Exhibit No.:	
Issues:	Residential Customer Charges; Residential Volumetric Charges
Witness:	Martin Hyman
Sponsoring Party:	Missouri Department of Economic Development – Division of Energy
Type of Exhibit:	Direct Testimony
Case No.:	WR-2017-0285

MISSOURI PUBLIC SERVICE COMMISSION

MISSOURI-AMERICAN WATER COMPANY

CASE NO. WR-2017-0285

DIRECT TESTIMONYOF

MARTIN R. HYMAN

ON

BEHALF OF

MISSOURI DEPARTMENT OF ECONOMIC DEVELOPMENT

DIVISION OF ENERGY

Jefferson City, Missouri
December 13, 2017

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas.	))))	**File No. WR-2017-0285**

AFFIDAVIT OF MARTIN HYMAN

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Martin R. Hyman, of lawful age, being duly sworn on his oath, deposes and states:

1. My name is Martin R. Hyman. I work in the City of Jefferson, Missouri, and I am employed by the Missouri Department of Economic Development as a Planner III, Division of Energy.
2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of the Missouri Department of Economic Development – Division of Energy.
3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge.

Martin R. Hyman

Subscribed and sworn to before me this 13th day of December, 2017.

LAURIE ANN ARNOLD
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: April 26, 2020
Commission Number: 16808714

Notary Public

My commission expires: 4/26/20

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Martin R. Hyman. My business address is 301 West High Street, Suite 720, PO Box 1766, Jefferson City, Missouri 65102.

Q. By whom and in what capacity are you employed?

A. I am employed by the Missouri Department of Economic Development – Division of Energy ("DE") as a Planner III.

Q. Please describe your educational background and employment experience.

A. In 2011, I graduated from the School of Public and Environmental Affairs at Indiana University in Bloomington with a Master of Public Affairs and a Master of Science in Environmental Science. There, I worked as a graduate assistant, primarily investigating issues surrounding energy-related funding under the American Recovery and Reinvestment Act of 2009. I also worked as a teaching assistant in graduate school and interned at the White House Council on Environmental Quality in the summer of 2011. I began employment with DE in September of 2014. Prior to that, I worked as a contractor for the U.S. Environmental Protection Agency to coordinate intra-agency modeling discussions.

Q. Have you previously filed testimony before the Missouri Public Service Commission ("Commission") on behalf of DE or any other party?

A. Yes. Please see Schedule MRH-Dir-RD1 for a summary of my case participation.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your Direct Testimony in this proceeding?

A. The purpose of my Direct Testimony is to:

1. Describe why the Commission should not raise the residential customer charges for Missouri-American Water Company's ("MAWC" or "Company") residential customers;
2. Provide information on inclining block rate designs for residential customers; and,
3. Present bill impact analyses of a sample of residential customers served by MAWC based on the Company's rate design proposal.

I base my positions on these billing analyses, along with considerations of cost of service, equity, efficiency, and gradualism.

III. OVERVIEW OF WATER RATE DESIGN CONSIDERATIONS

Q. Why is the Division of Energy interested in water efficiency?

A. There is a "water-energy" nexus involving the "embedded energy" used to pump, treat, distribute, and dispose of water and wastewater,[1] as discussed in the Missouri Comprehensive State Energy Plan.[2] This connection has been acknowledged by the Company,[3] which incurs significant fuel and power expenses.[4] Based on these considerations, it is clear that the promotion of water efficiency leads to the promotion of energy efficiency.

[1] Missouri Public Service Commission Case Nos. WR-2015-0301 and SR-2015-0302, *In the Matter of Missouri-American Water Company's Request for Authority to Implement a General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of Martin R. Hyman (Revenue Requirement) on Behalf of the Missouri Department of Economic Development – Division of Energy, December 23, 2015, pages 2-3, lines 14-21 and 1-5.
[2] Missouri Department of Economic Development – Division of Energy. 2015. *Missouri Comprehensive State Energy Plan*. https://energy.mo.gov/sites/energy/files/MCSEP.pdf. Pages 91-92.
[3] Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of Gregory P. Roach on Behalf of Missouri-American Water Company, June 30, 2017, page 35, lines 13-18.
[4] Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of Brian W. LaGrand on Behalf of Missouri-American Water Company, June 30, 2017, Schedules CAS-9 and CAS-13.

Q. Are the residential rate design considerations in the electric power sector similar to those in the water sector with respect to end-use efficiency?

