code to Planning Commission</i>	4/27/2021	5/18/2021	
<i>Public notice of proposed amended code (21 days in advance of City Council public)</i>	7/9/2021	7/31/2021	
<i>Submission of amended code to City Council</i>	7/9/2021	7/31/2021	
2.8 Summary of and Recommendations for Resolving Potential Conflicts	8/1/2020	2/26/2021	
2.9 Analysis of Agency Roles and Agreements (see Task 3)			
Task 3 Process Improvement Recommendations			
3.1 Kickoff and Discovery Meeting			2/7/2020
3.2 Review Existing Procedures for Approvals, Plan Review and Enforcement	9/14/2020	11/27/2020	
3.3 Develop Recommendations for Streamlining Including Integration with New Software	11/30/2020	2/26/2021	
3.4 Integration with Other Related Programs	11/30/2020	2/26/2021	
3.5 Development of Tiered Review Processes	8/26/2020	12/4/2020	
3.6 Legal Analysis for Proposed Improvements	1/4/2021	2/12/2021	
3.7 Staffing Requirements for Review, Inspections, and Enforcement	8/26/2020	12/4/2020	
3.8 Costs and Pricing for Services	1/25/2021	7/31/2021	
Task 4 Internal Policy Updates			
4.1 Kickoff and Discovery Meeting			2/7/2020
4.2 Analysis of Alternative Compliance Options	8/26/2020	12/4/2020	
4.3 Review of Draft MOU	5/4/2020	7/17/2020	
4.4 Develop Recommendations for SWM Responsibilities	9/14/2020	12/4/2020	
4.5 Staffing and Budget Requirements by Department	1/25/2021	7/31/2021	
Task 5 Stakeholder Communication			
5.1 Kickoff and Discovery Meeting			2/7/2020
<i>Community Engagement Plan Development</i>	3/2/2020	6/15/2020	
5.2 Introduction Meetings			
<i>Agency Workgroup</i>			2/7/2020
<i>Stakeholder Workgroup</i>			7/8/2020
5.3 Focused Workshops			
<i>Stakeholder Focus Groups / Workshops</i>	7/8/2020	9/30/2020	
<i>Agency Staff Interviews</i>	3/2/2020	10/31/2020	
5.4 Key Stakeholder Meetings			
<i>Meeting 1</i>			7/8/2020
<i>Meeting 2</i>			12/17/2020
<i>Meeting 3</i>			3/31/2021
5.5 Agency Work Group Meetings			
<i>Meeting 1</i>			5/5/2020
<i>Meeting 2</i>			8/6/2020
<i>Meeting 3</i>			12/15/2020
<i>2021 Meetings - TBD</i>			
5.6 Information Sessions (2)	6/1/2021	7/31/2021	

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III**

Philadelphia, Pennsylvania 19103-2029

In the Matter of:	:
	:
City of Pittsburgh	:
414 Grant Street	:
Pittsburgh, Pennsylvania 15219	:
	:
AND	:
	:
Pittsburgh Water and Sewer Authority	:
1200 Penn Avenue	:
Pittsburgh, Pennsylvania 15222	:
	:
Respondents	:
	:

**U.S. EPA Docket No. CWA-03-2021-0039DN
Proceeding under Section 309(a)
of the Clean Water Act**

ADMINISTRATIVE ORDER ON CONSENT

CERTIFICATE OF SERVICE

I certify that the enclosed Administrative Order on Consent was sent to the following persons by UPS Overnight Mail, at the following addresses:

Yvonne Hilton, Esq. and John Miller, Esq.
City of Pittsburgh
414 Grant Street
Pittsburgh, Pennsylvania 15219
Email: yvonne.hilton@pittsburghpa.gov and
john.miller@pittsburghpa.gov

Debbie Lestitian, Esq.
Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, Pennsylvania 15222
Email: dlestitian@pgh2o.com

David G. Ries, Esq.
Clark Hill
One Oxford Centre
301 Grant St., 14th Floor
Pittsburgh, Pennsylvania 15219
Email: dries@clarkhill.com

I certify that the enclosed Administrative Order on Consent was delivered to the following person by electronic mail, at the following addresses.

Regional Hearing Clerk (3RC00)
U.S. Environmental Protection Agency, Region III
Email: R3_Hearing_Clerk@epa.gov

I have also arranged for the Regional Hearing Clerk to distribute the Administrative Order by electronic mail to the persons listed above.

Date: 1/20/2021

By: *Genia Sebastia*
NAME:
TITLE:

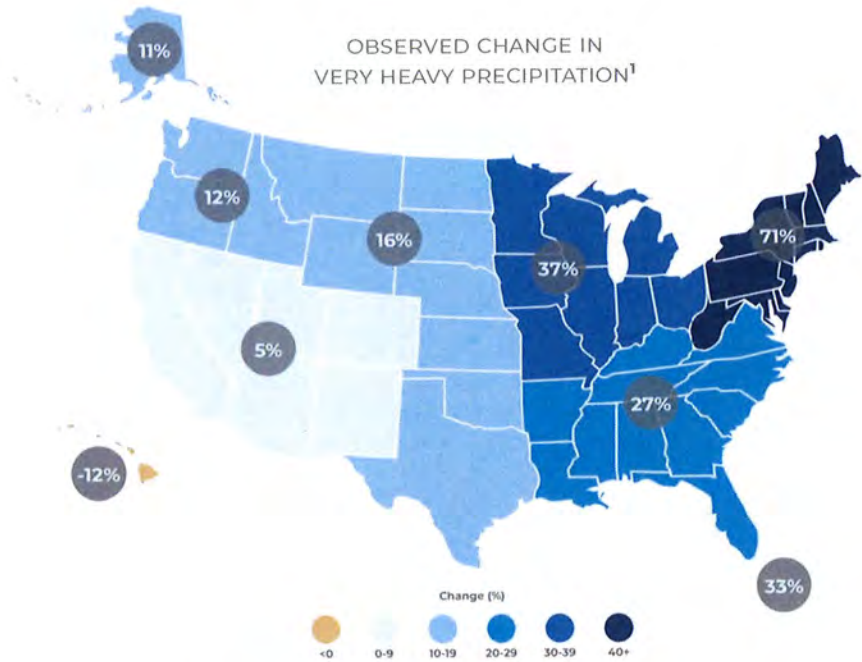
Exhibit TI-3

FINDINGS FROM THE **STORMWATER ADVISORY GROUP** TO PITTSBURGH WATER AND SEWER AUTHORITY

On Wednesday, May 1, 2019, the Stormwater Advisory Group, convened by the Pittsburgh Water and Sewer Authority (PWSA), recommends consideration of the following in helping to achieve the purpose of creating strong, healthy, flood-prepared neighborhoods throughout Pittsburgh.

STORMWATER ADVISORY GROUP

- David Miller, Chair
University of Pittsburgh
- Scott Bernotas
University of Pittsburgh
- Andrea Boykowycz
Oakland Planning & Development Corp.
- Karina Chavez
PCHE | Point Park College
- Stephanie Chiappini
BabyBird Electric, LLC
- Angelica Ciranni
Green Building Alliance
- Jenna Cramer
Green Building Alliance
- Jane Downing
The Pittsburgh Foundation
- Andy Dunmire
Eat'n Park
- Justin Evans
Giant Eagle
- Tom Hoffman
Allegheny Group Sierra Club
- Kevin Jenkins
Manchester Bidwell Corporation
- Darryl Jones
City of Pittsburgh
- Darrin Kelly
Allegheny-Payette Central Labor Council
- Vincent Kolb
Sixth Presbyterian Church
- Antoinette Lichty
Giant Eagle
- Marcia Martin
Gateway Health Plan
- Brenda Smith
Nine Mile Run Watershed Association
- Merrill Stabile
Alco Parking
- Michael Takacs
Bohler Engineering
- Catherine Udekwa
Gateway Medical Society
- Tony Young
Carnegie Museums of Pittsburgh



FINDING 1: The annual number of heavy rain events occurring in our region has increased dramatically over the last decade. *This is apparent in Pittsburgh.*

The National Climate Assessment found that from 1958 through 2012, **the Northeast saw more than a 70% increase in the amount of precipitation falling in very heavy events** (defined as the heaviest 1% of all daily events).²

Our region's wettest year on record was 2018, with 57.83 inches of rain recorded.³ This is an increase of 37% from 2017 and nearly 20 inches above the annual average of 38.19 inches.

In 2003, the base year used by ALCOSAN to begin planning increased capacity at the regional wastewater treatment plant, 41.06 inches of rain fell, which is 40% less rain than 2018.⁴

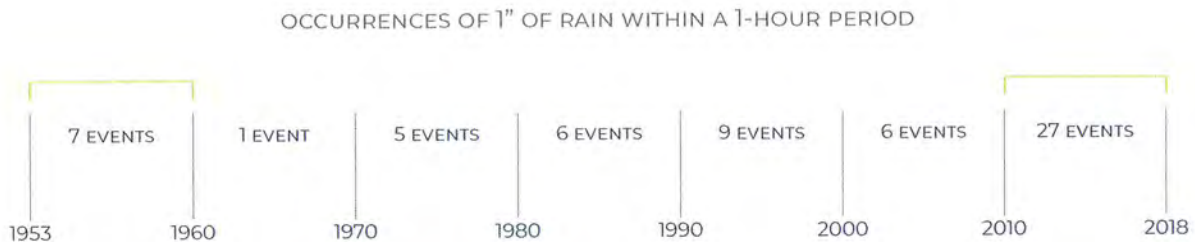
¹ Map: Observed Change in Very Heavy Precipitation 1958-2012
<https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing#graphic-16693>

² Northeast Key Message Planning and Adaptation: <https://nca2014.globalchange.gov/highlights/regions/northeast>

³ <https://www.weather.gov/images/pbz/features/plots/KPIT2018plot.png>

⁴ <https://www.weather.gov/images/pbz/features/plots/2003plotKPIT.png>

From 2010 to 2018, we experienced 27 rain events that resulted in one-inch of rain within a one-hour period. In comparison, fewer than 10 of these rain events occurred for each decade from the 1950s to early 2000s.⁵



Our wastewater and stormwater infrastructure are overwhelmed by these increasing rain events resulting in environmental and physical damage. Excess stormwater runoff has emerged as a serious issue within our region, and it needs to be addressed with appropriate public policies and resources.

There are two primary causes for the increase in stormwater:

- 1 *As our **climate changes** and the air becomes warmer, it holds more water. The continual warming of the planet is causing an increase in the frequency and intensity of rain events. This pattern is furthering the burden on our current wastewater and stormwater systems rendering them inadequate to handle increasing amounts of intense and heavy rain.*
- 2 *As **hard surfaces** (pavement, sidewalks, rooftops) have increased across the city, there is less available green space to absorb rainwater forcing it into our sewer system and creating major flooding and run-off problems. Residents are experiencing increasing amounts of basement backups, raw sewage is discharging into our rivers, and neighborhoods are flooding because this water has nowhere to go.*

FINDING 2: Pittsburgh's first public sewer lines were built as early as 1840 in present-day Shadyside and Oakland.⁶ These lines discharged stormwater and wastewater into the Monongahela River. By 1908, more than 390 miles of underground sewer lines were in place, establishing the start of our 1200-mile combined sewer system still utilized today. This was the technology available at the time and it was an acceptable practice to discharge sewage into local waterways.

Now with advances in sanitation and public health and greater importance on water quality, the methods used to manage stormwater a century ago are no longer acceptable. **The combined sewer system does not have the capacity to handle increasing amounts of rain and we are required to reduce the amount of sewage overflowing into our rivers and streams.** The entire region is now under a consent order with the Environmental Protection Agency (EPA) to meet stricter state and federal regulations for managing stormwater.

⁵ 1953 – 2013: National Oceanic and Atmospheric Administration Historical Hourly Precipitation Data at Pittsburgh International Airport and 2014 – 2018: Pittsburgh Regional Three Rivers Wet Weather Rain Gage Network

⁶ A Study in Local Decision Making: Pittsburgh and Sewage Treatment by George Peter Gregory. <https://journals.psu.edu/wpi/article/viewFile/3252/3083>





FINDING 3: The Pittsburgh Water and Sewer Authority's original mission was to provide drinking water to Pittsburgh homes and businesses and then to carry wastewater through sewers to treatment facilities. Addressing the impact of stormwater has been slowly added to the Pittsburgh Water and Sewer Authority's mission as the problem of stormwater itself has grown in scale.

The Pittsburgh Water and Sewer Authority has partially addressed the problem of excess stormwater. One of the charges customers see on their bill is a sewer conveyance fee, which finances the services associated with moving wastewater from homes through the sewer system and provides funding for stormwater projects. **At current funding levels this charge is inadequate to address the growing problems of excess stormwater. Additional funding is necessary.**

FINDING 4: There is a second problem associated with using the sewer conveyance fee to address stormwater. The fee is based on a customer's water usage. **The volume of water a customer uses is not an equitable way to charge customers for stormwater management.** The amount of stormwater a property generates is a function of hard surface (impervious area) on that property. The universal measure used by governments across the United States to charge for costs related to stormwater services is impervious surface area.

A recent national survey indicates that 92%⁷ of agencies charging a stormwater fee use impervious area as the basis for their fee structure. This survey was conducted in 2018 and includes 75 respondents from 21 states. Consistent with national standards, we believe the Pittsburgh Water and Sewer Authority should adopt such a stormwater management fee based on impervious area.

FINDING 5: The Pittsburgh Water and Sewer Authority has developed a strategic plan and budget and is currently conducting the analysis for project and program expenditures, which will serve as the basis for the new stormwater fee structure. The plan identifies the most appropriate, cost effective, and environmentally equitable approaches to implementing capital projects as well as the ongoing operations and maintenance needed to sustain the stormwater program. As an example, the plan includes projects identified in the Green First Plan, which have an estimated annual cost of \$40 million per year to implement.

We recognize that the funding currently available under the existing sewer conveyance fee is insufficient.

Any additional funding that may be generated from the stormwater fee should be related to the legitimate project needs and not the mere presence of a new fee structure. It is our understanding that the rate will be determined by the cost of implementing the strategic plan and what regulatory agencies will approve taking into consideration affordability for the region and the effectiveness of the plan.

We expect the Pittsburgh Water and Sewer Authority to maintain an ongoing and transparent dialogue with stakeholders as details about the fee structure and the funding needs of the stormwater program become available.

⁷ <https://www.bv.com/sites/default/files/18%20Stormwater%20Utility%20Survey%20Report%20WEB.pdf>



FINDING 6: Addressing Pittsburgh's current and projected problem of excess stormwater is a community undertaking that requires the active participation of private property owners to reduce the quantity of stormwater or improve its quality as it enters Pittsburgh's sewer system or waterways. To accomplish this goal, local governments frequently use a combination of incentives (grants, credits, and rebates) to encourage residential and non-residential customers to manage stormwater on-site.

The Pittsburgh Water and Sewer Authority should establish an incentives program that strongly encourages participation and private investment. The program should be mindful of the long-term positive implications of private investment and crafted to minimize the administrative burden placed on ratepayers who want to participate. The credits and incentives offered should be commensurate with the reduced stormwater service demand associated with participation. The incentives program should recognize that there are things everyone can do to manage stormwater.

FINDING 7: Education and outreach are essential to Pittsburgh's acceptance of the stormwater management fee and understanding of the stormwater management program.

Additionally, people have a right to know how the fee will be used to address our stormwater challenges. The Pittsburgh Water and Sewer Authority has developed a communication and outreach strategy that will be rolled out to ratepayers, stakeholder groups, and the broad community to build awareness and create a dialogue about the fee as well as the overall stormwater program.

FINDING 8: The Stormwater Advisory Group encourages Pittsburgh's property owners and residents to recognize that it will take time to see the improvements of a holistic stormwater management program.

Pittsburgh's sewer and stormwater systems were built at a different time when our city had more green space, less pavement, and before environmental considerations were given much thought. The problems of too much stormwater entering our system did not happen overnight. ***It will take time to implement needed solutions.***

The Pittsburgh Water and Sewer Authority would like to thank the members of the Stormwater Advisory Group for their participation and express our sincere appreciation for the contribution they provided over a six-month period from November 2018 to May 2019. In this short amount of time, we presented information about the magnitude and cause of Pittsburgh's stormwater problem, shared information about our stormwater management program, and developed a solid set of principles that will help guide the next phase of the process to establish the stormwater fee.

This collaboration was essential for advancing the stormwater program with ratepayers, stakeholder groups, and our regulatory agencies. It provided an opportunity to introduce the need to establish the fee, discuss the challenges we face with managing stormwater and hear concerns from individual stakeholder groups. We appreciate the contribution made by each member of the Stormwater Advisory Group and thank them for participating in this important effort.

Exhibit TI-4

Tariff Storm Water - Pa. P.U.C. No. 1
Original Page No. 1

THE PITTSBURGH WATER AND SEWER AUTHORITY

RATES, RULES AND REGULATIONS GOVERNING

THE PROVISION OF STORM WATER COLLECTION, CONVEYANCE,

TREATMENT AND/OR DISPOSAL SERVICE

TO THE PUBLIC IN THE TERRITORY DESCRIBED HEREIN

By: William J. Pickering, Chief Executive Officer
1200 Penn Avenue, Pittsburgh, PA 15222
Tel: 412-255-8800

{J2804790.2}

Issued: April 13, 2021

Effective: June 12, 2021

The Pittsburgh Water
And Sewer Authority

Tariff Storm Water - Pa. P.U.C. No. 1
Original Page No. 2

LIST OF CHANGES

The Filing of the Initial Tariff.

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List of Territories Served

The City of Pittsburgh.

The Pittsburgh Water
And Sewer Authority

Tariff Storm Water - Pa. P.U.C. No. 1
Original Page No. 7

PART I: SCHEDULE OF RATES AND CHARGES

Section A - Storm Water Management Service Charge

Section A.1 - Residential Service

1. Applicability:

The rates under this schedule apply throughout the Authority's service territory for service rendered on and after the effective date shown at the bottom of this page.

2. Availability:

The rates under this schedule are available to residential customers.

3. Rate:

Each residential customer receiving service under this schedule will be assessed a monthly service charge at the following rate. Rates shall be calculated based upon the Equivalent Residential Unit (ERU) as determined by the Authority.

Service Charge

	<u>Effective</u> <u>January 12, 2022</u>	<u>Effective</u> <u>January 12, 2023</u>
Tier 1 (Impervious area of 400 square feet to less than 1,015 square feet, 0.5 ERUs)	\$2.99	\$3.98
Tier 2 (Impervious area of 1,015 square feet to less than 2,710 square feet, 1 ERU)	\$5.96	\$7.95
Tier 3 (Impervious area greater than or equal to 2,710 square feet, 2 ERUs)	\$11.93	\$15.90

The Pittsburgh Water
And Sewer Authority

Tariff Storm Water - Pa. P.U.C. No. 1
Original Page No. 8

Section A.2 - Non-Residential Service

1. Applicability:

The rates under this schedule apply throughout the Authority's service territory for service rendered on and after the effective date shown at the bottom of this page.

2. Availability:

The rates under this schedule are available to non-residential customers.

3. Service Charge:

Rates for developed properties are determined on an Equivalent Residential Unit basis. Each Customer receiving service under this schedule will be assessed the following monthly service charge(s) based upon the total amount of measured impervious area contained on the property. Measured impervious area shall be divided by 1,650 square feet and rounded up to the nearest whole number to determine the number of ERUs represented on the property. The service charge applicable to each developed property shall be calculated as follows:

Calculation of Service Charge

Service Charge = (Total IA / 1,650 square feet per ERU (quotient rounded up to nearest whole number)) * ERUR

Where:

IA = The Customer's property impervious area (sq. ft.) as measured by the Authority.

ERUR = The equivalent rate in dollars and cents for one (1) ERU.

	<u>Effective</u> <u>January 12, 2022</u>	<u>Effective</u> <u>January 12, 2023</u>
Rate per (1) ERU	\$5.96	\$7.95

The minimum service charge for any developed property is equal to that charged for Tier 2 residential properties.

Section B - Storm Water Management Service Charge CreditsB.1 - Residential and Non-Residential Credit1. Applicability:

The credits under this schedule apply throughout the Authority's service territory for service rendered on and after the effective date shown at the bottom of this page.

2. Availability:

This credit is available to non-residential Customers that meet Pittsburgh 2019 stormwater standards in Title Thirteen of the Pittsburgh Zoning Code, or more recent or restrictive standards, by controlling at least 1" of runoff from impervious surfaces on the property for which a credit is sought, if (i) Best Management Practices (BMPs) located on the property have been constructed in compliance with approved plans, (ii) the Customer is current with payments owed on all billed charges and fees on the Customer's account and are otherwise in compliance with the Rules and Regulations of this Tariff; (iii) the Customer remains responsible for all cost of operation and maintenance of the BMP; (iv) the Authority is granted access to the BMP for purpose of inspecting adherence to design, maintenance and operating standards; and (v) there is no significant change in land use draining to the BMP or alterations made to the approved BMP without prior approval of the Authority. This credit is also available to residential customers who disconnect downspouts and redirect property drainage to street planters. A similar credit is available for properties meeting the 2016 storm water standards that were replaced by the Pittsburgh 2019 storm water standards in Title Thirteen of the Pittsburgh Zoning Code.

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Tariff Storm Water - Pa. P.U.C. No. 1
Original Page No. 10

3. Determination of Credit:

For non-residential customers the amount of credit shall be 60% for that proportion of impervious surface for which the 2019 standard is met, and 45% for that proportion of impervious surface for which the 2016 standard is met. For residential tier 2 or tier 3 Customers the amount of the credit will be that associated with reducing the property's storm water service charge to that of the next lower residential tier rate. For tier 1 Customers the credit amount will be 50%.

For non-residential customers who undertake regional efforts or exceed Pittsburgh 2019 stormwater standards by controlling at least 25% more runoff than required, a higher level of credit may be granted upon review. The maximum credit under this approach will be 100%.

4. Terms:

Application

Customers must submit a completed BMP credit application. The current application will be available on the Authority's website.

Site Inspection

The Authority has the right to inspect the parcel and BMP(s) to verify the information provided in the application and to verify ongoing compliance with the Tariff. If a credit recipient fails an inspection, a notice will be sent to the Customer stating that corrections need to be made. If adequate corrections are not completed or addressed within the time frame specified in the notice, the credit shall be rescinded. To reinstate the credit, the Customer must reapply.

Maintenance

Customers receiving credits must notify the Authority if a BMP becomes impaired, inoperable or is removed from the property within 10 business days of the event causing this condition. If a Customer fails to maintain a BMP such that, in the Authority's sole determination, it ceases to function in the same manner as which the credit was approved, the Authority may terminate the Customer's credit and require a new credit application to be submitted and approved.

The Pittsburgh Water
And Sewer Authority

Tariff Storm Water - Pa. P.U.C. No. 1
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Credit Expiration

Credits based on runoff control shall expire after three (3) years. Customers may reapply to the Authority to receive a credit under this schedule.

Credit Transfer

Credits for runoff control approved under this section are not transferrable upon any sale or transfer of the property. A new credit application will be required for any Customer seeking this credit.

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Section C - Returned Check Charge

A charge of \$40.00 will be assessed any time where a check which has been presented to the Authority for payment on account has been returned by the payor bank for any reason if the customer has not paid a returned check charge under PWSA's water or wastewater tariff.

Section D - Reserved

Section E - Reserved

Section F - Reserved

Section G - Collection Expenses and Fees described in the
Authority's Supplemental Service Conditions

Reserved for Future Use.

The Pittsburgh Water
And Sewer Authority

Tariff Storm Water - Pa. P.U.C. No. 1
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Section H - Miscellaneous Charges, Fees, and Penalties (includes processing fees, permits, and connection fees)

The following charges and fees will be adjusted annually for increases in the annual Consumer Price Index for the Pittsburgh area most recently published by the Bureau of Labor Statistics or any successor organization prior to such anniversary. If the change in the Consumer Price Index is 0% or is a decrease, there will be no automatic adjustment.

1. Processing Fees

<u>Item</u>	<u>Charge or Fee*</u>
Certified mailing	\$20.00
History retrieval	\$10.00
Final bill	\$20.00
Map and Record Requests	\$40.00
Easement Recording	\$3,700.00
Inspection Fee	\$120 for first 2 hours + \$60 per hour after 2 hours

*Assessed per account.

Dye Test Application Processing Fees

Evidence of Compliance Statement	\$20.00
Temporary Evidence of Compliance Statement	\$30.00
Duplicate Evidence of Compliance Statement	\$20.00

The Pittsburgh Water
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Tariff Storm Water - Pa. P.U.C. No. 1
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2. Penalties

Illegal Connection - \$60.00
Residential

Illegal Connection - \$110.00
Commercial

3. Failure to Cleanup and Remedy Prohibited Discharges Charge:

Failure of the owner of any property and/or Customer to satisfactorily cleanup and remedy any prohibited discharge by act or omission, willfully, recklessly or negligently within twenty-four (24) hours, will result in a penalty of three hundred dollars (\$300), plus an additional three hundred dollars (\$300) for each day thereafter of non-compliance. The owner and/or Customer shall additionally be responsible for payment of the remedial cleanup costs, as well as any costs to or damages or losses suffered by the Authority as a result of any interference in operation of the Authority's systems.

The Authority reserves the right to compel the discontinuance of the use of any system in order to prevent the discharge of any wastes into the storm water or combined sewer system which may be deemed harmful to the storm water or combined sewer system, or to have an adverse effect on effluent or discharge requirements by the applicable regulatory agencies.

4. Activities Related to Permits/Approvals Issued by PWSA

a. Development Permits - required for constructing or renovating a structure larger than a single-family home including single-family homes with a fire service line or multi-family homes

<u>Activity</u>	<u>Fee</u>
Developer Fee - Water and Sewer Availability Letter	\$40.00
Tap-in Plan Review	\$420.00
Tap-In Plan Review - Expedited*	\$740.00
Developer Permit Revisions Review	\$140.00
Developer Permit Revisions Review - Expedited*	\$250.00
Private Construction of Public Facilities Plan Review	\$680.00
Private Construction of Public Facilities Plan Review - Expedited*	\$1,190.00

*Expedited = guaranteed review within 15 business days

b. Residential Permit - for new water and/or sewer taps or reconnecting to existing water and/or sewer service (includes party line separations)

<u>Activity</u>	<u>Fee</u>
Residential Permit	\$40.00

c. Other Permits (for any customer wanting to schedule an operation of a PWSA facility such as a fire hydrant or waterline shut)

<u>Activity</u>	<u>Fee</u>
Termination Only Permit	\$250.00

d. Land Operations Permits (may be required for construction project, administered by City of Pittsburgh but requires review by PWSA before permit will be issued)

<u>Activity</u>	<u>Fee</u>
Review of City Land Operation Permit	\$80.00

e. City of Pittsburgh Department of Mobility and Infrastructure (DOMI) Approvals (PWSA required to submit approval letter if affected)

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Activity	Fee
Review of City Street Vacation Permits	\$100.00
Review of City Encroachment Permits	\$100.00

Section I - New Automatic Payment Enrollment Credit

Customers enrolling in paperless billing and establishing automatic bill payments for the first time will receive a one-time credit of \$5.00. For customers receiving water, wastewater, and/or storm water service from PWSA, this credit will only be applied once per PWSA account.

Issued: April 13, 2021

Effective: June 12, 2021

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Rider BDP - Bill Discount Program (Residential)

1. Bill Discount Program: This rider is a program designed to enroll residential ratepayers who satisfy the criteria set forth below in a monthly discounted rate program.

2. Availability: This rider is available for a Residential customer that meets the low-income criteria of annual household gross income at or below 150% based on the Federal Poverty Level.
 - a. A residential ratepayer who meets the eligibility criteria should complete an application for the Bill Discount Program.
 - b. Eligible customers may be asked to verify income every two years.

3. Rate (Storm Water Service Charge): The Storm Water Service Charge for residential customers pursuant to Rider BDP for participants with income at or below 150% of the Federal Poverty Level will pay 25% of the applicable Storm Water Service Charge under Part I, Section A.1 (which represents a 75% discount off the service charge). Any other rates, fees and charges will be at the prevailing amounts under this tariff.

