



City of Tempe, Arizona

2020 Water and Wastewater Rate Study – Final Report Addendum

December 18, 2020



A. FIXED CHARGES

The City of Tempe (City) currently does not have a fixed monthly service charge for a 10" water meter codified in its City Code. After the 2020 Water and Wastewater Rate Study (Study) was completed, City staff discovered that there is one 10" water meter in use in Tempe. As a follow-up to the Study, Stantec was asked to determine an appropriate fixed monthly service charge for 10" meters, consistent with the methodology applied in the Study and used to calculate fixed monthly service charges for all other water meter sizes. This addendum provides the results of that analysis and presents a recommended fixed monthly service charge for 10" water meters.

A. FIXED CHARGE ANALYSIS

As part of the Study, Stantec recommended that the City collect a fixed monthly service charge that is comprised of two components: the customer service revenue requirements and a portion of the average day revenue requirements. Stantec recommended that the customer service portion of revenue requirements be collected as a component applied per bill, regardless of water meter size. This customer component is applied to the recommended 10" water meter fixed monthly service charge. The customer component was \$7.44 per month, per the Study's methodology.

Stantec also recommended that the fixed monthly service charge recover a portion of the City's average day revenue requirements, to be applied based on meter size, and scaled based on average water usage by meter size from Fiscal Year (FY) 2017 through FY 2019. The water average usage per bill, by water meter size, is shown in Table A-1, in addition to the count of bills by water meter size.

Table A-1: Bill Count and Average Usage per Bill

Meter Size	FY19 Bill Count	FY17-19 Average Usage (1,000 gal/bill)
5/8"	342,476	10.7
3/4"	65,259	13.9
1"	42,026	27.5
1.5"	16,467	73.9
2"	31,243	157.1
3"	1,345	373.0
4"	1,005	543.6
6"	848	2,129.7
8"	233	2,447.1
10"	4	1,577.9

Notably, just one 10” water meter is installed in the City and, in FY 2019, only four bills were provided in the billing data analyzed as part of the Study. The average water usage for the 10” water meter is lower than it is for the 6” and 8” water meters, as shown in Table A-1. Given the limited amount of billing and usage data available for 10” water meters in the City, this trend does not necessarily represent the potential water usage of existing and future customers with a 10” water meter.

As such, Stantec recommends using a scaling method that would serve to account for the lack of reasonable usage data for 10” water meters. Table A-2 shows the water meter equivalency factor scaling, based on average water usage, shown above, and scaling recommended by the American Water Works Association’s (AWWA) Manual M1: Principles of Water Rates, Fees, and Charges. For the average day portion of the fixed monthly service charge, Stantec recommends applying a ratio of 1.5, derived from the AWWA 10” scaling factor (210), divided by the AWWA 8” scaling factor (140), to the average usage profile observed for the 8” water meter size. This scaling factor accounts for the use of reliable local data available up to the 8” water meter, while maintaining the expected relationship of the 10” water meter to smaller meter sizes, based on AWWA industry standard data. Figure A-1 displays the exact calculation used to derive the hybrid scaling factor.

Table A-2: Scaling Factor Approaches

Meter Size	Scaling Based on Average Usage	AWWA Scaling Factor	Hybrid Method for 10”
5/8”	1.00	1.00	
3/4”	1.30	1.50	
1”	2.58	2.50	
1.5”	6.93	5.00	
2”	14.74	8.00	
3”	34.99	21.75	
4”	50.99	37.50	
6”	199.79	80.00	
8”	349.63	140.00	
10”	148.02	210.00	524.44

Figure A-1: Calculation of 10” Hybrid Meter Ratio

$$\frac{\text{AWWA 10" Flow Factor } 210}{\text{AWWA 8" Flow Factor } 140} = \overset{\text{10" AWWA Implied Ratio to 8"}}$$

$$1.5 \times \overset{\text{Observed 8" Ratio}}{349.63} = \overset{\text{Hybrid 10" Ratio}}{524.44}$$

Using the scaling method based on average water usage for the meter sizes with sufficient data per the Study, and extrapolating those results based upon widely used industry publication data for a 10" water meter, Table A-3 presents the current and recommended water fixed monthly service charges by water meter size. The recommended fixed monthly service charges for 8" water meters and smaller were previously included in the Study.

Table A-3: Current and Recommended Water Fixed Monthly Service Charges

Meter Size	Current Fixed Monthly Service Charge	Recommended Scaling Factor	Recommended Customer Component	Recommended Portion of Average Day Cost	Total Recommended Fixed Monthly Service Charge*
5/8"	\$11.50	1.00	\$7.44	\$5.71	\$13.15
3/4"	\$15.70	1.30	\$7.44	\$7.42	\$14.85
1"	\$23.50	2.58	\$7.44	\$14.72	\$22.15
1.5"	\$41.60	6.93	\$7.44	\$39.59	\$47.00
2"	\$67.90	14.74	\$7.44	\$84.17	\$91.60
3"	\$154.00	34.99	\$7.44	\$199.83	\$207.25
4"	\$302.00	50.99	\$7.44	\$291.24	\$298.70
6"	\$599.00	199.79	\$7.44	\$1,141.09	\$1,148.55
8"	\$1,400.00	349.63	\$7.44	\$1,996.91	\$2,004.35
10"	\$2,220.00	524.44	\$7.44	\$2,995.37	\$3,002.80

*Recommended fixed monthly service charges are rounded to the nearest \$0.05.

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