

**PENNSYLVANIA-AMERICAN WATER COMPANY**

**2017 GENERAL BASE RATE CASE**

**R-2017-2595853**

**EXHIBITS NO. 12-F, 12-G**

**WASTEWATER OPERATIONS (EXCLUDING SCRANTON WASTEWATER), SCRANTON  
WASTEWATER OPERATIONS**

**COST OF SERVICE**

**AS OF DECEMBER 31, 2018**

PENNSYLVANIA-AMERICAN WATER COMPANY

Hershey, Pennsylvania

WASTEWATER OPERATIONS  
(EXCLUDING SCRANTON WASTEWATER OPERATIONS)

WASTEWATER COST OF SERVICE

ALLOCATION STUDY

AS OF DECEMBER 31, 2018

AND

PROPOSED CUSTOMER RATES

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Harrisburg, Pennsylvania



Excellence Delivered **As Promised**

April 25, 2017

Pennsylvania-American Water Company  
800 West Hersheypark Drive  
Hershey, PA 17033

Attention

Ladies and Gentlemen:

Pursuant to your request, we have conducted a cost of service allocation study based on pro forma revenue requirements estimated for the test year ended December 31, 2018 and have prepared proposed water rate schedules designed to produce pro forma revenues more commensurate with the allocated costs.

The attached report presents the results of the allocation study, as well as supporting schedules which set forth the detailed cost allocation calculations and the proposed schedule of rates. Schedules A and A-1, on pages 6 and 7, present a comparison of the cost of service by customer classification with the pro forma revenues produced by each classification under present and proposed rates. The proof of revenue calculations are set forth in Exhibit No. 12-D.

Respectfully submitted,

GANNETT FLEMING VALUATION  
AND RATE CONSULTANTS, LLC

A handwritten signature in black ink, appearing to read "Paul R. Herbert".

PAUL R. HERBERT  
President

A handwritten signature in black ink, appearing to read "Constance E. Heppenstall".

CONSTANCE E. HEPPENSTALL  
Project Manager, Rate Studies

PRH:mlw

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PART I. INTRODUCTION

PENNSYLVANIA-AMERICAN WATER COMPANY  
WASTEWATER OPERATION  
(EXCLUDING SCRANTON WASTEWATER OPERATIONS)  
WATER COST OF SERVICE ALLOCATION STUDY  
AS OF DECEMBER 31, 2018  
AND  
PROPOSED CUSTOMER RATES

PART I. INTRODUCTION

PLAN OF REPORT

The report sets forth the results of the cost of service allocation study for the water operations and the Wastewater Operations (excluding Scranton Wastewater Operations) based on pro forma costs as of December 31, 2018, for Pennsylvania-American Water Company. Part I, Introduction, contains statements with respect to the basis of the study, the procedures employed, and a summary of the results of the study. Schedule A, on page 6, summarizes the cost allocation for the water and wastewater operations and total revenues under present and proposed rates. Part II, Cost of Service by Customer Classification - Wastewater Operations, presents detailed schedules of the allocation of costs to customer classifications, as well as the basis for the allocations. Part III, Comparisons of Present and Proposed Customer Rates, sets forth the proposed rate schedules for water and wastewater service.

BASIS OF STUDY

The method used for the allocation of wastewater cost of service incorporates the functional cost allocation methodology described in the text "Financing and Charges for Wastewater Systems", Manual of Practice No. 27, published by the Water Environment

Federation. This method is recognized for allocating the cost of providing wastewater service to customer classifications in proportion to the classifications' use of the commodity, facilities, and services. It is generally accepted as a sound method for allocating the cost of wastewater service. Under the functional cost method, costs are assigned to cost components using predominant operational purposes as cost-causative factors.

Each element of the cost of service is allocated to customer classifications according to the functional categories. The cost functions are flow, infiltration and inflow (I&I), customer facilities and customer accounting. The functional costs are allocated to customer classifications based on the amount of flow contributed to the system, the amount of I&I allocated to each class, and the number and relative size of customers.

The results of the allocation of wastewater cost of service is summarized on Schedule A, column 2. The cost allocation results can be compared with revenues under present and proposed rates in columns 4 and 6 of Schedule A. The proposed increase and percentage increase in revenues are shown in columns 8 and 9.

The cost of service by customer classification is developed in Schedule D. The allocation factors referenced in column 2 are applied to the costs by account in column 3. The allocation factors are set forth in Schedule E.

The proposed wastewater rates as well as the remaining wastewater service areas are shown in Schedule F.

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COMPARISON OF COST OF SERVICE WITH REVENUES UNDER PRESENT AND PROPOSED RATES  
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2018

Customer Classification (1)	Cost of Service		Revenues, Present Rates		Revenues, Proposed Rates		Proposed Increase	
	Amount (Schedule B) (2)	Percent (3)	Amount (4)	Percent (5)	Amount (6)	Percent (7)	Amount (8)	Percent Increase (9)
Residential	\$ 17,333,927	63.4%	\$ 13,802,424	59.3%	\$16,855,593	61.7%	\$ 3,053,169	22.1%
Non-Residential	4,785,886	17.5%	4,219,900	18.1%	4,742,188	17.3%	522,288	12.4%
Large Industrial	1,055,323	3.9%	947,849	4.1%	1,054,522	3.9%	106,674	11.3%
Bulk Users/VA Hospital	4,163,674	15.2%	4,310,091	18.5%	4,686,194	17.1%	376,103	8.7%
Total Sales	27,338,810	100.0%	23,280,262	100.0%	27,338,497	100.0%	4,058,234	17.4%
Other Revenues	783,385		747,635		783,385		35,750	4.8%
COS Recovered from Water Rates	3,429,475		0		0		0	
Total	\$ 31,551,670		\$ 24,027,897		\$ 28,121,882		\$ 4,093,984	17.0%



PART II. COST OF SERVICE BY CUSTOMER CLASSIFICATION

PENNSYLVANIA-AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
DEVELOPMENT OF RATE OF RETURN BY CUSTOMER CLASSIFICATION  
UNDER PRESENT RATES

ITEM (1)	COST OF SERVICE (2)	RESIDENTIAL (3)	NON-RESIDENTIAL (4)	LARGE INDUSTRIAL (5)	BULK USERS/ VA HOSP (6)
1. REVENUES FROM SALES	23,280,262	13,802,424	4,219,900	947,849	4,310,091
2. OTHER REVENUES (INCLUDES WATER CONTRIB.)	747,635	480,206	133,453	29,681	104,295
3. TOTAL OPERATING REVENUES	24,027,897	14,282,630	4,353,352	977,530	4,414,386
4. LESS: OPERATING EXPENSES (NET OF COST OF SERVICE RECOVERED FROM WATER)	13,319,370	8,438,792	2,351,904	531,959	1,996,714
5. RETURN AND INCOME TAXES	10,708,527	5,843,837	2,001,448	445,570	2,417,672
6. LESS: TAXABLE EXCLUSIONS - ALLOCATED ON RATE BASE	4,829,675	3,157,135	874,670	189,722	608,148
7. TAXABLE INCOME	5,878,852	2,686,702	1,126,779	255,848	1,809,523
8. LESS: INCOME TAXES (TAX. INC.)	2,230,200	1,019,227	427,454	97,058	686,460
9. NET RETURN (Line 5 - Line 8)	8,478,327	4,824,611	1,573,994	348,512	1,731,211
10. ORIGINAL COSTS MEASURE OF VALUE	170,361,774	111,364,662	30,853,061	6,692,254	21,451,797
11. RATE OF RETURN, PERCENT	4.98	4.33	5.10	5.21	8.07
12. RELATIVE RATE OF RETURN	1.00	0.87	1.03	1.05	1.62

PENNSYLVANIA-AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
DEVELOPMENT OF RATE OF RETURN BY CUSTOMER CLASSIFICATION  
UNDER PROPOSED RATES

ITEM (1)	COST OF SERVICE (2)	RESIDENTIAL (3)	NON-RESIDENTIAL (4)	LARGE INDUSTRIAL (5)	BULK USERS/ VA HOSP (6)
1. REVENUES FROM SALES	27,338,497	16,855,593	4,742,188	1,054,522	4,686,194
2. OTHER REVENUES (INCLUDES WATER CONTRIB.)	783,385	506,537	139,834	30,865	106,149
3. TOTAL OPERATING REVENUES	28,121,882	17,362,130	4,882,022	1,085,388	4,792,342
4. LESS: OPERATING EXPENSES (NET OF COST OF SERVICE RECOVERED FROM WATER)	10,039,948	6,016,482	1,652,833	375,556	1,995,076
5. RETURN AND INCOME TAXES	18,081,934	11,345,647	3,229,189	709,832	2,797,266
6. LESS: TAXABLE EXCLUSIONS - ALLOCATED ON RATE BASE	4,833,860	3,160,688	875,139	189,881	608,153
7. TAXABLE INCOME	13,248,074	8,184,959	2,354,050	519,951	2,189,113
8. LESS: INCOME TAXES (TAX. INC.)	5,288,078	3,267,094	939,639	207,543	873,803
9. NET RETURN (Line 5 - Line 8)	12,793,856	8,078,553	2,289,550	502,289	1,923,463
10. ORIGINAL COSTS MEASURE OF VALUE	170,361,774	111,393,464	30,842,878	6,692,046	21,433,386
11. RATE OF RETURN, PERCENT	7.51	7.25	7.42	7.51	8.97
12. RELATIVE RATE OF RETURN	1.00	0.97	0.99	1.00	1.19