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PART II: Definitions

The following words and phrases, when used in this tariff, shall have the meanings assigned below unless the context clearly indicates otherwise:

1. ALCOSAN: The Allegheny County Sanitary Authority, Allegheny County, Pennsylvania.
2. Applicant: A person or entity who applies to become a customer of the Authority in accordance with Part III, Section A of this tariff.
3. Authority or PWSA: The Pittsburgh Water and Sewer Authority, a municipal authority organized and existing under the laws of the Commonwealth of Pennsylvania.
4. Authority Collection Main: The Authority has a duty to operate, maintain, inspect, repair, replace or abandon only those Wastewater Collection Mains that are a part of or connected to the public Wastewater collection, transmission and conveyance and that fall into one of the following classifications: (1) Wastewater Collection Mains leased to the Authority by the City under the Capital Lease Agreement effective July 27, 1995, as amended; (2) Wastewater Collection Mains constructed by the City or the Authority for public use since July 27, 1995; and (3) Wastewater Collection Mains dedicated to public use and accepted by the Authority on or after July 27, 1995.
5. Authority Storm Water Sewers or Public Storm Sewers: The Authority has a duty to operate, maintain, inspect, repair, replace or abandon only those Storm Sewers that are a part of or connected to the public Sewer System and that fall into one of the following classifications: (a) Storm Sewers leased to the Authority by the City under the Capital Lease Agreement effective July 27, 1995, as amended; (b) Storm Sewers constructed by the City or the Authority for public use since July 27, 1995; and (c) Storm Sewers dedicated to public use and accepted by the Authority on or after July 27, 1995.
6. Best Management Practices or BMPs: Activities, facilities, designs, measures, practices, procedures, or combination

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- thereof determined to be the most effective and practicable used to manage storm water runoff, control sediment, stabilize soil, reduce nonpoint source pollution and/or meet state water quality requirements. Refer to Pennsylvania Department of Environmental Protection's suggested guidelines for storm water quality as defined in the current edition of the Pennsylvania Stormwater Best Management Practices Manual.
7. Capital Lease Agreement: The agreement bearing that title between the City and the Authority on July 15, 1995, effective July 27, 1995, and includes any amendments thereto.
 8. City: The City of Pittsburgh, Pennsylvania.
 9. City Lien Verification Letter: A written letter from the City to a Person regarding any liens, claims, or taxes due the City from that Person.
 10. Combination Sewer or Combined Sewer: Sewers designed and built to carry sanitary sewage and/or industrial waste combined with storm water.
 11. Commercial or Commercial Property: Any property used, acquired or leased for purposes of carrying on a trade, business, profession, vocation, or any commercial, service, financial, or utility business or activity including, but not limited to, hotels, office buildings, gas service stations, laundries, commercial establishments, stores, malls, car washes, and parking lots.
 12. Commission or PUC: The Pennsylvania Public Utility Commission.
 13. Customer: Person or entity that is responsible for payment of storm water service charges. Customers are classified as either residential or non-residential. The property owner or, in the case of non-residential property, a Guaranteed Lessee are the Customer.
 14. Customer Facilities: The portion of any collection and/or conveyance asset connected to the Authority's facilities from a property which is owned and maintained by one or more Customers or property owners.
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15. Design Storm: The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence and duration, used in the design and evaluation of storm water facilities, best management practices, conveyance systems, and controls.
 16. Developed Property: A parcel altered from a natural state that contains an impervious area from manmade changes including but not limited to, buildings, structures, gravel, and pavement equal to or greater than 400 square feet.
 17. Developer: Any person(s) requesting an extension to provide service to an existing property or group of properties where service is to be provided to a property or structure other than a preexisting residential property or structure. This term also includes any person converting undeveloped property into developed property.
 18. Direct Connection: Customer facilities that discharge storm water into Authority facilities through any method other than sheet flow. Direct Connections include, but are not limited to, physical connections between Customer facilities and Authority facilities.
 19. Dye Test: A commonly accepted plumbing test whereby a nontoxic, non-staining dye is introduced into the surface Storm Water collection system of real property to determine if any surface Storm Water is entering the Sanitary Sewer system. The term "Dye Test" shall include any other reasonable and appropriate testing methodologies (excluding the use of smoke testing to detect roof leaders) acceptable to the Authority to determine if surface Storm Water is entering the Sanitary Sewer system.
 20. Dye Testing Ordinance: City Ordinance No. 3 of 2006, adopted March 28, 2006, effective July 5, 2006, as codified in Title Four, Public Places and Property, Article III Sewers, Chapter 433, Illegal Storm Water Connections, of the Pittsburgh Code, and includes any amendments thereto.
 21. Dye Testing Results Form: The form provided by the Authority to any person who has applied for evidence of compliance for a property served by a Sanitary Sewer, completed by a Registered Plumber.
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22. Dwelling Unit: An individual housing unit on or in a Residential Property such as a single-family home or a single apartment within a multi-unit apartment building or mixed use building.
23. Equivalent Residential Unit (ERU): Unit of measurement that standardizes the amount of impervious area on a property to the typical amount of impervious area found on one residential parcel. The Authority equates 1 ERU to 1,650 square feet of impervious area.
24. Evidence of Compliance Statement: A written letter or statement from the Authority confirming that it has on file a completed Dye Testing Results Form or other statement by a Registered Plumber certifying that there are no Illegal Surface Storm Water Connections to the Sanitary Sewer system on the property that is the subject of the application or statement.
25. Extension: An addition to the Authority's facilities to extend service within the Authority's service territory to accommodate more than one Customer.
26. Facilities or Authority Facilities: All plant and equipment of the Authority, including all tangible and intangible, real and personal property without limitation, and any and all means and instrumentalities in any manner owned, operated, leased, licensed, used, controlled, furnished, or supplied for, by, or in connection with, the business of the Authority. This term does not include Customer Facilities.
27. Facility Owner: The person(s) responsible for operation and maintenance of a facility.
28. Garbage: Discarded solid waste generated by human activity including, among other things, paper, plastics, metals and food matter.
29. Ground Water: Water located beneath the ground surface that emanates from sources other than the Authority's water or wastewater systems.
30. Guaranteed Lessee: A non-residential Tenant to whom a Property Owner has made an assignment of possessory rights by

agreement, which renders the Tenant responsible for the payment of storm water charges.

31. Guarantor: A Property Owner who guarantees payment of storm water by a Guaranteed Lessee.
32. Health Department: The Allegheny County Health Department, Allegheny County, Pennsylvania.
33. Illegal Surface Storm Water Connection: Any connection to the Authority's Sanitary Sewers that allows surface storm water to be discharged into the separate Sanitary Sewer system from sources including, but not limited to, downspout drainage, roof drainage, and areaway drainage.
34. Impervious Area or IA: A manmade surface resulting from parcel improvements which prevents or limits the infiltration of water into the ground including compacted or covered semi-pervious surfaces such as compacted earth or clay, gravel that is installed and maintained for vehicle travel or parking, most conventionally hardscaped surfaces such as: streets, driveways, roofs, sidewalks, parking lots, walkways, patio areas, attached and detached structures, and other similar surfaces.
35. Infiltration: Process by which rainfall and runoff enters the subsurface soil and recharges water sources such as rivers, streams, lakes, and aquifers.
36. Inspection(s): Examination of storm water facilities, best management practices, conveyance systems, or control measures, including but not limited to, during application, installation/construction, and post-construction to ensure compliance with applicable Authority regulations and standards.
37. Interference: A discharge which, alone or in conjunction with a discharge from other sources, does the following:
 - a. Inhibits or disrupts the storm water treatment facilities, its treatment processes or operations or its biosolids processes, use or disposal; or

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- b. Is a cause of a violation of a requirement of the Authority's NPDES permit(s) - including an increase in the magnitude or duration of a violation - or of the prevention of biosolids use or disposal in compliance with the following statutory provisions and regulations or permits issued there under - or more stringent State or local regulations:
- i. Section 405 of the Clean Water Act (33 U.S.C.A. § 1345).
 - ii. The Solid Waste Disposal Act (SWDA) (42 U.S.C.A. §§ 6901 - 6987), including Title II, more commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA).
 - iii. Regulations contained in the State's biosolids management plan prepared under Subtitle D of the SWDA, the Clean Air Act (42 U.S.C.A. §§ 7401 - 7642), the Toxic Substances Control Act (15 U.S.C.A. §§ 2601 - 2629) and the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C.A. §§ 1431 - 1434; 33 U.S.C.A. §§ 1401, 1402, 1411 - 1421 and 1441 - 1445).
30. Land Survey: A land survey completed by a Pennsylvania-registered land surveyor that shows a property's gross area, impervious area and types of surface materials, as appropriate, and any other information required by the Authority.
31. Lateral, Customer Lateral or Sewer Lateral: Wastewater or storm water lines that connect a property to the Authority's Collection Mains and carry sewage and/or storm water from one or more buildings or Premises to the Authority's Collection Mains.
32. Main or Sewer Main or Wastewater Collection Main: Collection and transmission pipelines and related equipment and facilities, generally located in streets, public ways, or easements, that are used to collect and convey Sewage and/or Storm Water. Mains may be either Authority Collection Mains or Private Collection Mains.
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33. Main extension: (For Line/Main Extension Purposes) An addition to the Authority's Wastewater Collection Main(s) which is necessary to serve the Premises of a new Customer.
34. Meter: Any device for the purpose of recording water consumption or the volume of wastewater discharged into a Wastewater Collection Main. This term includes, but it is not limited to any certified device used by the Authority, or by the Commission or for the purpose of measuring water, sewer or wastewater usage.
35. Municipal Separate Storm Sewer System or MS4: Municipally owned and maintained real property, infrastructure or natural features used and/or constructed for purposes of transporting, conveying, retaining, detaining, or discharging storm water runoff, fully separate of any wastewater collection system, subject to NPDES permitting requirements. See also Title 40 of the Code of Federal Regulations (CFR) 122.26 and CFR 122.30-122.37.
36. Non-residential Property: Any property which is not considered residential property.
37. Non-residential Service: Storm Water service supplied to any property that is not considered residential property.
38. National Pollutant Discharge Elimination System or NPDES Permit: National Pollutant Discharge Elimination System permit or equivalent document or requirement issued by the Environment Protection Agency, or if appropriate, by the Pennsylvania Department of Environmental Protection, to regulate the discharge of pollutants under Section 402 of the Clean Water Act (33 U.S.C.A. § 1342).
39. Nuisance: A public nuisance as known in common law or in equity jurisprudence; whatever is dangerous to human life or detrimental to health or the environment.
40. Occupant: A person to whom an Owner has allowed occupancy of a Property through a lease or other contractual arrangement and who has a reasonable expectation of occupying the property for six months or more.
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41. Owner: The person having an interest as owner, or a person representing themselves to be the owner, whether legal or equitable, sole or partial, in any Premises that are or are about to be supplied with water, wastewater conveyance, or storm water service by the Authority.
 42. Person: Individual natural persons, firms, partnerships, joint ventures, societies, associations, clubs, trusts, corporations, governments, political subdivisions, or organizations of any kind, including officers, agents, employees, or representatives of any of the foregoing, in any capacity, acting either for him- or herself or for any other person, under either personal appointment or pursuant to law.
 43. Plumbing Code: The Allegheny County Health Department's Rules and Regulations for Plumbing and Building Drainage, Article XV, as amended, together with the International Building Codes for residential and commercial plumbing that Article XV amends or revises.
 44. Pollutants: Contaminants typically found in storm water runoff collected from overland flow or by contamination including, but not limited to, sediments, hydrocarbons, trash, nutrients, and metals.
 45. Point of Service: The point at which storm water runoff originating from one or more properties enters the Authority's facilities. Such entry may be at an approved direct connection or other Authority storm water collection inlets or retention structures.
 46. Private Collection Main: Any Main that is not an Authority Collection Main.
 47. Private Storm Water Sewers or Private Storm Sewers: Any Storm Water Sewer that is not an Authority Storm Water Sewer.
 48. Premises: Unless otherwise indicated, the Customer's property.
 49. Property: Any parcel of land owned in fee simple absolute, including any home(s), condominium(s), homeowner's association or building(s) affixed thereto, which is delineated by the description contained on the recorded deed,
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and which may be further delineated by any public roads. Each property is either a developed property or an undeveloped property.

50. Property Owner: The person having an interest as owner, or a person representing themselves to be the owner, whether legal or equitable, sole or partial, in any property that is provided Storm Water service by the Authority.
51. Registered Plumber: A plumber registered and certified by the Commonwealth of Pennsylvania and the Allegheny County Health Department.
52. Remote Reading Device: The device that is generally affixed to the outside of a Premises or a meter installation and remotely collects and transmits Meter data. It is considered part of the Meter and meter reading equipment.
53. Residential Customer: See definition of *Residential Property*.
54. Residential Property: Property used exclusively for residential purposes with at least one and no more than four dwelling units and which cannot be classified as condominium property. Each residential property is considered to be a residential customer.
55. Residential Service: Storm water service supplied to a residential property.
56. Residential Tenant: A Person who leases a Dwelling Unit in a Residential Property pursuant to a current lease agreement.
57. Regulatory Agency: Agencies, including but not limited to the Pennsylvania Public Utility Commission (PUC), the Pennsylvania Department of Environmental Protection (DEP), U.S. Environmental Protection Agency (EPA), and the river basin commissions, which have authority over the operations and/or discharges into and/or from the Authority's Storm Water system. This term also includes any local, state or federal government agency with jurisdiction over a property.
58. Runoff: Any water flow, resulting from either naturally occurring precipitation, snowmelt or human activity, that

does not immediately infiltrate into the ground and travels along the ground surface potentially picking up pollutants until it has infiltrated, collected or reaches a receiving water body.

59. Sanitary Sewers: Those portions of the Sewer System in the City of Pittsburgh that were designed and built to carry sanitary sewage and/or industrial waste separately from Storm Water discharge, and portions of the Sewer System designated as Sanitary Sewers by the Authority.
60. Service, Storm Water Service, or Storm Water Management Service: Operation, maintenance, monitoring, regulation, or improvement of overland or underground infrastructure that conveys, supports, or provides relief to associated infrastructure that provides conveyance of storm water, whether that infrastructure also conveys wastewater or not.
61. Service Territory: The land area where the Authority has the exclusive right to provide storm water service.
62. Sewage: Wastewater that contains the waste products or other discharges from the bodies of human beings or animals and any noxious or deleterious substances harmful or inimical to public health or to animal or aquatic life, or to the use of waters for domestic water supply or for recreation, or which constitutes pollution under the Pennsylvania Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended.
63. Sewer System: The entire system consisting of the Authority Collection Mains and the Authority Storm Water Sewers.
64. Special Utility Service: Residential or business service which exceeds that required for ordinary residential purposes.
65. Sheet Flow: Runoff which flows over the ground surface as a thin layer, not concentrated in a channel.
66. Storm Water: Drainage or runoff resulting from precipitation or snow or ice melt.
67. Storm Water Collection System or Storm Water Sewers: A separate network of gutters, ditches, swales, pipes and

inlets which receives discharges of storm water and/or conveys surface water, subsurface drainage or storm water from buildings, grounds, parking lots, streets, etc. but excludes sewage. Storm Water Collection System may be Authority Storm Water Sewers or Private Storm Water Sewers.

68. Storm Water Credit: A conditional reduction to the storm water management service charge available to a Customer for implementing certain eligible property conditions or controls that reduce the property's demand for service.
69. Storm Water Management Facility or SWM Facility: Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, infiltrates, evaporates, transpires, cleans, or otherwise affects storm water runoff.
70. Street: Any cart way, road, highway, lane, avenue, court, cul-de-sac, alley public way or public square, including but not limited to streets that are dedicated to public use.
71. Surface Discharge: The discharge of Storm Water runoff from a property to an adjacent surface water body without the use of Authority infrastructure.
72. Storm Water Management Service Charge or SMSC: The service charge imposed by the Authority hereunder, as amended from time to time, against each Customer for the use of the storm water system and other storm water services provided by the Authority.
73. Tariff: All service rates, charges, rules and regulations issued by the Authority, together with any supplements or revisions thereto, officially approved by the Commission and contained in this document.
74. Temporary Evidence of Compliance Statement: An Evidence of Compliance Statement issued under those circumstances and conditions detailed in these Rules and Regulations.
75. Tenant: A Person or entity leasing Premises pursuant to a current lease agreement.

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76. Protected-Tenant: A Residential Tenant, not a Customer, whose Dwelling Unit and water/sewer service at the time of rental, and who would be adversely affected by a shut off of service Protected-Tenants are covered by the Discontinuance of Service to Leased Premises Act (DSLPA), 66 Pa.C.S. § 1521, et. seq. Applicability of the Utility Service Tenants Rights Act (USTRA), 68 Pa. S.A. § 399.1 - 399.18, as amended, is subject to further Commission review. An individual is not a Protected-Tenant if he or she is or has agreed under the rental agreement to be a Customer or if he or she took possession of the Dwelling Unit when it was without water/sewer service.
77. Undeveloped Property: Any property that is not considered developed property.
78. Vacancy Affidavit: A notarized statement by the Owner of a property certifying that the property has been vacant and water service has been terminated at the Curb Stop for a period in excess of 90 days.
79. Wastes: Any liquid, gaseous, or solid substances or combination thereof which are discarded, leached, or spilled substances or combination thereof including wastewater but excluding unpolluted, storm and ground waters.
80. Wastewater: Liquid waste discharged into the Sewer System by Dwelling Units or Non-Residential Properties, including wash water, Sewage, and other contaminants.

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PART III: RULES AND REGULATIONS

Section A - Storm Water Service

All properties within the Authority's storm water service territory shall be subject to the rules and regulations described herein.

1. Service Application Required: The Authority may require applications for service to be completed in writing on a form(s) provided by the Authority and signed by the Owner or Occupant of the property, as outlined in these Rules and Regulations and as otherwise provided in the Authority's Supplemental Service Conditions.
 - a. Service Conditions: The Authority will furnish service only in accordance with its PUC Approved Tariff and Supplemental Service Conditions, which are made a part of every application, contract, agreement, or license entered into between the Owner or Customer and the Authority. All such changes to these Supplemental Service Conditions will be a part of every application, contract, agreement or license for water, sewer, and storm water service in effect at the time such changes are adopted by the Authority.

2. Change in Ownership or Tenancy: Customers shall be responsible for storm water service charges until the Authority obtains evidence of a recorded land transfer, or upon any change in the identity of the Customer. The Authority shall consider the date of the change in ownership as the date of title transfer established by the record deed or otherwise established by sufficient evidence to show title to the property.
 - a. Date of eligibility to Assume Ownership: The Owner of a Dwelling Unit becomes a Customer as of the date of property title transfer established by the record deed or otherwise established by sufficient evidence to show the Owner's title to the property.

 - b. Unpaid Account Balances: The Authority may require, as a condition of furnishing service to an Owner, the

payment of any outstanding residential account balance(s) that accrued within the prior 4 years for which the applicant is legally responsible and for which the applicant was properly billed.

3. Service Stipulations for Residential Tenants and Non-Owner Occupants

- a. Prospective Tenants and other Non-Owner Occupants are encouraged to contact the Authority prior to signing a lease to determine whether there is an existing, delinquent account for a Dwelling Unit or property.
- b. The Authority may require, as a condition of furnishing residential service to a Tenant or Non-Owner Occupant:
 - i. Payment by the Owner or their agent of any delinquent balance for the Dwelling Unit or property for which an Owner was properly billed;
 - ii. Payment by the applicant of any outstanding residential account that accrued within the prior 4 years for which the applicant is legally responsible and for which the applicant was properly billed.
 - iii. A tenant will not be required to assume liability for debt previously accrued at the property for which the tenant was not residing and/or for which the tenant was not on the mortgage, deed or lease as a condition to establishing service.
- c. Except as otherwise provided applicable to Protected-Tenant rights, a Tenant or Non-Owner Occupant of a Dwelling Unit who wishes to become a Customer of the Authority must submit:
 - i. Satisfactory evidence, as determined by the Authority, of the Owner's consent to possession of the Dwelling Unit, which may be a current rental agreement, rent book, receipts, cancelled checks, other utility bills in the Tenant's or Occupant's name at that address, or other written

evidence of the Owner's consent to occupancy;
and,

- ii. At least one personal identification document such as a driver's license, birth certificate, military ID card or passport or other document issued by a public agency or public utility which contains the name and address of the tenant. If the personal identification does not bear the applicant's photograph, a second piece of personal identification may be required at the discretion of the Authority.

- d. The Authority may notify the Property Owner if Residential Tenants and Non-Owner Occupants are delinquent in paying amounts due to the Authority.

4. Service Stipulations for Non-Residential Customers

- a. The Authority accepts Non-Residential property Owners, their duly authorized agents or Guaranteed Lessees as Authority Customers.
- b. The Owner of a property is eligible to become a Customer when the Authority obtains evidence of a recorded land transfer established by the record deed or otherwise established by sufficient evidence to show the Owner's title to the property.
- c. A tenant of a non-residential property who wishes to become a Non-Residential Customer of the Authority may apply to become a Guaranteed Lessee. A tenant applying for storm water service must submit:
 - i. names of the business' principals, official address, and a business license;
 - ii. satisfactory evidence of the Owner's consent to possession of the property by the tenant; generally, a copy of the lease agreement or other written evidence of the Owner's consent;
 - iii. written guarantee from the Owner assuring payment of any charges and fees billed to the tenant; and

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- iv. where violations of the Health Department Plumbing Code exist, certification by a Registered Plumber that necessary corrections have been made and that the Non-Residential Property is compliant with the applicable Plumbing Codes.
- d. The Authority may notify the Property Owner if the tenant of a non-residential property is delinquent in paying amounts due to the Authority.
- 5. Application Forms: Application forms can be obtained at the Authority's local business office, presently located at 1200 Penn Avenue, Pittsburgh PA 15222; or by other means, as determined by the Authority.
- 6. Properties With Multiple Owners: Where a property has more than one owner, all property owners jointly and severally shall be responsible for payment of Authority charges. The Authority will not issue separate bills, divide applicable charges or take any other action to modify its standard policies and practices for such properties.

Section B - Construction and Maintenance of Facilities

- 1. Customer Lateral: The Customer Lateral shall be furnished, installed, maintained and/or replaced, when necessary, by and at the sole expense of the Customer. The Authority reserves the right to determine the size, location, type, material, and depth of Customer Laterals.
 - a. No person shall connect a private sewer, Storm Sewer or Sanitary Sewer to an Authority Sewer System without first obtaining a permit from the Authority.
 - b. No Person shall do any of the following without the written authorization of the Authority:
 - i. make an opening of any kind in an Authority Sewer Main; or
 - ii. make any connection with any Sewer Lateral.
 - c. The Authority may require the Owner of any structure located within the Authority's service area that has

access to a public Storm Sewer, Sanitary Sewer, or Combination Sewer to connect to the applicable public sewer or sewers by means of Sewer Laterals constructed, at the property Owner's cost, of materials and in a manner acceptable to the Authority and to the Health Department.

- i. No structure shall be used or occupied as a Dwelling Unit if the structure or Premises does not have an approved connection with the Authority's Sewer System or alternate sewage facilities approved by the Health Department.
2. Separate Trench: The customer lateral shall not be laid in the same trench with electrical, gas, drain or water pipe, the facilities of any other public utility or of any municipality or municipal authority that provides a public utility service, or within three (3) feet of any open excavation, unless a written exception is granted by the Authority.
3. Customer's Responsibilities: All customer laterals, connections and fixtures furnished by the Customer shall be maintained by the Customer in good working order. All equipment and appliances furnished by the Authority and on property owned or leased by the Customer shall be protected properly by the Customer. All leaks on the customer lateral or any pipe or fixtures in or upon the Customer's premises must be repaired immediately by the Customer.
4. Right to Reject: The Authority may refuse to connect with any piping system or furnish service through a lateral already connected if such system or lateral is not properly installed or maintained. The Authority, at any time, may request a Gravity Sewer Test be performed on the building lateral, at the sole expense of the owner, whenever it has evidence the lateral is leaking excessively, as determined by the Authority. Generally, leakage is considered excessive when the groundwater flow exceeds one hundred (100) gallon per inch of nominal diameter per mile of pipe per day. The Gravity Sewer Test shall be in accordance with Section 312.6 of the International Plumbing Code.[®]

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5. Individual Laterals: Except as otherwise expressly authorized by the Authority and/or as expressly approved by the Health Department, each individual Customer shall be served only through a separate lateral connected directly to the Authority's conveyance main, and that lateral shall not serve any other Customer or premise. No additional attachment may be made to any customer's lateral for any purpose without the express written approval of the Authority.

 6. Connection to Authority Conveyance Mains: No connection shall be made to the Authority conveyance main or detachment from it, except under the direction and control of the Authority's authorized representative or its agent. All such connections shall be the property of the Authority and shall be accessible to it and under its control.
 - a. All connections to the Authority's Sanitary Sewers, Combined Sewers, and Storm Sewers shall be made in conformity with plans and specifications approved by the Authority and shall be subject to the Authority's inspection.

 - b. Requirements for connections to Authority Sanitary Sewer, Combined Sewer, or Storm Sewer Mains for residential Development greater than a single-family residence or involving proposed flows of greater than 799 gallons per day, and for Non-Residential Properties, are contained In the Authority's Procedures Manual for Developers, which is incorporated in these Rules and Regulations and made a part hereof.

 7. Privilege to Investigate/Right of Access: The Authority's authorized representatives shall have the right of access at all reasonable times to all parts of any premises connected with the Authority's Collection Mains and/or the Authority's Storm Sewers, including meters, manholes, Laterals and other property owned by it on the premises of the Customer, for the purpose of examining and inspecting connections and fixtures, including but not limited to BMPs pending credit approval, approved BMPs, for disconnecting service for any proper cause, for purposes of replacement, maintenance, operation or repair thereof, or for the purpose of examining and inspecting
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any aspect of the premises that contributed runoff to the Authority's facilities.

Section C - Discontinuance of Service

1. Customer Responsibilities: Customers will remain responsible for paying all future charges for storm water service to the Property until such time as there is acceptance of a new Customer for the Property by the Authority.

2. Termination of Free Service Under Certain Contracts and Other Instruments: Notwithstanding any contract provision contained in any deed, grant, contract, franchise, permit, consent or other instrument (other than an instrument expressly set forth in and constituting a part of this tariff) made, executed or delivered between the Authority or any predecessor in interest and a Customer of the Authority or any predecessor in interest:
 - a. Every Customer who receives services under this tariff shall pay for such services as provided in the applicable schedule of rates set forth herein and subject to the rules and regulations of the Authority.
 - b. No credit, off-set or other allowance shall be allowed by the Authority against any bill for storm water service on account of the making, execution, or delivery of, or pursuant to any provisions of, any such instrument.

Section D - Reserved For Future Use

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Section E - Billing and Collection

1. Issuance of Bills: The Authority will bill each Customer within fifteen (15) days of the last day of each billing period.
2. Billing Due Date: The due date for payment of a bill for nonresidential service shall be no less than fifteen (15) days from the date of transmittal. The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the Authority are not open to the general public, the due date shall be extended to the next business day. Failure to receive a bill shall not relieve the Customer from their payment obligation. Pending credit applications shall not relieve the Customer from their payment obligation. The Authority may not impose a late-payment charge unless payment is received more than five (5) days after the stated due date.
3. Late Payment Charge: All amounts not paid when due shall accrue a late payment charge at the rate of 0.83 percent per billing period, not to exceed ten percent (10%) per year when not paid as prescribed in paragraph E.2 of this Section. Such charge shall be calculated every thirty (30) days thereafter only on the overdue portion of the bill excluding previous late charges.
4. Change in Billing Address: Where a Customer fails to notify the Authority of a change in billing address, the Customer shall remain responsible to remit payment by the billing due date.
5. Application of Payment: Utility bills rendered by the Authority shall include only the amount due for water service. Where a customer remittance to the Authority includes payment for any non-utility services, proceeds will be applied first to pay all outstanding regulated utility charges. For customers receiving any combination of water, wastewater, and storm water services, any partial remittance will be applied in the following order: water, wastewater and storm water charges.

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6. Return Check Charges: The Customer will be responsible for the payment of a charge for each time a check or automatic transfer of funds presented to the Authority for payment on that Customer's utility bill is returned by the payor bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date, account garnished, or unauthorized signature. This charge is in addition to any charge which may be assessed against the Customer by the bank with interest. Interest shall be calculated at the applicable rate for late payment charges.

 7. Disputed Bills: In the event of a dispute between the Customer and the Authority with respect to any bill, the Authority will promptly make such investigation as may be required by the particular case and report the result to the Customer. The Customer is not obligated to pay the disputed portion of the bill during the pendency of the Authority's investigation. When the Authority has made a report to the Customer sustaining the bill as rendered, the Customer shall have fifteen (15) days from the date of such report in which to pay the bill. If the Authority determines that the bill originally rendered is incorrect, the Authority will issue a corrected bill with a new due date for payment. Any amounts received by the Authority in excess of the amount determined to be due by the Authority's investigation of the dispute shall be refunded to the Customer with interest computed at 1.5% per month.

