

Exhibit No.:  
Issues: Declining Usage  
Witness: Gary A. Naumick  
Exhibit Type: Direct  
Sponsoring Party: Missouri-American Water Company  
Case No.: WR-2011-0337  
SR-2011-0338  
Date: June 30, 2011

**MISSOURI PUBLIC SERVICE COMMISSION**

**CASE NO. WR-2011-0337  
CASE NO. SR-2011-0338**

**DIRECT TESTIMONY**

**OF**

**GARY A. NAUMICK**

**ON BEHALF OF**

**MISSOURI-AMERICAN WATER COMPANY**

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

IN THE MATTER OF MISSOURI-AMERICAN )	
WATER COMPANY FOR AUTHORITY TO )	
FILE TARIFFS REFLECTING INCREASED )	CASE NO. WR-2011-XXXX
RATES FOR WATER AND SEWER )	CASE NO. SR-2011-XXXX
SERVICE )	

**AFFIDAVIT OF GARY A. NAUMICK**

Gary A. Naumick, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying testimony entitled "Direct Testimony of Gary A. Naumick"; that said testimony and schedules were prepared by him and/or under his direction and supervision; that if inquires were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge.

  
\_\_\_\_\_  
Gary A. Naumick

**State of New Jersey  
County of Mercer**

**SUBSCRIBED and sworn to**

**Before me this 28 day of June 2011.**

  
\_\_\_\_\_

**Notary Public**

**JUN 28 2011**

**My commission expires:**

DAVID E. LEACH IV  
COMMISSION EXPIRES 03/25/14  
ID #2223562

**DIRECT TESTIMONY  
GARY A. NAUMICK  
MISSOURI-AMERICAN WATER COMPANY  
CASE NO. WR-2011-0337  
SR-2011-0338**

**TABLE OF CONTENTS**

I.	Witness Identification and Background .....	1
II.	Scope of Testimony .....	3
III.	Declining Usage .....	3

**DIRECT TESTIMONY**

**OF**

**GARY A. NAUMICK**

**I. WITNESS IDENTIFICATION AND BACKGROUND**

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 **A.** My name is Gary A. Naumick. My business address is 1025 Laurel Oak Road, Voorhees,  
3 New Jersey 08043.

4

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 **A.** I am employed by the American Water Works Service Company, Inc. (“Service Company”)  
7 as the Senior Director of American Water Engineering.

8

9 **Q. WHAT ARE YOUR RESPONSIBILITIES IN THIS POSITION?**

10 **A.** My duties include directing the engineering function for American Water Works Company,  
11 Inc. (“American Water”). The Engineering department’s responsibilities include providing  
12 engineering services, strategy, standards, governance and oversight for water and  
13 wastewater system master planning; capital budgeting and capital investment management;  
14 asset technical standards; design and design management; capital project delivery and  
15 construction management; support to operations, environmental management, and rates  
16 functions.

17

18 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

1 A. I received a Bachelor of Science degree in Civil Engineering from the Pennsylvania State  
2 University in 1977. I received a Master of Science degree in Engineering Management from  
3 the New Jersey Institute of Technology in 2002.

4

5 **Q. WHAT HAS BEEN YOUR BUSINESS EXPERIENCE?**

6 A. I have been employed by the Service Company since 1986. From 1986 to 1988, I was a  
7 Senior Planning Engineer. I was promoted to Director of Planning in 1988, and to the position  
8 of Director of Planning & Strategy and Capital Investment Management in 2003. I have been  
9 in charge of American Water’s asset planning program since 1988. I was promoted to my  
10 present position, Senior Director of Engineering for American Water, in 2008.

11 During the period from 1977 to 1986, I was employed by the U.S. Environmental  
12 Protection Agency (“USEPA”) as an Environmental Engineer.