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>OPERATION AND MAINTENANCE EXPENSES</b>						
<b>SEWAGE TREATMENT</b>						
601.3 Salary and Wages	1	1,067,527	620,553	198,240	49,533	199,201
601.4 Salary and Wages	1	211,794	123,116	39,330	9,827	39,521
615.3 Purchased Power	1	1,254,815	729,424	233,019	58,223	234,148
618.3 Chemicals	1	423,110	245,954	78,572	19,632	78,952
620.3 Materials and Supplies - Operation	1	92,798	53,943	17,233	4,306	17,316
635.3 Contract Services Test	1	152,159	88,450	28,256	7,060	28,393
636.3 Contract Services - Operation	1	189,501	110,157	35,190	8,793	35,361
641.3 Rental of Building	1	1,373	798	255	64	256
650.3 Transportation	1	33	19	6	2	6
620.4 Materials and Supplies - Maintenance	1	34,646	20,140	6,434	1,608	6,465
636.4 Contract Services - Maintenance	1	122,826	71,399	22,809	5,699	22,919
650.4 Transportation	1	258	150	48	12	48
675.4 Misc. Operating Expense - Waste Disposal	1	892,480	518,799	165,734	41,411	166,537
675.4 Misc. Operating Expense	1	330,053	191,860	61,291	15,314	61,588
<b>TOTAL SEWAGE TREATMENT EXPENSE</b>		<b>4,773,373</b>	<b>2,774,762</b>	<b>886,415</b>	<b>221,485</b>	<b>890,711</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>COLLECTION</b>						
601.5 Salary and Wages	2	53,954	34,272	8,692	1,678	9,312
601.6 Salary and Wages	2	235,827	149,797	37,992	7,334	40,704
615.5 Purchased Power	2	111,716	70,962	17,997	3,474	19,282
620.5 Materials and Supplies	2	11,514	7,314	1,855	358	1,987
636.5 Contract Services	2	21,347	13,560	3,439	664	3,684
642.5 Rental of Equipment	2	1,417	900	228	44	245
<b>TOTAL T &amp; D EXPENSE OPERATION</b>		<b>435,775</b>	<b>276,804</b>	<b>70,203</b>	<b>13,553</b>	<b>75,215</b>
<b>620.6 Materials and Supplies</b>						
620.6 Materials and Supplies	2	45,511	28,909	7,332	1,415	7,855
636.6 Contract Services	2	94,718	60,165	15,259	2,946	16,348
675.6 Miscellaneous Maintenance Expense	2	59,570	37,839	9,597	1,853	10,282
675.5 Miscellaneous Operating Expense	2	91,176	57,915	14,688	2,836	15,737
<b>TOTAL T &amp; D EXPENSE - MAINTENANCE</b>		<b>290,975</b>	<b>184,827</b>	<b>46,876</b>	<b>9,049</b>	<b>50,222</b>
<b>TOTAL T &amp; D EXPENSE</b>		<b>726,750</b>	<b>461,632</b>	<b>117,079</b>	<b>22,602</b>	<b>125,437</b>
<b>CUSTOMER ACCOUNTS</b>						
601.7 Salary and Wages	5	555	523	32	0	0
670.7 Bad Debts	5	468,227	440,836	27,204	94	94
675.7 Miscellaneous Expense	5	7,103	6,687	413	1	1
<b>TOTAL CUSTOMER ACCOUNTING EXPENSE</b>		<b>475,885</b>	<b>448,046</b>	<b>27,649</b>	<b>95</b>	<b>95</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>ADMINISTRATIVE AND GENERAL EXPENSES</b>						
601.8 Salaries and Wages	10	238,836	153,643	38,859	8,813	37,521
603.8 Salaries of Officers	10	107	69	17	4	17
604.8 Employee Pension & Benefits	6	513,991	307,469	91,850	21,947	92,724
615.8 Purchased Power	10	106,991	68,827	17,407	3,948	16,808
620.8 Materials and Supplies	10	14,995	9,646	2,440	553	2,356
632.8 Contractual Services - Accounting	10	106	68	17	4	17
636.8 Contractual Services	10	4,758	3,061	774	176	747
642.8 Rental of Equipment	10	582	374	95	21	91
650.8 Transportation	10	34,246	22,030	5,572	1,264	5,380
675.8 Miscellaneous Expense	10	312,363	200,943	50,821	11,526	49,072
<b>TOTAL A &amp; G EXPENSE</b>		<b>1,226,975</b>	<b>766,132</b>	<b>207,853</b>	<b>48,257</b>	<b>204,734</b>
<b>Total Operation &amp; Maintenance Expenses</b>		<b>7,202,983</b>	<b>4,450,571</b>	<b>1,238,996</b>	<b>292,438</b>	<b>1,220,977</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>DEPRECIATION EXPENSE</b>						
354.20 Structures and Improvements - Collection	2	82,566	52,446	13,301	2,568	14,251
354.30 Structures and Improvements - Pumping	2	267,916	170,180	43,161	8,332	46,242
354.40 Structures and Improvements - Treatment	3	475,335	339,674	108,519	27,142	0
354.40 Structures and Improvements - Treatment - Bulk	DA	215,515				215,515
354.70 Structures and Improvements - General	2	31,710	20,142	5,108	986	5,473
355.00 Power Generation Equipment	2	123,416	78,394	19,882	3,838	21,302
360.10 Force Mains	3	388,619	277,707	88,722	22,190	0
361.10 Gravity Mains	3A	1,132,785	869,639	220,553	42,593	0
361.10 Gravity Mains	DA	63,650				63,650
361.20 Manholes	3A	242,865	186,447	47,286	9,132	0
361.20 Manholes	DA	462				462
363.00 Service Laterals	4	415,811	359,552	55,469	790	0
364.00 Flow Measuring Devices	2	37,167	23,608	5,988	1,156	6,415
365.00 Flow Measuring Devices - Installations	2	726	461	117	23	125
370.00 Receiving Wells	2	2,036	1,293	328	63	351
371.00 Pumping Equipment	2	212,536	135,003	34,240	6,610	36,684
380.00 Treatment Equipment	3	1,035,198.7	739,753	236,336	59,110	0
380.00 Treatment Equipment - Bulk	DA	159,794				159,794
381.00 Plant Sewers	1	129,728	75,411	24,090	6,019	24,207
382.00 Outfall Sewers	1	13,561	7,883	2,518	629	2,530
389.10 Other Plant and Misc. Equip. - Intangible	10	19,509	12,550	3,174	720	3,065
390.00 Office Furniture and Equipment	10	12,102	7,785	1,969	447	1,901
391.00 Transportation Equipment	10	33,815	21,753	5,502	1,248	5,312
392.00 Stores Equipment	10	2,314	1,489	376	85	364
393.00 Tools, Shop and Garage Equipment	10	(2,837)	(1,825)	(462)	(105)	(446)
394.00 Laboratory Equipment	1	13,533	7,867	2,513	628	2,525
395.00 Power Operated Equipment	10	22,094	14,213	3,595	815	3,471
396.00 Communication Equipment	10	47,409	30,498	7,713	1,749	7,448
397.00 Miscellaneous Equipment	10	218,341	140,459	35,524	8,057	34,301
<b>Total Depreciation Expense</b>		<b>5,397,677</b>	<b>3,572,383</b>	<b>965,524</b>	<b>204,825</b>	<b>654,945</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>Amortization Expense</b>						
685100 Utility Reg Assessment Fee	8	292,426	191,217	52,929	11,492	36,787
<b>Taxes Other Than Income</b>						
685200 Property Taxes	8	152,532	91,245	27,257	6,513	27,517
685320 Payroll Taxes	8	158,260	102,331	28,249	6,235	21,444
	8	265,545	173,640	48,064	10,436	33,406
	6	576,337	367,215	103,571	23,184	82,367
<b>Total Taxes, Other Than Income</b>						
		13,469,423	8,581,387	2,361,020	531,940	1,995,076
<b>Total Operating Expense</b>						
4091 Income Taxes	8	5,288,078	3,457,874	957,142	207,821	665,240
<b>Utility Income Available for Return</b>						
	8	12,794,169	8,366,107	2,315,745	502,811	1,609,506
<b>Total Cost of Service</b>						
		31,551,670	20,405,368	5,633,907	1,242,572	4,269,823
<b>Less: Other Revenues</b>						
	9	783,385	506,537	139,834	30,865	106,149
<b>Less: Cost of Service Recovered from Water Rates</b>						
	9A	3,400,000	2,542,860	702,100	155,040	0
<b>Less: Cost of Service Recovered from Water Rates - Penalties</b>						
	9A	29,475	22,044	6,087	1,344	0
<b>Total Cost of Service Related to Sales of Wastewater Services</b>						
		27,338,810	17,333,927	4,785,886	1,055,323	4,163,674



PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 1. ALLOCATION OF COSTS ASSOCIATED WITH WASTEWATER TREATMENT

Factors are based on the pro forma test year average daily consumption for each customer classification with adjustments. The detail regarding calculation of adjusted flows can be found on the following page.

Classification (1)	Total Adjusted Average Daily Customer Flow 100 gallons (a) (2)	I&I Gallons Per Day 100 gallons (b) (3)	Total I&I And Average Flow (4)=(2)+(3)	Allocation Factor (7)
Residential	21,837	21,325	43,162	0.5813
Non-Residential	8,995	4,791	13,786	0.1857
Large Industrial	2,694	755	3,449	0.0464
Bulk Users/VA Hospital	12,884	975 (c)	13,859	0.1866
Total	46,410	27,846	74,256	1.0000

(a) Customer Flow.

(b) Allocation based on Factor 1A for Residential, Non-Residential and Large Industrial.

(c) Per 2010 I&I Study and allocation per prior cost of service study.

FACTOR 1A. ALLOCATION OF INFILTRATION AND INFLOW BY CUSTOMER CLASS.

Factors are based on a 1/3-2/3 weighting of flow and number of customers, as follows:

Customer Classification (1)	Total Adjusted Average Daily Flow 100 gallons (2)	Average Daily Flow Factor (3)	Average Daily Flow Weight (4)=(3) x 0.3333	Number of Service Equivalents (5)	Number of Customers Factor (6)	Number of Customers Weight (7)=(6) x 0.6667	Allocation Factor (8)=(4)+(7)
Residential	21,837	0.6513	0.2171	23,086	0.8647	0.5765	0.7936
Non-Residential	8,995	0.2683	0.0894	3,560	0.1334	0.0889	0.1783
Large Industrial	2,694	0.0804	0.0268	50	0.0019	0.0013	0.0281
Total	33,526	1.0000	0.3333	26,696	1.0000	0.6667	1.0000

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER

FACTOR 1. ALLOCATION OF COSTS ASSOCIATED WITH AVERAGE DAILY FLOW INCLUDING INFILTRATION AND INFLOW (CONT.)