 9. ERU Adjustments: The determination of the number of ERUs or tier applicable to a customer may be adjusted from time to time as more accurate information is obtained or the condition of the property is altered, consistent with the following:
 - a. If an ERU adjustment will increase a Customer's bill, the following shall apply:
 - i. For ERU adjustments occurring outside of a base rate case filed with the Commission, the Authority will provide written notice to the Customer at least sixty (60) days in advance of the effective date of the ERU adjustment.
-

- ii. For ERU adjustments occurring concurrent with a base rate case filed with the Commission, the Authority will include information regarding the ERU adjustment in its written notice to the Customer. The Authority may delay the effective date of the ERU adjustment until the conclusion of the base rate case.
 - b. If an ERU adjustment will decrease a Customer's bill, the following shall apply:
 - i. The effective date of the ERU adjustment shall be the date the Authority received or collected the ERU data that resulted in the ERU adjustment.
 - ii. Any amounts received by the Authority in excess of the amount determined to be due by the Authority shall be provided as a credit to the Customer's account. If the excess amount is greater than the Customer's next bill, the Authority shall refund the difference between the excess amount and the Customer's next bill upon request by a Customer.
10. Limitation of Liability for Reliance on ERU Data: The Authority will undertake to use reasonable care and diligence to ensure ERU data is accurate but cannot and does not guarantee the accuracy of ERU data. The Authority's liability to a Customer for any loss or damage from reliance on ERU data shall be limited to an amount no more than amounts received by the utility in excess of the amount determined to be due by the Authority's investigation of the dispute.

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Section F - Reserved

Section G - Reserved

Section H - Reserved

Section I - Service Continuity

1. Regularity of Service: The Authority may, at any time, interrupt service in case of accident or for the purpose of making connections, alterations, repairs or changes, or for other reasons. The Authority will, pursuant to Commission regulations at 52 Pa. Code § 67.1 and as circumstances permit, notify customers to be affected by service interruptions. The Authority reserves the right to restrict the use of service whenever the public welfare may require it.

2. Liability for Service Interruptions:

- a. Limitation of Damages: The Authority's liability to a Customer for any loss or damage from any excess or deficiency in the storm water service due to any cause other than willful misconduct or negligence by the Authority, its employees or agents shall be limited to an amount no more than the customer charge or minimum bill for the period in question. The Authority will undertake to use reasonable care and diligence in order to prevent and avoid interruptions in storm water service, but cannot and does not guarantee that such will not occur. The Authority shall not be considered in any manner an insurer of property or persons against loss or damage by storm water, or otherwise. The Authority shall not be liable in any action where the loss or damage involves an act of God, force majeure or does not involve a duty of the Authority.
- b. Responsibility for Customer Facilities: The Authority shall not be liable for any loss or damage caused by reason of any breaks, leaks, stoppages or other defects in property owner or customer-owned facilities including pipes, joints, fixtures or other installations except

where the expense or damage is a result of the negligence or willful misconduct of the Authority, its employees or agents.

The maintenance, repair and replacement of privately-owned facilities is the responsibility of the property owner or the Customer served by such facilities.

The Authority reserves the right to require the property owner or the Customer served by privately-owned facilities to repair or replace such facilities, or enter into a main extension agreement, at the property owner or Customer's option, if such facilities are in disrepair, can no longer be used for whatever reason or are determined by the Authority or a court of competent jurisdiction to be a nuisance. The property owner or Customer must perform such repair or replacement at the property owner or Customer's own expense. The property owner or Customer must perform such repair or enter into a main extension agreement immediately after receiving notice from the Authority that the privately-owned facilities are a nuisance or within ten days after receiving notice from the Authority that the privately-owned facilities are in disrepair or can no longer be used.

The Authority reserves the right to prevent or limit a Customer's use of Authority facilities after legal notice of such required action is not taken within the time indicated above.

3. Inadequate Facilities

The Authority may decline to provide service to an applicant if it does not possess adequate existing facilities required to render the service desired or if such service is of a character that is likely to have a detrimental effect upon service to other customers.

4. Interference with Authority Facilities

No person shall physically alter Authority facilities without the Authority's consent.

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Section J - Waivers

The Authority may, at its sole discretion, waive any of the rules contained herein that operate for the benefit of the Authority; provided, that no such waiver will be valid unless in writing and signed by an authorized representative of the Authority, and provided that no waiver will be allowed where the waiver would constitute a violation of the Public Utility Code, the regulations of the Commission or of any other applicable statute, law or regulation.

Section K - Amendment of Commission Regulations

Whenever Commission regulations in Title 52 of the Pennsylvania Code are duly amended in such a way as would produce a difference between Commission regulations and this tariff, this tariff is deemed to be amended so as to be consistent with the amendments to the regulations, except that if application of the amendment to Title 52 is discretionary, this tariff will remain unchanged.

Section L - Prohibited conduct

1. No Person shall:
 - a. Damage, injure or displace, by willful, careless or negligent act, any Sanitary Sewer, Combined Sewer, or Storm Sewer operated and maintained by the Authority, or any portion or component thereof, or anything else pertaining to the Authority's Sewer System.
 - b. Throw, discard, discharge, or otherwise place or allow to flow or enter into the water of any fountain, pond, lake, stream, or other body of water in or adjacent to any park or any tributary, stream, Storm Sewer or drain flowing into such waters, any hazardous materials or other substances that the person knows or should know will result in pollution of the water.
 - c. Open, remove or in any way disturb or tamper with the lid, grate, or cover of any manhole, Inlet, or catch basin that is a part of the Authority's Sewer System.

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2. No Person shall discharge or permit the discharge or infiltration of any of the following substances into any Authority storm drain or sewer:
- a. mineral acids, waste acid, pickling or plating of liquors from the pickling or plating of iron, steel, brass, copper, or chromium, or any other dissolved or solid substances;
 - b. cyanides or cyanogen compounds capable of liberating hydrocyanic gas on acidification
 - c. gas tar, phenols in concentrations greater than 60 parts per million, residues from petroleum storage, refining or processing, excess fuel or lubricating oil, gasoline, naphtha, benzene, or explosive, flammable liquids, solids, or gases;
 - d. ashes, cinders, sand, mud, lime, or acetylene sludges, straw, shavings, metals, glass, rags, feathers, tar, plastics, wood, sawdust, paunch manure, hair, hides, dead animals, spent mash and grain, pulp from food processing, water or wastes containing excess grease, cement or cementitious materials, or any other solid, semi-solid, or viscous substances capable of causing obstruction to the flow in sewers or other Interference with the proper operation of the Authority's or ALCOSAN's facilities;
 - i. The combined concentration of oil and grease shall not exceed 200 parts per million.
 - e. sludges or other materials from septic tanks or similar facilities or from sewage or industrial waste treatment plants or from water treatment plants;

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- f. garbage, whether ground or not;
 - g. water or wastes having a pH lower than 5.0 or higher than 10.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, or individuals;
 - h. any industrial, commercial, or medical waste or discharge;
 - i. any waste that exceeds the naturally occurring background levels for alpha, beta, or gamma radiation or any Wastewater containing any radioactive wastes or Isotopes of half-life or concentration;
 - j. any wastes that are defined or listed as hazardous under the laws and regulations of the federal government or the Commonwealth of Pennsylvania; or
 - k. any noxious or malodorous liquids, gases, or solids that either singly or in combination with other wastes may create a public nuisance or adversely affect public health or safety.
3. Penalties and damages:
- a. In the event of any damage to the Authority's Collection Mains or the Authority's Storm Water Sewers caused by a Customer, such damage shall be immediately reported to the Authority and said Customer shall reimburse the Authority for the costs of repairs.
 - b. The Authority will refer to the City for prosecution as a summary offense any violation of Sections L.1 or L.2

above. Any Person who is found to have violated any of these tariff provisions shall, upon conviction, be punished by a fine of \$300.00 for each offense, recoverable with costs, and in default of payment of the fine and costs, shall be subject to imprisonment for a period not exceeding 30 days, in addition to any other remedies at law. Each day that a violation is continued shall constitute a separate offense. If the offender is a partnership or association, the penalty may be imposed upon the partners or members thereof. If the offender is a corporation, the penalty may be imposed upon the officers thereof.

- c. Any Person who willfully or negligently discharges or permits the discharge into an Authority sewer of any substance prohibited by Section L.2 shall be responsible for the containment, clean up, abatement, removal, and disposal of any pollutant or obstructing substance or material discharged into the Sewer System. The Authority shall give notice to such Person that a violation has occurred and shall require such Person to immediately contain, clean up, abate, remove, and dispose of the discharge. Such notice shall be sufficient if hand delivered or mailed to the Person at the person's last known address.
- d. If a Person notified under Section L.3.c fails to comply with the notice, the Authority may perform the containment, clean up, abatement, removal, and disposal of the discharge. Costs incurred by the Authority in such activities shall be charged to the Person notified.
- e. When the Authority determines that a discharge to the Sewer System in violation of this section has caused an imminent threat to human health or the environment, the Authority may contain, clean up, abate, remove, and dispose of any such discharge without prior notice. Costs incurred in such activities shall be charged to the Person who has violated this section L.

In addition, if there is a discharge of an explosive or flammable material or any other material which is highly toxic or creates a toxic gas so that there is imminent

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danger to the personnel or property of the Authority or treatment process of ALCOSAN, or to the public or the environment, then the Authority shall take whatever action is necessary to halt service and to protect the life and property.

- f. When the Authority charges its costs to a Person under this section, such charges shall be due within 30 days of the date the bill is rendered. If the charges remain unpaid more than 30 days after the date the bill is rendered, a lien in the amount of the bill shall be recorded against the property causing the discharge.
 - g. The penalties and remedies contained in this section shall be cumulative, not exclusive. Further, the penalties and remedies contained herein shall be in addition to any other penalties or remedies available under federal, state, or local laws, regulations or ordinances.
4. No Owner or Occupant of any real property fronting a street shall fail to keep the street gutters open and clear of refuse, debris, snow, and ice, so as to prevent an obstruction of the street gutters.

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PART IV: Compliance Statements

Section A - Sales of real property and City Lien Verification Letters

A request to the City for a City Lien Verification Letter must be accompanied by:

- a. a valid Evidence of Compliance Statement; or
- b. a valid Temporary Evidence of Compliance Statement.

Section B - Applications for Evidence of Compliance Statement

1. Any Person selling real property located within the City shall apply to the Authority for an Evidence of Compliance Statement at least 14 days in advance of the date of closing and shall pay the required application fee. The application for an Evidence of Compliance Statement may be found at <https://www.pgh2o.com/residential-commercial-customers/buying-or-selling-property/dye-testing> or by calling 412-255-0801.
2. If the Authority determines that the real property is served by a Combined Sewer, the Authority shall issue a certified Evidence of Compliance Statement within 7 business days of the Authority's receipt of the properly completed application therefor.
3. If the Authority determines that the real property is served by a Sanitary Sewer, then within 7 business days of its receipt of the properly completed application for an Evidence Of Compliance Statement, the Authority shall notify the applicant that a Dye Test is required and provide the applicant with a Dye Testing Results Form.

Section C - Sales of vacant, undeveloped property

1. Where the real property proposed for sale is vacant property upon which no buildings or structures exist, the applicant for an Evidence of Compliance Statement shall so indicate and, within 7 business days of receipt of the application, the Authority shall conduct a visual inspection of the property to verify that there are no Illegal Surface Storm Water Connections.

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2. If the Authority verifies upon visual inspection that there are no Illegal Surface Storm Water Connections on the property, the Authority shall issue an Evidence of Compliance Statement within 3 business days of the visual inspection.
3. If the Authority determines upon visual inspection that there are possible Illegal Surface Storm Water Connections on the property, then within 3 business days of the visual inspection, the Authority shall notify the applicant by Issuance of a letter that a Dye Test is required as provided under Section E of this Part.

Section D - Reserved

Section E - Dye testing

1. Except for visual inspection requests for vacant properties containing no buildings or structures pursuant to Section C or this Part, and sales that are exempt under the Dye Testing Ordinance, any Person selling real property located within the City shall have a Registered Plumber perform a Dye Test on the property to be sold.
2. Upon completion of the Dye Test, the Registered Plumber shall complete the Dye Testing Results Form confirming that the dye testing has been completed and certifying the results of the Dye Test.
3. If the Registered Plumber certifies that there are no illegal Surface Storm Water Connections on the property to be sold, the Authority shall issue a certified Evidence of Compliance Statement within 7 business days of the Authority's receipt of the properly completed Dye Test Results Form.
4. If the Dye Test reveals the existence of an illegal Surface Storm Water Connection, the Registered Plumber shall certify that there is an Illegal Surface Storm Water Connection on the real property.
5. If one or more illegal Surface Storm Water Connections exist on the real property, the Authority will not issue an Evidence

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of Compliance Statement until the connection or connections have been disconnected or removed as required by Part VI, Section E and the disconnection and removal has been certified by a Registered Plumber.

6. The Authority shall issue a certified Evidence of Compliance Statement within 7 business days of the Authority's receipt of:
 - a. a properly completed statement by a Registered Plumber describing and certifying the disconnection and removal of the Illegal Surface Storm Water Connection; or
 - b. verification that the real property in question is not located in an area served by Sanitary Sewers.
7. A certified Evidence of Compliance Statement shall be valid for 3 years following the date of its Issuance. If any additions are made to the property within the 3 year period, certification that the addition has no Illegal Storm Water Connections shall be provided to the Authority by a Registered Plumber. Provided, however, that if the Evidence of Compliance Statement is issued because the property in question is served by a Combination Sewer, and the public sewers serving the property are divided into separate Sanitary Sewers and Storm Sewers within the 3-year period, then the Evidence of Compliance Statement will automatically expire.

Section F - Application for Temporary Evidence of Compliance Statement due to inclement weather

1. In the event that weather conditions or other factors do not permit a Dye Test to be done in a timely manner, the sellers and the buyers of the real property may submit a signed agreement promising that dye testing will be completed as soon as conditions permit. The agreement must provide that the buyer of the real property will be responsible for the performance of the Dye Test.
2. An Application for a Temporary Evidence of Compliance Statement must be accompanied by the agreement and by a \$1,000.00 security deposit in the form of cash, certified check, or cashier's check to guarantee that the Dye Test will

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be completed. The security deposit will be returned to the applicant after a Registered Plumber certifies that the Dye Test has been completed.

3. Once conditions permit the performance of the Dye Test, the test shall be performed, the results certified, and the Evidence of Compliance Statement Issued as provided in section E of this Part.

Section G - Application for Temporary Evidence of Compliance
Statement with present illegal Surface Storm Water
Connection

1. In the event an Illegal Surface Storm Water Connection is discovered during the performance of a Dye Test or otherwise, and the necessary remediation of the condition would require a length of time to perform such that it would create an undue hardship on the applicant to perform prior to the date of closing on the sale of the real property, the applicant may apply to the Authority for a Temporary Evidence of Compliance Statement, which must be accompanied by the following:
 - a. a bona fide, executed agreement between the applicant and a Registered Plumber requiring the Registered Plumber to complete the necessary remedial work to correct and/or disconnect and remove the Illegal Surface Storm Water Connection, and granting the Authority the right and power to enforce the contract as a third-party beneficiary;
 - b. a security deposit in the form of cash, a certified check, or a cashier's check in the amount of 120 percent of the contract described in Section G.1.a above, which will be held by the Authority in a non-interest bearing account and returned to the applicant upon the Authority's receipt of a properly completed statement by a Registered Plumber describing and certifying the disconnection and removal of the Illegal Surface Storm Water Connection; and
 - c. a written acknowledgement and notarized agreement in which the buyer agrees to be responsible for all cost overruns related to the remedial work, together with the
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grant to the Authority of a license to enter upon the property to complete the work at the expense and cost of the buyer should the contractor or the applicant default on the agreement.

2. Should the Authority issue a Temporary Evidence of Compliance Statement, It will be effective for no more than 60 days. The expiration date of the Temporary Evidence of Compliance Statement will be clearly noted on the Statement.
3. Remediation of the Illegal Surface Storm Water Connections shall proceed as required by Sections E and F of this Part.
4. If, upon the expiration of the Temporary Evidence of Compliance Statement, the Authority has not received certification from a Registered Plumber that the Illegal Surface Storm Water Connection has been remedied, then the Authority may use the cash security, or a portion of the cash security, to have the required remedial work completed. Any balance remaining in the security deposit will be returned to the buyer. Any additional cost of the remedial work, in excess of the security deposit, will be the sole and exclusive responsibility of the buyer and will constitute a lien against the property.

Section H - Rejection of applications

1. The Authority may reject an application for an Evidence of Compliance Statement or a Temporary Evidence of Compliance Statement whenever the requirements of the Dye Testing Ordinance or of these Rules and Regulations have not been met.
2. In rejecting the application for an Evidence of Compliance Statement or Temporary Evidence of Compliance Statement, the Authority shall specify the nature of the deficiency and what action or actions must be taken to comply with the requirements of the Dye Testing Ordinance and/or these Rules and Regulations.
3. In the event of such a rejection, the applicant may file an appeal as set forth in Section I of this Part.

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Section I - Application appeals

1. Any applicant or person aggrieved by a decision of the Authority rejecting an application for an Evidence of Compliance Statement or a Temporary Evidence of Compliance Statement shall have the right to appeal to the Authority Board of Directors, provided that a written application for an appeal is made within 30 days of the date of the Authority's rejection. Appeals shall be made in writing and sent by certified mail to the Authority, to the attention of the Executive Director.
2. Any appeal made under this section shall state with specificity the reason(s) why the applicant is appealing the rejection and shall provide sufficient factual information and documentation, including a statement by a Registered Plumber or professional engineer, to support the appellant's position that the Evidence of Compliance Statement or the Temporary Evidence of Compliance Statement should have been issued by the Authority.

Section J - Fees

1. All applications for an Evidence of Compliance Statement or Temporary Evidence of Compliance Statement or for visual inspection by the Authority shall be accompanied by the appropriate application fee set from time to time by the Authority. No application shall be processed by the Authority if it is not accompanied by the applicable fee.
2. Fees for applications for Evidence or Temporary Evidence of Compliance are set forth in Part I, Section H of this tariff.

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PART V: Storm Water

Section A - Ownership and maintenance of Storm Sewers

1. The Authority has a duty to operate, maintain, inspect, repair, replace or abandon only those Storm Sewers that are a part of or connected to the public Sewer System and that fall into one of the following classifications:
 - a. Storm Sewers leased to the Authority by the City under the Capital Lease Agreement effective July 27, 1995, as amended;
 - b. Storm Sewers constructed by the City or the Authority for public use and accepted by the Authority since July 27, 1995; and
 - c. Storm Sewers dedicated to public use and accepted by the Authority on or after July 27, 1995.
2. Storm sewers that have been created or constructed by parties other than the City or the Authority, that have never been dedicated to or accepted for public use, or that do not connect to any of the Authority's Sewer Mains are not owned by the City or the Authority, and neither the City nor the Authority has any responsibility for their condition, operation, maintenance, inspection, repair, replacement, or abandonment. Responsibility for such private or common storm sewers lies with the Owners of the property or properties served by them.

Section B - Illegal Surface Storm Water Connections

No Person shall construct, install, maintain, repair, operate, use or allow an Illegal Surface Storm Water Connection on real estate that Person owns. This prohibition expressly includes, without limitation, illegal Surface Storm Water Connections made prior to the effective date of the Dye Testing Ordinance and prior to the effective date of these Rules and Regulations.

Section C - Permit requirements of other government entities

Prior to the commencement of any remedial work on the Illegal Surface Storm Water Connection, all necessary and required building permits, street opening permits, sidewalk opening permits, tap-in permits and fees, and other approvals and permits that may be necessary to accomplish the disconnection and redirection of the Storm Water shall be obtained.

Section D - Methods of Illegal Surface Storm Water
disconnections

1. Acceptable remediation of an Illegal Storm Water Connection to the Sanitary Sewer shall mean that the Illegal Storm Water Connection is disconnected from the Sanitary Sewer, the access point to the Sanitary Sewer is capped and sealed, and the private storm Sewer Lateral redirected as directed by the Health Department.
2. In no event is Storm Water to be collected and discharged upon or across public sidewalks or upon public streets, or discharged upon adjacent property owned by another person.

Section E - Completion of illegal Surface Storm Water
disconnections

1. After disconnection of the illegal Surface Storm Water Connection to the Sanitary Sewer and the redirection of the Storm Water, the real property shall be Dye Tested again to demonstrate that all Illegal Surface Storm Water Connections have been remedied.
2. The disconnection and the successful repeat Dye Test shall be certified by a Registered Plumber on a Dye Testing Results Form submitted to the Authority.
3. The Authority shall issue an Evidence of Compliance Statement within 7 business days of the submission of the appropriately completed Dye Testing Results Form.

Section F - Illegal connections to public Storm Sewers

1. No Person shall construct, Install, maintain, repair, operate, or use any drain or conveyance, whether on or below the surface, that allows any non-Storm Water discharge, including the discharge of Sewage, process Wastewater, or wash water, to enter the public Storm Sewers operated and maintained by the Authority. This prohibition expressly includes, without limitation, connections made prior to the effective date of the Dye Testing Ordinance and/or prior to the effective date of these Rules and Regulations.
2. Provided they do not significantly contribute to pollution of the waters of the Commonwealth, the following discharges may enter the Storm Sewers:
 - a. discharges from firefighting activities;
 - b. potable water from sources such as de-chlorinated water lines and fire hydrant flushing;
 - c. air conditioning condensate
 - d. pavement wash waters, unless contaminated by toxic or hazardous materials or detergents;
 - e. flow from watering of lawns, unless contaminated by fertilizers or by toxic or hazardous materials;
 - f. dechlorinated swimming pool discharges;
 - g. water from car washing on Residential Property, unless contaminated by detergents or toxic or hazardous materials;
 - h. water from external washing of Residential or Non-Residential Properties, unless contaminated by detergents or toxic or hazardous materials;
 - i. Irrigation drainage, unless contaminated by fertilizers or by toxic or hazardous materials;
 - j. water from crawl space pumps, unless contaminated by toxic or hazardous materials;
 - k. uncontaminated water from foundations or from footing drains;
 - l. uncontaminated springs;
 - m. uncontaminated flows from riparian habitats or wetlands;
 - n. uncontaminated groundwater; and

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- o. any activity authorized by a valid Pennsylvania permit for discharge to the waters of the Commonwealth.
- 3. Should the Authority, the City, or the Commonwealth Department of Environmental Protection determine that any of the discharges otherwise permitted by Section F.2 significantly contribute to the pollution of the waters of the Commonwealth, then the Authority, the City or the Department of Environmental Protection will notify the responsible Person to cease the discharge.

Exhibit TI-5

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(UTILITY NAME AS CERTIFICATED)
RATES, RULES AND REGULATIONS GOVERNING
THE PROVISION OF STORMWATER COLLECTION, CONVEYANCE,
TREATMENT AND/OR DISPOSAL SERVICE TO THE PUBLIC IN:

**(Description of Service Territory, including county and
municipal or political subdivision)**

By: (Name and Title of Responsible Company Representative)
(Company Business Address)
(Company Telephone Number)
(Company Email Address)

Issued: (Issued Date)

Effective: (Effective Date)

Utility Name

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Disclaimer regarding the Commission's Model Stormwater Tariff

Act 65 of 2017 amended the Pennsylvania Public Utility Code to include Chapter 32 which provides for the Commission's jurisdiction over the provision of water, wastewater and stormwater service by Pennsylvania cities of the second class under the Municipal Authorities Act, namely the Pittsburgh Water and Sewer Authority. 66 Pa. C.S. Chapter 32. The model stormwater tariff drafted by the Commission's Bureau of Technical Utility Services and made available on the Commission's website is an informal staff opinion issued pursuant to 52 Pa. Code § 1.96 whereby Commission personnel may provide unofficial, informal opinions and reports that are not binding upon the Commonwealth or the Commission. The Bureau of Technical Utility Services makes the model stormwater tariff available as an aid to the public. The model tariff does not have the force and effect of law and is not a legal determination; it is not binding upon the Commonwealth or the Commission. The model stormwater tariff renders no opinions on any formal or informal matters pending before the Commission either presently or in the future. The model stormwater tariff is intended and provided only to facilitate a framework of potential concepts and information that a stormwater utility may choose to consider in developing a stormwater tariff for submission to and consideration by the Commission.

LIST OF CHANGES

Establish initial tariff.

Issued: (Issued Date)Effective: (Effective Date)

Utility Name

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PART I: SCHEDULE OF RATES AND CHARGES

SECTION A: STORMWATER MANAGEMENT SERVICE CHARGE

1. RESIDENTIAL SERVICE

APPLICABILITY

The rates under this schedule apply throughout the utility's service territory for service rendered on and after the effective date shown at the bottom of this page.

AVAILABILITY

The rates under this schedule are available to residential customers.

RATE

Each customer receiving service under this schedule will be assessed a monthly service charge at the following rate:

Service Charge

\$XX.XX

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Original Page No. 5**2. NON-RESIDENTIAL SERVICE****APPLICABILITY**

The rates under this schedule apply throughout the utility's service territory for service rendered on and after the effective date shown at the bottom of this page.

AVAILABILITY

The rates under this schedule are available to non-residential customers.

RATE

[Note: Equitable rates may be established through various methods; for the purposes of this model tariff, two example rate structure methodologies are depicted. The utility should select a methodology that best suits its situation and is fair and equitable to its customer base.]

a. Methodology I – Equivalent Residential Unit (ERU) Basis:

Each customer receiving service under this schedule will be assessed the following monthly service charge(s). The number of ERUs applicable to each property shall be calculated to the thousandth place and rounded down to the nearest hundredth place:

Service Charge

$$\text{Service Charge} = (\text{PGA}/\text{MRGA}) * \text{ERUR}$$

Where:

PGA	=	The customer's property gross area (sq. ft.) as observed or calculated by the utility rounded down to the nearest hundred square feet.
MRGA	=	The mean residential gross area (sq. ft.) calculated in determining the residential service charge.
ERUR	=	The residential service charge, which is the equivalent rate for one (1) ERU.

The minimum service charge assigned to a customer receiving service under this schedule shall be \$XX.XX.

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b. Methodology II – Parcel Area-Basis:

Each customer receiving service under this schedule will be assessed the following monthly service charge(s) according to the property's observed GA and IA, rounded down to the nearest hundred square feet:

Service Charge

GA Rate \$X.XXXX per sq. ft.

IA Rate \$X.XXXX per sq. ft.

Service Charge = (GAR * PGA) + (IAR * PIA)

Where:

GAR = GA Rate

PGA = The customer's property gross area (sq. ft.) as
observed or calculated by the utility rounded
down to the nearest hundred square feet.

IAR = IA Rate

PIA = The customer's property impervious area (sq. ft.)
as observed or calculated by the utility rounded
down to the nearest hundred square feet.

The minimum service charge assigned to a customer receiving service under this schedule shall be \$XX.XX.

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3. CONTRIBUTING MUNICIPALITY SERVICE

APPLICABILITY

The rates under this schedule apply for service rendered on and after the effective date shown at the bottom of this page.

AVAILABILITY

The rates under this schedule are available to all adjacent municipalities contributing stormwater to utility-owned facilities within the utility's service territory either directly or indirectly.

RATE

[Note: The method below depicts an option a utility may exercise to recover the cost of service provided by the utility at points or areas within its service territory to customers located outside of its service territory.]

Each customer receiving service under this schedule will be assessed a monthly service charge at the following rate(s):

Service Charge

Municipality 1: \$XXX,XXX

Municipality 2: \$XXX,XXX

TERMS

Rates charged to the contributing municipality shall be calculated based upon a hydrologic and hydraulic study, or by other recognized engineering methods, to quantify the extent to which properties, adjacent to the utility's service territory, are contributing stormwater runoff to utility owned facility(s) acting as the point(s) of service. The GA and IA characteristics shall be determined for each contributing property. Total GA and IA square footages shall be calculated based on the total area of the contributing properties. Multiplying the GA and IA square foot totals with the GA and IA rate per square foot will yield the contributing municipality's stormwater service charge.

The utility, alternatively, may determine the rate charged to the municipality by multiplying the number of contributing parcels by the regularly filed and published rates of this tariff, applicable to residential and non-residential customers within the utility's approved service territory.