A. Generally, yes. Higher customer charges decrease the customer's incentive to use water more efficiently compared to higher variable charges, since a customer charge does not change with the amount of water used. Similarly, declining block rate structures – those in which higher tiers, or "blocks," of use incur lower variable charges – discourage efficient water use. Theoretically, the ideal water rate design to encourage conservation and efficiency would involve low customer charges and inclining variable rate blocks, with the customer and volumetric charges based on cost-of-service allocation, equity, gradualism, and efficiency principles. Uniform volumetric rates also improve the price signal sent to customers compared to declining block rates. As discussed below, the Company currently employs uniform volumetric rates for its residential customers and proposes to continue using such a rate structure.

A. CUSTOMER CHARGES

Q. What types of costs are allocated to customer charges in water rate design?

A. The American Water Works Association publishes a cost allocation manual ("AWWA manual") that is used as a reference guide for ratemaking in the water utility industry.[5] This manual states that, "Fixed and variable charges as defined for rate design in a cost-of-service water-rate analysis depart from standard or traditional accounting definitions of fixed and variable costs."[6] In a cost of service rate design (as is used in Missouri), customer charges recover dedicated "customer-related costs" based on the number of customers

[5] Zieburtz, Bill, and Giardina, Rick. 2012. "Principles of Water Rates, Fees, and Charges." American Water Works Association. AWWA Manual M1. Sixth ed. Denver: American Water Works Association.
[6] *Ibid*, page 138.

served by a utility or based on another "nonconsumptive" measure.[7] The long-run view of utility costs is that they are all variable – lower demand results in lower plant investment. The recovery of historic costs, while important for utilities, should not "lock in" future utility spending decisions by encouraging higher use (and a subsequent need for greater investment in plant).

Q. What are some examples of dedicated customer-related costs?

A. The AWWA manual lists meter reading, billing, meter and service line-related costs, and – in the case of minimum charges – a minimum quantity of water as the typical costs included in customer charges.[8]

Q. Should the Commission allow the Company to recover service capacity and minimum consumption costs in its customer charges?

A. No. Regarding capacity cost-related charges, the AWWA manual notes that:

> The use of a water system is reflected in both potential and average usage patterns, **so a continued reliance on volumetric charges has value from an equity perspective**.
>
> The extent to which a strategy of large service charges is employed is frequently limited as a result of **concerns over impacts on affordability for smaller customers** …. (Emphases added.)[9]

The AWWA manual also states that minimum volumetric charges: (1) typically lead to higher customer charges; (2) may be deemed unfair; and, (3) if the minimum water quantity

[7] *Ibid*, pages 137-138.
[8] *Ibid*, pages 138-139.
[9] *Ibid*, page 139.

included in the calculation is too high, are believed to discourage conservation.[10] Higher customer charges could make it more difficult for smaller customers to stay on a water system. Consequently, DE does not recommend the inclusion of capacity and minimum consumption components in customer charges.

Q. Should the Commission attempt to set the Company's customer charges at the lowest level necessary while still allowing the Company to recover its dedicated customer-related fixed costs?

A. Yes, with the recognition that the Company currently relies upon variable revenues more than fixed revenues for cost recovery, as noted by Company witness Mr. James M. Jenkins.[11] While it is a generally accepted principle of ratemaking to align revenues and charges with their cost causers, it is also generally accepted that this principle is limited by considerations of equity, fairness, gradualism, and efficiency.

Q. How should the Commission apply the principle of gradualism to potential customer charge changes in this case?

A. Currently, the Company's monthly residential customer charge is $15.33 across its entire service territory for 5/8-inch meters, and the lowest quarterly residential customer charge is $22.35.[12] These charges, which were the outcome of a case that resulted in significant

[10] *Ibid*, pages 139-140.
[11] Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of James M. Jenkins on Behalf of Missouri-American Water Company, June 30, 2017, page 19, lines 2-4.
[12] Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of Constance E. Heppenstall on Behalf of Missouri-American Water Company, June 30, 2017, page 12, lines 7-9.

rate increases for certain service areas due to rate and service area consolidation,[13] have been in effect for less than two years,[14] so any further increases to residential customer charges could result in additional rate shock, particularly for lower income customers. DE recommends that the Commission not increase residential customer charges in this case.