13 I am a licensed Professional Engineer in the Commonwealth of Pennsylvania. I am an  
14 active member of the American Water Works Association (AWWA), and have served on  
15 AWWA’s Conservation Committee. Since 2005, I have served as a faculty member for the  
16 Institute of Public Utilities Regulatory Studies Program. I have presented on the topic of  
17 water consumption trends at national water industry functions (AWWA Water Utility  
18 Management Conference, February 2011; National Association of Regulatory Utility  
19 Commissioners (NARUC), Subcommittee on Accounting and Finance, September 2006;  
20 NARUC, Regulatory Policy Conference, December 2004). I also co-authored an article  
21 entitled “Declining Residential Water Use Presents Challenges, Opportunities” which was  
22 published in the May 2011 edition of *Opflow*, a monthly publication of the AWWA.

23

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE REGULATORY AGENCIES?**

2 **A.** Yes. I have provided testimony on behalf of American Water subsidiary rate filings in Indiana,  
3 Kentucky, New Jersey, New Mexico, and Pennsylvania.

4

5

## **II. SCOPE OF TESTIMONY**

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

7 **A.** The purpose of my testimony is to supplement the findings of Missouri-American Water  
8 Company (“MAWC” or “Company”) witness Mr. Kevin Dunn regarding the water usage  
9 trend exhibited by MAWC’s residential customers. A significant and continuing trend of  
10 declining water usage by residential customers has been experienced by MAWC, and my  
11 testimony discusses the reasons why this decline is occurring.

12

13

## **III. DECLINING USAGE**

14 **Q. WHAT WERE THE RESULTS OF MR. DUNN’S ANALYSIS?**

15 **A.** Mr. Dunn’s analysis has shown that there is a continuing annual decline across all MAWC  
16 districts, ranging from 682 gallons per customer per year (gpcy) in the Mexico district to  
17 3,169 gpcy in the Platte County district. In the Company’s largest district, St. Louis  
18 County, the rate of decline is 1,137 gpcy, or approximately 3.1 gallons per customer  
19 per day (gpcd).

20

21 **Q. WHAT DO YOU BELIEVE IS THE CAUSE OF THIS DECLINE?**

22 **A.** This decline can be attributed to several key factors, including but not limited to: increasing  
23 prevalence of low flow (water efficient) plumbing fixtures and appliances within residential

1 households, conservation ethic of the customers, conservation programs implemented by the  
2 utility or other entities, and price elasticity.

3  
4 **Q. PLEASE EXPLAIN WHAT YOU MEAN BY THE “PREVALENCE OF LOW FLOW  
5 FIXTURES AND APPLIANCES.”**

6 A. Plumbing fixtures such as toilets, showerheads, and faucets are more water efficient today  
7 than they were in the past. Similarly, appliances such as dishwashers and washing machines  
8 are also more water efficient. So, put very simply, when a customer replaces an older toilet,  
9 washing machine, or dishwasher, the new unit will use less water than the one it replaced.  
10 New homes will have water efficient fixtures. Similarly, if a customer remodels his or her  
11 kitchen, bathroom or laundry room, he or she will use less water in the future.

12  
13 **Q. HOW MUCH WATER DO THE NEW FIXTURES AND APPLIANCES SAVE?**

14 A. The Energy Policy and Conservation Act of 1992 mandated the manufacture of water  
15 efficient toilets, showerheads and faucet fixtures. For example, a toilet manufactured after  
16 1994 uses 1.6 gallons per flush, compared to a pre-1994 toilet which uses 3.5 to 7 gallons  
17 per flush. In fact, toilets using 1.28 gallons per flush are now becoming more prevalent in  
18 the marketplace. That is a savings of 2 to nearly 6 gallons for every flush for every toilet that  
19 is replaced with a more efficient model. The USEPA has estimated that there are over 220  
20 million toilets in the U.S.<sup>1</sup>, and that 10 million new toilets are sold each year for installation  
21 in new homes or replacement of aging fixtures in existing homes.<sup>2</sup>

---

<sup>1</sup> US EPA, WaterSense Tank-Type High-Efficiency Toilet Specification Supporting Statement, February 9, 2007.

<sup>2</sup> D&R International, Plumbing Fixtures Market Overview: Water Savings Potential for Residential and Commercial Toilet and Urinals, September 30, 2005.