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Agreement

Municipalities shall be provided with the option to enter into a mutually acceptable agreement in lieu of being subject to the utility's tariff, provided that such an agreement may not materially restrict the utility's ability to secure a fair return on its investment or unduly burden the utility's existing customers. If a mutually acceptable agreement cannot be achieved, the utility may propose rates under this schedule for such municipalities as part of a base rate proceeding before the Commission.

SECTION B: STORMWATER MANAGEMENT SERVICE CHARGE CREDITS**1. BEST MANAGEMENT PRACTICE CREDIT****APPLICABILITY**

The credits under this schedule apply throughout the utility's service territory for service rendered on and after the effective date shown at the bottom of this page.

AVAILABILITY

This credit is available to non-residential customers that: (i) have one or more utility approved Best Management Practices (BMPs) located on the customer owned property; (ii) are located on a property with an IA greater than X square feet; and (iii) are current with payments owed on all billed charges and fees on the customer's account and are otherwise in compliance with the Rules and Regulations of this Tariff.

DETERMINATION OF CREDIT

The amount of credit shall be based upon the benefit the utility receives from the approved BMP(s). The utility, at its sole discretion, will determine the amount of the credit to be provided to a customer and will provide the applicant a breakdown of the credit calculation. The maximum amount of credit shall be X% of the otherwise applicable monthly tariff charges. Customers whose properties contain BMPs funded, in whole or in part, by the utility may be provided a reduced credit under this schedule based upon the value of the utility's investment.

TERMSApplication and Application Fee

Customers must submit a completed BMP credit application. The current application will be available on the utility's website. Customers applying for this credit will be subject to a non-refundable application fee of \$X.

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Maintenance Agreement Required

As part of the BMP credit application process, and prior to the utility's approval of any BMP credit application, the customer will be required to sign a Maintenance Agreement, which will specify, among other things, the customer's responsibilities for maintenance of the approved BMP(s). The Maintenance Agreement is subject to revision by the utility from time to time, which will be communicated to the customer via the applicable notice provisions stated in the Maintenance Agreement, and the customer's agreement to any such revisions will be required to remain eligible for the credit.

Credit Expiration

This credit shall expire after X years. Customers may reapply to the utility to receive a credit under this schedule.

Credit Transfer

The credits approved under this section are not transferrable upon the sale of the property by the customer. A new credit application will be required for any customer seeking a credit under this schedule. The utility may require an inspection of any Stormwater Management (SWM) facilities or BMPs prior to granting a credit under the terms then in effect including, but not limited to, requiring the customer to enter into a new Maintenance Agreement with the utility.

Self-Certification and Compliance

Customers that fail to provide the utility with a completed self-certification form annually may become ineligible for this credit. Customers receiving this credit must notify the utility if the BMP becomes impaired, inoperable or is removed from the property within 10 business days of the event causing this condition. If a customer fails to maintain a BMP or SWM facility such that, in the utility's sole determination, it ceases to function or provide the stormwater runoff reduction in compliance with the performance standard, the utility may terminate the customer's credit within X days of notifying the customer.

Site Inspection

In accordance with Part III, Section G, Rule 12 of this Tariff, the utility has the right to inspect the parcel and BMP(s) to verify the information provided in the application and to verify ongoing compliance with the Tariff.

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2. ALTERNATIVE DISCHARGE METHOD CREDIT**APPLICABILITY**

The credit under this schedule apply throughout the utility's service territory for service rendered on and after the effective date shown at the bottom of this page.

AVAILABILITY

This credit is available to non-residential customers that: (i) use a utility-approved alternative discharge method that prevents at least X% of stormwater originating from the property from entering the utility's facilities; (ii) do not rely on utility facilities to manage stormwater in any manner; and (iii) are current with payments owed on all billed charges and fees on the customer's account and are otherwise in compliance with the Rules and Regulations of this Tariff.

METHODS

The following alternative discharge methods may be approved by the utility: (a) receiving water method; (b) National Pollutant Discharge Elimination System (NPDES) method.

a. Receiving Water Method

This method is available for properties that discharge stormwater directly into receiving waters through non-point source methods. Customers may apply to the utility to become eligible for this credit. Customers applying to become eligible for this credit shall provide the utility with a hydrological study and any engineering calculations required by the utility to demonstrate to the utility that the customer is eligible for this credit. Properties approved under this credit method shall be eligible for a credit of X% of the otherwise applicable monthly tariff charge(s).

b. NPDES Method

This method is available for properties that discharge stormwater into receiving waters as permitted under an approved NPDES Permit. Customers must apply to the utility to receive this credit and provide the utility with a copy of their effective NPDES permit. Customers must provide the utility with copies of renewal NPDES permits prior to the expiration date of NPDES permits previously provided to the utility to remain eligible for this credit. Additionally, customers must inform utility within X days of receipt of any violations of their NPDES permit or any such correspondence from a local, county, state or federal agency dealing with the detrimental quantity or quality of water being

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discharged from the property. Properties using this method shall be eligible for a credit of X% of the otherwise applicable monthly tariff charge(s).

TERMSApplication and Application Fee

Customers must submit a completed alternative discharge method credit application. The current application will be available on the utility's website. Customers applying for this credit will be subject to a non-refundable application fee of \$X.

Credit Expiration

This credit shall expire after X years or upon the expiration of a property's NPDES permit as applicable to the alternative discharge method. Customers may reapply to the utility to receive a credit under this schedule.

Credit Transfer

The credits approved under the NPDES method are not transferrable upon the sale of the property or transfer of the NPDES permit by the customer. A new application will be required upon the sale of the property or the transfer or expiration of the NPDES permit. The utility may require an inspection of the transferred NPDES permit prior to granting a credit under the terms then in effect.

Site Inspection

In accordance with Part III, Section G, Rule 12 of this Tariff, the utility has the right to inspect the parcel to verify the information provided in the application and to verify ongoing compliance with the Tariff.

Site Characteristics

The Customer is required to provide X days prior notice to the utility before the commencement of any modification to the property affecting greater than X% of the gross area which changes the site characteristics by increasing the impervious area, altering surface elevations, or otherwise changing the property hydrology. If a customer fails to notify the utility of property modifications, the utility may terminate the customer's credit within X days of notifying the customer.

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Original Page No. 12**SECTION C: MISCELLANEOUS CHARGES AND FEES****1. RETURNED CHECK CHARGE:**

A charge of _____ dollars (\$____.00) will be assessed any time where a check which has been presented to the utility for payment on account has been returned by the payer's bank for any reason. Terms and conditions regarding this charge are found in Section X, Rule and Regulation X.

2. LATE PAYMENT CHARGE:

A late payment charge will be assessed to any customer who fails to pay all of the amount invoiced by the utility in a timely manner as prescribed in Part III, Section D, Rule 3. A late payment charge of _____ percent (____%) per month on any overdue amount will be assessed in the utility's subsequent invoice.

3. FAILURE TO CLEANUP AND REMEDY PROHIBITED DISCHARGES CHARGE:

Failure of the owner of any property and/or customer to satisfactorily cleanup and remedy any prohibited discharge by act or omission, willfully, recklessly or negligently as characterized in Part III, Section E, within twenty-four (24) hours, will result in a penalty of X dollars (\$X), plus an additional X dollars (\$X) for each day thereafter of non-compliance. The owner and/or customer shall additionally be responsible for payment of the remedial cleanup costs, as well as any costs to or damages or losses suffered by the utility as a result of any interference in operation of the utility's systems.

The utility reserves the right to compel the discontinuance of the use of any system in order to prevent the discharge of any wastes to the stormwater or combined sewer system which may be deemed harmful to the stormwater or combined sewer system, or to have an adverse effect on effluent or discharge requirements by the applicable regulatory agencies.

4. CONNECTION PERMIT APPLICATION AND CUSTOMER FACILITIES INSPECTION CHARGE

A charge of X dollars (\$X.XX) will be assessed to the owner of an improved property to cover the costs incidental to the processing of a connection application and the inspection of the customer's facilities following installation. This charge shall be payable when the connection application is filed.

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PART II: DEFINITIONS

The following words and phrases, when used in this tariff shall have the meanings assigned below unless the context specifically and clearly indicates otherwise:

1. Applicant: Any person, at least 18 years of age, who has an interest in property located within the utility's service territory, including property owners, persons who have entered into an agreement, or other persons having a similar interest.
2. Association Property: A type of non-residential property, portions of which are designated for separate ownership and the remainder of which is designated for common ownership by the owners of these portions. Individual owners of fee simple property within the association property, regardless of the method of apportionment of the stormwater management service charge, shall be treated as residential customers.
3. Best Management Practices or BMPs: Activities, facilities, designs, measures or procedures used to manage stormwater runoff, control sediment, stabilize soil, reduce nonpoint source pollution and/or meet state water quality requirements. Refer to Pennsylvania Department of Environmental Protection's suggested guidelines for stormwater quality as defined in the current edition of the Pennsylvania Stormwater Best Management Practices Manual.
4. Combined Sewer System: A wastewater collection and/or conveyance system which collects and/or conveys both sanitary and stormwater flows.
5. Commission: The Pennsylvania Public Utility Commission.
6. Utility: ***(insert the Utility's Name)***, acting through its properly authorized agents or employees, each acting with the scope of the duties entrusted to them.
7. Utility Collection Mains: A network of pipes located in public highways, streets, alleys or any other public or private rights-of-way for the purpose of gathering stormwater from those public highways, streets, alleys or other public or private rights-of-way and conveying stormwater to a surface water body and/or a treatment or retention facility.
8. Customer: An owner of any property who by operation of law or agreement is responsible for payment of stormwater service charges. Customers are classified as either residential, non-residential or contributing municipality. Contributing municipalities may be customers by operation of law or agreement.

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9. Customer Facilities: The portion of any collection and/or conveyance asset connected to the utility's facilities from a property which is owned and maintained by one or more customers or property owners.
 10. Design Storm: The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence and duration, used in the design and evaluation of stormwater facilities, green infrastructure and gray infrastructure.
 11. Developed Property: A parcel altered from a natural state that contains an impervious area equal to or greater than X square feet.
 12. Developer: Any person(s) requesting an extension to provide service to an existing property or group of properties where service is to be provided to a property or structure other than a preexisting residential property or structure. This term also includes any person converting undeveloped property into developed property.
 13. Direct Connection: Customer facilities that discharge stormwater into utility facilities through any method other than sheet flow. Direct Connections include, but are not limited to, physical connections between customer facilities and utility facilities.
 14. Equivalent Residential Unit or ERU: A unit of measurement that equates and standardizes non-residential properties to the estimated equivalent amount of stormwater discharged by a typical residential property. One (1) ERU shall be equal to X square feet of impervious area and to X square feet of gross area.
 15. [Billing Unit] Adjustment: A change in the number of [billing units] assigned to a non-residential customer due to a difference between existing and updated [billing unit] Data.
 16. [Billing Unit] Data: Records accepted and used by the utility to determine the number of [billing units] assigned to a non-residential customer. Such records may include, but are not limited to, aerial imagery accepted by the utility, visual inspections performed by the utility, as-built drawings and land surveys.
 17. Extension: An addition to the utility's facilities to extend service within the utility's service territory to accommodate more than one customer.
 18. Facilities or Utility Facilities: All plant and equipment of the utility, including all tangible and intangible, real and personal property without limitation, and any and all means and instrumentalities in any manner owned, operated, leased,

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licensed, used, controlled, furnished, or supplied for, by, or in connection with, the business of the utility. This term does not include Customer Facilities.

19. Facility Owner: The person(s) responsible for operation and maintenance of a facility.
20. Garbage: Discarded solid waste generated by human activity including, among other things, paper, plastics, metals and food matter.
21. Gray Infrastructure: Structures or equipment engineered to collect, convey, capture, and/or store stormwater such as pipes, tanks, tunnels, manholes, basins.
22. Green Infrastructure: Structures or technology designed to capture, store, delay, or reduce the quantity and/or improve the quality of stormwater runoff reaching the utility's stormwater system.
23. Gross Area or GA: The area within the legally described boundaries of a property excluding streets, medians and sidewalks in the public right-of-way and railroad tracks and station platforms in the railroad right-of-way.
24. Impervious Area or IA: A surface which prevents or limits the infiltration of water into the ground including compacted or covered semi-pervious surfaces such as compacted earth or clay, gravel, most conventionally hardscaped surfaces such as streets, driveways, roofs, sidewalks, parking lots, walkways, patio areas, attached and detached structures, and other similar surfaces.
25. Infiltration: Any groundwater entering the system through cracks and defective joints in pipes.
26. Inflow: Any water discharged into the system through illicit connections such as foundation and roof drains, floor drains, sump pumps, outdoor paved areas, cooling water from air conditioners, and unpolluted waters.
27. Inspection(s): Examination of stormwater facilities or control measures, including but not limited to, reviewing all application materials, construction as-builts, maintenance records, and surrounding property attributes to ensure proper function.
28. Interference: A discharge which, alone or in conjunction with a discharge from other sources, does the following:
 - a. Inhibits or disrupts the stormwater treatment facilities, its treatment processes or operations or its biosolids processes, use or disposal; or

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- b. Is a cause of a violation of a requirement of the utility's NPDES permit(s) – including an increase in the magnitude or duration of a violation – or of the prevention of biosolids use or disposal in compliance with the following statutory provisions and regulations or permits issued there under – or more stringent State or local regulations:
- i. Section 405 of the Clean Water Act (33 U.S.C.A. § 1345).
 - ii. The Solid Waste Disposal Act (SWDA) (42 U.S.C.A. §§ 6901 – 6987), including Title II, more commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA).
 - iii. Regulations contained in the State's biosolids management plan prepared under Subtitle D of the SWDA, the Clean Air Act (42 U.S.C.A. §§ 7401 – 7642), the Toxic Substances Control Act (15 U.S.C.A. §§ 2601 – 2629) and the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C.A. §§ 1431 – 1434; 33 U.S.C.A. §§ 1401, 1402, 1411 – 1421 and 1441 – 1445).
30. Land Survey: A land survey completed by a Pennsylvania-registered land surveyor that shows a property's gross area, impervious area and types of surface materials, as appropriate, and any other information required by the utility.
31. Municipal Separate Storm Sewer System or MS4: Municipally owned and maintained real property, infrastructure or natural features used and/or constructed for purposes of transporting, conveying, retaining, detaining, or discharging stormwater runoff, fully separate of any wastewater collection system, subject to NPDES permitting requirements. See also Title 40 of the Code of Federal Regulations (CFR) 122.26 and CFR 122.30-122.37.
32. Non-Residential Property: Any property which is not considered residential property.
33. Non-Residential Service: Stormwater service supplied to any property that is not considered residential property.
34. National Pollutant Discharge Elimination System or NPDES Permit: National Pollutant Discharge Elimination System permit or equivalent document or requirement issued by the Environment Protection Agency, or if appropriate, by the Pennsylvania Department of Environmental Protection, to regulate the discharge of pollutants under Section 402 of the Clean Water Act (33 U.S.C.A. § 1342).

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35. Nuisance: A public nuisance as known in common law or in equity jurisprudence; whatever is dangerous to human life or detrimental to health or the environment.
36. Owner: Any person(s) vested with title, legal or equitable, sole or partial, of any property.
37. Person: Any individual, at least 18 years of age, partnership, utility, association, society, trust, corporation or other group or entity, including municipalities, municipal authorities, school districts and other units of government, and lessee, assignee, receiver, executor, administrator and other successors in interest.
38. Pollutants: Dredged spoil, solid waste, incinerator residue, filter backwash, wastewater, garbage, stormwater treatment biosolids, munitions, medical wastes, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, municipal, agricultural, commercial and industrial wastes, and certain characteristics of wastewater.
39. Point of Service: The point at which stormwater runoff originating from one or more properties enters utility facilities. Such entry may be at an approved direct connection or other utility stormwater collection inlets or retention structures.
40. Premises: Unless otherwise indicated, the customer's property.
41. Property: Any parcel of land owned in fee simple absolute, including any home(s), condominium(s), homeowner's association or building(s) affixed thereto, which is delineated by the description contained on the recorded deed, and which may be further delineated by any public roads, that contributes stormwater runoff to the utility's facilities. Each property is either a developed property or an undeveloped property.
42. Property Owner: The person having an interest as owner, or a person representing themselves to be the owner, whether legal or equitable, sole or partial, in any property that is provided stormwater service by the utility.
43. Residential Property: Property used exclusively for residential purposes with at least one and no more than four dwelling units and which cannot be classified as condominium property. Each residential property is considered to be a residential customer.
44. Residential Service: Stormwater service supplied to a residential property.

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45. Regulatory Agency: Agencies, including but not limited to the Pennsylvania Public Utility Commission (PUC), the Pennsylvania Department of Environmental Protection (DEP), U.S. Environmental Protection Agency (EPA), and the river basin commissions, which have authority over the operations and/or discharges into and/or from the utility's stormwater system. This term also includes any local, state or federal government agency with jurisdiction over a property.
46. Runoff: Any water flow, resulting from either naturally occurring precipitation, snowmelt or human activity, that is not immediately absorbed into the ground and travels along the ground surface potentially picking up pollutants until it is absorbed, collected or reaches a receiving water body.
47. Service Territory: The land area where the utility has the exclusive right to provide stormwater service. The boundaries of this land area were approved by the Pennsylvania Public Utility Commission in an order dated **(insert entered date)**, in accordance with its certificate of public convenience at docket no. **(insert docket no.)**.
48. Sheet Flow: Runoff which flows over the ground surface as a thin layer, not concentrated in a channel.
49. Stormwater Credit: A temporary reduction to the stormwater management service charge available to a non-residential customer for implementing certain eligible activities or property conditions.
50. Stormwater Management Facility or SWM Facility: Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, infiltrates, evaporates, transpires, cleans, or otherwise affects stormwater runoff.
51. Street: Any cart way, road, highway, lane, avenue, court, cul-de-sac, alley public way or public square, including such streets as are dedicated to public use.
52. Stormwater: Any water flow occurring during or resulting from any form of natural precipitation, including snowmelt.
53. Surface Discharge: The discharge of stormwater runoff from a property to an adjacent surface water body without the use of utility infrastructure.
54. Stormwater Management Service Charge or SMSC: The service charge imposed by the utility hereunder, as amended from time to time, against each customer for the use of the stormwater system.
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55. Stormwater System: A system of collection and conveyance facilities, including, but not limited to, underground pipes, conduits, mains, inlets, culverts, catch basins, gutters, ditches, manholes, outfalls, dams, flood control structures, channels, detention ponds, public streets, curbs, drains and all devices, appliances, appurtenances and facilities appurtenant thereto used for collecting, conducting, pumping, conveying, detaining, discharging and/or treating stormwater. The stormwater system shall further be defined to include the combined sewer and municipal separate storm sewer systems and to include utility facilities and any customer facilities contributing stormwater to the utility's facilities.
56. Tariff: All service rates, charges, rules and regulations issued by the utility, together with any supplements or revisions thereto, officially approved by the commission and contained in this document.
57. Toxic Substances: Any gaseous, liquid or solid waste substance which, when discharged to the utility's facilities in sufficient quantities, will be detrimental to any biological stormwater treatment process, constitute a hazard to human beings or animals, inhibit aquatic life, or create a hazard to recreation in receiving waters of the effluent from the stormwater treatment plant, as defined pursuant to PL 92-500 (federal water pollution control act amendments of 1972) or its amendments.
58. Undeveloped Property: Any property that is not considered developed property.
59. Wastes: Any liquid, gaseous, or solid substances or combination thereof which are discarded, leached, or spilled substances or combination thereof including wastewater but excluding unpolluted, storm and ground waters.
60. Wastewater: Any used water carrying household and toilet wastes, water-carried solids or industrial wastes discharged from any developed property and any water resulting from inflow and infiltration, stormwater, which is or is to be, mixed with water as described herein within a combined sewer system or water as may be present in utility collection mains and laterals. This term does not include stormwater collected in a MS4.

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PART III: RULES AND REGULATIONS**SECTION A: STORMWATER SERVICE**

All properties within the utility's stormwater service territory shall be subject to the rules and regulations described herein.

1. Service Application Required for Properties Not Served As of XX/XX/XXXX:

The utility may serve additional properties not served by the utility as of XX/XX/XXXX only after each of the following conditions are met:

- a. The utility must receive an application for service. The utility, at its sole discretion, may require applicants to sign separate applications. All applications must be in writing on an application form provided by the utility and signed by one or more of the following:
 - i. The owner(s) of the property to which service will be provided.
 - ii. A regulatory agency with jurisdiction over the properties.
- b. The utility has applied for and received approval from the Commission to provide stormwater service in the geographic location of the property requesting service.
- c. The utility's tariff rules and regulations governing main and facility extensions have been satisfied.

2. Change in Ownership:

Customers shall be responsible for service charges until the utility receives evidence of a recorded land transfer. The Utility shall apply service charges until the day prior to the effective date of the recorded land transfer. A new application must be made to the utility upon any change in ownership where the owner of the property is the customer, or upon any change in the identity of a lessee where the lessee of the property is the customer.

3. Acceptance of Application:

An application for service shall be considered accepted by the utility only upon written approval by the utility. The utility may provide service to the applicant pending formal review and acceptance of the application. The person(s) making the application must sign the same and will be considered the customer(s) under the contract and will be responsible for all charges and proper observance of these rules and regulations.

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4. Application Form:

An application for service form can be obtained at the utility's local business office, presently located at **(utility's business office address)**.

5. Application to Transfer Ownership of Customer Stormwater Facilities:

Customer facilities may become utility facilities only upon ownership transfer by the private owner(s) and acceptance by the utility. The utility may require the customer to provide any necessary easements or rights-of-way or perform or cause to be performed repairs or replacements deemed necessary by the utility, as a condition of accepting facilities.

6. Notice of Availability of Stormwater Service and Billing After Notice:

At the time of filing an application to operate and maintain facilities to serve properties in an area not previously served by the utility, the utility shall provide individual notice to such properties. Such properties shall become customers of the utility and shall be subject to the utility's tariff upon Commission approval of the utility's application.

7. Direct Connections:

Any customer wishing to construct a direct connection to utility facilities must apply to the utility to request service by direct connection. All applications must be in writing on an application form provided by the utility. The utility will review all applications and decide whether a direct connection may be approved based upon the available capacity of the utility's facilities. Approval of the application shall be at the utility's sole discretion.

8. Properties With Multiple Owners:

Notwithstanding where a property has more than one owner, all property owners jointly and severally shall be responsible for payment of utility charges. The utility will not issue separate bills, divide applicable charges or take any other action to modify its standard policies and practices for such properties.

SECTION B: CONSTRUCTION AND MAINTENANCE OF CUSTOMER'S FACILITIES

1. Customer's Responsibilities:

All customer facilities including building service lines, connections, cleanouts, traps, interceptors, separators and screens furnished by the owner shall be maintained by the owner in good working order. All pipes, connections, couplings, valves, meters and fixtures furnished by the utility and on property owned or leased by the customer shall be protected properly by the customer. When there is a backup in the premises, the

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customer should contact the utility's office to report the problem. The utility will dispatch an authorized representative or agent to inspect its facilities to investigate the cause of the problem and will inform the caller of their findings. This inspection service is provided free of charge. The customer is responsible for the immediate repair of any leaks or blockages hindering the operation of their facilities. The utility shall not be liable for any damage or expense resulting from leaks, stoppages or defective plumbing or from any other cause occurring to any premises or within any building or structure when such damage or expense is found to have resulted from stoppage, damage or defects in customer facilities. The utility shall not be liable for a deficiency or failure of service when occasioned by an emergency, required repair, or failure from any cause beyond its control.

2. Right to Reject and Test:

The utility may refuse to furnish service through a direct connection already connected if such direct connection is not properly installed, maintained, tested, repaired or replaced to the satisfaction of the utility. The utility at any time may request a gravity sewer test be performed on the direct connection, at the sole expense of the owner, whenever it has evidenced the direct connection is experiencing excessive inflow and/or infiltration into the system. The leakage is excessive when the groundwater flow exceeds XX gallon per inch of nominal diameter per mile of pipe per day. The Gravity Sewer Test shall be in accordance with Section 312.6 of the International Plumbing Code®.

3. Individual Direct Connection Requirements:

Except as otherwise expressly authorized by the utility, each property shall be served primarily by sheet flow or by an approved direct connection. No additional attachment may be made to direct connections for any purpose without the express written approval of the utility. Direct connections shall not pass through or across any property other than that to be served.

4. Direct Connection to Utility's Facilities:

No direct connection shall be made to utility facilities without prior permission from the utility through an application for a direct connection.

- a. The customer's facilities shall be installed in a workmanlike manner and shall conform to all rules and regulations of the utility.
- b. Where a customer is required and approved to install a direct connection, the utility will specify the size, kind, quality and location of all materials used in the customer's facilities and the customer shall comply with those specifications.

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- c. Customers must maintain their facilities in good condition and free from defects at the customer's cost and expense.
- d. The utility shall make changes and bear the full cost of direct connection changes required due to changes in grade, relocation of utility facilities and other causes not related to the customer. The customer shall bear the full cost of direct connection changes desired by the customer for the customer's convenience.

5. Change in Location:

Whenever a change in location of utility facilities is ordered by a municipality, the utility and the municipality shall rely upon prior records to establish the antecedence of the land or easement rights of each entity to determine if such changes will be made at the expense of the municipality or the utility.

SECTION C: CONNECTION MANAGEMENT AND DISCONNECTIONS

1. Stormwater Connections to Combined Sewer System

No person shall install any new direct connection to discharge stormwater or groundwater drainage to the stormwater system, or undertake any modification that increases the flow of stormwater or groundwater being discharged via an existing direct connection to the stormwater system, without completing an application and receiving approval from the utility. Consideration and issuance of any connection application is subject to the following:

- a. No new or increased discharge of stormwater or groundwater to the combined sewer system will be permitted if MS4 facilities or receiving streams exist in a reasonable proximity to the proposed connection to the combined sewer system. The person seeking a connection permit must demonstrate to the satisfaction of the utility that the discharge of stormwater or groundwater flows to anywhere but to the combined sewer system is not (i) technically or economically feasible or (ii) permissible under applicable environmental regulations.
- b. No new or increased discharge of stormwater or groundwater will be allowed unless there is adequate capacity in the combined sewer system, and such flows can be managed in compliance with all laws and requirements applicable to the combined sewer system. When known or potential hydraulic capacity overloads exist or may be created as the result of the proposed new or modified direct connection to the combined sewer system, the utility reserves the right to require a detailed hydraulic

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study of the affected portion of the combined sewer system. The work and cost associated with such study shall be paid for by the party seeking the connection.

- c. Any new or modified direct connections involving the discharge of stormwater or groundwater to the combined sewer system shall comply with all applicable state regulations and municipal ordinances.
- d. In the case of new or modified direct connections from a property that is presently contributing stormwater or groundwater to a combined sewer system, the peak rate of discharge must be controlled. The peak rate of discharge to the combined sewer system after development or improvement shall be no greater than XX% of the peak rate of discharge to the combined sewer system prior to development or improvement under storm conditions for a X-year rainfall event. Refer to most current edition of the Pennsylvania Stormwater Best Management Practices Manual.
- e. Except where specifically approved by the utility, all new sanitary sewers laterals and mains shall be separate from stormwater laterals and mains.
- f. If a connection to the combined sewer system, is permitted as provided above: (1) any facilities using the direct connection to the combined sewer system shall utilize inlet structures equipped with devices to prevent solids and floatable debris from entering the combined sewer system of a design approved by the utility; and (2) the connection shall be made to an existing or new manhole or other utility approved structure that complies with design standards prescribed by the utility.
- g. No downspout gutter shall be connected to the combined sewer system.

2. Stormwater Disconnections from the Combined Sewer System:

When the utility, either through its planned replacement program or any other maintenance or emergency activity related to a combined sewer system, discovers an illegal or historical stormwater direct connection extending from a property to said combined sewer system, the utility will take all actions necessary to remove those stormwater direct connections from the combined sewer system to conform with the EPA's CSO Policy and the Nine Minimum Technology-Based Controls.

3. Notice and Timing of Disconnection and/or Termination of Water Service:

The utility will notify the customer in writing when one or more conditions that warrant disconnection is/are discovered, including violations of Rule 1, c., e. or g. of this section.

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Notice of disconnection will be given in such a manner as may be specified in the Public Utility Code, 66 Pa. C.S. §§ 101 et seq. The utility reserves the right to terminate water service to the property until these conditions are corrected, consistent with the utility's water tariff and applicable agreements between the utility and other entities that provide water service to the utility's customers.