B. VOLUMETRIC RATE STRUCTURES

Q. What are some of the rationales for implementing inclining block or uniform water rates?

A. The AWWA manual states that inclining block rates can send "consistent" price signals and recover peak capacity costs.[15] Regarding uniform rates, the AWWA manual indicates that, "In general, [they] … provide a more conservation-oriented rate signal than decreasing block rates."[16]

Q. In its Report and Order from the Company's previous rate case, did the Commission address inclining block rates?

A. Yes. The Commission stated:

> It is also possible to design volumetric rates using inclining blocks. Under such a structure, customers would pay more for water as they increase their usage. Such a

[13] For example, it was estimated in Case No. WR-2015-0301 that, as a result of consolidation and a revenue requirement increase, residential customers served on 5/8-inch meters in the Emerald Point area would experience bill impacts of 106.1 percent at only 3,000 gallons of usage per month; in St. Louis, the projected impact for similarly situated customers was 12.2 percent. See Missouri Public Service Commission Case Nos. WR-2015-0301 and SR-2015-0302, *In the Matter of Missouri-American Water Company's Request for Authority to Implement a General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Staff's Response to Order Directing Staff to Prepare Scenarios, May 16, 2016, MAWC Exhibit 49R, page 1.

[14] See Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony of Cheryl D. Norton on Behalf of Missouri-American Water Company, June 30, 2017, page 4, lines 12-16.

[15] Zieburtz and Giardina, page 112.

[16] *Ibid*, page 100.

structure would be designed to encourage water conservation by discouraging discretionary water usage, such as outdoor watering or other summer use.

Conservation of water is important for more than just a need to conserve the supply of water. Water and wastewater supply processes are energy intensive. Large amounts of electricity are required to pump water through the pumping stations, treatment facilities and distribution system. Thus, the promotion of water efficiency leads to the promotion of energy efficiency.

The establishment of inclining block rates would further promote efficiency, but none of the parties advocated for the establishment of inclining block rates in this case, although the Division of Energy's witness suggested they should be implemented in a future rate case.

Inclining block rates are difficult to design in a way that will ensure Missouri-American recovers its approved revenue requirement. The data required to properly design inclining block rates is not available in this case. (Citations omitted.)[17]

Q. Did the Commission also request information on inclining block rates in this case?

A. Yes. In the above-cited Report and Order, the Commission stated, "In the next rate case, the Commission asks the parties to file information on inclining block rates so the Commission can consider the information in setting just and reasonable rates in that case."[18]

[17] Missouri Public Service Commission Case Nos. WR-2015-0301 and SR-2015-0302, *In the Matter of Missouri-American Water Company's Request for Authority to Implement a General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Report and Order, May 26, 2016, pages 34-35.
[18] *Ibid*, page 41.

Q. Are there any subsidiaries of the American Water Company that use inclining block rate structures?

A. Yes. According Mr. Jenkins, California American Water and New York American Water have inclining block rates.[19]

Q. Did the Company provide adequate information or data on inclining block rates in this case?

A. No. DE will respond to the Company's presentation of information on inclining block rates in Rebuttal Testimony.

Q. How should inclining block rates be designed?

A. Inclining block rates should be designed with several goals in mind. The first block of an inclining block rate should encompass the basic amount of indoor water usage for an average household; in so doing, the rate provides a "lifeline" to low-income customers. In setting the amount of usage incorporated in the first block, the Commission should also consider the balance between encouraging efficient water use and the fact that some households are larger than "average."

Designing an inclining block rate also requires determining the number of blocks in the rate and the difference in rates between blocks. Fewer blocks can improve the understandability of rates, but more blocks can provide greater granularity as to price signals. The difference in price between rate blocks is also an important determinant of the price signals received by consumers.

[19] WR-2017-0285 and SR-2017-0286, Jenkins Direct, pages 36-37, lines 20-22 and 1-3.

Overall, rates should be designed not just to recover costs from cost causers and encourage efficiency, but with an understanding of the bill impacts on customers at varying levels of usage. Initially, inclining block rate designs should avoid severe bill impacts on high-use customers; for example, the rates could be designed such that customers at the 95th percentile of use (i.e., customers that use more water than 95 percent of other customers in their class) experience no greater than a five percent monthly bill impact under a new rate design on a revenue-neutral basis.

Q. Should the Commission require MAWC to implement residential inclining block rates in this rate case?

A. Only if such rates would not result in significantly adverse impacts. As shown below, the Company's proposed consolidation of rate districts for residential water customers, combined with its proposed revenue requirement increase, could already create adverse bill impacts on certain customers; these bill impacts are in addition to those already experienced from the relatively recent implementation of rates from MAWC's last rate case. If the Commission orders full district consolidation for residential water customers, implementing inclining block rates in this case could compound the bill impacts experienced by some customers. However, depending on the consolidation and revenue requirement decisions in this case, MAWC should be required to implement residential inclining block rates in this or a subsequent case, based on an evaluation of bill impacts.