Classification (1)	Annual Flow 100 gallons (2)	Average Daily Flow 100 gallons (3)=(2)/365	Average Daily Unmetered Flow 100 gallons (4)	Total Average Daily Flow 100 gallons (3)+(4)=(5)	Water Sales Adjustment Per I&I Study (6)	Average Daily Adjusted Water sales 100 gallons (7)
Residential	8,884,319	24,341	474	24,814	0.8800	21,837
Non-Residential	3,287,527 **	9,007	1,214	10,221	0.8800	8,995
Large Industrial	983,440	2,694		2,694	1.0000	2,694
Bulk Users/VA Hospital	4,702,813	12,884		12,884	1.0000	12,884
Total	17,858,099	48,926	1,688	50,614		46,410

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 2. ALLOCATION OF COSTS ASSOCIATED WITH THE COLLECTION SYSTEM

Factors are based on peak daily flow for each customer classification.

Customer Classification (1)	Ave. Flow Consumption, 100 gpd (2)	Peak I&I Flow 100 gallons (a) (3)	Total Peak I&I And Average (4)=(2)+(3)	Allocation Factor (5)
Residential	21,837	119,667	141,504	0.6352
Non-Residential	8,995	26,886	35,881	0.1611
Large Industrial	2,694	4,237	6,931	0.0311
Bulk Users/V/A Hospital	12,884	25,568 (b)	38,452	0.1726
Total	46,410	176,358	222,768	1.0000

(a) Allocation based on Factor 1A.

(b) Per I&I Study and allocation per prior cost of service study.

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 3. ALLOCATION OF CAPITAL COSTS ASSOCIATED WITH PROJECTED AVERAGE DAILY FLOW INCLUDING INFILTRATION AND INFLOW EXCLUDING BULK USERS

Factors are based on the projected average daily consumption for each customer classification.

Classification (1)	Total Average Daily Flow 100 gallons (2)	Direct I&I Gallons Per Day 100 gallons (a) (3)	Total Direct I&I And Average (4)=(2)+(3)	Allocation Factor (7)
Residential	21,837	21,325	43,162	0.7146
Non-Residential	8,995	4,791	13,786	0.2283
Large Industrial	2,694	755	3,449	0.0571
Bulk Users/VA Hospital	-	-	0	-
Total	33,526	26,871	60,397	1.0000

(a) Allocation based on Factor 1A.

(b) Allocated based on Column 4

FACTOR 3A. ALLOCATION OF CAPITAL COSTS ASSOCIATED WITH PROJECTED MAXIMUM DAILY FLOW INCLUDING INFILTRATION AND INFLOW EXCLUDING BULK USERS

Factors are based on the projected average daily consumption for each customer classification.

Classification (1)	Ave. Flow Consumption, 100 gpd (2)	Direct I&I Peak I&I Flow 100 gallons (a) (3)	Total Peak I&I And Average (4)=(2)+(3)	Allocation Factor (7)
Residential	21,837	119,667	141,504	0.7677
Non-Residential	8,995	26,886	35,881	0.1947
Large Industrial	2,694	4,237	6,931	0.0376
Bulk Users/VA Hospital	-	-	0	-
Total	33,526	150,790	184,316	1.0000

(a) Allocation based on Factor 1A.

(b) Allocated based on Column 4

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
ORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH CUSTOMER FACILITIES.

Factors are based on the estimated relative cost of customer facilities, as follows:

<u>Customer Classification</u> (1)	<u>Number of Customers</u> (2)	<u>Service Equiv. Ratio (a)</u> (3)	<u>Service Equivalents</u> (2)X(3)=(4)	<u>Allocation Factor</u> (5)
Residential	23,086	1.0	23,086	0.8647
Non-Residential	1,424	2.5	3,560	0.1334
Large Industrial	2	25.0	50	0.0019
Bulk Users/VA Hospital	-	-	-	0.0000
Total	<u>24,512</u>		<u>26,696</u>	<u>1.0000</u>

(a) Based on ratio by class for Coatesville service area.

FACTOR 5. ALLOCATION OF COSTS ASSOCIATED WITH BILLING AND COLLECTING.

Factors are based on the number of customers.

<u>Customer Classification</u> (1)	<u>Number of Customers</u> (2)	<u>Allocation Factor</u> (3)
Residential	23,086	0.9415
Non-Residential	1,424	0.0581
Large Industrial	2	0.0002
Bulk Customers/VA	6	0.0002
Total	<u>24,518</u>	<u>1.0000</u>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
ORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 6. ALLOCATION OF LABOR RELATED TAXES AND BENEFITS.

Factors are based on the allocation of direct labor expense.

<u>Customer Classification</u>	<u>Direct Labor Expense</u>	<u>Allocation Factor</u>
(1)	(2)	(3)
Residential	\$1,081,973	0.5982
Non-Residential	323,162	0.1787
Large Industrial	77,190	0.0427
Bulk Users/VA Hospital	<u>326,276</u>	<u>0.1804</u>
Total	<u><u>\$1,808,600</u></u>	<u><u>1.0000</u></u>

FACTOR 7. ALLOCATION OF ORGANIZATION, FRANCHISES AND CONSENTS,  
MISCELLANEOUS INTANGIBLE PLANT AND OTHER RATE BASE ELEMENTS.

Factors are based on the allocation of the original cost less depreciation other than those items being allocated, as follows:

<u>Customer Classification</u>	<u>Original Cost Less Depreciation</u>	<u>Allocation Factor</u>
(1)	(2)	(3)
Residential	\$146,979,121	0.6540
Non-Residential	40,677,533	0.1810
Large Industrial	8,817,798	0.0392
Bulk Users/VA Hospital	<u>28,276,017</u>	<u>0.1258</u>
Total	<u><u>\$224,750,469</u></u>	<u><u>1.0000</u></u>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
OPERATIONS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 8. ALLOCATION OF INCOME TAXES AND INCOME AVAILABLE FOR RETURN.

Factors are based on the allocation of the original cost measure of value rate base as shown on the following pages and summarized below.

Customer Classification	Original Cost Measure of Value	Allocation Factor
(1)	(2)	(3)
Residential	\$111,393,464	0.6539
Non-Residential	30,842,878	0.1810
Large Industrial	6,692,046	0.0393
Bulk Users/VA Hospital	<u>21,433,386</u>	<u>0.1258</u>
Total	<u><u>\$170,361,774</u></u>	<u><u>1.0000</u></u>

FACTOR 9. ALLOCATION OF REGULATORY COMMISSION EXPENSES, ASSESSMENTS AND OTHER WATER REVENUES.

The factors are based on the allocation of the total cost of service, excluding those items being allocated.

Customer Classification	Total Cost of Service	Allocation Factor
(1)	(2)	(3)
Residential	\$19,938,180	0.6466
Non-Residential	5,504,665	0.1785
Large Industrial	1,214,409	0.0394
Bulk Users/VA Hospital	<u>4,178,186</u>	<u>0.1355</u>
Total	<u><u>\$30,835,439</u></u>	<u><u>1.0000</u></u>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>RATE BASE</b>						
352.00 Franchises	7	221,140	144,625	40,026	8,669	27,819
353.20 Land and Land Rights - Collection	2	1,093,483	694,581	176,160	34,007	188,735
353.30 Land and Land Rights - Pumping	2	85,560	54,348	13,784	2,661	14,768
353.40 Land and Land Rights - Treatment	3	1,070,539	765,007	244,404	61,128	0
354.40 Land and Land Rights - Treatment - Bulk User	DA	481,987				481,987
354.20 Structures and Improvements - Collection	2	3,363,850	2,136,718	541,916	104,616	580,601
354.30 Structures and Improvements - Pumping	2	11,464,494	7,282,247	1,846,930	356,546	1,978,772
354.40 Structures and Improvements - Treatment	3	25,902,993	18,510,279	5,913,653	1,479,061	0
354.40 Structures and Improvements - Treatment - Bulk	DA	11,825,114				11,825,114
354.70 Structures and Improvements - General	2	1,009,263	641,084	162,592	31,388	174,199
355.00 Power Generation Equipment	2	3,614,507	2,295,935	582,297	112,411	623,864
360.10 Force Mains	3	20,247,155	14,468,617	4,622,425	1,156,113	0
361.10 Gravity Mains	3A	61,835,091	47,470,799	12,039,292	2,324,999	0
361.10 Gravity Mains	DA	3,472,936				3,472,936
361.20 Manholes	3A	9,286,995	7,129,626	1,808,178	349,191	0
361.20 Manholes	DA	18,076				18,076
363.00 Service Laterals	4	9,183,471	7,940,947	1,225,075	17,449	0
364.00 Flow Measuring Devices	2	445,072	282,710	71,701	13,842	76,819
365.00 Flow Measuring Devices - Installations	2	15,434	9,804	2,486	480	2,664
370.00 Receiving Wells	2	83,107	52,790	13,389	2,585	14,344
371.00 Pumping Equipment	2	7,287,783	4,629,200	1,174,062	226,650	1,257,871
380.00 Treatment Equipment	3	37,015,606	26,451,352	8,450,663	2,113,591	0
380.00 Treatment Equipment - Bulk	DA	5,794,983				5,794,983
381.00 Plant Sewers	1	5,328,694	3,097,570	989,538	247,251	994,334
382.00 Outfall Sewer Lines	1	489,207	284,376	90,846	22,699	91,286
389.10 Other Plant and Misc. Equip. - Intangible	10	267,446	172,048	43,513	9,869	42,016
390.00 Office Furniture and Equipment	10	122,470	78,785	19,926	4,519	19,240
391.00 Transportation Equipment	10	328,334	211,217	53,420	12,116	51,581
392.00 Stores Equipment	10	41,437	26,656	6,742	1,529	6,510
393.00 Tools, Shop and Garage Equipment	10	399,982	257,308	65,077	14,759	62,837
394.00 Laboratory Equipment	1	122,826	71,399	22,809	5,699	22,919
395.00 Power Operated Equipment	10	234,261	150,700	38,114	8,644	36,802
396.00 Communication Equipment	10	584,340	375,906	95,072	21,562	91,800
397.00 Miscellaneous Equipment	10	2,233,973	1,437,115	363,467	82,434	350,957
TOTAL SEWER UTILITY PLANT IN SERVICE		224,971,609	147,123,747	40,717,559	8,826,467	28,303,836



PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	Bulk/VA Hospital (7)
<b>Other Rate Base Items:</b>						
Overheads and AFUCD	7	0		0	0	0
Cash Working Capital	11	204,727	126,501	35,213	8,312	34,701
Materials and Supplies	7	81,503	53,303	14,752	3,195	10,253
PrePaid Deposit - Fairview Nitrogen	1	245,833	142,903	45,651	11,407	45,872
Extension Deposits	2	(521,925)	(331,527)	(84,082)	(16,232)	(90,084)
Acquisition Adjustment	7	2,396,714	1,567,451	433,805	93,951	301,507
Deferred, Accrued and Prepaid Taxes	7	(57,016,687)	(37,288,913)	(10,320,020)	(2,235,054)	(7,172,699)
Total Other Rate Base Elements		(54,609,835)	(35,730,283)	(9,874,681)	(2,134,421)	(6,870,450)
<b>Total Original Cost Measure of Value</b>		<b>170,361,774</b>	<b>111,393,464</b>	<b>30,842,878</b>	<b>6,692,046</b>	<b>21,433,386</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
ORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 9A. ALLOCATION OF REVENUE FROM WATER RATES

The factors are based on the allocation of the total cost of service, excluding those items being allocated.

<u>Customer Classification</u> (1)	<u>Total Cost of Service</u> (2)	<u>Allocation Factor</u> (3)
Residential	\$ 19,938,180	0.7479
Non-Residential	5,504,665	0.2065
Large Industrial	1,214,409	0.0456
Bulk Users/VA Hospital	<u>0.0000</u>	<u>0.0000</u>
Total	<u><u>26,657,253</u></u>	<u><u>1.000</u></u>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
ORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 10. ALLOCATION OF ADMINISTRATIVE AND GENERAL EXPENSES

Factors are based on the allocation of all other operation and maintenance expenses excluding purchased water, power, chemicals and waste disposal.

Customer Classification	Operation & Maintenance Expenses	Allocation Factor
(1)	(2)	(3)
Residential	\$2,119,301	0.6433
Non-Residential	535,822	0.1627
Large Industrial	121,440	0.0369
Bulk Users/VA Hospital	517,324	0.1571
	<u>517,324</u>	<u>0.1571</u>
Total	<u>\$3,293,887</u>	<u>1.0000</u>

FACTOR 11. ALLOCATION OF CASH WORKING CAPITAL

Factors are based on the allocation of operation and maintenance expenses including purchased water, power, chemicals and waste disposal.

Customer Classification	Operation & Maintenance Expenses	Allocation Factor
(1)	(2)	(3)
Residential	\$4,450,571	0.6179
Commercial	1,238,996	0.1720
Large Industrial	292,438	0.0406
Other Public Authority	1,220,977	0.1695
	<u>1,220,977</u>	<u>0.1695</u>
Total	<u>\$7,202,983</u>	1.0000

PART III. COMPARISONS OF PRESENT AND  
PROPOSED CUSTOMER RATES

PENNSYLVANIA-AMERICAN WATER COMPANY - WASTEWATER OPERATIONS EXCLUDING SCRANTON  
 COMPARATIVE SCHEDULE OF PRESENT AND PROPOSED RATES  
 RESIDENTIAL, COMMERCIAL, MUNICIPAL, INDUSTRIAL AND SPECIAL RATE CUSTOMERS

	Present Rates Per Month											Proposed Rates	
	Zone 1 - Coatesville/Clayville/Clean Treatment	Zone 2 - Clarion/Pocono	Zone 3 - Lehman/Pike/Winoona/Blue Mtn.	Zone 4 - Koppel	Zone 5 - Franklin	Zone 6 - Paint Elk	Zone 7 - Hamiltonban	Zone 8 - Shippensville	Zone 9 - McEwensville	Zone 10 - Fairview	Zone 11 - New Cumberland	Zone 1 - Cumberland	New Cumberland
<b>Customer Charges</b>													
Residential - Per Edu	\$ 7.50	\$ 7.50	\$ 7.50	\$ 38.36	**	\$ 36.00		\$ 42.00	**		\$ 25.54	\$ 10.00	\$ 26.17
Non-Residential	\$ 20.00	\$ 20.00	\$ 20.00			\$ 36.00		\$ 42.00	**	\$ 77.67	***	\$ 25.00	\$ 26.17
Per Edu	7.50 *	7.50 *	7.50 *			36.00		42.00 **		77.67 ***		25.00	26.17
3/4 to 1 1/2 inch	10.00 *	10.00 *	10.00 *			36.00		42.00 **		77.67 ***		25.00	26.17
2-inch and up	20.00 *	20.00 *	20.00 *			36.00		42.00 **		77.67 ***		25.00	26.17
<b>Consumption Charges Per 100 Gallons:</b>													
<b>Residential</b>													
First Block	1.2880	1.0135	1.2880	-		0.7000		-		NA		1.6560	0.0000
Second Block				0.3290				0.6500		NA			1.2310
Third Block													1.0476
Fourth Block													0.8385
Fifth Block													0.6304
Sixth Block													0.5269
<b>Commercial</b>													
First Block	1.1194	1.0073	1.2880	-		0.7000		-		1.1506		1.1891	0.0000
Second Block		0.7722	1.2880	0.3290				0.6500					1.2310
Third Block													1.0476
Fourth Block													0.8385
Fifth Block													0.6304
Sixth Block													0.5269
<b>Municipal</b>													
First Block	1.1194	1.0073		-		0.7000		-		1.1506		1.1891	0.0000
Second Block		0.8423		0.3290				0.6500					1.2310
Third Block													1.0476
Fourth Block													0.8385
Fifth Block													0.6304
Sixth Block													0.5269
<b>Industrial</b>													
First Block	1.1194	1.0059										1.1891	0.0000
Second Block	1.1194	0.7519											1.2310
Third Block		0.5962											1.0476
Fourth Block													0.8385
Fifth Block													0.6304
Sixth Block													0.5269
<b>Special Rates</b>													
Customer Charge	250.00											250.00	
Consumption Charge	0.8528											0.9640	
Large Industrial	0.8664											0.9870	
Bulk Users/Va Hosp				7,144.47									
Koppek Steel - Flat Rate				460.41									
PSSM Metals - Flat Rate				1,189.28									
PSSM - Flat Rate													
Knous Foods - Flat Rate						4,981.67							
<b>Flat Rate</b>													
Residential	56.50	47.63	56.50		85.00	72.00	50.00	42.00	48.00	64.00		70.11	
Non-Residential	56.50	47.63	56.50		85.00	72.00	70.67	48.00	48.00			70.11	
Industrial	56.50	47.63	56.50		85.00	72.00	72.20					70.11	
Property Owners Assoc													
Residential - Sand Mound					39.24								70.11

\* Applied only to Coatesville.  
 \*\* Includes 2,000 gallon allowance, except Koppel which has a 4,000 gallon allowance.  
 \*\*\* Includes 6,000 allowance.  
 \*\*\*\* Includes 2,100 gallon allowance

## APPENDIX A

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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.

RESPONSE

A description of the methods used for the cost of service study is provided in Exhibit No. 12-F and in PAWC Statement No. 12. A comparison of the allocated cost of service by class with the present and proposed revenues is provided on Schedule A of Exhibit No. 12-F.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- 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.

RESPONSE

The methods used for establishing the allocation factors in the cost of service study have not deviated from the previous study submitted in the last case.



PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- c. Supply the average day, the maximum day and the maximum hour deliveries to the system adjusted for storage for the test year and two 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.

RESPONSE

Not applicable.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:

- d. Explain thoroughly the methodology employed if the Company distinguishes between transmission and distribution mains in its allocation of costs.

RESPONSE

Not applicable.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- e. Provide a detailed explanation of how storage is utilized to meet base, maximum day and maximum hour demands.

RESPONSE

There is no storage for this system.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- f. Provide workpapers, calculations and supporting documentation which develop the equivalent meters and equivalent service weights reflected in the Company's cost of service study.

RESPONSE

There are no meter or service equivalents calculated for this study.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- g. Provide all workpapers and supporting documentation for the fire flow requirement and duration utilized in the cost of service study.

RESPONSE

Because this is a wastewater operation, there is no fire flow requirements.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:

- h. Provide a breakdown of the number and size of private fire services according to the general water service class of customer.

RESPONSE

Not applicable.

PENNSYLVANIA-AMERICAN WATER COMPANY  
 RESPONSES TO RATE STRUCTURE  
 AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:

- i. Provide a calculation of the Company's base cost of water per unit of consumption.