A reasonable time will be allowed to investigate, correct or cure the condition(s) specified when the customer provides written notification to the utility of a realistic time schedule. A customer who does not notify the utility is subject to disconnection without further notice from Monday through Friday.

SECTION D: BILLING1. Issuance of Bills:

The utility will bill each customer within fifteen (15) days of the last day of each billing period.

2. Billing Due Date:

The due date for payment of a bill for residential service shall be no less than twenty (20) days from the date of transmittal. The due date for payment of a bill for non-residential service shall be no less than fifteen (15) days from the date of transmittal. If the last day for payment falls on a Saturday, Sunday or bank holiday, or on any day when the offices of the utility are not open to the general public, the due date shall be extended to the next business day. Failure to receive a bill shall not relieve the customer from their payment obligation. Pending BMP or alternative discharge method credit applications shall not relieve the customer from their payment obligation. The presentation of bills to customers is a matter of accommodation and not a waiver of this rule. For bills paid by mail, the date of the postal service postmark is considered the payment date.

3. Late-Payment Charge:

All amounts not paid when due shall accrue a late-payment charge. The utility may not impose a late-payment charge unless payment is received more than five (5) days after the billing due date. Such charge shall be calculated every thirty (30) days thereafter only on the overdue portion of the bill excluding previous late charges.

4. Change in Billing Address:

Where a customer fails to notify the utility of a change in billing address, the customer shall remain responsible to remit payment by the billing due date.

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5. Application of Payment:

Utility bills rendered by the utility that include amounts due for other regulatory utility service in addition to stormwater service, the customers remittance to the utility shall first be applied to outstanding regulated stormwater charges, then wastewater, and then water service.

6. Return Check Charges:

The customer will be responsible for the payment of a charge, for each time a check or automatic transfer of funds is presented to the utility for payment on a customer's bill, if the check is returned by the bank for any reason including, but not limited to, insufficient funds, account closed, payment stopped, two signatures required, post-dated, stale date, no account, drawn against uncollected funds or unauthorized signature. This charge is in addition to any charge, which may be assessed against the customer by the bank.

7. Disputed Bills:

In the event of a dispute between the customer and the utility with respect to any bill, the utility will promptly make such investigation as may be required by the particular case and report the result to the customer. The customer is not obligated to pay the disputed amount during the pendency of the utility's investigation. When the utility has made a report to the customer sustaining the bill as rendered, the customer shall have fifteen (15) days from the date of such report in which to pay the bill. If the utility determines that the bill originally rendered is incorrect, the utility will issue a corrected bill with a new due date for payment. Any amounts received by the utility in excess of the amount determined to be due by the utility's investigation of the dispute shall be refunded to the customer.

8. [Billing Unit] Adjustments:

[Note: Billing Unit will be replaced with ERU or Parcel Area depending on the rate methodology chosen by the utility]

The determination of the number of [Billing Units] applicable to a non-residential customer may be adjusted from time to time as more accurate information is obtained or the condition of the property is altered, consistent with the following:

- a. If a [Billing Unit] adjustment will increase a customer's bill, the following shall apply:

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- i. For [Billing Unit] adjustments occurring outside of a base rate case filed with the Commission, the utility will provide written notice to the customer at least sixty (60) days in advance of the effective date of the [Billing Unit] adjustment.
 - ii. For [Billing Unit] adjustments occurring concurrent with a base rate case filed with the Commission, the utility will include information regarding the [Billing Unit] adjustment in its written notice to the customer. The utility may delay the effective date of the [Billing Unit] adjustment until the conclusion of the base rate case.
- b. If a [Billing Unit] adjustment will decrease a customer's bill, the following shall apply:
 - i. The effective date of the [Billing Unit] adjustment shall be the date the utility received or collected the [Billing Unit] data that resulted in the [Billing Unit] adjustment.
 - ii. Any amounts received by the utility in excess of the amount determined to be due by the utility shall be provided as a credit to the customer's account. If the excess amount is greater than the customer's next bill, the utility shall refund the difference between the excess amount and the customer's next bill upon request by a customer.

9. Limitation of Liability for Reliance on [Billing Unit] Data

The utility will undertake to use reasonable care and diligence to ensure [Billing Unit] data is accurate but cannot and does not guarantee the accuracy of [Billing Unit] data. The utility's liability to a customer for any loss or damage from reliance on [Billing Unit] data shall be limited to an amount no more than amounts received by the utility in excess of the amount determined to be due by the utility's investigation of the dispute.

10. Appeal Procedure:

All customers shall comply with the following appeal procedure:

- a. For All Customers:
 - i. All appeals shall be made using forms supplied by the utility.
 - ii. All customers may appeal the classification of their property.

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- iii. The grounds supporting the basis of the customer's appeal shall be stated in writing and shall include any exhibits, such as photographs, drawings or maps, site plans, and affidavits that support the claim.
 - iv. The customer filing the appeal is solely responsible to demonstrate, by clear and convincing evidence, that the information used by the utility is erroneous.
 - v. The filing of an appeal shall not prevent the imposition, calculation or duty to pay undisputed amounts.
- b. For Non-Residential Customers:
- i. Non-residential customers may appeal the [Billing Unit] calculation for their property if the appeal would result in a material change in the number of calculated [Billing Units] for their property. A material change is a change that would decrease the non-residential customer's monthly stormwater management service charge by more than \$X.
 - ii. Non-residential customers may appeal [Billing Unit] adjustments.
 - iii. For properties with more than X [Billing Unit], a land survey shall be attached to non-residential customer appeals. The utility may waive the submission of a land survey if the utility determines the land survey is not necessary to make a determination on the appeal.

SECTION E: STORMWATER CONTROL REGULATIONS

1. Prohibited Stormwater Discharges:

No person shall cause or permit to be discharged into the utility's stormwater system any pollutants, substances, or stormwater having any of the following characteristics:

- a. Stormwater containing any gasoline, benzene, naphtha, fuel oil or other explosive liquids, or solids which by reason of their nature or quality may cause a fire or explosion, or be in any other way injurious to persons, the structures, or equipment of the stormwater system, or its operation.
- b. Stormwater containing ashes, cinders, sand, litter, mud, straw, shavings, metal, glass, tar, rubber, plastics, wood, bottles, cans, utensils, shoes, rags, clothing, undergarments, hand towels, cotton, wool, or other fibers, chemical or paint residues, feathers, hair and fleshing, bone, entrails, whole blood, paunch, manure, butcher's offal, lime slurry or any other solid

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or viscous material of such character or in such quantity as in the opinion of the utility may cause an obstruction to the flow in the utility collection mains or otherwise interferes with the proper operation of the stormwater system.

- c. Stormwater containing any pollutants or substances, including conventional pollutants or substances released at a flow rate and/or concentration that may cause interference with the operation of the stormwater system.

2. Disposal of Wastes from Holding and Septic Tanks or Cesspools

No person shall dispose of wastes from holding and septic tanks, cesspools, or other such sources of domestic waste to the utility's stormwater system.

3. Damage to System and Indemnification

In the event of any damage to the utility's stormwater system caused by a customer, such damage shall be immediately reported to the utility and said customer shall reimburse utility for the costs of repairs.

SECTION F: UTILITY COLLECTION MAIN EXTENSIONS FOR A BONA FIDE SERVICE APPLICANT

1. Request by a Bona Fide Service Applicant:

When the applicant making an application for stormwater service is determined by the utility to be a bona fide service applicant, the utility will execute an extension agreement for a bona fide service applicant to the extent that the contents do not materially handicap its ability to secure a fair return on investment or does not unduly burden its existing customers consistent with the following directives:

- a. The collection main extension will be funded by the utility without a customer advance from the bona fide service applicant where the annual revenue from the collection main extension will equal or exceed the utility's annual collection main extension costs.
- b. If the annual revenue from the collection main extension will not equal or exceed the utility's annual collection main extension costs, a bona fide service applicant may be required to provide a customer advance towards the utility's cost of construction for the collection main extension. The utility's investment for the collection main extension shall be the portion of the total construction costs which generate the annual collection main

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extension costs equal to annual revenue from the collection main extension. The customer advance amount shall be determined by subtracting the utility's investment for the collection main extension from the total construction costs.

- c. The utility's investment for the collection main extension shall be based on the following formula, where x equals the utility's investment attributed to each bona fide service applicant:

X = [AR - OM] divided by [I + D]; where:

AR = the utility's annual revenue,

OM = the utility's operating and maintenance costs,

I = the utility's current debt ratio multiplied by the utility's weighted long-term debt cost rate, and

D = the utility's current depreciation accrual rate.

2. Definitions:

The following words or phrases, when used in this section shall have the meanings assigned below unless context specifically and clearly indicates otherwise.

- a. Annual Collection Main Extension Costs: the sum of a utility's additional annual operating and maintenance costs, debt service costs and depreciation charges associated with the collection main extension.
- b. Annual Revenue: the utility's expected additional annual revenue from the collection main extension based on the utility's currently effective tariff rates and on the average annual usage of customers similar in nature and size to the bona fide service applicant.
- c. Bona Fide Service Applicant: a person applying for stormwater service to an existing or proposed structure within the utility's service territory for which a valid occupancy or building permit has been issued if the structure is either a primary residence of the applicant or a place of business. An applicant shall not be deemed a bona fide service applicant if:
- i. An applicant is requesting stormwater service to a building lot, subdivision or a secondary residential dwelling;

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- ii. The request for service is part of a plan for the development of a residential dwelling or subdivision; or
 - iii. The request for service requires special utility service.
- d. Collection Main Extension: an extension to the utility existing collection main system which is necessary to serve a bona fide service applicant's property located within the utility's service territory.
- e. Debt Service Costs: the utility's additional annual cost of debt associated with financing the collection main extension's investment based on the current debt ratio and weighted long-term debt cost rate for the utility, or that of a comparable jurisdictional wastewater utility.
- f. Depreciation Charges: the utility's additional annual depreciation charges associated with the collection main extension's investment, based on the current depreciation accrual rates for the utility, or that of a comparable jurisdictional wastewater utility.
- g. Operating and Maintenance Costs: the utility's average annual operating and maintenance costs associated with serving an additional customer, including customer accounting, billing and collection, power, chemicals, and other variable costs based on the current total utility level of such costs, as well as costs particular to the specific needs of that customer.
- h. Special Utility Service: A person or entity applying for stormwater service to an existing or proposed structure within the utility's service territory will be deemed to be requesting special utility service if one or more of the following applies. An otherwise bona fide applicant requesting service which includes a special utility service component is entitled to bona fide applicant status, including the corresponding contribution toward the costs of the collection main extension which do not meet the special utility service criteria:
- i. If the property's stormwater service needs exceed that required for one (1) [Billing Unit] of stormwater discharge;
 - ii. If the property's stormwater discharge needs are already adequately met by an alternative means; or
 - iii. If the property requires the installation of facilities such as oversized mains, booster pumps or storage tanks to provide adequate service.

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3. Customer Advance Financing, Refunds and Facilities on Private Property:

- a. When a customer advance is required from a bona fide service applicant, and an additional customer or customers are served by the collection main extension within a ten (10) years period, the utility shall refund a portion of the advance to the customer. Deposits made for additional facilities other than the collection main extension are contributions-in-aid-of-construction and are not refundable.
- b. The utility will refund to the bona fide service applicant, during a period of ten (10) years from the signing date of the final memorandum, a per customer amount for each additional bona fide service applicant served by such collection main extension, as distinguished from extensions or branches thereof. Provided, however, that the total amount refunded shall not exceed the original deposit without interest, and provided that all or any part of the deposit not refunded within the said ten (10) year period shall become the property of the utility, and shall be treated as contributions-in-aid-of-construction for ratemaking purposes. The per customer refund amount shall equal the utility's investment attributed to each bona fide service applicant as calculated in the formula contained in Section G, Rule 1, Subsection c. of this tariff.
- c. The utility shall require the bona fide service applicant to pay in advance a reasonable charge for any equipment or devices installed on private property for the exclusive use of the bona fide service applicant. These other facilities which may be installed by the utility, will be owned by, maintained by, and will become the sole responsibility of the bona fide service applicant.
- d. Section G, Rule 1, a. through c. of this tariff does not apply to special utility service. By way of illustration and not limited to, special utility service component shall include: the cost for installation of facilities such as a manhole for the purpose of sampling, measurement, and observation of a discharge, an oversized collection main or installation of or upgrade of existing pumping facilities as necessary to provide adequate service to the bona fide service applicant. An otherwise bona fide service applicant requesting service which includes a "special utility service" component is entitled to bona fide service applicant status, including the corresponding utility contribution toward the costs for the collection main extension which does not meet the special utility service criteria.

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4. Utility Collection Main Extensions for a Developer

- a. A developer who wants to request stormwater service to an area outside of the utility's existing service territory shall execute a collection main extension agreement. The construction cost of the collection main extension shall be estimated and shown in the preliminary memorandum. A master agreement may be executed where collection main extensions are to be made in phases over a period of time. A separate agreement and payment of a separate customer advance shall be made with each phase.
- b. The preliminary memorandum shall include a fee for the utility's administrative, engineering and inspection costs to be paid by the land developer. The utility's construction overhead costs which relate to its administrative, engineering and inspection expenses will be expressed as a percentage rate shall be applied to the land developer's estimated and final cost of construction and is intended to offset the administrative, engineering and inspection costs that are incurred by the utility as a result of the project.
- c. The developer shall be required to install the collection main extension and appurtenances through a pre-qualified contractor retained by the land developer and to pay all costs related thereto. The utility shall supply the developer with a list of utility approved contractors. At the sole discretion of the utility, the utility may undertake construction of all or part of the facilities otherwise subject to this section, in which event the developer will retain financial responsibility for the installation of collection mains and appurtenances as specified.
- d. All construction costs, whether initially incurred by the developer or the utility, related to the collection main extension shall be the responsibility of the land developer.
- e. Collection mains and appurtenance installation work shall be performed in accordance with the specifications and conditions of the utility.
- f. All costs of materials, installations, permits, inspection and the utility's construction overhead costs required to serve the developer's property shall be the responsibility of the developer. The developer shall contract directly with a pre-qualified contractor, recognized and approved by the utility, for all collection mains and appurtenances required to serve the project.

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- g. Any construction involving pre-existing facilities of the utility including, but not limited to, relocation of existing facilities and connection of collection mains or direct connections with existing facilities shall be the responsibility of the developer.
 - h. The developer's estimate of the cost for the project must be acceptable to the utility. Estimates which appear to be inaccurate may be rejected by the utility.
 - i. The developer shall obtain all necessary permits from federal, state and local authorities. If any of these authorities require the utility to obtain such permits, the utility will apply for the permits, at the developer's expense.
 - j. All construction shall be subjected to inspection by the utility's employees or agents. No trenches shall be backfilled prior to approval from the utility's inspectors.
 - k. The developer shall supply the utility with an accurate "as built" set of plans for the construction project. This set of "as built" plans shall be created in accordance with the standards and specifications of the utility. The developer's engineer of record shall provide a letter certifying the "as built" information is correct, and that all necessary properties, easements and/or rights-of-way has been identified with running descriptions.
 - l. The utility, in its sole discretion, will not accept ownership of the facilities or provide stormwater service to any connection therefrom until the utility determines:
 - i. That all construction related to the collection mains and appurtenance installation work is properly completed in accordance with the official plans and specifications;
 - ii. That all of the facilities are acceptable for public service;
 - iii. That the utility costs have been paid;
 - iv. That a proper accounting of construction costs has been provided to the utility;
 - v. That the utility received certified copies of all legal instruments, duly recorded in the county office of the recorder of deeds, describing the necessary properties, easements and/or right-of-way; and

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- vi. That the utility has received the "as built" plans and the letter from the engineer of record, as specified above.
- m. Following acceptance of the completion of all items specified above, ownership of all the facilities shall be transferred to the utility, at no cost to the utility and free and clear of any liens.
- n. At the time of transfer of ownership of the facilities to the utility, the customer shall provide, at no cost to the utility, all appropriate rights-of-way with any and all easement dedications that are necessary for future access to repair, maintain, replace or other related reasons.
- o. Upon completion of the ownership transfer, a final memorandum shall be prepared and completed by the land developer and signed by both parties showing the actual costs and the utility construction overhead costs.
- p. The developer shall warrant and be responsible for all maintenance of facilities constructed by the developer and holds the utility harmless against all costs, expenses and losses, including, without limitation, incidental and consequential damages resulting from any defects in the facilities, including, without limitation, defects in materials and workmanship, which are discovered or arise within a one (1) year period following the signing of the final memorandum as described in paragraph 15 above. As security for the developer's performance of its representation and warranty, simultaneously with the conveyance of the facilities to the utility, the developer shall deliver to the utility an executed performance bond or another utility approved financial instrument, in form and substance satisfactory to the utility. The performance bond shall be in the amount of one hundred percent (100%) of the total actual costs including the utility's construction overhead costs. The performance bond shall have as the surety thereon such surety utility, acceptable to the utility, as is authorized to write bonds of such character and amount under the laws of the Commonwealth of Pennsylvania. The attorney-in-fact, or other officer who signs the bond for a surety utility, must file with such bond a certified copy of their power of attorney authorizing them to do so. Subject to the approval of the utility, the land developer may elect to deliver to the utility a performance bond in compliance with all requirements herein and in a form acceptable to the utility, from the developer's contractors as the principal with the developer and the utility as co-obliges. The performance bond shall remain in force for a period of two (2) years, beginning on the date of transfer for the ownership of the facilities to the utility, as defined herein.
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- q. Once the utility is aware of a defect in the facilities, the developer will be notified of the defect(s) within ten (10) business days. If the developer fails to make or commence timely repairs or replacements of any defects in the facilities discovered or arising within the said two (2) year period, the developer or their surety shall be liable to the utility for all costs arising there from. All documents referred to in or required by this paragraph, and the prior paragraph, shall be a form acceptable to the utility.

5. Nuisance Abatement

Where it is prudent, reasonable and in the public interest, the utility may, at its option, enter into nuisance abatement contracts with regulatory agencies which depart from the standard terms of the utility's collection main extension agreements. The regulatory agency must demonstrate, to the utility's satisfaction, that one or more existing conditions on one or more properties is/are a nuisance and that an extension of utility facilities would abate this nuisance. These nuisance abatement agreements shall become effective thirty (30) days after the utility has filed a copy thereof with the Commission, or in the event that the Commission institutes an investigation, at such time as the Commission grants its approval thereof.

6. Customer Facility Investment Program

Where it is prudent, reasonable and in the public interest, the utility may, at its option, enter into contracts or agreements with property owners to finance or guarantee a project involving the construction or improvement of privately-owned stormwater facilities. These agreements shall become effective thirty (30) days after the utility has filed a copy thereof with the Commission, or in the event that the Commission institutes an investigation, at such time as the Commission grants its approval thereof.

One or more property owner(s) may apply to the utility, on an application form provided by the utility, for the utility to consider their proposed project. Each year, the utility shall publish on its website the amount of funding available under this program. If the amount of funding available under this program is greater than \$0, the following shall apply:

- a. Projects eligible for funding under this program must have an estimated construction or improvement cost greater than \$X.
- b. The utility shall announce the projects selected under this program every X months.
- c. The utility's prioritization of projects, and the amount of the utility's funding/guarantee, shall be based upon the following factors:

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-
- i. The project's financial benefit to the utility;
 - ii. The project's ability to reduce stormwater runoff; and
 - iii. The project's ability to improve water quality.
- d. The utility may provide one or more of the following:
- i. Grant funding, which may be based upon, in whole or in part, the customer providing funding equal to the amount of the utility's contribution;
 - ii. Loan funding, which may be based upon, in whole or in part, the applicant's ability to secure the loan and the applicant's selection of a fixed or variable interest rate; or
 - iii. A loan guarantee by the utility.

SECTION G: GENERAL

1. Limitation of Liability of Utility for Damages

The utility's liability to a property owner for any loss or damage from any excess or deficiency in stormwater service due to any cause other than willful misconduct or negligence by the utility, its employees or agents shall be limited to an amount no more than the customer charge or minimum bill for the period in question. The utility will undertake to use reasonable care and diligence in order to prevent and avoid any excess or deficiency in stormwater service but cannot and does not guarantee that such will not occur. The utility shall not be considered in any manner an insurer of property or persons against loss or damage by stormwater, or otherwise. The utility shall not be liable in any action where the loss or damage involves an act of God, force majeure or does not involve a duty of the utility.

2. Responsibility for Property Owner and Customer Facilities

The utility shall not be liable for any loss or damage caused by reason of any breaks, leaks, stoppages or other defects in property owner or customer-owned facilities including pipes, joints, fixtures or other installations except where the expense or damage is a result of the negligence or willful misconduct of the utility, its employees or agents.

The maintenance, repair and replacement of privately-owned facilities is the responsibility of the property owner or the customer served by such facilities.

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The utility reserves the right to require the property owner or the customer served by privately-owned facilities to repair or replace such facilities, or enter into a main extension agreement, at the property owner or customer's option, if such facilities are in disrepair, can no longer be used for whatever reason or are determined by the utility or a court of competent jurisdiction to be a nuisance. The property owner or customer must perform such repair or replacement at the property owner or customer's own expense. The property owner or customer must perform such repair or enter into a main extension agreement immediately after receiving notice from the utility that the privately-owned facilities are a nuisance or within ten days after receiving notice from the utility that the privately-owned facilities are in disrepair or can no longer be used.

The utility reserves the right to prevent or limit a customer's use of utility facilities after legal notice of such required action is not taken within the time indicated above.

3. Service Continuity

The utility may, at any time, prevent or inhibit use of the stormwater system in case of accident or for the purposes of making connections, alterations, repairs, changes or for other reasons, including emergencies that pose an imminent risk to public welfare or safety.

4. Inadequate Facilities

The utility may decline to provide service to an applicant if it does not possess adequate existing facilities required to render the service desired or if such service is of a character that is likely to have a detrimental effect upon service to other customers.

5. Interference with Utility Facilities

No person shall physically alter utility facilities without the utility's consent.

6. Termination of Free Service Under Certain Contracts and Other Instruments

Notwithstanding any contract provision contained in any deed, grant, contract, franchise, permit, consent or other instrument (other than an instrument expressly set forth in and constituting a part of this tariff) made, executed or delivered between the utility or any predecessor in interest and a customer of the utility or any predecessor in interest:

- a. Every person who receives services under this tariff shall pay for such services as provided in the applicable schedule of rates set forth herein and subject to the rules and regulations of the utility.

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- b. No credit, off-set or other allowance shall be allowed by the utility against any bill for stormwater service on account of the making, execution, or delivery of, or pursuant to any provisions of, any such instrument.

7. Waiver

The utility may, at its sole discretion, waive any of the rules contained herein that operate for the benefit of the utility; provided, that no such waiver will be valid unless in writing and signed by an authorized representative of the utility, and provided that no waiver will be allowed where the waiver would constitute a violation of the public utility code, the regulations of the commission or of any other applicable statute, law or regulation.

8. Amendment of Commission Regulations

Whenever Commission regulations in Title 52 of the Pennsylvania Code are duly amended in such a way as would produce a difference between Commission regulations and this tariff, this tariff is deemed to be amended so as to be consistent with the amendments to the regulations, except that if application of the amendment to Title 52 is discretionary, this tariff will remain unchanged.

9. Industrial and Commercial Establishments Service Limitations

The U.S. Environmental Protection Agency (EPA) Regional Administrator has not determined that the Utility needs a Pretreatment Program meeting the criteria established in Title 40 Code of Federal Regulations (CFR) Part 403. Therefore, the Utility's NPDES permit currently does not require it to administer an approved Pretreatment Program to control the discharges from non-domestic sources. All industrial and commercial waste proposed for discharge into the utility's system shall be studied to determine the degree of pretreatment, if any, necessary in order that the waste will not adversely affect the collection system and/or the stormwater treatment facilities. The utility will have the authority to properly control any waste discharge into its system by regulating the rate of any waste discharge, by requiring necessary equalization and/or pretreatment, and by excluding certain waste, if necessary, to protect the integrity of the system.

10. Utility Limitations:

The utility will not be liable nor bound to increase stormwater collection capacity and/or operations to accommodate industrial or commercial waste.

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11. Specific Dangers:

In general, any waste will be considered harmful to the utility stormwater system if it may cause any of the following damaging effects:

- a. Chemical reaction either directly or indirectly with the materials of construction of the system in such a manner as to impair the strength or durability of the structures;
- b. Mechanical action that will destroy the structures;
- c. Restriction of the hydraulic capacity of the structures or system;
- d. Restriction of the normal inspection or maintenance of the structures or system;
- e. Danger to public health and safety; or
- f. Obnoxious condition contrary to public interest.

12. Right to Inspect / Right of Access:

The utility, its employees and authorized agents shall have the right to access and enter at all reasonable hours, the customer's private property including the access to all parts of any premise connected to the system, for the purpose of examining and inspecting connections, facilities and fixtures, including but not limited to BMPs pending credit approval, approved BMPs, alternative discharge methods pending credit approval, approved alternative discharge methods; for the purpose of disconnecting service for any proper cause; and for the purpose of examining and inspecting any aspect of the premise that contributes runoff to the utility's facilities. The inspections of premises will occur at the utility's reasonable discretion. The inspection of non-residential facilities and property may also occur at any hour the facility is in operation to aid in compliance monitoring. It is the responsibility of the customer to grant permission to the utility, its employees and authorized agents to enter the customer's private property for inspection and disconnection purposes.

13. Rule Variance:

No employee of the utility can vary these rules and regulations, and no authorized representatives, agent or employee of the utility can bind it by any agreement or representation except when authorized in writing by the utility.

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EXHIBIT 1: SAMPLE CALCULATIONS

RESIDENTIAL SERVICE

Sample Charge Determination:

- (i) Based upon the infiltration rate, soil characteristics and other specific area factors, as determined by the utility, the service area revenue requirement allocation shall be assigned as follows:

Gross Area = XX%
Impervious Area = XX%

- (ii) Utilizing a 2-year average of all residential parcel data within the service territory, compute the mean GA and mean IA.
- (iii) Determine the total revenue requirement.
- (iv) Multiply the total revenue requirement by the rate base GA and IA revenue requirement allocation.
- (v) Divide the total GA revenue requirement by the total GA for all parcels to determine the yearly GA rate per square foot. Divide the yearly GA rate per square foot by 12 to yield the monthly GA rate per sq. ft.
- (vi) Divide the total IA revenue requirement by the total IA for all parcels to determine the yearly IA rate per square foot. Divide the yearly IA rate per square foot by 12 to yield the monthly IA rate per sq. ft.
- (vii) Multiply the GA rate per square foot with the mean GA to determine the GA component of the customer charge.
- (viii) Multiply the IA rate per square foot with the mean IA to determine the IA component of the customer charge.
- (ix) Add the GA component charge and the IA component charge together to establish the total monthly residential stormwater service charge.

Sample Calculation:

A service territory has a total gross area of 2,100,433,600 sq. ft. comprised of 972,980,000 sq. ft. of residential gross area and 1,127,453,600 sq. ft. of non-residential gross area. The associated total

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impervious area is 1,120,160,520 sq. ft. comprised of 492,124,000 sq. ft. of residential impervious area and 628,036,520 sq. ft. of non-residential impervious area. The approved total revenue requirement is \$177,100,000.

The determined revenue requirement allocation is:

Gross Area = 20%
Impervious Area = 80%

Additionally, the service territory has a 2-year average of residential parcel data with a calculated mean GA equal to 2,100 square feet and a mean IA equal to 1,200 square feet.

Approved Revenue Requirement = \$177,100,000
 Gross Area Revenue Allocation = \$177,100,000 x .20 =
 \$35,420,000
 Impervious Area Revenue Allocation = \$177,100,000 x .80 =
 \$141,680,000
 Monthly GA Rate per sq. ft. = (\$35,420,000 ÷ 2,100,433,600)/12 =
 \$0.0014/sq. ft.
 Monthly IA Rate per sq. ft. = (\$141,680,000 ÷ 1,120,160,520)/12 =
 \$0.0105/sq. ft.

GA = \$0.0014/sq. ft.
 IA = \$0.0105/sq. ft.
 GA Component Charge = 2,100 sq. ft. x \$0.0014/sq. ft. = \$2.94
 IA Component Charge = 1,200 sq. ft. x \$0.0105/sq. ft. = \$12.60
 Monthly Stormwater Management Service Charge =
 \$2.94 + \$12.72 = \$15.54

NON-RESIDENTIAL SERVICE

Methodology I – Equivalent Residential Unit (ERU) Basis:

Sample Charge Determination:

- (i) Calculate or observe the property's gross area in sq. ft. rounded down to the nearest hundred feet.