IV. COMPANY'S RESIDENTIAL RATE DESIGN PROPOSALS

Q. Has MAWC proposed full consolidation of its residential water district rates?

A. Yes.[20]

Q. What revenue requirement increase has the Company proposed for the residential class of water customers?

A. The Company proposes a 37.0 percent revenue requirement increase for its residential water customers.[21]

Q. What residential water customer charges are proposed by the Company in this case?

A. For 5/8-inch meters, MAWC proposes a monthly water customer charge of $10.00 and a quarterly water customer charge of $30.00;[22] the customer charges would increase for larger meters, "… based on the existing meter ratios by size to the 5/8-inch charge."[23] Therefore, the proposal for monthly customer charges represents a decrease, while the proposal for quarterly customer charges represents an increase.

Q. What is your overall recommendation with respect to the Company's residential customer charge proposals?

A. As noted above, DE does not recommend increasing residential customer charges in this case.

Q. Did the Company propose uniform residential volumetric water rates?

A. Yes. The proposed volumetric rates for both its residential and non-residential water customers are uniform.[24] The changes in residential volumetric rates are shown below in

[20] WR-2017-0285 and SR-2017-0286, Heppenstall Direct, pages 12-13, lines 23-24 and 1-3.
[21] *Ibid*, Part II. Cost of Service by Customer Classification, Schedule A.
[22] *Ibid*, page 12, lines 12-15.
[23] *Ibid*, lines 19-21.
[24] *Ibid*, pages 12-13, lines 23-24 and 1-3.

Table 1. Note that customers in some areas will continue not to be billed for volumetric use and will not have the same customer charges as others in their current districts.[25]

Table 1. MAWC's proposed changes to volumetric rates for residential water customers.[26]

District	Current (per 100 gal)	Proposed (per 100 gal)	Change
1	$0.41398	$0.62953	52.07%
2	$0.47378	$0.62953	32.87%
3	$0.37424	$0.62953	68.22%

Q. What do you observe from your comparison of current and proposed volumetric rates?

A. Residential water customers in District 2 would experience a percentage volumetric charge increase that is lower than the residential revenue requirement increase, while residential water customers in the other two districts would experience a percentage volumetric charge increase that is higher than the residential revenue requirement increase. This is a result of the Company's proposed consolidation of residential water rates.

Q. In principle, do you agree with a uniform volumetric residential water rate design for the current case?

A. Yes, although, as noted above, DE would support an inclining block rate depending on the bill impacts resulting from any ordered consolidation or revenue requirement increase. Uniform (i.e., non-inclining or non-declining) volumetric rates can encourage efficient consumption through a relatively simple and equitable design. While DE is interested in

[25] Missouri Public Service Commission Case Nos. WR-2017-0285 and SR-2017-0286, *In the Matter of Missouri-American Water Company's Request for Authority to Implement General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Transmittal Letter and Tariff Revisions (YW-2017-0276 and YW-2017-0277), Appendix B.
[26] *Ibid*.

moving toward implementation of inclining block rates for residential water customers, given recent consolidation of districts and the potential increase in this case, DE has concerns that moving to inclining block rates would result in significantly adverse impacts for high use customers; consequently, any potential implementation of inclining block rates should be based on bill impact analyses.

V. RESIDENTIAL BILL IMPACT ANALYSES

Q. What is the purpose of a bill impact analysis?

A. The purpose of a bill impact analysis is to determine the changes to customer bills as the result of changes in rates. While such an analysis is often based on the "average" customer's use, it should also take into account customers who use greater or lesser amounts of a given commodity to determine equity and efficiency impacts.

Q. What is the basis of your analyses?

A. My analyses are based on a sample of five percent of customers from each of the Company's three current rate districts, which I received in response to Data Request DED-DE 201. The sample includes usage information for the same customers for all months or quarters of the historic test year in this case.

Q. How did you conduct your analyses?

A. I calculated the bills that each specific customer with a 5/8-inch or 3/4-inch meter in the sample would receive based on current rates and the Company's proposed rates[27] using the

[27] The current and proposed residential rates are shown in WR-2017-0285 and SR-2017-0286, LaGrand Direct, Schedule CAS-11-12, Test Year Operating Revenues at Present Rates vs Proposed Rates, District #1 (St Louis, Mexico, Jefferson City, Lake Carmel, Hickory Hills, Anne Meadows, Redfield, Jaxson Estate), pages 2-3, District #2 (St Joseph, Brunswick, Platte County), page 2, and District #3 Joplin, Warrensburg, Tri-State, Emerald Pt, Branson Canyon, Spring Valley, Ozark Mountain, Lakewood, Rankin Acres, Whitebranch, Maplewood, Stonebridge, Saddlebrooke, Riverside, page 2.

usage information in the sample. I then calculated the difference between these bills for each of these customers on both an absolute (dollar) basis and a relative (percentage) basis. Finally, I summarized the results for each district based on the average, median, minimum, and maximum results for these customers, as well as the results at the fifth and 95th percentiles for each type of calculation. It is important to consider not just the average, minimum, and maximum values, but the values between these results in order to understand the distribution of potential bill impacts. I also calculated similar summary statistics for the sampled customers' usages. I performed separate calculations for the monthly and quarterly customers in District 1.