RESPONSE

The calculation of the average flow cost per hundred gallons is as follows:

Total Flow Cost	\$14,613,760
Pro Forma Usage (Hundred Gallons) (Includes Estimated Unmetered)	17,858,099
Flow Cost per Hundred Gallons	\$0.8183

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b>OPERATION AND MAINTENANCE EXPENSES</b>						
<b>SEWAGE TREATMENT</b>						
601.3 Salary and Wages	1	1,067,527	667,204	400,323	0	0
601.4 Salary and Wages	1	211,794	132,371	79,423	0	0
615.3 Purchased Power	1	1,254,815	784,259	470,556	0	0
618.3 Chemicals	1	423,110	264,444	158,666	0	0
620.3 Materials and Supplies - Operation	1	92,798	57,999	34,799	0	0
635.3 Contract Services Test	1	152,159	95,099	57,060	0	0
636.3 Contract Services - Operation	1	189,501	118,438	71,063	0	0
641.3 Rental of Building	1	1,373	858	515	0	0
650.3 Transportation	1	33	21	12	0	0
620.4 Materials and Supplies - Maintenance	1	34,646	21,654	12,992	0	0
636.4 Contract Services - Maintenance	1	122,826	76,766	46,060	0	0
650.4 Transportation	1	258	161	97	0	0
675.4 Misc. Operating Expense - Waste Disposal	1	892,480	557,800	334,680	0	0
675.4 Misc. Operating Expense	1	330,053	206,283	123,770	0	0
<b>TOTAL SEWAGE TREATMENT EXPENSE</b>		<b>4,773,373</b>	<b>2,983,358</b>	<b>1,790,015</b>	<b>0</b>	<b>0</b>



PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b>TRANSMISSION</b>						
601.5 Salary and Wages	2	53,954	11,239	42,715	0	0
601.6 Salary and Wages	2	235,827	49,123	186,704	0	0
615.5 Purchased Power	2	111,716	23,270	88,446	0	0
620.5 Materials and Supplies	2	11,514	2,398	9,116	0	0
636.5 Contract Services	2	21,347	4,447	16,900	0	0
642.5 Rental of Equipment	2	1,417	295	1,122	0	0
TOTAL T & D EXPENSE OPERATION		435,775	90,772	345,003	0	0
<b>620.6 Materials and Supplies</b>						
636.6 Contract Services	2	45,511	9,480	36,031	0	0
675.6 Miscellaneous Maintenance Expense	2	94,718	19,730	74,988	0	0
675.5 Miscellaneous Operating Expense	2	59,570	12,408	47,162	0	0
TOTAL T & D EXPENSE - MAINTENANCE		290,975	60,610	230,365	0	0
<b>TOTAL T &amp; D EXPENSE</b>		726,750	151,382	575,368	0	0
<b>CUSTOMER ACCOUNTS</b>						
601.7 Salary and Wages	5	555	0	0	0	555
670.7 Bad Debts	5	468,227	0	0	0	468,227
675.7 Miscellaneous Expense	5	7,103	0	0	0	7,103

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b>TOTAL CUSTOMER ACCOUNTING EXPENSE</b>		475,885	0	0	0	475,885
<b>ADMINISTRATIVE AND GENERAL EXPENSES</b>						
601.8 Salaries and Wages	10	238,836	117,674	94,006	0	27,156
603.8 Salaries of Officers	10	107	53	42	0	12
604.8 Employee Pension & Benefits	6	513,991	277,864	228,263	0	7,864
615.8 Purchased Power	10	106,991	52,714	42,112	0	12,165
620.8 Materials and Supplies	10	14,995	7,388	5,902	0	1,705
632.8 Contractual Services - Accounting	10	106	52	42	0	12
636.8 Contractual Services	10	4,758	2,344	1,873	0	541
642.8 Rental of Equipment	10	582	287	229	0	66
650.8 Transportation	10	34,246	16,873	13,479	0	3,894
675.8 Miscellaneous Expense	10	312,363	153,901	122,946	0	35,516
<b>TOTAL A &amp; G EXPENSE</b>		<u>1,226,975</u>	<u>629,151</u>	<u>508,894</u>	<u>0</u>	<u>88,930</u>
<b>Total Operation &amp; Maintenance Expenses</b>		<u>7,202,983</u>	<u>3,763,891</u>	<u>2,874,277</u>	<u>0</u>	<u>564,815</u>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b>DEPRECIATION EXPENSE</b>						
354.20 Structures and Improvements - Collection	2	82,566	17,198	65,368	0	0
354.30 Structures and Improvements - Pumping	2	267,916	55,807	212,109	0	0
354.40 Structures and Improvements - Treatment	1	475,335	297,084	178,251	0	0
354.40 Structures and Improvements - Treatment - Bulk	1	215,515	134,697	80,818	0	0
354.70 Structures and Improvements - General	2	31,710	6,605	25,105	0	0
355.00 Power Generation Equipment	2	123,416	25,708	97,708	0	0
360.10 Force Mains	3	388,619	242,887	145,732	0	0
361.10 Gravity Mains	3	1,132,785	707,990	424,794	0	0
361.10 Gravity Mains	3	63,650	39,781	23,869	0	0
361.20 Manholes	3	242,865	151,790	91,074	0	0
361.20 Manholes	3	462	289	173	0	0
363.00 Service Laterals	4	415,811	0	0	415,811	0
364.00 Flow Measuring Devices	2	37,167	7,742	29,425	0	0
365.00 Flow Measuring Devices - Installations	2	726	151	575	0	0
370.00 Receiving Wells	2	2,036	424	1,612	0	0
371.00 Pumping Equipment	2	212,536	44,271	168,265	0	0
380.00 Treatment Equipment	1	1,035,199	646,999	388,199	0	0
380.00 Treatment Equipment - Bulk	1	159,794	99,871	59,923	0	0
381.00 Plant Sewers	1	129,728	81,080	48,648	0	0
382.00 Outfall Sewers	1	13,561	8,476	5,085	0	0
389.10 Other Plant and Misc. Equip. - Intangible	10	19,509	9,612	7,679	0	2,218
390.00 Office Furniture and Equipment	10	12,102	5,963	4,763	0	1,376
391.00 Transportation Equipment	10	33,815	16,661	13,310	0	3,845
392.00 Stores Equipment	10	2,314	1,140	911	0	263
393.00 Tools, Shop and Garage Equipment	10	(2,837)	(1,398)	(1,117)	0	(323)
394.00 Laboratory Equipment	1	13,533	8,458	5,075	0	0
395.00 Power Operated Equipment	10	22,094	10,886	8,696	0	2,512
396.00 Communication Equipment	10	47,409	23,358	18,660	0	5,390
397.00 Miscellaneous Equipment	10	218,341	107,577	85,939	0	24,825
<b>Total Depreciation Expense</b>		<b>5,397,677</b>	<b>2,751,109</b>	<b>2,190,650</b>	<b>415,811</b>	<b>40,107</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b>Amortization Expense</b>	8	292,426	159,460	120,363	11,960	643
<b>Taxes Other Than Income</b>						
685100 Utility Reg Assessment Fee	9	158,260	84,463	64,538	5,935	3,323
685200 Property Taxes	8	265,545	144,802	109,298	10,861	584
685320 Payroll Taxes	6	152,532	82,459	67,739	0	2,334
<b>Total Taxes, Other Than Income</b>		576,337	311,724	241,576	16,796	6,241
<b>Total Operating Expense</b>		13,469,423	6,986,183	5,426,865	444,567	611,807
4091 Income Taxes	8	5,288,078	2,883,589	2,176,573	216,282	11,634
<b>Utility Income Available for Return</b>	8	12,794,169	6,976,660	5,266,080	523,282	28,147
<b>Total Cost of Service</b>		31,551,670	16,846,433	12,869,518	1,184,131	651,588
<b>Less: Other Water Revenues</b>	9	783,385	418,093	319,464	29,377	16,451
<b>Less: Water Revenues</b>	9	3,400,000	1,814,580	1,386,520	127,500	71,400
<b>Total Cost of Service Related to Sales of Wastewater Services</b>		27,368,285	14,613,760	11,163,534	1,027,254	563,737

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
<b><u>RATE BASE</u></b>						
352.00 Franchises	7	221,140	120,344	91,287	9,045	464
353.20 Land and Land Rights - Collection	2	1,093,483	227,773	865,711	0	0
353.30 Land and Land Rights - Pumping	2	85,560	17,822	67,738	0	0
353.40 Land and Land Rights - Treatment	1	1,070,539	669,087	401,452	0	0
354.40 Land and Land Rights - Treatment - Bulk User	1	481,987	301,242	180,745	0	0
354.20 Structures and Improvements - Collection	2	3,363,850	700,690	2,663,160	0	0
354.30 Structures and Improvements - Pumping	2	11,464,494	2,388,054	9,076,440	0	0
354.40 Structures and Improvements - Treatment	1	25,902,993	16,189,371	9,713,622	0	0
354.40 Structures and Improvements - Treatment - Bulk	1	11,825,114	7,390,696	4,434,418	0	0
354.70 Structures and Improvements - General	2	1,009,263	210,229	799,034	0	0
355.00 Power Generation Equipment	2	3,614,507	752,902	2,861,605	0	0
360.10 Force Mains	3	20,247,155	12,654,472	7,592,683	0	0
361.10 Gravity Mains	3	61,835,091	38,646,932	23,188,159	0	0
361.10 Gravity Mains	3	3,472,936	2,170,585	1,302,351	0	0
361.20 Manholes	3	9,286,995	5,804,372	3,482,623	0	0
361.20 Manholes	3	18,076	11,298	6,779	0	0
363.00 Service Laterals	4	9,183,471	0	0	9,183,471	0
364.00 Flow Measuring Devices	2	445,072	92,708	352,364	0	0
365.00 Flow Measuring Devices - Installations	2	15,434	3,215	12,219	0	0
370.00 Receiving Wells	2	83,107	17,311	65,796	0	0
371.00 Pumping Equipment	2	7,287,783	1,518,045	5,769,738	0	0
380.00 Treatment Equipment	1	37,015,606	23,134,754	13,880,852	0	0
380.00 Treatment Equipment - Bulk	1	5,794,983	3,621,865	2,173,119	0	0
381.00 Plant Sewers	1	5,328,694	3,330,434	1,998,260	0	0
382.00 Outfall Sewer Lines	1	489,207	305,754	183,453	0	0
389.10 Other Plant and Misc. Equip. - Intangible	10	267,446	131,771	105,267	0	30,409
390.00 Office Furniture and Equipment	10	122,470	60,341	48,204	0	13,925
391.00 Transportation Equipment	10	328,334	161,770	129,232	0	37,332
392.00 Stores Equipment	10	41,437	20,416	16,310	0	4,711
393.00 Tools, Shop and Garage Equipment	10	399,982	197,071	157,433	0	45,478
394.00 Laboratory Equipment	1	122,826	76,766	46,060	0	0
395.00 Power Operated Equipment	10	234,261	115,420	92,205	0	26,635
396.00 Communication Equipment	10	584,340	287,904	229,996	0	66,439
397.00 Miscellaneous Equipment	10	2,233,973	1,100,678	879,292	0	254,003
TOTAL SEWER UTILITY PLANT IN SERVICE		224,971,609	122,432,092	92,867,604	9,192,516	479,396

PENNSYLVANIA AMERICAN WATER COMPANY  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO COST FUNCTIONS

Account (1)	Factor Ref. (2)	Cost of Service (3)	Flow (4)	I&I (5)	Customer Facilities (6)	Customer Accounting (7)
Other Rate Base Items:						
Overheads and AFUCD	7	0	0	0	0	0
Cash Working Capital	11	204,727	106,990	81,686	0	16,051
Materials and Supplies	7	81,503	44,354	33,644	3,333	171
PrePaid Deposit - Fairview Nitrogen	1	245,833	153,646	92,187	0	0
Extension Deposits	2	(521,925)	(108,717)	(413,208)	0	0
Acquisition Adjustment	7	2,396,714	1,304,292	989,364	98,026	5,033
Deferred, Accrued and Prepaid Taxes	7	(57,016,687)	(31,028,481)	(23,536,488)	(2,331,982)	(119,735)
		(54,609,835)	(29,527,916)	(22,752,815)	(2,230,623)	(98,480)
Total Other Rate Base Elements		170,361,774	92,904,176	70,114,789	6,961,892	380,916
<b>Total Original Cost Measure of Value</b>						

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

- RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three 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 rate structure is fair and equitable to all classifications of water users (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:
- 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 attached schedule.