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- (ii) Divide property gross area by the mean residential gross area to the nearest thousandth rounded down to the nearest hundredth place to determine the number of property ERUs.
- (iii) Multiply the property's ERUs by the ERU Rate, which is the residential service charge per one (1) ERU, to establish property's monthly stormwater management service charge.

Sample Calculation:

A property has a gross area equal to 11,211.86 sq. ft., rounded down to 11,200 sq. ft.

PGA = 11,200 sq. ft.

MRGA = 2,100 sq. ft.

ERUR = \$15.54/ERU

Monthly Stormwater Management Service Charge =

$$(11,200 \text{ sq. ft.} / 2,100 \text{ sq. ft.}) * \$15.54 = \$82.82$$

Methodology II – Parcel Area-Basis:

Sample Charge Determination:

- (i) Based upon the infiltration rate, soil characteristics and other specific area factors, as determined by the utility, the service area revenue requirement allocation shall be assigned as follows:

Gross Area = XX%

Impervious Area = XX%

- (ii) Determine the total revenue requirement allocated to providing non-residential service.
- (iii) Multiply the total non-residential revenue requirement by the rate base GA and IA revenue requirement allocation.
- (iv) Divide the total GA non-residential revenue requirement by the total GA for all non-residential parcels to determine the GA rate per square foot.
- (v) Divide the total IA non-residential revenue requirement by the total IA for all non-residential parcels to determine the IA rate per square foot.

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- (vi) Multiply the GA rate by the property's gross area to determine the property's GA charge.
- (vii) Multiply the IA rate by the property's impervious area to determine the property's IA charge.
- (viii) Add the GA charge and the IA Charge together for the total monthly Stormwater Management Service Charge.

Sample Calculation:

A property has a GA of 11,211.86 sq. ft., rounded down to 11,200 sq. ft. and IA of 7,124.67 sq. ft., rounded down to 7,100 sq. ft.

GAR = \$0.0014/sq. ft.
IAR = \$0.0105/sq. ft.
PGA = 11,200 sq. ft.
PIA = 7,100 sq. ft.

Monthly Stormwater Service Charge =

$(\$0.0014/\text{sq. ft.} * 11,200 \text{ sq. ft.}) + (\$0.0105/\text{sq. ft.} * 7,100 \text{ sq. ft.}) = \90.23

BEST MANAGEMENT PRACTICE CREDIT

[Utility provided Sample Calculation based upon Credit Program]

[End of the Model Tariff.]

Issued: (Issued Date)

Effective: (Effective Date)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

KEITH READLING

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2021-3024773 (Water)

R-2021-3024774 (Wastewater)

R-2021-3024779 (Stormwater)

TOPICS:

Stormwater Program Revenue Requirements
Identifying Impervious Area
Stormwater Fee Structure, Stormwater Fee Billing,
Stormwater Credit Program

April 13, 2021

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TABLE OF EXHIBITS

Appendix A	Resume of K. Readling
Exhibit KR-1	Technical Memorandum #4 – Revenue Requirements, prepared by Black & Veatch for PWSA, dated August 1, 2013

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Keith Readling. My business address is 1001 Winstead Drive, Suite 335,
4 Cary, North Carolina, 27513.

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 A. I am Executive Vice President of Raftelis Financial Consultants, Inc. (Raftelis), a
7 consulting firm specializing in the areas of water and wastewater finance and pricing.
8 Raftelis was established in 1993 in Charlotte, North Carolina, by George A. Raftelis to
9 provide financial and management consulting services to public and private sector clients.
10 Raftelis is a national leader in the development of water, wastewater, and stormwater
11 rates.

12 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND WORK**
13 **EXPERIENCE.**

14 A. I obtained a Bachelor of Science degree in Civil Engineering from North Carolina State
15 University in 1985, and am a registered Professional Engineer in North Carolina. My
16 engineering license is inactive as I do not practice engineering. I have more than 35
17 years of experience in municipal stormwater management and civil engineering. As an
18 executive and leader of Raftelis' Stormwater Management Consulting Division, I work
19 with entities across the United States with a focus on stormwater utility development and
20 implementation, as well as program and financial planning. I have consulted with many
21 of the largest and most complex stormwater utilities in the country, and have assisted
22 with the establishment of about 50 stormwater utilities in at least 16 different states,
23 serving as lead consultant for many of those projects. Additionally, I have managed the
24 development of more than 30 stormwater utility impervious area or intensity of

1 development databases and utility billing and collections or integration systems to
2 support the connectivity of geographic billing data to legacy account-based billing
3 systems.

4 A complete description of my background and experience is set forth in Appendix
5 A to this testimony.

6 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA**
7 **PUBLIC UTILITY COMMISSION (“PUC” OR “COMMISSION”)?**

8 A. No.

9 **Q. PLEASE DESCRIBE YOUR WORK WITH THE PITTSBURGH WATER AND**
10 **SEWER AUTHORITY (“PWSA”).**

11 A. Over the last three years, I have assisted PWSA with developing its stormwater rates.
12 This has included reviewing the development of stormwater revenue requirements,
13 working with PWSA staff to plan rate structures, billing policies and procedures, data
14 development, and overseeing stormwater billing information software development.

15 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

16 A. The purpose of my testimony is to describe PWSA’s proposed stormwater fee and how it
17 was developed.

18 **Q. HOW DOES YOUR TESTIMONY RELATE TO THAT OF OTHER PWSA**
19 **WITNESSES?**

20 A. Mr. Igwe is sponsoring PWSA’s proposed stormwater tariff. His testimony describes
21 PWSA’s stormwater system and provides an overview of PWSA’s stormwater fee
22 proposal. Mr. Smith’s testimony describes how the stormwater revenue requirements
23 were determined and also addresses proposed adjustments to arrive at the proposed
24 stormwater fee. My testimony describes how PWSA developed the stormwater fee and
25 provides other details as to how it will be implemented.

1 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

2 A. Yes. Exhibit KR-1 is a technical memorandum on revenue requirements, prepared by
3 Black & Veatch for PWSA dated August 1, 2013. I will also be co-sponsoring schedules
4 included in the testimony of Mr. Smith.

5 **II. STORMWATER PROGRAM REVENUE REQUIREMENTS**

6 **Q. WHAT ARE THE REVENUE REQUIREMENTS THAT FORM THE BASIS FOR**
7 **THE STORMWATER RATE CALCULATION?**

8 A. The stormwater program revenue requirements are the total costs associated with
9 stormwater management, including flood control, strategic planning, and water quality
10 related regulatory compliance. The way in which the stormwater revenue requirements
11 were determined is described in the testimony of Harold Smith. As shown on HJS-1SW,
12 the revenue requirements for FY2022 total approximately \$36.7 million. This figure
13 includes:

- 14 • Costs associated with control of combined sewer overflows;
- 15 • Costs associated with separate storm sewer operation and maintenance;
- 16 • Rate-funded stormwater capital projects;
- 17 • 50% of costs associated with combined wastewater system maintenance and
18 existing debt service;
- 19 • Future debt service based on stormwater capital projects in the CIP; and
- 20 • Administrative costs shared between water, wastewater, and stormwater.

21 **Q. HOW WERE CONVEYANCE AND DEBT SERVICE COSTS ALLOCATED**
22 **BETWEEN STORMWATER AND WASTEWATER RATES?**

23 A. We looked at several methods for allocating conveyance and debt service costs between
24 stormwater and wastewater rates. We considered the relationship of stormwater peak
25 flow and total volume of stormwater to the volume of all flows in combined systems. For
26 the peak flow method, I reviewed work performed by Black & Veatch for PWSA in

1 2013¹ wherein the three largest storms during a “typical year” for the Pittsburgh region
2 were considered in terms of what portion of flows within combined sewers on those days
3 was stormwater. These three largest storms of the year suggest that during those storms,
4 stormwater accounted for about 70% of the total flow. Using this as the rationale for
5 allocating O&M and debt service costs, 70% of the costs would be attributable to
6 stormwater. We also approached the issue using a total volume method wherein we
7 evaluated the total volume of stormwater contributed to the system based upon rainfall
8 totals in a “typical year” and a “wet year.” Under this method, stormwater accounts for
9 less than 20% of the flow, and thus less than 20% of costs would be allocated to
10 stormwater.

11 During smaller rainfall events and dry weather, stormwater is a smaller fraction of
12 the total flow, and during large (but rare) storm events, stormwater is a large portion of
13 the flow. To balance the demand placed on the system by stormwater over time, I
14 recommended allocating O&M and debt service costs for shared infrastructure evenly
15 between the two services. An even split balances the peak flow and total flow allocation
16 methodologies. Calculated rates are driven by the 50-50 split between sewer and
17 stormwater for these shared infrastructure costs, which include gravity collection sewers,
18 manholes, and power operated equipment.

¹ Exhibit KR-1 – Technical Memorandum #4 – Revenue Requirements, prepared by Black & Veatch for PWSA, dated August 1, 2013.

1 **Q. DOES PWSA ANTICIPATE THAT STORMWATER BILLS WILL HAVE A**
2 **HIGHER NON-PAYMENT RATE THAN WATER OR WASTEWATER**
3 **SERVICE?**

4 A. We anticipate that stormwater-only bills (those on accounts without an existing water
5 and/or wastewater service) will have a higher non-payment rate than water/wastewater
6 bills. When impervious area fees were implemented by the Northeast Ohio Regional
7 Sewer District and by the Philadelphia Water Department the collection rate for
8 stormwater-only customers was significantly lower than for customers who also were
9 already water and wastewater customers. Initially the collection rate for stormwater-only
10 customers averaged about 60% for these two utilities. There are a number of reasons for
11 this. Many of these properties are economically stressed, and essentially all have
12 absentee owners. In addition, PWSA will have comparatively little leverage to collect on
13 stormwater fees sent to these properties in the near-term. For stormwater fees being
14 added onto existing water/wastewater bills, we anticipate PWSA will have the same
15 collection rate as for water/wastewater bills.

16 **Q. HOW HAVE YOU ACCOUNTED FOR HIGHER RATES OF NON-PAYMENT**
17 **FROM STORMWATER ONLY CUSTOMERS?**

18 A. The Bad Debt Expense shown on HJS-2SW reflects a 40% rate of non-payment from
19 stormwater only customers while the non-payment rate for existing water and wastewater
20 customer will remain at 2%.

21 **Q. WILL PWSA'S PROPOSED STORMWATER RATES RECOVER ALL OF THE**
22 **REVENUE REQUIRMENTS ALLOCATED TO STORMWATER?**

23 A. No. The proposed rates will ultimately generate about 2/3 of the needed revenue to fund
24 the full \$36.7 million stormwater program as described. In addition, as mentioned in the
25 testimony of Mr. Pickering and Mr. Smith, PWSA plans to phase the fee in over a two-

1 year period, so initially the fee will only recover about half of the revenue requirement.

2 This decision was made to blunt the first-year impact of the new fee, especially in light of
3 the community's economic stress caused by the COVID-19 pandemic. In most cases the
4 shift to the stormwater fee, even adjusting for proposed rate increases, increases
5 customers' total bills, and PWSA is sensitive to the most extreme impacts.

6 The intentional underrecovery of the total revenue requirement such that severe
7 customer impacts are mitigated is consistent with PWSA's use of the "gradualism"
8 ratemaking practice. Gradualism provides another benefit; it accounts for the fact that
9 PWSA does not plan to dramatically expand its stormwater program in the near term;
10 costs that were previously recovered through the wastewater fee are shifting to the
11 stormwater fee. Based on my experience implementing new stormwater fees, customers
12 expect to see new projects or initiatives when charged a substantially higher overall fee.
13 As PWSA is not dramatically enhancing readlingits stormwater program, I did not advise
14 PWSA to pursue full recovery of revenue requirements from the stormwater fee in the
15 first year.

16 17 **III. IDENTIFYING IMPERVIOUS AREA**

18 **Q. WHAT IS IMPERVIOUS AREA?**

19 A. Impervious area is a hard surface that prevents or significantly impedes precipitation or
20 snowmelt from soaking into the ground. When precipitation falls on an impervious area,
21 it runs off the property rather than being absorbed into the ground. Impervious surfaces
22 include areas such as rooftops and paved areas.

1 **Q. WHY IS IMPERVIOUS AREA IMPORTANT TO THE DEVELOPMENT OF A**
2 **STORMWATER FEE?**

3 A. Impervious surface area is the most commonly used metric across the United States to
4 charge for costs related to stormwater services like flood control and water quality
5 management. Impervious surfaces, like sidewalks, rooftops and driveways, impede
6 water's ability to infiltrate into the ground. Therefore, the more impervious area on a
7 property, the more runoff the property generates and the greater the demand for the
8 utility's stormwater conveyance, flood control and water quality management services.

9 **Q. IS PWSA PROPOSING TO BASE ITS STORMWATER FEE ON IMPERVIOUS**
10 **AREA?**

11 A. Yes. PWSA's proposed stormwater fee is based on a property's impervious area.

12 **Q. WHAT IS AN EQUIVALENT RESIDENTIAL UNIT?**

13 A. An Equivalent Residential Unit ("ERU") is the amount of impervious area found on a
14 typical residential property in the service area. Based on parcel, land use, and existing
15 water and wastewater account characteristics, properties that are classified as single
16 family residential ("SFR") in PWSA's service territory include townhouses, row houses,
17 mobile homes, single family homes, and two-, three- and four-family homes. These types
18 of properties are substantially similar in their impervious area amounts, so it is reasonable
19 to treat them similarly under the proposed residential rate structure. Under this definition,
20 there are about 92,000 SFR parcels in Pittsburgh.

21 Using measured impervious area data, Raftelis performed a statistical analysis on
22 the impervious area values for properties classified as SFR. The Raftelis team found that
23 the median impervious area found on these SFR parcels is about 1,650 square feet, and
24 this is the currently proposed ERU value.

1 The ERU is also the billing unit that will be used to calculate the stormwater fee
2 for other (non-SFR) properties.

3 **Q. HAS PWSA CALCULATED IMPERVIOUS AREA FOR ALL PARCELS IN ITS**
4 **SERVICE TERRITORY?**

5 A. PWSA engaged Michael Baker International (“Michael Baker”) to capture impervious
6 area on parcels containing impervious features that were visible in 2017 Allegheny
7 County imagery. While all currently mapped parcels were reviewed as part of this effort,
8 not all parcels have impervious area and therefore impervious area was not determined
9 for all parcels. Additionally, impervious area created since 2017 may not have been
10 captured. Updating impervious area will be an ongoing effort and will have to be
11 completed once newer aerial imagery has been received by PWSA.

12 **Q. HOW DID PWSA IDENTIFY AND CALCULATE IMPERVIOUS AREA?**

13 A. Using ArcGIS mapping software, impervious area polygons were created on properties
14 containing impervious features that were visible in 2017 Allegheny County imagery.
15 This software and other similar software allows users to look at multiple layers of
16 geographic data at once, for example, parcel polygons and aerial photos, then draw
17 features that are seen in the overlay. The creation of impervious area polygons is done by
18 humans who look at impervious features they see in the photos, like parking lots or
19 buildings, and draw the outlines of these features with a mouse or other input device to
20 create closed polygons. Later these polygons can be intersected topologically with parcel
21 polygons to measure the area of features that fall on any given parcel.

22 These features had to meet PWSA’s definition of ‘impervious’ – which includes
23 sidewalks, rooftops and driveways – that prevent or impede water’s ability to infiltrate
24 into the ground. Excluded are public roadways and railroad ballast.

1 Michael Baker captured impervious surface features in separate geographic layer
2 files based on feature type. Michael Baker and PWSA have completed quality
3 assurance/quality checks (“QA/QC”) on the data. Raftelis received the impervious area
4 data from PWSA on October 16, 2020. Raftelis performed limited QA/QC on the data.

5 Also using ArcGIS, Raftelis merged the separate geographic layer files into one
6 impervious feature layer, excluding the features described above. This impervious area
7 layer was intersected with the current parcel layer to determine the impervious area on a
8 per parcel basis. The impervious area will be submitted back to PWSA for additional
9 QA/QC to be performed prior to implementation of stormwater rates in 2022.

10 **Q. IN CALCULATING IMPERVIOUS AREA, HAS PWSA IDENTIFIED PARCELS**
11 **THAT DO NOT CURRENTLY RECEIVE WATER OR WASTEWATER**
12 **SERVICE FROM PWSA THAT WILL BE CHARGED FOR STORMWATER**
13 **SERVICE?**

14 A. Yes. As part of this process, PWSA has identified parcels with impervious area that
15 cannot be associated with an existing PWSA water or wastewater account. These are
16 commonly called “stormwater-only” parcels as they will be billed only for stormwater
17 service. There are approximately 6,000 stormwater-only parcels, and as such their owners
18 will become new PWSA stormwater-only customers receiving monthly bills upon
19 approval of the stormwater tariff. To identify the owners of these properties, PWSA will
20 use parcel ownership information, including owner name and address, from Allegheny
21 County tax data. Future PWSA bills will be sent to customers at these addresses. PWSA
22 also plans to send notices to these parcel owners as described in Ms. Quigley’s and Mr.
23 Igwe’s testimony.

24
25
26

1 **IV. STORMWATER FEE STRUCTURE**

2 **Q. PLEASE PROVIDE AN OVERVIEW OF PWSA’S PROPOSED STORMWATER**
 3 **FEE.**

4 A. As described above, the proposed fee will be based on the amount of impervious area on
 5 a property. Impervious surface area is the most common rate structure among those
 6 communities with stormwater fees because it is a good surrogate for directly measuring a
 7 ratepayer’s demand on the stormwater system. For residential customers, PWSA will be
 8 implementing a three tiered rate structure which is described in further detail below. For
 9 non-residential customers, PWSA will be billing per ERU of impervious area.

10 **Q. PLEASE DESCRIBE THE PROPOSED STORMWATER FEE FOR SINGLE**
 11 **FAMILY RESIDENTIAL CUSTOMERS.**

12 A. PWSA is proposing a three tiered rate structure for SFR customers. Statistical analysis
 13 was performed by Raftelis to analyze and determine the most appropriate residential
 14 tiering structure. Of the tiering structures considered, PWSA decided on a structure in
 15 which the middle tier contains 70% of all the SFR properties, making it by far the largest
 16 group. Properties with less than 1,015 square feet of impervious area would be
 17 considered the low tier and would be billed for the median amount of impervious area
 18 found on parcels in that tier, which is about 830 square feet of impervious area, or 0.5
 19 ERUs. Properties in the middle tier would be billed for 1 ERU. Those properties with
 20 2,710 square feet or more of impervious area would fall into the high tier and would be
 21 billed for the median amount of impervious area found on parcels in that tier, which is
 22 about 3,355 square feet of impervious area, or 2 ERUs.

1 **Q. WHAT TYPES OF PROPERTIES ARE CLASSIFIED AS “SINGLE FAMILY**
 2 **RESIDENTIAL”?**

3 A. For purposes of the stormwater fee, residential customers include single family homes,
 4 townhouses, rowhouses, mobile homes, and two-, three-, or four-family buildings.

5 **Q. WHY IS PWSA PROPOSING A TIERED STORMWATER FEE FOR SINGLE**
 6 **FAMILY RESIDENTIAL CUSTOMERS?**

7 A. The impervious area found on a residential lot in Pittsburgh varies from about 400 square
 8 feet to more than 4,000 square feet. Using tiers instead of one flat rate allows PWSA to
 9 differentiate among SFR ratepayers and maintain an equitable approach across the
 10 various types of development and homes.

11 **Q. HOW DID PWSA DETERMINE THE APPROPRIATE BREAKPOINTS**
 12 **BETWEEN THESE TIERS?**

13 A. We considered three tiering alternatives, where the middle tiers encompassed 50%, 60%
 14 and 70% of the SFR properties, respectively. The 70% middle tier option was selected
 15 because it recognized similarity among parcels within the center of the impervious area
 16 frequency histogram with only significantly smaller and larger properties being included
 17 in Tier 1 and Tier 3, respectively. A summary of the parcels and ERUs by tier is
 18 presented on HJS-3SW.

19 **Q. WHAT TYPES OF PROPERTIES ARE CLASSIFIED AS “NON-SINGLE**
 20 **FAMILY RESIDENTIAL”?**

21 A. Non-single family residential properties are any properties not included in the definition
 22 of single family residential property described above. This includes apartment buildings,
 23 commercial properties, industrial properties, condominiums, schools, and railroad
 24 properties. Specifically, these properties will be customers in the existing Commercial,
 25 Industrial, and Health and Education Classes. City parcels will be mostly non-residential
 26 with the exception of those existing accounts already classified as Residential.

1 **Q. FOR NON-SINGLE FAMILY RESIDENTIAL CUSTOMERS, HOW IS THE**
2 **TOTAL ERU DETERMINED?**

3 A. The ERUs for non-single family residential customers are calculated by dividing the
4 impervious area on the property (in square feet) by the ERU value of 1,650 square feet.
5 This number is then rounded up to the nearest integer to provide their total ERU. A
6 summary of the parcels and ERUs is presented on HJS-3SW. To calculate a monthly
7 charge, the total ERU is multiplied by the per ERU fee to calculate the total monthly
8 stormwater charge.

9 **Q. WHY IS PWSA PROPOSING THIS APPROACH FOR NON-SINGLE FAMILY**
10 **RESIDENTIAL CUSTOMERS?**

11 A. This approach for non-single family customers strikes a balance between fairness and
12 technical simplicity. While SFR properties are fairly similar in size and composition,
13 non-single family properties can vary greatly among those categories and encompass a
14 wide range of customer classifications. A flat rate or tiered rate such as used with SFR
15 properties would not be equitable across such a wide range of classifications.

16 **Q. HOW IS THE MONTHLY STORMWATER RATE DETERMINED?**

17 A. The process for calculating the stormwater rate to be assessed to all customers follows a
18 similar process as the water and wastewater conveyance CCOSS presented in the Direct
19 Testimony of PWSA witness, Mr. Smith.

20 First, the unadjusted cost of service rate is determined so that stormwater costs
21 can be assigned to customer classes. The determination of cost of service by customer
22 class is presented in HJS-4SW. Once the unadjusted cost of service by customer class is
23 determined, appropriate adjustments are made to determine the adjusted cost of service
24 by customer class, as presented on HJS-5SW. The adjustments, which are described
25 throughout this testimony and the testimony of Mr. Smith, include:

- 1 • **Gradualism Between Sewer and Stormwater** – This adjustment reduces the
2 total revenue requirement by \$12.4 million which helps mitigate customer
3 impacts.
- 4 • **Bad Debt Expense** – Bad debt expense for stormwater-only and non-
5 stormwater-only customers.
- 6 • **Cost of Credits and Incentives** – The credit program results in forgone
7 revenue that must be recovered from all customer classes.
- 8 • **Cost of Bill Discount Program Forgone Revenue** – As specified in the
9 Direct Testimony of Ms. Quigley, PWSA is proposing a 75% discount on the
10 stormwater fee for enrolled CAP-BDP customers.

11 Once costs had been appropriately allocated to customer classes, Raftelis

12 designed rates to recover the adjusted net stormwater revenue requirement. PWSA is
13 proposing a uniform stormwater rate per ERU. The proposed rate is \$7.95 per ERU for
14 the FPPTY. The rate design process and proposed rates for residential and non-residential
15 customers are shown in HJS-6SW.

16 **Q. IS THERE A MINIMUM STORMWATER FEE?**

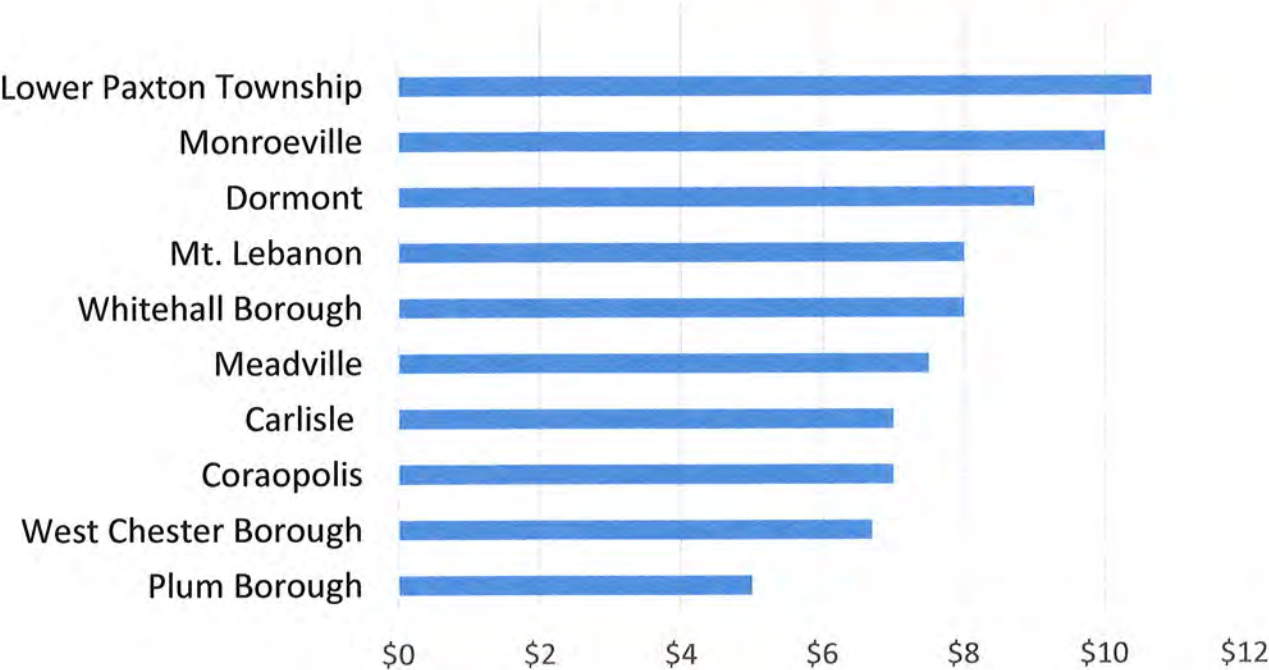
17 A. A property will not be charged a stormwater fee if the impervious area on the property is
18 less than 400 square feet. The minimum stormwater fee that can be charged for SFR
19 properties with impervious area greater than or equal to 400 square feet is for those
20 properties that fall into Tier 1 and are billed for 0.5 ERU. The minimum stormwater fee
21 for non-single family residential properties with impervious area greater than or equal to
22 400 square feet is 1 ERU.

23 **Q. HOW DOES PWSA’S PROPOSED STORMWATER FEE COMPARE TO**
24 **STORMWATER FEES IN OTHER CITIES OR MUNICIPALITIES?**

25 A. All stormwater programs are different and reflect each location’s unique operational,
26 infrastructure, climate, and funding challenges. Locally and nationally, stormwater fees
27 vary significantly. As shown in the tables below, stormwater fees per ERU in
28 Pennsylvania range from approximately \$5.00 to over \$10.00 per month. Nationally,

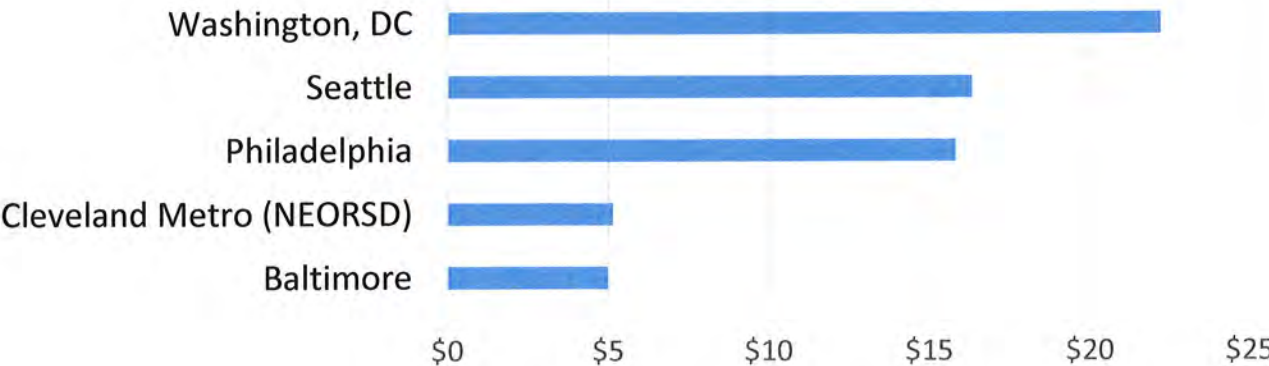
1 stormwater fees per ERU range from \$5.00 to over \$20.00 per month. PWSA’s proposed
2 initial stormwater fee is in the lower range among these peers.