1 A recently enacted law will impact indoor water usage further, and could perpetuate  
2 and further accelerate the downward trend. The Energy Independence & Security Act of  
3 2007 (Public Law 110–140) has established high efficiency standards for dishwashers and  
4 clothes washers. Dishwashers manufactured after 2009 and clothes washers manufactured  
5 after 2010 must meet water usage requirements that could reduce water used by these  
6 appliances by 54% and 30%, respectively. Overall, with all other factors being equal, a  
7 typical residential household in a home with new fixtures and appliances would use 35%  
8 less water for indoor purposes than a non-retrofitted home built prior to 1994. Schedule  
9 GAN-1 contains more details on the requirements of the laws and the typical expected  
10 impact on residential water usage.

11  
12 **Q. ELABORATE ON THE OTHER FACTORS CAUSING THE DECLINE IN**  
13 **RESIDENTIAL CONSUMPTION.**

14 A. Customer awareness and interest in the benefits of conserving water and energy continue to  
15 increase. As awareness of water and energy efficiency increases, customers may decide to  
16 replace a fixture or appliance even before it has broken. Also, customers may further reduce  
17 consumption by changing their household water use habits in other various ways. As  
18 discussed above, Missouri-American’s residential customers in the St. Louis County district  
19 have reduced their base usage by about 3.1 gallons per customer per day on average. A 3.1  
20 gallon per day decrease can be achieved by subtle changes in customer behavior. For  
21 instance, here are some ways a customer can reduce 3.1 gallons per day:

- 22 ○ A shorter shower by about 1 minute
- 23 ○ Two flushes per day with a newer low-flow toilet fixture vs. an older toilet



- 1           ○ Running the dishwasher 5 times per week instead of 7
- 2           ○ Turning off the water for about 1 minute while brushing your teeth

3           In addition, there is some elasticity to price that contributes to a reduction in usage as rates  
4           increase.

5

6   **Q.   HAVE YOU STUDIED WATER CONSUMPTION TRENDS FOR OTHER**  
7   **AMERICAN WATER SUBSIDIARIES BESIDES MAWC?**

8   A.   Yes.

9

10 **Q.   ARE THE RESULTS OF MR. DUNN’S ANALYSIS CONSISTENT WITH YOUR**  
11 **ANALYSIS IN OTHER STATES?**

12 A.   Yes. We have studied the residential consumption patterns for other American Water state  
13 operating systems located in climates similar to Missouri, and it has become clear that the  
14 trend experienced by MAWC is very similar to the trends being experienced in other states.  
15 The results are shown on Schedule GAN-2. This Schedule shows that nearby states have  
16 experienced a decline in residential consumption per customer averaging 1.35% per year  
17 over the last 10 years.

18

19 **Q.   IS THIS TREND BEING OBSERVED ACROSS THE INDUSTRY, BEYOND MAWC**  
20 **AND OTHER AMERICAN WATER COMPANIES?**

21 A.   Yes. According to the 2010 Water Research Foundation (“WRF”) report, “many water  
22 utilities across the United States and elsewhere are experiencing declining water sales

1 among households.” (WRF Report, p. 1)<sup>3</sup> The report further states: “A pervasive decline in  
2 household consumption has been determined at the national and regional levels.” (WRF  
3 Report, p. xxviii).

4  
5 **Q. DO YOU EXPECT THE DECLINING USAGE TREND TO CONTINUE IN THE**  
6 **FUTURE?**

7 A. Yes. It is clear that water efficient fixtures and other drivers such as conservation education  
8 and price elasticity will continue to drive further efficiency into residential usage per  
9 customer. In fact, the trend could accelerate. Water usage declines when a resident changes  
10 from an older, less efficient fixture, to a new, efficient fixture. This occurs (1) when a resident  
11 remodels his or her existing bathroom, kitchen or laundry, replacing older fixtures and  
12 appliances with new, water-efficient ones; and (2) as new homes that include water-efficient  
13 fixtures and appliances are built. As discussed, a new toilet will use 1.6 (or 1.28) gallons per  
14 flush, compared to 3.5 to 7.0 gallons per flush for a pre-1994 toilet.

15 The regulations mandating water efficient washing machines and dishwashers are  
16 relatively new. Given the life expectancy of appliances, it is likely that the replacement of  
17 existing appliances, and the corresponding reduction in water used, will continue to occur  
18 over time for the next fifteen years or more.