PENNSYLVANIA AMERICAN WATER  
WASTEWATER OPERATIONS EXCLUDING SCRANTON WASTEWATER

CALCULATION OF CUSTOMER COST PER MONTH

		<u>Per Month</u>
(1) Cost Related to Customer Facilities	\$ 1,027,254	
(2) Service Equivalents X 12	294,144	
(3) Cost per Bill - Meter related		\$ 3.49
(4) Cost Related to Customer Accounting	\$ 563,737	
(5) Number of Bills	294,216	
(6) Cost per Bill		\$ 1.92
(7) Cost Related to I&I	\$ 11,163,534	
(8) Percentage of I&I Cost to to be recoverd in Customer Charge	66.67%	
(9) Net Cost Related to I&I to be recovered in Customer Charge	\$ 7,442,728	
(10) Service Equivalents X 12	294,144	
(11) Cost per Bill - I&I Related		\$ 25.30
(12) Total Customer Costs (3)+(6)+(11)		\$ 30.71



RS2.

PENNSYLVANIA-AMERICAN WATER COMPANY  
RESPONSES TO RATE STRUCTURE  
AND COST OF SERVICE FILING REQUIREMENTS

RS2. 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.

RESPONSE

There are no negotiated special rate contracts that are not under a tariff rate.

PENNSYLVANIA-AMERICAN WATER COMPANY

Hershey, Pennsylvania

SCRANTON WASTEWATER OPERATIONS

WASTEWATER COST OF SERVICE

ALLOCATION STUDY

AS OF DECEMBER 31, 2018

AND

PROPOSED CUSTOMER RATES

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Harrisburg, Pennsylvania



Excellence Delivered **As Promised**

April 25, 2017

Pennsylvania-American Water Company  
800 West Hersheypark Drive  
Hershey, PA 17033

Attention

Ladies and Gentlemen:

Pursuant to your request, we have conducted a wastewater cost of service allocation study based on pro forma revenue requirements estimated for the test year ended December 31, 2018 and have prepared proposed water rate schedules designed to produce pro forma revenues more commensurate with the allocated costs.

The attached report presents the results of the allocation study, as well as supporting schedules which set forth the detailed cost allocation calculations and the proposed schedule of rates. Schedule A on page 6 presents a comparison of the cost of service by customer classification with the pro forma revenues produced by each classification under present and proposed rates. The proof of revenue calculations are set forth in Exhibit No. 12-E.

Respectfully submitted,

GANNETT FLEMING VALUATION  
AND RATE CONSULTANTS, LLC

A handwritten signature in black ink, appearing to read "Paul R. Herbert".

PAUL R. HERBERT  
President

A handwritten signature in black ink, appearing to read "Constance E. Heppenstall".

CONSTANCE E. HEPPENSTALL  
Project Manager, Rate Studies

PRH:mlw

062027.400

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
COMPARISON OF COST OF SERVICE WITH REVENUES UNDER PRESENT AND PROPOSED RATES  
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2018

Customer Classification (1)	Cost of Service		Revenues, Present Rates		Revenues, Proposed Rates		Proposed Increase	
	Amount (Schedule C) (2)	Percent (3)	Amount (4)	Percent (5)	Amount (6)	Percent (7)	Amount (8)	Percent Increase (9)
Residential	\$ 13,757,042	63.5%	\$ 13,739,039	63.2%	\$ 13,739,039	63.2%	\$ -	0.0%
Non-Residential	7,532,653	34.8%	7,470,477	34.3%	7,470,477	34.3%	0	0.0%
Large Industrial	369,713	1.7%	539,840	2.5%	539,840	2.5%	0	0.0%
Total Sales	21,659,407	100.0%	21,749,356	100.0%	21,749,356	100.0%	0	0.0%
COS Recovered from Water	10,375,712							
Other Revenues	304,318		214,369		214,369		0	0.0%
Total	\$ 32,339,437		\$ 21,963,725		\$ 21,963,725		\$ -	0.0%

PENNSYLVANIA-AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
DEVELOPMENT OF RATE OF RETURN BY CUSTOMER CLASSIFICATION  
UNDER PRESENT AND PROPOSED RATES

Item (1)	Cost of Service (2)	Residential (3)	Non-Residential (4)	Large Industrial (5)
1. Revenues From Sales	\$ 21,749,356	\$ 13,739,039	\$ 7,470,477	\$ 539,840
2. Other Revenues	214,369	135,417	73,632	5,321
3. Total Operating Revenues	21,963,725	13,874,456	7,544,109	545,161
4. Less: Operating Expenses	15,876,209	10,075,209	5,505,885	295,115
5. Return and Income Taxes	6,087,516	3,799,247	2,038,224	250,046
6. Less: Taxable Exclusions - Allocated On Rate Base	4,306,979	2,729,434	1,509,644	67,901
7. Taxable Income	1,780,537	1,069,813	528,580	182,145
8. Less: Income Taxes (Tax. Inc.)	624,406	375,166	185,364	63,875
9. Net Return (Line 5 - Line 8)	5,463,110	3,424,080	1,852,859	186,170
10. Original Cost Measure of Value	151,996,032	96,323,466	53,276,304	2,396,262
11. Rate Of Return, Percent	3.59	3.55	3.48	7.77
12. Relative Rate of Return	1.00	0.99	0.97	2.16

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

	Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)		Non-Residential (5)		Large Industrial (6)		CSO Stormwater (7)	
					\$		\$		\$		\$
<b>OPERATION AND MAINTENANCE EXPENSES</b>											
<b>SEWAGE TREATMENT</b>											
601.3	Salary and Wages	2	\$ 1,054,038	\$ 538,403	\$ 326,436	\$ 20,975	\$ 168,224				
601.4	Salary and Wages	2	0	0	0	0	0				
615.3	Purchased Power	2	616,283	314,797	190,863	12,264	98,359				
618.3	Chemicals	1	1,013,293	615,879	373,398	24,015	0				
620.3	Materials and Supplies - Operation	2	0	0	0	0	0				
635.3	Contract Services Test	2	0	0	0	0	0				
636.3	Contract Services - Operation	2	41,564	21,231	12,872	827	6,634				
641.3	Rental of Building	2	0	0	0	0	0				
642.3	Rental of Equipment	2	26,190	13,378	8,111	521	4,180				
650.3	Transportation	2	0	0	0	0	0				
620.4	Materials and Supplies - Maintenance	2	394,761	201,644	122,257	7,856	63,004				
636.4	Contract Services - Maintenance	2	0	0	0	0	0				
650.4	Transportation	2	0	0	0	0	0				
675.3	Waste Disposal	1	1,039,145	631,592	382,925	24,628	0				
675.4	Misc. Operating & Maint. Expense	2	261,746	133,700	81,063	5,209	41,775				
<b>TOTAL SEWAGE TREATMENT EXPENSE</b>			<b>4,447,020</b>	<b>2,470,624</b>	<b>1,497,925</b>	<b>96,295</b>	<b>382,175</b>				
<b>COLLECTION EXPENSES</b>											
601.5	Salary and Wages	2	0	0	0	0	0				
601.6	Salary and Wages	2	2,678,168	1,368,008	829,429	53,296	427,436				
601.6	Salary and Wages - CSO	DA	273,282				273,282				
615.5	Purchased Power	2	68,861	35,174	21,326	1,370	10,990				
620.5	Materials and Supplies	2	0	0	0	0	0				
636.5	Contract Services	2	0	0	0	0	0				
642.5	Rental of Equipment	2	0	0	0	0	0				
<b>TOTAL COLLECTION EXPENSE OPERATION</b>			<b>3,020,311</b>	<b>1,403,182</b>	<b>850,755</b>	<b>54,666</b>	<b>711,708</b>				