Local/Regional Monthly Stormwater Fees per ERU



3

National Monthly Stormwater Fees per ERU



4

1 **Q. IF A CUSTOMER BELIEVES THEIR IMPERVIOUS AREA CALCULATION**
 2 **OR RESIDENTIAL TIER ASSIGNMENT IS INACCURATE, WILL A PROCESS**
 3 **BE AVAILABLE TO QUESTION THE IMPERVIOUS AREA?**

4 A. Yes. As explained more fully by Ms. Quigley, PWSA will process customer disputes
 5 related to stormwater charges in the same manner as it currently processes disputes
 6 related to its other charges. PWSA’s stormwater dispute process will also include a
 7 further evaluation regarding the measured impervious area.

8

9 **V. STORMWATER FEE BILLING**

10 **Q. HOW WILL STORMWATER, A NON-METERED SERVICE, BE ADDED TO**
 11 **EXISTING PWSA BILLS?**

12 A. The new stormwater fee will be added to bills for existing PWSA accounts, or will be the
 13 sole fee on bills for new, stormwater-only accounts. Stormwater fees are calculated on a
 14 per parcel basis, and the fee for a parcel (or multiple aggregated parcels) will be billed to
 15 one or more of the accounts associated with the parcel(s). PWSA maintains a parcel
 16 number as a characteristic of an account. These data have been reviewed for accuracy and
 17 updated where necessary by Raftelis. After the stormwater fee is implemented, PWSA
 18 will use a new piece of software to manage the parcel-account relationship, parcel
 19 aggregations, and other stormwater billing information that influence the stormwater fees
 20 billed.

21 **Q. HOW WILL STORMWATER BILLING DATA BE KEPT UP TO DATE?**

22 A. PWSA staff will update stormwater billing source data – impervious surface area data
 23 and parcel boundary data – in response to customer inquiries and event triggers indicating
 24 new or changed development (such as development permits, Certificates of Occupancy
 25 issued, building inspections, etc.). Updates will also be made as needed following new
 26 releases of aerial imagery.

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VI. STORMWATER CREDIT PROGRAM

Q. IS PWSA PROPOSING A CREDIT PROGRAM THAT WILL ALLOW CUSTOMERS TO REDUCE THEIR MONTHLY STORMWATER FEE?

A. Yes. PWSA is proposing a credit program that will allow residential or non-residential customers to reduce their stormwater fee by taking specific actions to reduce their demand for stormwater service.

Q. WHAT ARE THE OVERALL GOALS OF A CREDIT PROGRAM?

A. One goal is to refine the stormwater fee for an individual ratepayer to account for things that happen on their site that cause their true stormwater demand to be different than that computed from impervious area. Another is to encourage customers to undertake or maintain helpful best management practices. In designing the credit program, PWSA has sought to create a program that can achieve meaningful benefits in terms of stormwater reduction and recognize customers’ efforts to reduce stormwater runoff, while also imposing minimal administrative burden on ratepayers or the Authority.

Q. WHAT CREDITS IS PWSA PROPOSING TO MAKE AVAILABLE TO NON-SINGLE FAMILY RESIDENTIAL CUSTOMERS?

A. As Mr. Igwe explains, PWSA is proposing a Stormwater Control Structures Credit to be made available to non-single family residential properties with well-maintained, functioning structural stormwater controls that meet either the 2019 City of Pittsburgh stormwater standards (up to 60% credit) or the 2016 City of Pittsburgh stormwater standards (up to 45% credit).

Q. WHY IS PWSA BASING ITS NON-RESIDENTIAL CREDIT ON THE 2019 DEVELOPMENT STANDARDS?

A. PWSA is basing its non-residential credit primarily on the 2019 Development Standards because these are the standards that are currently in place, and are expected to still be in

1 place when the stormwater fee goes into effect (Ord. No. 12-2019, art. I, § 13101, eff. 3-
2 20-19). Similarly, the 2016 Development Standards have recently been in place. By
3 tying the performance of stormwater controls to an existing standard we hope to minimize
4 the administrative burden that the credits program places on ratepayers and the Authority.
5 Using these standards provides clear guidance for both PWSA and its customers as to
6 whether requirements for a credit have been met and ensures that the stormwater controls
7 will meaningfully reduce stormwater runoff from a property.

8 **Q. WHAT CREDITS IS PWSA PROPOSING TO MAKE AVAILABLE TO SINGLE**
9 **FAMILY RESIDENTIAL CUSTOMERS?**

10 A. As described by Mr. Igwe, PWSA is proposing a Residential Downspout Disconnection
11 and Street Planters Credit for residential customers. Additionally, residential customers
12 can get a credit for capturing and slowly releasing the runoff from ¾-inch of rain from
13 the impervious surfaces on the property.

14 **Q. WHY IS PWSA PROPOSING THIS TYPE OF CREDIT FOR RESIDENTIAL**
15 **CUSTOMERS?**

16 A. Downspout disconnection and rerouting of roof drainage to street planters can divert
17 runoff from significant amounts of impervious area on residential properties, which
18 would be very beneficial to the proper function of PWSA's infrastructure in some areas
19 of the City. While PWSA recognizes that not all properties will be able to disconnect
20 downspouts or reroute to street planters due to limitations at the property, this initial
21 residential credit offering will recognize customers who meaningfully reduce their
22 demand for stormwater service by disconnecting downspouts or rerouting drainage to
23 street planters while limiting the administrative burden for PWSA.

1 Although it is not technically a credit, I would also note that customers can may
2 simply remove impervious area in order to potentially qualify for a lower tier of the
3 stormwater fee.

4 **Q. DID PWSA CONSIDER OFFERING OTHER TYPES OF CREDITS?**

5 A. Yes, PWSA considered a variety of credits when developing the program. PWSA
6 recognizes that customers and interested parties may want other types of credits to be
7 offered as part of the program. However, I would emphasize that the credit program
8 proposed here is a first step for PWSA. Once an initial credit program has been
9 successfully implemented, PWSA can examine other types of credits and may expand the
10 program at a later date. The primary focus at this time is to implement an initial program
11 that provides credits for meaningful reduction in demand for stormwater service with
12 minimal administrative burden for the ratepayer or Authority. The credits proposed here
13 meet these criteria.

14 **Q. WILL PWSA VERIFY THAT STORMWATER MITIGATION MEASURES ARE**
15 **INSTALLED AND MAINTAINED?**

16 A. The intent is that credits would remain in place as long as the stormwater mitigation
17 measure is in place and is functioning properly. Continued eligibility for the credit would
18 be verified by periodic field reviews by PWSA or through coordination with City staff.
19 Details of which parties would be involved in which parts of the process are likely to be
20 fleshed out in the MOU process.

21 **Q. OVER WHAT TIME PERIOD WILL A CREDIT APPLY?**

22 A. Credits will be valid for up to three (3) years. Customers can reapply every three years to
23 continue receiving a credit as long as the stormwater mitigation measure remains in place
24 and is working properly, thereby reducing the property's demand for stormwater service.

1 **Q. WHAT IMPACT DOES PWSA EXPECT THE CREDIT PROGRAM WILL**
2 **HAVE ON STORMWATER REVENUE?**

3 A. PWSA anticipates participation in the credit program to result in revenue offsets of less
4 than 5% of full billings. Estimates for “forgone revenues” from the credit program have
5 been included in the stormwater rate calculation. The estimated cost is based on 5% of
6 non-single-family residential billings.

7

8 **VII. CONCLUSION**

9 **Q. DOES THAT COMPLETE YOUR DIRECT TESTIMONY?**

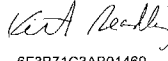
10 A. Yes.

VERIFICATION

I, Keith Readling, hereby state that: (1) I am the Executive Vice President, Raftelis Financial Consultants, Consultant to The Pittsburgh Water and Sewer Authority (“PWSA”); (2) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (3) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 03/29/2021 | 8:52 AM EDT

DocuSigned by:



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Keith Readling
Executive Vice President
Raftelis Financial Consultants

Consultant to:
The Pittsburgh Water and Sewer Authority

Appendix A

Keith Reading

Executive Vice President



PROFILE

Keith has 35 years of experience in municipal stormwater management and civil engineering. As an executive, he has broad responsibilities for service delivery to clients across the U.S., with a particular focus on program and financial planning, stormwater utility development and implementation, and enterprise fund data and systems development for local governments. Keith has consulted with and/or helped stand up many of the largest and most complex stormwater utilities in the U.S. and is one of the foremost authorities in the country regarding stormwater management programs, data, systems, and business processes. He has assisted with the establishment of more than 45 stormwater utilities. As a senior manager for data-related services in this capacity, he has developed more than 30 stormwater utility impervious area or intensity of development rate structures, databases and utility billing and collections or integration systems to support the connectivity of geographic billing data to legacy account-based billing systems. Keith's other technical expertise includes water resources and civil engineering planning, analysis, graphical and non-graphical database development and management, and environmental and regulatory compliance efforts. He is experienced in all aspects of implementing municipal stormwater management programs, from strategic planning and regulatory compliance services to database architecture and customer service support systems. Keith also co-authored a chapter entitled, "Expanding Financing and Pricing Concepts into Stormwater," for the Fourth Edition of the industry guidebook, *Water and Wastewater Finance and Pricing: The Changing Landscape*.

REPRESENTATIVE PROJECT DESCRIPTIONS

City of Charlotte and Mecklenburg County (NC)

Keith served as project manager, and has served as Principal in Charge for a number of projects for the City of Charlotte and Mecklenburg County over the past 15 years. One highlighted project was strategic planning in support of business process improvements for all business processes that relate to stormwater utility billing, collections, database maintenance, and customer service. The outcomes from this project supported improvements in the connectivity between the third-party billing vendor and the stormwater utility. Past projects have included residential rate structure changes, utility credit policy development and adjustment, capital project prioritization assistance, and various financial planning services.

Town of Westford (MA)

As a subconsultant, Keith served as finance lead for a project with the Town of Westford (Town) to evaluate future program scope and cost, and provide funding options for an expanded stormwater management program for the Town.

Sewerage and Water Board of New Orleans (LA)

Keith served as project manager for a recent effort whereby the Sewerage and Water Board of New Orleans evaluated different funding approaches for generating additional stormwater management funds to fund operation and maintenance of various new large flood control infrastructure and to fund an expanded groundwater management program. Keith was

Specialties

- Stormwater program planning & development
- Stormwater finance & utility development
- Management policy & practice
- Business process development & improvement
- Data & systems integration
- Database architecture & design

Professional History

- Rafelis: Executive Vice President (2016-present); Vice President (2014-2015); Director of Stormwater Management Consulting (2011-2013)
- AMEC: Vice President (1998-2011); Senior project manager (1995-1998); project manager (1991-1995)
- Jarvis Associates: Project Engineer (1988-1991)
- Talbert, Cox, & Associates: Project Engineer (1985-1988)

Education

- Bachelor of Science in Civil Engineering - North Carolina State University (1985)

Professional Registrations

- Registered Professional Engineer: NC (Inactive)

Professional Memberships

- American Public Works Association: Past President, North Carolina Chapter, Water Resources Division

Appendix A

responsible for all aspects of the evaluation including rate base estimates, rate structure recommendations, and impact analyses.

Northeast Ohio Regional Sewer District (OH)

Keith serves in an ongoing role for an engagement with the Northeast Ohio Regional Sewer District (District) which includes data management, policy development, and financial analysis tasks. The primary effort was focused on building a billing database and related functionality to support the District's stormwater management program, which began billing on January 1, 2013, then was stopped and restarted as a result of legal challenges, in which the District eventually prevailed. During the project, the Raftelis team enhanced the database to provide for ongoing maintenance of about 400,000 stormwater accounts, and numerous customer service and program reporting functions. Raftelis led a process to refine stormwater billing and program policies, which required various updates and expansions of current processes, partly driven by the results of several lawsuits.

Keith also served as Data Lead in the development of the user fee to support the District's stormwater management program. In this role, he oversaw data collection and data development, including developing and reviewing key data process algorithms and the rate structure. In addition, Keith aided the client in the creation and revision of key business processes related to periodic data updates from the 60 municipalities and portions of three counties in the District's service area. He was the lead database architect and also provided guidance relating to the District's customer service protocols and billing policies.

City of Baltimore (MD)

Keith served as Program Manager for a complex and fast-paced project to implement a stormwater fee for the City of Baltimore Bureau of Water and Wastewater. He was responsible for oversight of all data-, systems-, and policy-related efforts in support of developing the fee.

City of Philadelphia (PA)

Keith served as lead analyst for this project for the Philadelphia Water Department to assess many aspects of the stormwater utility's residential rate structure, phase-in plans, credits program, and economic assistance program. The project required detailed account assessment at the individual account level for more than 500,000 records. Keith developed the database architecture for the analysis and directed the analytical efforts of programmers and DBAs. He was also responsible for developing summary reports that depicted the estimated implications of proposed rate and credit and phase-in policy shifts.

City of Manchester (NH)

Keith served as Data Track Manager on this project to develop a user fee to support the City of Manchester's (City) stormwater program. Keith was responsible for the associated graphical GIS-based impervious area database used for billing stormwater service charges as well as the creation of billing policies and the connection of stormwater-specific characteristics to the legacy sanitary sewer billing system.

Lexington-Fayette Urban County Government (KY)

Keith served as Data Manager for the stormwater utility project for this combined city-county government. Keith managed data collection and data development, including developing and reviewing the impervious area database. He developed the concepts and was lead architect for middleware developed and deployed to connect stormwater billing characteristics to a third-party billing system maintained by American Water Company. He also developed the concepts and architecture for an enterprise customer service and database maintenance platform that connected to the legacy billing system and the City/County 311 (LexCall) system. Keith also provided billing policy, collections, and enforcement recommendations.

Appendix A

Georgetown County (SC)

Keith served as Principal in Charge for the development and implementation of Georgetown County's (County) stormwater utility. Keith was responsible for all phases of the utility development, including: analyzing the proposed cost-of-service; determining strategic, organizational, and staffing needs; developing the rate structure analysis; coordinating the public education effort; developing the impervious area database; creating the billing system; and developing a stormwater fee crediting policy with design guidelines and credit procedures. He developed and deployed the master account database and developed the connectivity protocol for this database to connect to the County's tax database for billing.

City of Dallas (TX)

Keith serves as project manager for the study and implementation of a stormwater rate structure change for the City of Dallas (City). The City implemented a stormwater fee in 1991 that generates about \$49 million annually. The rate structure change represents a significant effort on the part of the City to assure the financial stability of its Storm Drainage Fund, recover costs more equitably from its ratepayers, and to do both in a transparent fashion. Now implemented, the updated rate structure embodies a considerable change, not only for ratepayers receiving changed bills, but also for the City's business processes for billing and account maintenance. Raftelis was tasked with determining the stormwater cost-of-service and developing the stormwater financial plan. Raftelis also updated available impervious area data and evaluated potential rate structures. The team performed an account review and evaluated the impacts upon customers of a rate structure change. In addition, we evaluated the billing mechanism and performed account to parcel matching. Raftelis assisted the City with necessary rate ordinance changes and with public outreach around the rate structure changes.

City of Mount Lebanon (PA)

Keith served as Lead Data Consultant for this project to establish a stormwater utility for the City of Mount Lebanon. The work included editing an existing cost-of-service model developed by others, developing a rate structure and rate, developing data and billing policies, codifying an ordinance establishing the utility and rates, developing a credits program, developing the master account database, and connecting the database to a third-party privatized billing system.

Arapahoe County and Douglas County (CO)

Keith served as technical advisor for both Douglas and Arapahoe Counties' stormwater billing and data management tasks in support of developing a stormwater utility fee. His involvement included review of cadastral and imagery source data, discussions about the potential connectivity between an external parcel-based data management system and legacy tax billing systems (for conveying the potential fees), and decisions about appropriate rate structures that would be defensible and supportable by the extent and quality of the source data. Much of his work on these two separate projects fed into what ultimately became a Stormwater Authority (SEMSWA).

City of Jacksonville (NC)

Keith served as Principal in Charge for this project to identify compliance efforts, prepare the City of Jacksonville's (City) annual National Pollutant Discharge Elimination System (NPDES) report, establish and facilitate a stormwater advisory committee, and develop a stormwater post-construction ordinance for the City. In addition to directing the compliance efforts, Keith facilitated all stakeholder meetings and City Council education sessions. Keith also served as Principal in Charge for the development of a user fee to support the City's stormwater management program. He facilitated a citizens' stormwater advisory team to build consensus and provide informed policy guidance to City staff. In addition, he was responsible for all phases of utility development, including analyzing the cost-of-service and rate structure, determining organizational and staffing needs, developing the impervious area database, and managing the overall project administration. Currently, he is assisting the City with regulatory compliance for new coastal runoff laws and editing the City's administrative process manual that defines how developers procure permits for new development.

Appendix A

Wake County (NC)

Keith served as Principal in Charge for this multi-faceted project to implement the recommendations for better land development standards of a County-wide stakeholder group. The project involved several disparate elements: facilitation of a stakeholder group tasked with developing a multi-jurisdictional post-construction ordinance, development of a risk-based methodology for erosion control enforcement, and an innovative pilot basin model that will help Wake County (County) test development scenarios. Keith facilitated the stakeholder and staff-level discussions to arrive at business process decisions to ensure that the multi-jurisdictional ordinance, administered by the County, is workable for the participating jurisdictions, developers, and permitting staff.

City of Rock Island (IL)

Keith served as Data Track Leader for developing this stormwater utility for the City of Rock Island (City) which, at the time, was the first stormwater utility in Illinois. His efforts included developing the ERU value that is still used today (2,800 square feet of impervious surface) by performing statistical analysis on a residential property sample. He also developed statistical relationships that ultimately allowed the City to implement a simplified residential rate based solely on the gross property area found on a residential land parcel. Connectivity of the stormwater fees to the existing City water billing system was also developed as part of this project.

City of Champaign (IL)

Keith served as Manager of data-related services for the first phase of this multi-phase stormwater utility feasibility study and implementation project for the City of Champaign (City). His role was to evaluate available data and recommend a rate structure and billing mechanism supportable by the legacy data (for efficiency). In this capacity, Keith determined that the Urbana-Champaign Sanitary District (UCSD) could provide billing and customer services for the stormwater utility most efficiently, if processes were put into place to connect that system to the City's GIS-derived rate structure and customer base. This decision was facilitated by the UCSD's unusual billing policies that essentially always bill owners (instead of occupants) for wastewater services.

City of Raleigh Public Utilities Department (NC)

In March 2012, the City of Raleigh (City) contracted Raftelis to conduct a comprehensive organizational analysis and development study for the City's Public Utility Department within a 20-week time frame. For several years, the City had been discussing whether to relocate its stormwater utility from the Public Works Department to the Public Utilities Department. The move could have had far-reaching effects on the relationship between stormwater and transportation, the efficiency of planning, design, and engineering activities, regulatory compliance, and customer service management. Keith was the Project Lead on the Raftelis team. With extensive knowledge of and experience in the field of surface water management, the Raftelis team was asked to compile, measure, and analyze the costs and benefits of relocating the utility. As this data would inevitably be presented in both qualitative and quantitative formats, Raftelis conducted both types of analyses to arrive at its recommendation. Finally, Raftelis reported its findings to the leadership of Public Utilities, Public Works, and the City Council.

City of Urbana (IL)

On a parallel track with the work in Champaign, IL, Keith provided similar services to the City of Urbana. Although the projects were separate and distinct, they were procured and performed on the same schedule to save money, and under the approach that assumed a common billing method would be found.

Montgomery County (OH)

Keith is serving as a solutions architect for a solid waste rate study for Montgomery County Environmental Services (MCES). The first phase of the study will include three components: 1) information technology and business systems review; 2) solid waste rate benchmarking; and 3) rate development and financial planning. The primary task under the information technology and business systems review is to perform an audit of the County's billing system. MCES is concerned that it is not billing all of the customers it is serving and that it may be incorrectly billing some of those customers that it is billing. One of the complicating factors is that MCES must rely on private haulers for billing

Appendix A

information. The objective of the solid waste rate benchmarking is to identify the way other solid waste districts in Ohio and across the country charge for the services provided. MCES currently recovers about half of its revenue from tipping fees and half from annual property charges. The third component of this phase of work will be to develop a multi-year financial plan for the solid waste enterprise fund. The model will be used to evaluate alternative charge methodologies and, ultimately, it will be a financial planning tool for MCES.

City of Morristown (TN)

Keith served as project director for the development of a unified solution for viewing, editing, and billing stormwater, solid waste, and wastewater services for the City of Morristown (TN). This solution allows City staff to view billing data for those services on a particular account, allows staff to change accounts and communicate those changes to the City's third-party biller, and also provides account rectification protocols where City records do not align with records maintained by the biller. Development of this solution included database and software creation, data analysis, and coordination with the third-party biller. Raftelis team members also developed documentation and training materials to describe the use and operation of the software solution and offered recommendations on related business processes.

Carlisle Borough (PA)

Raftelis was engaged by the Borough of Carlisle to provide assistance in assessing the financial needs of its growing stormwater program and evaluating the feasibility of a fee as the most appropriate funding mechanism. Keith served as Principal in Charge for this successful effort. He provided expertise based on an extensive engineering background during the program assessment phases. Keith led numerous public outreach meetings and presented several updates to elected officials. Subsequent to the feasibility study, Raftelis was engaged by the Borough to implement the stormwater fee based on implementation and data maintenance considerations and recommendations made during the feasibility phase. Keith led the implementation effort for the fee.

Lower Paxton Township (PA)

Raftelis was engaged by Lower Paxton Township to evaluate the feasibility of establishing a stormwater fee as the funding mechanism for the Township's growing stormwater program. Keith served as Principal in Charge of this project. Keith provided expert guidance to the Township as the project team evaluated its current program and envisioned the scope and costs of the future program, and is assisted with the Township's implementation of the stormwater fee which went live in 2019. Keith served as primary liaison to the Township Board.

STORMWATER PROGRAM AND UTILITY DEVELOPMENT - FULL CLIENT LIST

Keith served or is serving as project manager, Data and Systems Manager, Consultant, or Principal in Charge responsible for various components of stormwater management program or utility consulting for these clients:

- Arapahoe County (CO)
- City of Archdale (NC)
- City of Albemarle (NC)
- City of Atlanta (GA)
- City of Baltimore (MD)
- Beaufort County (SC)
- City of Beaufort (SC)
- City of Bellingham (MA)
- City of Bluffton (SC)
- Boston Water and Sewer Commission (MA)
- City of Burlington (NC)
- City of Butner (NC)
- Camden County (NC)
- Capital Region Water (PA)
- Borough of Carlisle (PA)
- City of Cartersville (GA)
- City of Champaign (IL)
- City of Chapel Hill (NC)
- City of Charlotte (NC)
- City of Colorado Springs (CO)
- City of Columbia (SC)
- Columbia County (GA)
- City of Creedmoor (NC)
- Cumberland County (NC)
- City of Dallas (TX)
- DC Water (DC)
- City of Decatur (GA)
- Douglas County (CO)
- City of Durham (NC)
- Durham County (NC)

Appendix A

- City of East Point (GA)
- City of Fayetteville (NC)
- City of Franklin (MA)
- City of Fort Worth (TX)
- City of Gainesville (GA)
- Georgetown County (SC)
- City of Goldsboro (NC)
- Granville County (NC)
- City of Greensboro (NC)
- City of Greenville (NC)
- City of Greenville (SC)
- City of Griffin (GA)
- City of Hilton Head Island (SC)
- Horry County (SC)
- City of Hudson Oaks (TX)
- City of Indianapolis (IN)
- City of Jacksonville (NC)
- City of Kannapolis (NC)
- City of Kernersville (NC)
- Lexington-Fayette County (KY)
- Lower Paxton Township (PA)
- City of Manchester (NH)
- City of Marathon (FL)
- City of Maryville (TN)
- City of Meadville (PA)
- Mecklenburg County (NC)
- City of Milford (MA)
- City of Mooresville (NC)
- City of Morristown (TN)
- City of Mount Lebanon (PA)
- City of Nashville (TN)
- City of New Castle (DE)
- New Hanover County (NC)
- City of New Orleans (LA)
- Town of North East (MD)
- Northeast Ohio Regional Sewer District (OH)
- Person County (NC)
- City of Philadelphia (PA)
- Pittsburgh Water and Sewer Authority (PA)
- City of Pompano Beach (FL)
- City of Portland (ME)
- City of Port Royal SC)
- City of Raleigh (NC)
- City of Reno (NV)
- Richland County (SC)
- City of Rock Island (IL)
- City of Rocky Mount (NC)
- San Diego County (CA)
- City of San Jose (CA)
- City of Shelby (MT)
- St. Louis MSD (MO)
- City of South Burlington (VT)
- City of Tega Cay (SC)
- City of Urbana (IL)
- Wake County (NC)
- Town of Westford (MA)
- Village of Wilmette (IL)
- City of Wilmington (NC)
- City of Yarmouth (MA)

Exhibit KR-1

TECHNICAL MEMORANDUM 4

Revenue Requirements

PREPARED FOR: Pittsburgh Water & Sewer Authority

DATE: August 1, 2013

The purpose of this Technical Memorandum (TM) is to summarize the estimated stormwater program revenue requirements and associated cost allocation methodology.

This Technical Memorandum is organized as follows:

Section 1 - Revenue Requirements

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1 Revenue Requirements Analysis

1.1 Background

The revenue requirements analysis includes a six-year financial plan for Fiscal Year (FY) 2012 through FY 2017. In this financial plan, FY 2014 is set as the “Test Year” as it is assumed to be a likely year in which a stormwater rate structure could be realistically launched if PWSA decide to implement a stormwater rate structure.

The revenue requirements analysis involves the following components:

- Allocation factors;
- O&M cost projections;
- Capital cost projections;
- Other revenue requirement adjustments; and
- Net revenue requirement projections

The following sub-sections discuss each of these revenue requirement analysis components.

1.1.1 Allocation Factors

To determine the revenue requirements, allocation factors were required, as the current financial records at PWSA only differentiate between water and wastewater costs. As such, the costs associated with stormwater are a portion of the overall wastewater costs. To separate the wastewater costs into stormwater and sanitary components for the purposes of budgeting for the stormwater authority, allocation factors were developed that focused on the peak flow of the system and the size of the collection system. The following sections describe the methodology that was used to develop those representative allocation factors.

1.1.1.1 Operation and Maintenance Conveyance Cost Allocation Factor

To allocate the O&M costs associated with the combined sewer collection system, a comparison of peak flows was established. The peak flow comparison was used, given that the combined sewer collection system is sized to convey wet weather events, essentially stormwater, which require larger infrastructure and, therefore, higher O&M costs than if the system was only sized to convey sanitary flows.

To determine the percentage of dry weather flows versus the wet weather flows, results from the current Main Rivers Planning Basin effort were used to be consistent with other feasibility studies that are currently underway within the region and the ability to correlate to documented dry weather flows. The Main Rivers Planning Basin was used based on its coverage of the majority of the PWSA system, which is assumed herein to represent the typical flow characteristics within the entire PWSA sewer system.

Table 5.1 compares total runoff from the watersheds during the top three rainfall events in 2003, which is being used by the region as the “Typical Year”. The total runoff from the watersheds was added to the average dry weather flow of 63.0 million gallons per day (MGD) to determine the total volume for that day. When comparing the percentages for the two largest events during the “Typical Year”, the approximate ratio of stormwater runoff to sanitary (dry weather) runoff was approximately 73/27. The smaller storm event illustrates that the ratio was reduced to a 60/40 storm-to-sanitary ratio.

The results of the flow comparisons are presented below.

Table 1.1: Peak Day Runoff of Three (3) Storm Events During the 2003 Typical Year

(8/29/03 to 8/30/03, 1.60 inch rainfall)		
Avg. Dry Weather Flow	63.0 MGD	26.4%
Runoff from Watersheds	175.2 MGD	73.6%
Total Flow	238.2 MGD	100%
(7/21/03 to 7/22/03, 1.53 inch rainfall)		
Avg. Dry Weather Flow	63.0 MGD	26.7%
Runoff from Watersheds	172.8 MGD	73.3%
Total Flow	235.8 MGD	100%
(7/4/03, 0.92 inch rainfall)		
Avg. Dry Weather Flow	63.0 MGD	40.0%
Runoff from Catchments	94.4 MGD	60.0%
Total Flow	157.4 MGD	100%

In summary, it was determined that a 70/30 stormwater to sanitary ratio was reasonable to allocate the O&M costs for the conveyance system. The 70/30 ratio is supported by the results documented in Table 1.1 and also compares reasonably well with other large combined sewer systems that have used similar methodologies to allocate costs between sanitary and stormwater for the purposes of developing a stormwater authority.