19  
20 **Q. ARE THERE BENEFITS FROM REDUCED WATER USAGE BY RESIDENTIAL**  
21 **CUSTOMERS?**

---

<sup>3</sup> Coomes, Paul et al., North America Residential Water Usage Trends Since 1992 – Project #4031. (Water Research Foundation, 2010)

1 A. Yes. There are environmental and operational benefits from lower water usage by  
2 residential customers. Reduced usage helps maintain source water supplies. Diversions  
3 from supply sources are lessened, leaving more water for passing flows, environmental  
4 benefit, or drought reserve. Reductions in power consumption, chemical usage, and waste  
5 disposal not only reduce water utility operating costs but also provide environmental  
6 benefits such as reduced carbon footprint and waste streams. Furthermore, reduced water  
7 usage by residential customers also reduces energy consumption within the customer's  
8 home, for instance, through lower hot water heating needs. In addition, on a case-specific  
9 basis, reduced water usage has the potential to enable the utility to delay or downsize a  
10 capacity addition. In systems where demand is approaching the capacity of water supplies  
11 or treatment facilities, the water saved through efficient usage by customers can be a  
12 preferred alternative to a supply-side expansion, with a resulting lower cost to customers.  
13 Currently, there is an economic disincentive to MAWC to sell less water in its service  
14 territories; however, MAWC would like to work with the Commission to move beyond  
15 historic barriers, to fully unlock the benefits of resource preservation. According to the  
16 WRF Report, "while water conservation is normally seen as positive, this gradual erosion in  
17 residential consumption may force utilities to raise rates to provide sufficient revenues for  
18 expanding service and replacing old water mains and equipment." (WRF report p. xxi) The  
19 report further states, "pricing that recovers the costs of building, operating and maintaining  
20 the systems is absolutely essential to achieving sustainability. Drinking water and  
21 wastewater utilities must be able to price water to reflect the full costs of treatment and  
22 delivery." (WRF report p. 74-75) MAWC is fully committed to preserving natural

1 resources, and welcomes the Commission's support and partnership to help all parties  
2 receive the benefits from conservation and efficient water use by its customers.

3

4 **Q. WHAT IS YOUR CONCLUSION ABOUT MR. DUNN'S FINDINGS REGARDING**  
5 **DECLINING CONSUMPTION BY MAWC'S RESIDENTIAL CUSTOMERS?**

6 A. It is my conclusion that Mr. Dunn's analysis is fundamentally sound, and that his findings  
7 are consistent with the findings of my analyses conducted for other American Water  
8 systems, and with findings being reported across the water utility industry.

9

10 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 A. Yes, it does.

## Schedule GAN-1

The following regulations are listed in the “*Energy Independence & Security Act of 2007*,” Public Law 110–140 – Dec. 19, 2007:

1. A top-loading or front-loading standard-size residential clothes washer manufactured on or after January 1, 2011 shall have a water factor of not more than 9.5. (water factor is equal to gallons/cycle/cubic feet)
2. Dishwashers manufactured on or after January 1, 2010, shall—
  - a. for standard size dishwashers ( $\geq 8$  place settings + six serving pieces) not exceed **6.5 gallon per cycle**; and
  - b. for compact size dishwashers ( $< 8$  place settings + six serving pieces) not exceed **4.5 gallons per cycle**.

**TABLE 1**

**Flow rates from typical household fixtures and appliances before and after Federal Standards**

Type of Use	Pre-Regulatory Flow*	New Standard (maximum)	Federal Standard	Year Effective
Toilets	3.5 gpf	1.6 gpf	<b>U.S. Energy Policy Act</b>	1994
Clothes washers**	41 gpl (14.6 WF)	Estimated 26.6 gpl (9.5 WF)	<b>Energy Independence &amp; Security Act of 2007</b>	2011
Showers	2.75 gpm	2.5 gpm	<b>U.S. Energy Policy Act</b>	1994
Faucets***	2.75 gpm	2.5 gpm (1.5 gpm)	<b>U.S. Energy Policy Act</b>	1994
Dishwashers	14.0 gpc	6.5 gpc for standard; 4.5 gpc for compact	<b>Energy Independence &amp; Security Act of 2007</b>	2010

\* Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

\*\* Average estimated gallons per load and water factor (see calculations)

\*\*\* Regulation maximum of 2.5 gpm at 80 psi, but lavatory faucets available at 1.5 gpm maximum (see calculations)

<b>ABBREVIATIONS USED</b>	
gpcd	gallons per capita per day
gpf	gallons per flush
gpl	gallons per load
gpm	gallons per minute
gpc	gallons per cycle
WF	water factor, or gallons per cycle per cubic feet capacity of the washer (the smaller the water factor, the more water efficient the clothes washer)

**TABLE 2**  
**Daily indoor per capita water use from various fixtures and appliances in a typical single family home before and after Federal Regulations**

Type of Use	Pre-Regulatory Standards		Post-Regulatory Standards		Savings
	Amount** (gpcd)	Percent of Total	Amount** (gpcd)	Percent of Total	
Toilets	17.9	30.4%	8.2	21.4%	54%
Clothes washers*	15	25.5%	9.8	25.6%	30%
Showers	9.7	16.5%	8.8	23.0%	9%
Faucets	14.9	25.3%	10.8	28.2%	28%
Dishwashers*	1.4	2.4%	0.65	1.7%	54%
<b>Total Indoor Water Use</b>	<b>58.9</b>	<b>100%</b>	<b>38.3</b>	<b>100%</b>	<b>35%</b>

*Note: List only includes common household fixtures and appliances and excludes leaks and "other domestic uses" in order to be conservative.*

\*Regulatory Standards effective in 2010 and 2011. For calculations of amount in gpcd, refer to the calculation below.

\*\*Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

### CALCULATIONS

**Clothes washer (pre-regulatory):**

Number of times clothes washer used everyday \* = 0.37 loads per day  
 Clothes washer water use rate range \* = 39 gpl to 43 gpl  
 Average water use rate = **41 gpl**  
 Water usage per capita = 41 gpl \* 0.37 loads/day  
 = **15 gpcd**  
 Water factor (WF) as gallons/cycle/cu. ft = 41 gpl / 2.8 cu. ft (assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)  
 = **14.6**

**Clothes washer (new standard):**

Number of times clothes washer used everyday \* = 0.37 loads per day  
 New regulatory standard = **9.5 WF**  
 = 9.5 gallons/per cycle/cubic feet  
 = **26.6 gpl** (Assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)  
 Therefore, new usage per capita = 26.6 gpl \* 0.37 loads/day  
 = **9.8 gpcd**

**Dishwasher:**

Number of times dishwasher used everyday\* = 0.10 times  
New regulatory standard = **6.5 gallons/per cycle** (for standard dishwashers only)  
Therefore, new usage per capita = 6.5 gallons/per cycle \* 0.1  
= **0.65 gpcd**

**Faucet:**

Actual faucet flow during use\* = 67% rated flow  
Rated flow\* = **1.5 gpm to 2.5 gpm**  
Frequency of faucet use\* = 8.1 min/day  
Range of usage per capita = 8.1 gpcd to 13.5 gpcd  
Assume average of range for estimated gpcd = **10.8 gpcd**

\*Source: *Handbook of Water Use and Conservation*, Amy Vickers, May, 2001

<b>Historic Slopes of Trendlines (Residential Usage) for Other Eastern/Midwestern US States*</b>	
	<b>10-Year Winter Trend</b>
Maximum	-1.68%
Minimum	-1.17%
Average	-1.35%

\* See below for more details about the other eastern/midwestern states.

As with Missouri American Water, residential usage trends were analyzed for other American Water subsidiaries. Four of these states are listed and summarized below. In all cases residential winter consumption trends were analyzed using a similar methodology as presented in this testimony.

<b>Background Information for Other State Trend Summary</b>		
<b>State</b>	<b>Number of Residential Customers as of 12/2010</b>	<b>Annual Rate of Decline at 2010</b>
Illinois	252,991	-1.17%
Iowa	54,702	-1.68%
Indiana	250,949	-1.32%
Pennsylvania	587,386	-1.21%