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	CSO Stormwater (7)
620.6 Materials and Supplies	2	114,720	58,599	35,529	2,283	18,309
636.6 Contract Services	2	0	0	0	0	0
675.6 Miscellaneous Maintenance Expense	2	0	0	0	0	0
675.5 Miscellaneous Operating Expense	2	92,741	47,372	28,722	1,846	14,801
<b>TOTAL COLLECTION - MAINTENANCE</b>		<b>207,461</b>	<b>105,971</b>	<b>64,251</b>	<b>4,128</b>	<b>33,111</b>
<b>TOTAL COLLECTION EXPENSE</b>		<b>3,227,772</b>	<b>1,509,153</b>	<b>915,006</b>	<b>58,794</b>	<b>744,819</b>
<b>CUSTOMER ACCOUNTS</b>						
601.7 Salary and Wages	6	336,529	281,170	55,258	101	0
670.7 Bad Debts	6	479,917	400,971	78,802	144	0
675.7 Miscellaneous Expense	6	36,939	30,863	6,065	11	0
<b>TOTAL CUSTOMER ACCOUNTING EXPENSE</b>		<b>853,385</b>	<b>713,003</b>	<b>140,126</b>	<b>256</b>	<b>0</b>
<b>ADMINISTRATIVE AND GENERAL EXPENSES</b>						
601.8 Salaries and Wages	11	212,201	113,443	58,058	3,416	37,284
603.8 Salaries of Officers	11	0	0	0	0	0
604.8 Employee Pension & Benefits	7	1,470,161	742,725	409,734	25,140	292,562
615.8 Purchased Power	11	6,688	3,575	1,830	108	1,175
620.8 Materials and Supplies	11	7,096	3,794	1,941	114	1,247
631.8 Contractual Services	11	141,729	75,768	38,777	2,282	24,902
632.8 Contractual Services - Legal	11	250,000	133,650	68,400	4,025	43,925
636.8 Contractual Services	11	5,847	3,126	1,600	94	1,027
641.8 Rental of Building	11	72,300	38,652	19,781	1,164	12,703
642.8 Rental of Equipment	11	6,392	3,417	1,749	103	1,123
650.8 Transportation	11	381,230	203,806	104,305	6,138	66,982
666.8 Rate Case Expense	10	25,000	11,928	6,560	348	6,165
675.8 Miscellaneous Expense	11	73,327	39,201	20,062	1,181	12,884
<b>TOTAL A &amp; G EXPENSE</b>		<b>2,651,971</b>	<b>1,373,083</b>	<b>732,797</b>	<b>44,112</b>	<b>501,979</b>
<b>Total Operation &amp; Maintenance Expenses</b>		<b>11,180,148</b>	<b>6,065,864</b>	<b>3,285,854</b>	<b>199,457</b>	<b>1,628,972</b>

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	CSO Stormwater (7)
<b>DEPRECIATION EXPENSE</b>						
354.30 Structures and Improvements - Pumping						
Froude Ave - Sanitary Only	3	5,284	3,326	1,871	88	0
Combined System	4	102,114	26,785	15,062	705	59,563
354.40 Structures and Improvements - Treatment						
Sewage Treatment	3	671,667	422,747	237,770	11,150	0
CSO Stormwater	DA	62,958				62,958
355.00 Power Generation Equipment	4	70,491	18,490	10,397	486	41,117
360.10 Force Mains	4	2,779	729	410	19	1,621
361.10 Gravity Mains						
Gravity Mains - Sanitary Only	3	225,811	142,125	79,937	3,748	0
Gravity Mains - Combined Sewers	4	384,491	100,852	56,712	2,653	224,274
CSO Assets	DA	256,553				256,553
361.20 Manholes						
Sanitary Only	3	80,152	50,448	28,374	1,331	0
Combined System	4	136,474	35,797	20,130	942	79,605
CSO Stormwater	DA	599				599
363.00 Service Laterals	5	302,070	201,753	99,139	1,178	0
364.00 Flow Measuring Devices	4	38,368	10,064	5,659	265	22,380
371.00 Pumping Equipment	4	96,878	25,411	14,290	668	56,509
380.00 Treatment Equipment						
Sewage Treatment	3	209,399	131,796	74,127	3,476	0
CSO Stormwater	DA	60,469				60,469
389.10 Other Plant and Misc. Equip. - Intangible	11	264,799	141,562	72,449	4,263	46,525
390.00 Office Furniture and Equipment	11	73,250	39,159	20,041	1,179	12,870
391.00 Transportation Equipment	11	152,322	81,431	41,675	2,452	26,763
391.00 Transportation Equipment - CSO Related	DA	19,168				19,168
393.00 Tools, Shop and Garage Equipment	11	48,880	26,131	13,374	787	8,588
394.00 Laboratory Equipment	1	7,252	4,408	2,672	172	0
395.00 Power Operated Equipment	11	21,507	11,498	5,884	346	3,779
396.00 Communication Equipment	11	128,392	68,638	35,128	2,067	22,558
397.00 Miscellaneous Equipment	11	45,883	24,529	12,554	739	8,062
<b>Total Depreciation Expense</b>		<b>3,468,010</b>	<b>1,567,678</b>	<b>847,656</b>	<b>38,714</b>	<b>1,013,962</b>



PENNSYLVANIA AMERICAN WATER COMPANY  
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COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	CSO Stormwater (7)
Account (1)						
<b>Amortization Expense</b>	9	638,965	280,314	156,674	7,604	194,373
<b>Taxes Other Than Income</b>						
685100 Utility Reg Assessment Fee	10	164,935	78,690	43,279	2,293	40,673
685200 Property Taxes	9	242,698	106,472	59,510	2,888	73,829
685320 Payroll Taxes	7	388,385	196,212	108,243	6,641	77,289
<b>Total Taxes, Other Than Income</b>		796,018	381,374	211,031	11,822	191,790
<b>Total Operating Expense</b>		16,083,141	8,295,231	4,501,215	257,597	3,029,098
4091 <b>Income Taxes</b>	9	4,841,394	2,123,920	1,187,110	57,613	1,472,752
<b>Utility Income Available for Return</b>	9	11,414,902	5,007,718	2,798,934	135,837	3,472,413
<b>Total Cost of Service</b>		32,339,437	15,426,868	8,487,259	451,047	7,974,263
<b>Less: Other Revenues</b>	10	(304,318)	(145,190)	(79,853)	(4,230)	(75,045)
<b>Total Cost of Service Related to Sales of Wastewater Services</b>		32,035,119	15,281,678	8,407,406	446,817	7,899,218
Reallocation of CSO Stormwater Costs	1A	0	5,064,979	2,733,919	100,320	(7,899,218)
Less: Cost of Service Recovered from Water Rates	10A	(10,375,712)	(6,589,615)	(3,608,673)	(177,425)	0
<b>Total</b>		\$ 21,659,407	\$ 13,757,042	\$ 7,532,653	\$ 369,713	\$ -

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTORS 1 and 2. ALLOCATION OF COSTS ASSOCIATED WITH AVERAGE DAILY FLOWS.

Factors are based on the pro forma test year average daily consumption for each customer classification.

Classification (1)	Total		I&I Average Day 100 gallons (b) (3)	Total		Allocation Factor 1 (5)	Average Day CSO 100 gallons (6)	Total	
	Average Daily Customer Flow 100 gallons (a) (2)	Average Daily Sanitary Average Flow (4)=(2)+(3)		Average Daily Sanitary Average Flow (4)=(2)+(3)	Average Day Wastewater Flow (7)=(4)+(6)			Allocation Factor 2 (8)	
Residential	32,527	53,815	21,288	53,815	0.6078	16,814	53,815	0.5108	
Non-Residential	21,135	32,626	11,491	32,626	0.3685		32,626	0.3097	
Large Industrial	1,673	2,095	422	2,095	0.0237		2,095	0.0199	
Stormwater CSO	-	-	-	-	-	16,814	16,814	0.1596	
<b>Total</b>	<b>55,335</b>	<b>88,536</b>	<b>33,201</b>	<b>88,536</b>	<b>1.0000</b>	<b>16,814</b>	<b>105,350</b>	<b>1.0000</b>	

(a) Customer water usage from bill analysis, adjusted to reflect 88% returned to sewer system. See below.

(b) Allocation based on Factor 1A for Residential, Non-Residential and Large Industrial.

Classification (1)	Annual Usage		Average Day 100 gallons (3)=(2)/366	Percent to Sewer System (6)	Adjusted	
	100 gallons (2)	Average Day 100 gallons (3)=(2)/366			Average Day 100 gallons (7)	Average Day 100 gallons (7)
Residential	13,528,325	36,963	88.0%	32,527		
Non-Residential	8,790,407	24,018	88.0%	21,135		
Large Industrial	695,945	1,901	88.0%	1,673		
<b>Total</b>	<b>23,014,677</b>	<b>62,882</b>		<b>55,335</b>		

PENNSYLVANIA AMERICAN WATER COMPANY  
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FACTOR 1. ALLOCATION OF COSTS ASSOCIATED WITH AVERAGE DAILY FLOW  
INCLUDING INFILTRATION AND INFLOW (CONT.)

Classification	Annual Flow 100 gallons	Average Daily Flow 100 gallons	Water Sales Adjustment Per I&I Study	Average Daily Adjusted Water sales 100 gallons
(1)	(2)	(3)=(2)/365	(6)	(7)
Residential	13,528,325	36,963	0.8800	32,527
Non-Residential	8,790,407	24,018	0.8800	21,135
Large Industrial	695,945	1,901	0.8800	1,673
Total	23,014,677	62,882		55,335

PENNSYLVANIA AMERICAN WATER COMPANY  
SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 1A. ALLOCATION OF INFILTRATION AND INFLOW BY CUSTOMER CLASS.

Factors are based on a 1/3-2/3 weighting of flow and number of customers, as follows:

Customer Classification (1)	Total Average Daily Flow 100 gallons (2)	Average Daily Flow		Service Equivalents (Factor 5)		Allocation Factor 1A (8)=(4)+(7)	
		Factor (3)	Weight (4)=(3) x 0.3333	Number (5)	Factor 5 (6)		Weight (7)=(6) x 0.6667
Residential	32,527	0.5879	0.1959	30,006	0.6679	0.4453	0.6412
Non-Residential	21,135	0.3819	0.1273	14,743	0.3282	0.2188	0.3461
Large Industrial	1,673	0.0302	0.0101	175	0.0039	0.0026	0.0127
Total	55,335	1.0000	0.3333	44,924	1.0000	0.6667	1.0000

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SCRANTON WASTEWATER  
FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTORS 3 and 4. ALLOCATION OF CAPITAL COSTS ASSOCIATED WITH PEAK DAILY FLOW.

Factors are based on the peak daily flow for each customer classification.