1.1.1.2 Debt Service Cost Allocation Factor

To allocate the costs associated with the existing and future debt service of the combined sewer collection system, a comparison of existing infrastructure was established. An inch-foot analysis was used to determine the ratio of infrastructure within the collection system in relation to stormwater and sanitary.

The inch-foot analysis was conducted based on PWSA's existing collection system and included determining the "inch-foot" total for each pipe by taking the diameter (or representative diameter) of each pipe times the length of the pipe. The total length of the pipe was obtained from the PWSA GIS data provided by PWSA. As shown on Table 1.2, the total length of the pipe within the PWSA system is 6,379,951 linear feet.

Table 1.2: Total Length of Pipe by Pipe Type

Pipe Type	Linear Feet
Combined	4,791,216
Force Main	7,420
Overflow	65,377
Sanitary	909,478
Storm	599,770
Undefined	5,973
Total	6,379,951

Once an inch-foot value was determined for each pipe, the total inch-foot was summarized based on “Pipe Type”. The inch-foot of each main category of pipe type in the PWSA system is presented in Table 1.3.

Table 1.3: Total Inch-Foot by Pipe Type

Pipe Type	In-Ft
Combined	100,476,225
Force Main	61,882
Overflow	2,885,669
Sanitary	9,041,697
Storm	12,044,613
Undefined	97,224
Total	124,607,310

For the purposes of this evaluation, the pipe types relating to combined portions of the system were grouped together to form one combined category. These included combined, force main and overflow pipe types. These types were included based on the fact that force mains are primarily serving to pump combined flow from low areas back into the gravity system. Overflow pipes were also included based on their responsibility to convey combined flows to a designated outfall. Last, undefined pipes were not included in the assessment, given that their use was undefined. The results of this grouping are provided in Table 1.4 below.

Table 1.4: Consolidated Total Inch-Foot by Pipe Type

Pipe Type	In-Ft	%
Combined	103,423,776	83.0%
Sanitary	9,041,697	7.3%
Storm	12,044,613	9.7%
Total	124,510,087	100.0%

To assign the combined total to either sanitary or storm, the peak flow allocation factor described in Section 1.1.1.1 was used. This resulted in 70 percent of the combined total being allocated to storm (72,396,643 inch-foot [in-ft]), with the remaining 30 percent allocated to sanitary (31,027,133 in-ft). The resulting inch-foot allocation is provided in Table 1.5 below.

Table 1.5: PWSA Sewer System Proposed Breakdown1

Pipe Type	In-Ft	%
Sanitary (allocated from combined)	31,027,133	24.9%
Sanitary (known)	9,041,697	7.3%
Sanitary (total)	40,068,830	32.2%
Storm (known)	12,044,613	9.7%
Storm (allocated from combined)	72,396,643	58.1%
Storm (total)	84,441,257	67.8%
Total	124,510,087	100.0%

- 1) Assumes the 70/30 split between storm sewers and sanitary sewers for combined systems.

In summary, a 68/32 stormwater to sanitary ratio was determined to be reasonable to allocate the debt service of the conveyance system. The 68/32 ratio is supported by the results documented in Table 1.5 and also compares reasonably well with other large combined sewer systems that have used similar methodologies to allocate costs between sanitary and stormwater for the purposes of developing a stormwater authority.

1.1.1.3 Treatment Cost Allocation Factor

Currently, ALCOSAN's charge for the treatment of wastewater is determined by water meter consumption. The ALCOSAN charge is currently a direct transfer through PWSA and is shown as a separate line item on the PWSA bill. As such, the stormwater authority would not include the cost associated with the treatment of wastewater; however, it should be noted that, while the ALCOSAN costs are currently determined by water consumption, there could be a shift in the future to base that charge on the actual flows to ALCOSAN. If that shift occurs in the future, the stormwater authority should consider reevaluating allocating a portion of the costs to the stormwater authority, given that reductions in stormwater contributions might reduce the overall cost of treatment.

1.1.1.4 Customer Service Allocation Factor

To develop a customer service allocation factor, individual costs items are first allocated based on the revenues between water and wastewater services. Given that the wastewater does not required meter readings, the meter readings were removed from the total cost. The remaining costs were then divided on an equal basis between sanitary sewer and the stormwater authority.

1.1.1.5 General and Administrative Allocation Factor

After all direct costs are allocated, the General and Administrative (G&A) costs are allocated proportionate to the allocation of all the direct (non-G&A) O&M costs.

Table 1.6 documents the allocation factors and the basis that was used for the development of the rate structure.

Table 1.6 –Wastewater O&M Allocation Factors

Allocation Factor/Cost Center	Allocation Basis	Sanitary Sewer Allocation	Stormwater Allocation
O&M Conveyance	Based on the ratio of estimated peak wet weather flow to peak dry weather flow volume.	30%	70%
Debt Service	Based on the inch-foot analysis.	32%	68%
Treatment	Treatment costs are allocated to Sanitary as it is assumed that these costs will continue to be borne by the Sanitary budget based on the rate established by ALCOSAN.	100%	0%
Customer Service	Individual cost items first allocated based on revenue between Water and Wastewater. Wastewater costs (except Meter costs) were then further allocated on an equal basis between sanitary and stormwater. The percentages reflect the overall resulting allocation.	63%	37%
General & Administrative	Based on the proportionate allocation of all the direct (Non-G&A) O&M costs.	94%	6%

1.1.2 O&M Cost Projections

The O&M cost projections typically include costs of existing operational activities, the costs currently expended by PWSA for stormwater management, and any anticipated increases in future operational activities.

For the six-year forecast period, the O&M costs are projected using PWSA's approved FY 2012 budget as the base year. Allocation factors discussed in Section 1.1.1 above were used to allocate the FY 2012 budget in terms of stormwater and sanitary costs. The O&M costs were developed using the multi-step process described below:

Step 1: PWSA's combined wastewater costs were first categorized in to functional costs. The four functional costs delineated are: Conveyance; Treatment; Customer Service; and G&A.

Step 2: Allocation factors were developed as noted in Section 1.1.1, to apportion each of the functional costs (except Treatment) between the sanitary sewer and stormwater budgets. Treatment costs are not allocated to stormwater as it is assumed that those costs will continue to be borne by the sanitary budget based on the rate established by ALCOSAN.

Step 3: Additional O&M costs for services currently provided by the City, for which the stormwater authority is expected to take responsibility for funding, were defined. It is assumed that the stormwater authority will take on these costs only from the Test Year and beyond. Hence, these costs are included only from FY 2014 onwards. Additional information pertaining to these costs is provided in Section 1.1.2.1 below.

Step 4: One-time stormwater authority implementation costs were estimated and included in the O&M cost projections. The total estimated implementation costs are assumed to occur over a two year period between FY 2014 and FY 2015.

The sum of all of the above costs provides the total estimated O&M costs. Recurring functional costs are projected using an escalation factor of 4.15 percent, which is an approximation of allowances for projected costs. Table 1.7 presents the six-year projections of O&M costs for the stormwater authority.

1.1.2.1 Additional O&M Costs Currently Conducted by the City

In addition to the FY 2012 PWSA budget, costs from the City DPW that were related to stormwater management were included in the O&M costs that are to be covered by the stormwater authority. These costs include DPW costs for labor and equipment for work orders that included stormwater repairs such as flood and storm damages, as well as inlet, manhole, gutter, and stream channel repairs. Those costs were projected to be a total of \$320,000 for FY 2012 and are presented in the table in Appendix A - Table A.1, Current Stormwater Responsibilities.

Given that the City currently provides engineering services which include zoning/development reviews pertaining to stormwater, as well as floodplain reviews, an additional engineer will be required for the stormwater authority in order to conduct those reviews. This engineer would also be responsible for reviewing and assisting with stormwater credit applications and appeals processing. To support with the inspection of private stormwater management facilities and verification of stormwater credit applications, an additional field inspector would be required. The field inspector would require a vehicle to conduct the inspections as well as the authority to enter private property, which is something that PWSA currently cannot do. In total, this equates to two additional staff with a combined cost of \$160,000 per year, which includes salary and benefits, as well as a vehicle estimated at \$10,000 per year to cover the lease of the vehicle, insurance, and fuel. As such, \$170,000 is added above the current PWSA budget to cover the additional staff required for the stormwater authority.

Table 1.7 – Projected O&M Expenses

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
<i>Annual Escalation Factor</i>		4.15%	4.15%	4.15%	4.15%	4.15%
Existing O&M Costs						
Conveyance	\$3,516,000	\$3,662,000	\$3,814,000	\$3,972,000	\$4,138,000	\$4,309,000
Treatment	-	-	-	-	-	-
Customer Service	\$537,000	\$559,000	\$583,000	\$607,000	\$632,000	\$658,000
General & Administrative	\$602,000	\$627,000	\$653,000	\$680,000	\$708,000	\$738,000
Additional Stormwater Related Costs						
Current City Services ⁽¹⁾	-	-	\$532,000	\$554,000	\$577,000	\$601,000
Implementation Costs ⁽²⁾	-	-	\$300,000	\$150,000	-	-
Total Estimated O&M Costs	\$4,655,000	\$4,848,000	\$5,882,000	\$5,963,000	\$6,055,000	\$6,306,000

Notes:

- (1) Current City Services include the following City activities anticipated to be taken over by PWSA in FY 2014:
 - o Stormwater Reviews and Inspections (2 FTEs and a vehicle lease). Estimated FY 2012 cost of \$170,000.
 - o Stormwater Facility Maintenance costs. Estimated FY 2012 cost of \$285,000 based on information provided by the City.
 - o Stream Maintenance costs. Estimated FY 2012 cost of \$35,000 based on information provided by the City.
- Assumes a January 2014 launch of the stormwater authority.

The sum of all of the above costs provides the total estimated O&M costs. Recurring functional costs are projected using an escalation factor of 4.15%. Table 1.2 presents the six-year projections of O&M costs for the stormwater utility.

1.1.3 Capital Cost Projections and Financing

1.1.3.1 Capital Cost Projections

The capital costs are projected based on the PWSA's CIP. PWSA's CIP was reviewed, and the wastewater related projects were identified. Appendix A - Table A.2, Capital Improvement Program Expenses, provides a summary of the wastewater-related projects included in PWSA's CIP.

1.1.3.2 Capital Cost Financing

PWSA's existing outstanding debt service was first allocated between the water and wastewater departments. The wastewater outstanding debt service was subsequently allocated between sanitary sewer and stormwater based on the Debt Service Cost Allocation Factor discussed in Section 1.1.1.2 above. Appendix A - Table A.3, Existing Debt Service, provides a summary of the stormwater authority's allocation of existing debt service.

For initial planning and evaluation purposes, it is assumed that all other capital program costs presented in Appendix A - Table A.2 will be entirely bond financed. A financing plan for PWSA's wastewater-related CIP was developed to estimate the projected bond issues necessary to provide the funding for the wastewater-related CIP. The projected debt service for the projected bond issues was subsequently allocated between the sanitary sewer and stormwater authority using the same proportion as the existing debt service. Appendix A Table A.4, Projected Capital Funding Expenses, provides a summary of the estimated wastewater CIP financing plan and subsequent allocation of proposed debt service to the stormwater authority.

PWSA's existing revenue bond covenant requires PWSA to maintain a debt service coverage ratio of 1.20 (120 percent). For initial planning and evaluation purposes, it is assumed that the stormwater authority will establish the annual revenue requirements to maintain a debt service coverage ratio of 1.25 (125 percent). A slightly higher debt service coverage than required by the bond covenant is recommended as a contingency to account for any potential shortfalls in the stormwater authority's revenues when the stormwater authority is launched. Estimated additional revenues required to maintain the 1.25 (125 percent) debt service coverage are included as a revenue requirement.

1.1.3.3 Routine Capital Outlay Costs

It is prudent and good financial practice to establish an annual capital budget for Routine Capital Outlays for minor unforeseen expenditures. To reflect this practice, an estimated additional budget has been defined for Routine Capital Outlays. This additional budget will provide an allowance for repairs to the system as well as cleaning and repairing structures such as roadway culverts which are not currently included within PWSA's maintenance contracts, but are a part of the overall stormwater management system with PWSA's service area.

For the purpose of this study, an annual budget estimate for Routine Capital Outlay is included

beginning FY 2014. The annual estimate is calculated as follows:

- Fifteen percent (15 percent) of the “conveyance” O&M costs allocated to stormwater for FY 2012, which equates to \$530,000 is estimated for minor repairs/cleaning for roadway culverts, inlets, etc.
- An additional \$320,000 is estimated for minor stormwater infrastructure repairs that the City typically performs.

The sum of the above two items which approximately equates to \$850,000 is defined as the baseline annual Routine Capital Outlay budget. For FY 2014, only 50 percent of this estimated baseline amount is included to reflect program initiation, and then the full baseline amount of \$850,000 is included in projection for FY 2015, and escalated using a nominal annual escalation factor of 4.15 percent for FY 2016 and FY 2017.

Table 1.8 presents the six-year projections of capital expenses including the allocation of existing outstanding bonds, proposed bonds, routine capital outlay, and debt service coverage requirement, needed to support the PWSA’s stormwater capital expenditure needs at the current level of service.

Table 1.8 – Projected Annual Expenditures

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
Existing Debt Service						
GO/Direct Debt	\$10,334,000	\$10,545,000	\$10,606,000	\$10,621,000	\$10,634,000	\$10,557,000
PennVest Loans	\$436,000	\$437,000	\$437,000	\$436,000	\$453,000	\$458,000
Proposed Debt Service						
Proposed Revenue Bonds	\$772,000	\$772,000	\$2,509,000	\$2,509,000	\$4,246,000	\$4,246,000
Routine Capital Outlay⁽¹⁾						
Routine Capital Outlay	-	-	\$425,000	\$850,000	\$885,000	\$922,000
Debt Service Coverage						
Debt Service Coverage	\$2,886,000	\$2,938,000	\$1,982,000	\$2,528,000	\$2,932,000	\$2,850,000
Total Estimated Capital Costs	\$14,428,000	\$14,692,000	\$15,959,000	\$16,944,000	\$19,150,000	\$19,033,000

Notes:

Routine Capital Outlay is funded within the revenues required to meet the 1.25 debt service coverage requirement

1.1.4 Operating Reserve Requirement

In addition to the projection of O&M costs and capital costs discussed above, the projection of revenue requirements for authority enterprise operations typically includes other operating and capital reserve requirements and cost adjustments for any anticipated user fee collections shortfall. These additional revenue requirement cost items are discussed below.

Operating Reserve Requirement

In projecting revenue requirements for an enterprise fund authority, it is prudent to include an estimate of annual operating reserve requirement to provide cash flow fluctuations during the fiscal year and to provide for any extraordinary unplanned for operational emergencies. The inclusion of working capital reserve requirement is consistent with PWSA's current bond covenants and PWSA's best practice financial management.

PWSA's existing revenue bond covenants requires PWSA to maintain an Operating Reserve Requirement of 60 days of annual O&M expenditures. As the stormwater authority is expected to be launched in FY 2014, the full 60-day operating reserve needed for that year is included. The incremental increase needed to meet the 60-day O&M reserve requirement is included in each subsequent year. The projected 60-day O&M reserve requirement for the study period is presented in Table 1.9.

1.1.4.1 Capital Reserve Requirement

PWSA's existing revenue bond covenants requires PWSA to maintain a Renewal and Replacement Fund in the amount designated by the PWSA's consulting engineer. For initial planning and evaluation purposes, it is assumed that no additional capital reserve requirements will be necessary during the study period.

1.1.4.2 Collection Shortfall Adjustments

Collection shortfalls, or bad debt amounts, are incurred when billed user fees become delinquent uncollectible amounts. Despite any collection shortfall, the stormwater authority still needs to generate sufficient revenues to meet all the annual expenditure obligations. Therefore, it is prudent financial practice to include an estimate of revenue requirement to offset any potential revenue collection shortfall. Collection shortfall revenue requirement adjustments are estimated as 5 percent of total billings. The projected Collection Shortfall Adjustments are presented in Table 1.9.

1.1.5 Net Revenue Requirement Projection

The net revenue requirement is defined as the revenues that need to be generated from user rates. Therefore, net revenue requirement is calculated as the total annual revenue requirement less any anticipated "miscellaneous revenues" that can offset some of the stormwater management costs. For initial planning and evaluation purposes, it is assumed that no miscellaneous revenues will be attributable to the stormwater authority during the study period. See Table 1.10 for the projected Net Revenue Services.

Table 1.9 – Other Revenue Requirement Adjustments

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
Reserve Requirements						
Operating Reserve Requirement	-	-	\$980,000	\$14,000	\$15,000	\$42,000
Capital Reserve Requirement	-	-	-	-	-	-
Revenue Adjustments						
Collection Shortfall Adjustments	\$954,000	\$977,000	\$1,141,000	\$1,146,000	\$1,261,000	\$1,269,000
Total Other Revenue Requirement Adjustments	\$954,000	\$977,000	\$2,121,000	\$1,160,000	\$1,276,000	\$1,311,000

Table 1.10 – Net Revenue Requirements

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
O&M Expenses	\$4,655,000	\$4,848,000	\$5,882,000	\$5,963,000	\$6,055,000	\$6,306,000
Capital Expenses	\$14,428,000	\$14,692,000	\$15,959,000	\$16,944,000	\$19,150,000	\$19,033,000
Reserve Requirements	-	-	-	-	-	-
Operating Reserve Requirement	-	-	\$980,000	\$14,000	\$15,000	\$42,000
Capital Reserve	-	-	-	-	-	-
Revenue Adjustments	-	-	-	-	-	-
Collection Adjustments	\$954,000	\$977,000	\$1,141,000	\$1,146,000	\$1,261,000	\$1,269,000
Miscellaneous Revenue	-	-	-	-	-	-
Total Net Revenue Requirements	\$20,037,000	\$20,517,000	\$23,962,000	\$24,067,000	\$26,481,000	\$26,650,000

APPENDIX

Table A.1 – DPW Current Stormwater Responsibilities

City of Pittsburgh Department of Public Works Stormwater Activities Cost Summary					
Program	Type of O&M	Total Cost			Projected Cost
		2009	2010	2011	2012
Flood/Storm Damage <i>- To be conducted by Stormwater Authority</i>	Labor	\$9,313	\$18,178	\$4,173	
	OT Labor	\$2,493	\$5,485	\$1,362	
	Materials	\$190	\$438	\$94	
	Equipment	\$8,062	\$8,504	\$2,985	
	Total	\$20,058	\$32,604	\$8,614	\$35,000
Catch Basin/Manhole/Gutters <i>- To be conducted by Stormwater Authority</i>	Labor	\$86,995	\$88,557	\$135,856	
	OT Labor	\$5,726	\$8,946	\$61	
	Materials	\$6,873	\$10,986	\$17,706	
	Equipment	\$48,799	\$60,932	\$105,755	
	Total	\$148,392	\$169,422	\$259,378	\$285,000
Street Sweeping <i>- To be conducted by the City</i>	Labor	\$704,279	\$404,132	\$232,735	
	OT Labor	\$9,078	\$5,383	\$6,445	
	Materials	\$29,282	\$178,675	\$159,945	
	Equipment	\$599,826	\$452,899	\$454,963	
	Total	\$1,342,465	\$1,041,089	\$854,089	\$939,497

Note: Data from City of Pittsburgh Department of Public Works

Table A.2 - Projected Capital Improvement Program Expenses

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
Existing Capital Program Costs						
Try Street Relief Sewer		\$2,209,000				
Sewage Pump Station Upgrades	\$3,090,000					
Becks Run CSO Improvements			\$1,454,000			
Bells Run CSO Improvements				\$5,981,000	\$6,161,000	\$6,346,000
Easy Street CSO Improvements			\$2,295,000			
Little Saw Mill Run CSO Improvements				\$5,459,000	\$5,622,000	\$5,791,000
McCartney Run CSO Improvements			\$5,507,000			
Weymans Run CSO Improvements			\$1,530,000			
Brook Street Run CSO Improvements			\$2,295,000			
COA Compliance	\$1,030,000	\$1,061,000	\$1,093,000	\$1,126,000	\$1,159,000	\$1,194,000
Sewer System Improvements	\$2,060,000	\$2,122,000	\$2,185,000	\$2,251,000	\$2,319,000	\$2,388,000
Total Estimated Capital Program Costs	\$6,180,000	\$5,392,000	\$16,359,000	\$14,817,000	\$15,261,000	\$15,719,000

Table A.2 – Projected Wastewater Related Capital Improvement Program Expenses

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
Existing Capital Program Costs						
Try Street Relief Sewer		\$2,209,000				
Sewage Pump Station Upgrades	\$3,090,000					
Becks Run CSO Improvements			\$1,454,000			
Bells Run CSO Improvements				\$5,981,000	\$6,161,000	\$6,346,000
Easy Street CSO Improvements			\$2,295,000			
Little Saw Mill Run CSO Improvements				\$5,459,000	\$5,622,000	\$5,791,000
McCartney Run CSO Improvements			\$5,507,000			
Weymans Run CSO Improvements			\$1,530,000			
Brook Street Run CSO Improvements			\$2,295,000			
COA Compliance	\$1,030,000	\$1,061,000	\$1,093,000	\$1,126,000	\$1,159,000	\$1,194,000
Sewer System Improvements	\$2,060,000	\$2,122,000	\$2,185,000	\$2,251,000	\$2,319,000	\$2,388,000
Total Estimated Capital Program Costs	\$6,180,000	\$5,392,000	\$16,359,000	\$14,817,000	\$15,261,000	\$15,719,000

Table A.3 – Existing Debt Service

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
<i>Outstanding GO/Direct Debt</i>						
Wastewater Utility						
Series 1993 A	\$3,050,936	\$3,401,975	-	-	-	-
Series 1993 B	-	-	-	-	-	\$799,020
Series 2003	\$784,764	\$784,748	\$4,298,309	\$4,321,793	\$4,336,731	\$646,857
Series 2007 A	\$1,997,559	\$2,000,477	\$1,999,261	\$1,998,236	\$1,999,287	\$1,998,940
Series 2007 B 1	\$564,422	\$564,422	\$564,422	\$564,422	\$564,422	\$564,422
Series 2007 B 2	\$564,490	\$564,490	\$564,490	\$564,490	\$564,490	\$564,490
Series 2008 A	\$1,574,240	\$1,574,240	\$1,574,240	\$1,574,240	\$1,574,240	\$4,355,177
Series 2008 B 1	\$1,392,751	\$1,376,615	\$1,376,615	\$1,376,615	\$1,377,517	\$1,376,615
Series 2008 B 2	\$1,393,898	\$1,376,521	\$1,376,521	\$1,376,521	\$1,377,422	\$1,376,521
Series 2008 C1 A	\$208,382	\$208,382	\$208,382	\$208,382	\$208,528	\$208,382
Series 2008 C1 B	\$208,382	\$208,382	\$208,382	\$208,382	\$208,528	\$208,382
Series 2008 C1 C	\$100,798	\$99,956	\$99,956	\$99,956	\$100,017	\$99,956
Series 2008 C1 D	\$633,484	\$629,089	\$617,977	\$617,977	\$617,977	\$617,977
Series 2008 C2	\$974,916	\$971,923	\$960,946	\$960,946	\$961,553	\$960,946
Series 2008 D 1	\$424,375	\$424,375	\$424,375	\$424,375	\$424,375	\$424,375
Series 2008 D 2	\$1,323,255	\$1,322,490	\$1,322,490	\$1,322,490	\$1,323,255	\$1,322,490
Total	\$15,196,650	\$15,508,087	\$15,596,366	\$15,618,826	\$15,638,343	\$15,524,550
Stormwater Utility Allocation						
Percent Allocation	68%	68%	68%	68%	68%	68%
Allocated Debt Service	\$10,333,722	\$10,545,499	\$10,605,529	\$10,620,801	\$10,634,073	\$10,556,694

Table A.3 – Existing Debt Service (Continued)

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
<i>PennVest Loans</i>						
Wastewater Utility						
Note # 71362 (#3)	\$264,769	\$264,770	\$264,769	\$264,769	\$281,646	\$290,087
Note # 27772 (#4)	\$611,446	\$611,445	\$611,444	\$611,444	\$649,347	\$656,930
Note # 27784 (#5)	\$268,519	\$268,520	\$268,520	\$268,520	\$268,520	\$268,520
Note # 71191 (#6)	\$10,375	\$10,376	\$10,375	\$10,376	\$10,374	\$10,374
Note # 58066 (#7)	\$52,056	\$52,056	\$52,056	\$52,058	\$52,059	\$52,055
Note # 71217 (#11)	\$136,848	\$136,848	\$136,848	\$136,848	\$136,848	\$136,848
Total	\$1,344,014	\$1,344,015	\$1,344,012	\$1,344,014	\$1,398,795	\$1,414,813
Stormwater Utility Allocation						
Percent Allocation ¹	32.5%	32.5%	32.5%	32.5%	32.5%	30%
Allocated Debt Service	\$436,531	\$436,531	\$436,530	\$436,532	\$452,967	\$457,770
<i>Total</i>						
Wastewater Utility	\$16,540,664	\$16,852,102	\$16,940,378	\$16,962,840	\$17,037,137	\$16,939,363
Stormwater Utility Allocation						
Percent Allocation	65.1%	65.2%	65.2%	65.2%	65.1%	65.0%
Allocated Debt Service	\$10,770,253	\$10,982,030	\$11,042,059	\$11,057,333	\$11,087,040	\$11,014,464

Notes:

1. Wastewater Utility related PennVest Loans allocated 30% to Stormwater Utility with the exception of Note # 58066 (#7) which is allocated 100% to the Stormwater Utility.

Table A.4 - Projected Capital Funding Expenses

Annual Expenditures	Projected Year 1 (FY 2012)	Projected Year 2 (FY 2013)	Projected Year 3 (FY 2014)	Projected Year 4 (FY 2015)	Projected Year 5 (FY 2016)	Projected Year 6 (FY 2017)
<i>Revenue Bond Issue Terms</i>						
Interest Rate	5.0%	-	5.0%	-	5.0%	-
Term	25 years	-	25 years	-	25 years	-
Issuance Date	January 1	-	January 1	-	January 1	-
Bond Issue	\$16,000,000	-	\$36,000,000	-	\$36,000,000	-
Estimated Issuance Expense ¹	(\$240,000)	-	(\$540,000)	-	(\$540,000)	-
Debt Service Reserve Requirement ²	(\$1,135,000)	-	(\$2,554,000)	-	(\$2,554,000)	-
Net Proceeds	\$14,625,000	-	\$32,906,000	-	\$32,906,000	-
<i>Construction Fund</i>						
Beginning Balance	\$0	\$8,572,000	\$3,239,000	\$20,093,000	\$5,403,000	\$23,381,000
Bond Proceeds	\$14,625,000	-	\$32,906,000	-	\$32,906,000	-
Capital Expenditures	(\$6,180,000)	(\$5,392,000)	(\$16,359,000)	(\$14,817,000)	(\$15,261,000)	(\$15,719,000)
Interest Income	\$127,000	\$59,000	\$307,000	\$127,000	\$333,000	\$156,000
Ending Balance	\$8,572,000	\$3,239,000	\$20,093,000	\$5,403,000	\$23,381,000	\$7,818,000
<i>Proposed Debt Service</i>						
Series 2012 Bonds	\$1,135,000	\$1,135,000	\$1,135,000	\$1,135,000	\$1,135,000	\$1,135,000
Series 2013 Bonds		-	-	-	-	-
Series 2014 Bonds			\$2,554,000	\$2,554,000	\$2,554,000	\$2,554,000
Series 2015 Bonds				-	-	-
Series 2016 Bonds					\$2,554,000	\$2,554,000
Series 2017 Bonds						-
Total Proposed Bonds	\$1,135,000	\$1,135,000	\$3,689,000	\$3,689,000	\$6,243,000	\$6,243,000
Stormwater Allocation	68%	68%	68%	68%	68%	68%
Stormwater Debt Service	\$772,000	\$772,000	\$2,509,000	\$2,509,000	\$4,246,000	\$4,246,000

Notes:

- 2. Bond Issuance costs estimated as 1.5% of bond issuance.
- 3. Estimated debt service reserve requirement based on level principal and interest payments.