Q. Why did you limit your analyses to customers with 5/8-inch or 3/4-inch meters?

A. Most residential customers of MAWC are served on these smaller meter sizes.[28] This methodology is also consistent with that used in my Direct Rate Design Testimony in the Company's previous rate case.[29]

Q. What were your results?

A. My results are shown in Schedule MRH-Dir-RD2.

Q. What do you observe from these results?

A. Customer usage varies by district; combined with differences in current volumetric rates between the districts, this drives variations in bill impacts by district. Differences in usage also result in differences in impacts between customers in District 1 that are billed on a

[28] *Ibid*.
[29] Missouri Public Service Commission Case Nos. WR-2015-0301 and SR-2015-0302, *In the Matter of Missouri-American Water Company's Request for Authority to Implement a General Rate Increase for Water and Sewer Service Provided in Missouri Service Areas*, Direct Testimony (Rate Design) of Martin R. Hyman on Behalf of the Missouri Department of Economic Development – Division of Energy, January 20, 2016, pages 19-20, lines 11-20 and 1-2.

monthly basis versus customers in District 1 that are billed on a quarterly basis; however, the difference in bill impacts between these two subsets of customers is also due to the differing changes in customer charges proposed for monthly and quarterly customers. Partly due to this difference in customer charge changes, District 1 customers that are billed on a quarterly basis would generally experience much higher percentage bill impacts than customers in other districts (except for higher use customers in District 3). Customers with higher use would tend to experience higher bill impacts; customers with lower or even median or average usage would experience bill decreases in some cases, depending on the district, but District 1 customers billed on a quarterly basis would experience higher bills irrespective of usage. A subset of higher use customers could experience bill impacts of over $100 in specific months or quarters, although – based on the sample – most of these customers would likely be billed on a quarterly basis; in fact, a significant number of the individual quarterly bill impacts would be greater than $100.

I would note again that these results apply to customers with 5/8-inch and 3/4-inch meters.

Q. Do the bill frequency and bill impact analyses support your previous conclusions regarding rate design?

A. Yes. The increase in customer charges for District 1 customers billed on a quarterly basis results in higher bills for all of these customers; however, bill impacts still increase with the amount of usage due to the accompanying increase in uniform volumetric rates for these customers. For customers billed on a monthly basis in all districts, the decrease in customer charges – and the accompanying increase in uniform volumetric rates – also results in higher bill impacts for customers with higher usage. The direction of the bill impacts based on usage will encourage customer efficiency actions; however, the

magnitude of the bill impacts on certain customers raises concerns with the effects of district consolidation and raising customer charges for District 1 customers that are billed on a quarterly basis. The Company's proposal involves consolidating volumetric rate designs that apply to districts with differing underlying costs and with heterogeneous usage patterns. As expected, this contributes to inequitable outcomes.

The high bill impacts on lower use quarterly-billed customers in District 1 are of particular concern, especially to the extent that these customers have lower incomes. The majority of residential customers served on 5/8-inch meters are billed on a quarterly basis,[30] so the higher bill impacts that would be experienced by these customers should be given particular weight in the Commission's decision-making.

Q. Do you have any additional recommendations based on these analyses?

A. Yes. To address the potential bill impacts on higher usage customers, DE recommends a temporary lower tail (i.e., final) block rate designed to apply to customers at the 95th percentile of the bill impacts shown above; such a design would ensure that the transitional tail block addresses customers with truly extraordinary usage. DE would also recommend that MAWC implement efficiency efforts focused on such customers to identify the reasons for their high usage and potential savings options. Having effective efficiency programs in place is important for the customers who could experience higher bill impacts because of their higher usage.

[30] Response to Data Request DED-DE 012.

VI. CONCLUSIONS

Q. Please summarize your conclusions and the positions of DE.

A. Based on the rate design principles that I discussed, DE does not recommend increasing residential water customer charges in this case. Additionally, DE does not recommend implementing inclining block rates for residential water customers at this time, unless such rates would not result in significantly adverse bill impacts. To mitigate impacts on the highest use customers, DE recommends a transitional tail block rate as described above, as well as targeted efficiency efforts focused on such customers. These recommendations are supported by the bill impact analyses presented above.

Q. Does this conclude your Direct Testimony in this case?

A. Yes.