Classification (1)	Total		I&I Peak Day 100 gallons (b) (3)	Total		Peak Day CSO 100 gallons (6)	Total	
	Average Daily Customer Flow 100 gallons (a) (2)	Sanitary Peak Flow (4)=(2)+(3)		Sanitary Peak Flow (4)=(2)+(3)	Allocation Factor 3 (5)		Peak Day Wastewater Flow (7)=(4)+(6)	Allocation Factor 4 (8)
Residential	32,527	157,346	124,819	157,346	0.6294	157,346	0.2623	
Non-Residential	21,135	88,509	67,374	88,509	0.3540	88,509	0.1475	
Large Industrial	1,673	4,145	2,472	4,145	0.0166	4,145	0.0069	
Stormwater CSO	-	-	-	-	-	350,000	0.5833	
<b>Total</b>	<b>55,335</b>	<b>250,000</b>	<b>194,665</b>	<b>250,000</b>	<b>1.0000</b>	<b>600,000</b>	<b>1.0000</b>	

(a) See Factor 1.

(b) Allocated based on Factor 1A

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FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 5. ALLOCATION OF COSTS ASSOCIATED WITH CUSTOMER FACILITIES.

Factors are based on the estimated relative cost of customer facilities, as follows:

<u>Customer Classification</u> (1)	<u>Number of Customers</u> (2)	<u>Service Equiv. Ratio</u> (3)	<u>Service Equivalents</u> (2)X(3)=(4)	<u>Allocation Factor</u> (5)
Residential	30,006	1.0	30,006	0.6679
Non-Residential	5,897	2.5	14,743	0.3282
Large Industrial	7	25.0	175	0.0039
Stormwater CSO	-	-	-	-
Total	<u>35,910</u>		<u>44,924</u>	<u>1.0000</u>

FACTOR 6. ALLOCATION OF COSTS ASSOCIATED WITH BILLING AND COLLECTING.

Factors are based on the number of customers.

<u>Customer Classification</u> (1)	<u>Number of Customers</u> (2)	<u>Allocation Factor</u> (3)
Residential	30,006	0.8355
Non-Residential	5,897	0.1642
Large Industrial	7	0.0003
Stormwater CSO	-	-
Total	<u>35,910</u>	<u>1.0000</u>

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FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 7. ALLOCATION OF LABOR RELATED TAXES AND BENEFITS.

Factors are based on the allocation of direct labor expense.

<u>Customer Classification</u> (1)	<u>Direct Labor Expense</u> (2)	<u>Allocation Factor</u> (3)
Residential	\$ 2,301,023	0.5052
Non-Residential	1,269,180	0.2787
Large Industrial	77,788	0.0171
Stormwater CSO	<u>906,226</u>	<u>0.1990</u>
Total	<u>\$ 4,554,218</u>	<u>1.0000</u>

FACTOR 8. ALLOCATION OF ORGANIZATION, FRANCHISES AND CONSENTS,  
MISCELLANEOUS INTANGIBLE PLANT AND OTHER RATE BASE ELEMENTS.

Factors are based on the allocation of the original cost less depreciation other than those items being allocated, as follows:

<u>Customer Classification</u> (1)	<u>Original Cost Less Depreciation</u> (2)	<u>Allocation Factor</u> (3)
Residential	\$ 58,540,222	0.4383
Non-Residential	32,731,164	0.2450
Large Industrial	1,586,439	0.0119
Stormwater CSO	<u>40,716,618</u>	<u>0.3048</u>
Total	<u>\$ 133,574,444</u>	<u>1.0000</u>

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FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 9. ALLOCATION OF INCOME TAXES AND INCOME AVAILABLE FOR RETURN.

Factors are based on the allocation of the original cost measure of value rate base as shown on the following pages and summarized below.

Customer Classification (1)	Original Cost Measure of Value (2)	Allocation Factor (3)
Residential	\$ 66,673,424	0.4387
Non-Residential	37,272,124	0.2452
Large Industrial	1,808,995	0.0119
Stormwater CSO	<u>46,241,489</u>	<u>0.3042</u>
Total	<u><u>\$ 151,996,032</u></u>	<u><u>1.0000</u></u>

FACTOR 10 and 10A. ALLOCATION OF REGULATORY COMMISSION EXPENSES,  
ASSESSMENTS, OTHER WATER REVENUES.

The factors are based on the allocation of the total cost of service, excluding those items being allocated.

Customer Classification (1)	Total Cost of Service (2)	Allocation Factor 10 (3)	Total Cost of Service with Stormwater Reallocated (4)	Allocation Factor 10A (5)
Residential	\$ 15,336,250	0.4771	\$ 20,346,656	0.6351
Non-Residential	8,437,420	0.2624	11,141,325	0.3478
Large Industrial	448,407	0.0139	547,137	0.0171
Stormwater CSO	<u>7,927,425</u>	<u>0.2466</u>	<u>-</u>	<u>-</u>
Total	<u><u>\$ 32,149,502</u></u>	<u><u>1.0000</u></u>	<u><u>\$ 32,035,119</u></u>	<u><u>1.0000</u></u>



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Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	CSO Stormwater (7)
<b><u>RATE BASE</u></b>						
353.20 Land and Land Rights - Collection	2	12,080,663	6,170,802	3,741,381	240,405	1,928,074
353.30 Land and Land Rights - Pumping	4	43,570	11,428	6,427	301	25,414
353.40 Land and Land Rights - Treatment	3	110,020	69,246	38,947	1,826	0
354.30 Structures and Improvements - Pumping						
Froude Ave - Sanitary Only	3	223,790	140,854	79,222	3,715	0
Combined System	4	4,325,221	1,134,506	637,970	29,844	2,522,901
354.40 Structures and Improvements - Treatment						
Sewage Treatment	3	36,341,736	22,873,489	12,864,975	603,273	0
CSO Stormwater	DA	3,406,417				3,406,417
355.00 Power Generation Equipment	4	2,399,273	629,329	353,893	16,555	1,399,496
360.10 Force Mains	4	82,584	21,662	12,181	570	48,171
361.10 Gravity Mains						
Gravity Mains - Sanitary Only	3	10,722,130	6,748,509	3,795,634	177,987	0
Gravity Mains - Combined Sewers	4	18,256,600	4,788,706	2,692,849	125,971	10,649,075
CSO Assets	DA	12,181,780				12,181,780
361.20 Manholes						
Sanitary Only	3	2,117,420	1,332,704	749,567	35,149	0
Combined System	4	3,605,336	945,680	531,787	24,877	2,102,992
CSO Stormwater	DA	15,813				15,813
363.00 Service Laterals	5	4,025,119	2,688,377	1,321,044	15,698	0
364.00 Flow Measuring Devices	4	653,534	171,422	96,396	4,509	381,206
371.00 Pumping Equipment	4	3,512,193	921,248	518,048	24,234	2,048,662
380.00 Treatment Equipment						
Sewage Treatment	3	7,069,288	4,449,410	2,502,528	117,350	0
CSO Stormwater	DA	2,041,422				2,041,422

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COST OF SERVICE FOR THE TWELVE MONTHS ENDING DECEMBER 31, 2018, ALLOCATED TO CUSTOMER CLASSES

Account (1)	Factor Ref. (2)	Cost of Service (3)	Residential (4)	Non-Residential (5)	Large Industrial (6)	CSO Stormwater (7)
389.10 Other Plant and Misc. Equip.	11	4,078,302	2,180,260	1,115,824	65,661	716,558
390.00 Office Furniture and Equipment	11	1,203,380	643,327	329,245	19,374	211,434
391.00 Transportation Equipment	11	1,477,476	789,859	404,237	23,787	259,593
391.00 Transportation Equipment - CSO Related	DA	185,927				185,927
393.00 Tools, Shop and Garage Equipment	11	735,485	393,190	201,229	11,841	129,225
394.00 Laboratory Equipment	1	47,876	29,099	17,642	1,135	0
395.00 Power Operated Equipment	11	205,865	110,055	56,325	3,314	36,170
396.00 Communication Equipment	11	1,782,106	952,714	487,584	28,692	313,116
397.00 Miscellaneous Equipment	11	644,119	344,346	176,231	10,370	113,172
<b>TOTAL SEWER UTILITY PLANT IN SERVICE</b>		<b>133,574,444</b>	<b>58,540,222</b>	<b>32,731,164</b>	<b>1,586,439</b>	<b>40,716,618</b>
<b>Other Rate Base Items:</b>						
Cash Working Capital	12	565,869	307,041	166,309	10,072	82,447
Materials and Supplies	8	100,181	43,909	24,544	1,192	30,535
Acquisition Adjustments	8	24,919,648	10,922,282	6,105,314	296,544	7,595,509
Deferred, Accrued and Prepaid Taxes	8	(7,164,110)	(3,140,029)	(1,755,207)	(85,253)	(2,183,621)
<b>Total Other Rate Base Elements</b>		<b>18,421,588</b>	<b>8,133,202</b>	<b>4,540,960</b>	<b>222,556</b>	<b>5,524,870</b>
<b>Total Original Cost Measure of Value</b>		<b>\$ 151,996,032</b>	<b>\$ 66,673,424</b>	<b>\$ 37,272,124</b>	<b>\$ 1,808,995</b>	<b>\$ 46,241,489</b>

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SCRANTON WASTEWATER

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 11. ALLOCATION OF ADMINISTRATIVE AND GENERAL EXPENSES

Factors are based on the allocation of all other operation and maintenance expenses excluding purchased water, power, chemicals and waste disposal.

<u>Customer Classification</u> (1)	<u>Operation &amp; Maintenance Expenses</u> (2)	<u>Allocation Factor</u> (3)
Residential	\$ 3,095,338	0.5346
Non-Residential	1,584,544	0.2736
Large Industrial	93,068	0.0161
Stormwater CSO	<u>1,017,645</u>	<u>0.1757</u>
Total	<u>\$ 5,790,595</u>	<u>1.0000</u>

FACTOR 12. ALLOCATION OF CASH WORKING CAPITAL

Factors are based on the allocation of operation and maintenance expenses including purchased water, power, chemicals and waste disposal.

<u>Customer Classification</u> (1)	<u>Operation &amp; Maintenance Expenses</u> (2)	<u>Allocation Factor</u> (3)
Residential	\$ 6,065,864	0.5426
Commercial	3,285,854	0.2939
Large Industrial	199,457	0.0178
Stormwater CSO	<u>1,628,972</u>	<u>0.1457</u>
Total	<u>\$ 11,180,148</u>	<u>1.0000</u>