

**MISSOURI PUBLIC SERVICE COMMISSION**

**STAFF REPORT**

**COST OF SERVICE**

**APPENDIX 2**

**Support for Staff  
Cost of  
Capital Recommendations**

**MISSOURI-AMERICAN WATER COMPANY**

**CASE NO. WR-2017-0285**

*Jefferson City, Missouri  
November 2017*

**AN ANALYSIS OF THE COST OF CAPITAL**

**FOR**

**MISSOURI-AMERICAN WATER COMPANY**

**CASE NO. WR-2017-0285**

**SCHEDULES**

**BY**

**Jeffrey Smith**

**Financial Analysis**

**MISSOURI PUBLIC SERVICE COMMISSION**

**November 2017**

Missouri American Water Company  
Case No. WR-2017-0285

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**Missouri-American Water Company  
CASE NO. WR-2017-0285**

**Federal Reserve Discount Rates Changes and Federal Reserve Funds Rates Changes**

Date	Federal Reserve Discount Rate	Federal Reserve Funds Rate	Date	Federal Reserve Discount Rate	Federal Reserve Funds Rate
01/01/83	8.50%		02/02/00	5.25%	5.75%
12/31/83	8.50%		03/21/00	5.50%	6.00%
04/09/84	9.00%		05/19/00	6.00%	6.50%
11/21/84	8.50%		01/03/01	5.75%	6.00%
12/24/84	8.00%		01/04/01	5.50%	6.00%
05/20/85	7.50%		01/31/01	5.00%	5.50%
03/07/86	7.00%		03/20/01	4.50%	5.00%
04/21/86	6.50%		04/18/01	4.00%	4.50%
07/11/86	6.00%		05/15/01	3.50%	4.00%
08/21/86	5.50%		06/27/01	3.25%	3.75%
09/04/87	6.00%		08/21/01	3.00%	3.50%
08/09/88	6.50%		09/17/01	2.50%	3.00%
02/24/89	7.00%		10/02/01	2.00%	2.50%
07/13/90		8.00%	11/06/01	1.50%	2.00%
10/29/90		7.75%	12/11/01	1.25%	1.75%
11/13/90		7.50%	11/06/02	0.75%	1.25%
12/07/90		7.25%	01/09/03	2.25%**	1.25%
12/18/90		7.00%	06/25/03	2.00%	1.00%
12/19/90	6.50%		06/30/04	2.25%	1.25%
01/09/91		6.75%	08/10/04	2.50%	1.50%
02/01/91	6.00%	6.25%	09/21/04	2.75%	1.75%
03/08/91		6.00%	11/10/04	3.00%	2.00%
04/30/91	5.50%	5.75%	12/14/04	3.25%	2.25%
08/06/91		5.50%	02/02/05	3.50%	2.50%
09/13/91	5.00%	5.25%	03/22/05	3.75%	2.75%
10/31/91		5.00%	05/03/05	4.00%	3.00%
11/06/91	4.50%	4.75%	06/30/05	4.25%	3.25%
12/06/91		4.50%	08/09/05	4.50%	3.50%
12/20/91	3.50%	4.00%	09/20/05	4.75%	3.75%
04/09/92		3.75%	11/01/05	5.00%	4.00%
07/02/92	3.00%	3.25%	12/13/05	5.25%	4.25%
09/04/92		3.00%	01/31/06	5.50%	4.50%
01/01/93			03/28/06	5.75%	4.75%
12/31/93	No Changes	No Changes	05/10/06	6.00%	5.00%
02/04/94		3.25%	06/29/06	6.25%	5.25%
03/22/94		3.50%	08/17/07	5.75%	5.25%
04/18/94		3.75%	09/18/07	5.25%	4.75%
05/17/94	3.50%	4.25%	10/31/07	5.00%	4.50%
08/16/94	4.00%	4.75%	12/11/07	4.75%	4.25%
11/15/94	4.75%	5.50%	01/22/08	4.00%	3.50%
02/01/95	5.25%	6.00%	01/30/08	3.50%	3.00%
07/06/95		5.75%	03/16/08	3.25%	
12/19/95		5.50%	03/18/08	2.50%	2.25%
01/31/96	5.00%	5.25%	04/30/08	2.25%	2.00%
03/25/97		5.50%	10/08/08	1.75%	1.50%
12/12/97	5.00%		10/28/08	1.25%	1.00%
01/09/98	5.00%		12/16/08	0.50%	0% - .25%
03/06/98	5.00%		02/19/10	0.75%	
09/29/98		5.25%	12/17/15	1.00%	.25% - .50%
10/15/98	4.75%	5.00%	12/15/16	1.25%	.50% - .75%
11/17/98	4.50%	4.75%	03/16/17	1.50%	.75% - 1.00%
06/30/99	4.50%	5.00%	06/15/17	1.75%	1.25% - 1.50%
08/24/99	4.75%	5.25%			
11/16/99	5.00%	5.50%			

\* Staff began tracking the Federal Funds Rate.

\*\*Revised discount window program begins. Reflects rate on primary credit. This revised discount window policy results in incomparability of the discount rates after January 9, 2003 to discount rates before January 9, 2003.

Source:

Federal Reserve Discount rate

<http://www.newyorkfed.org/markets/statistics/dlyrates/fedrate.html>

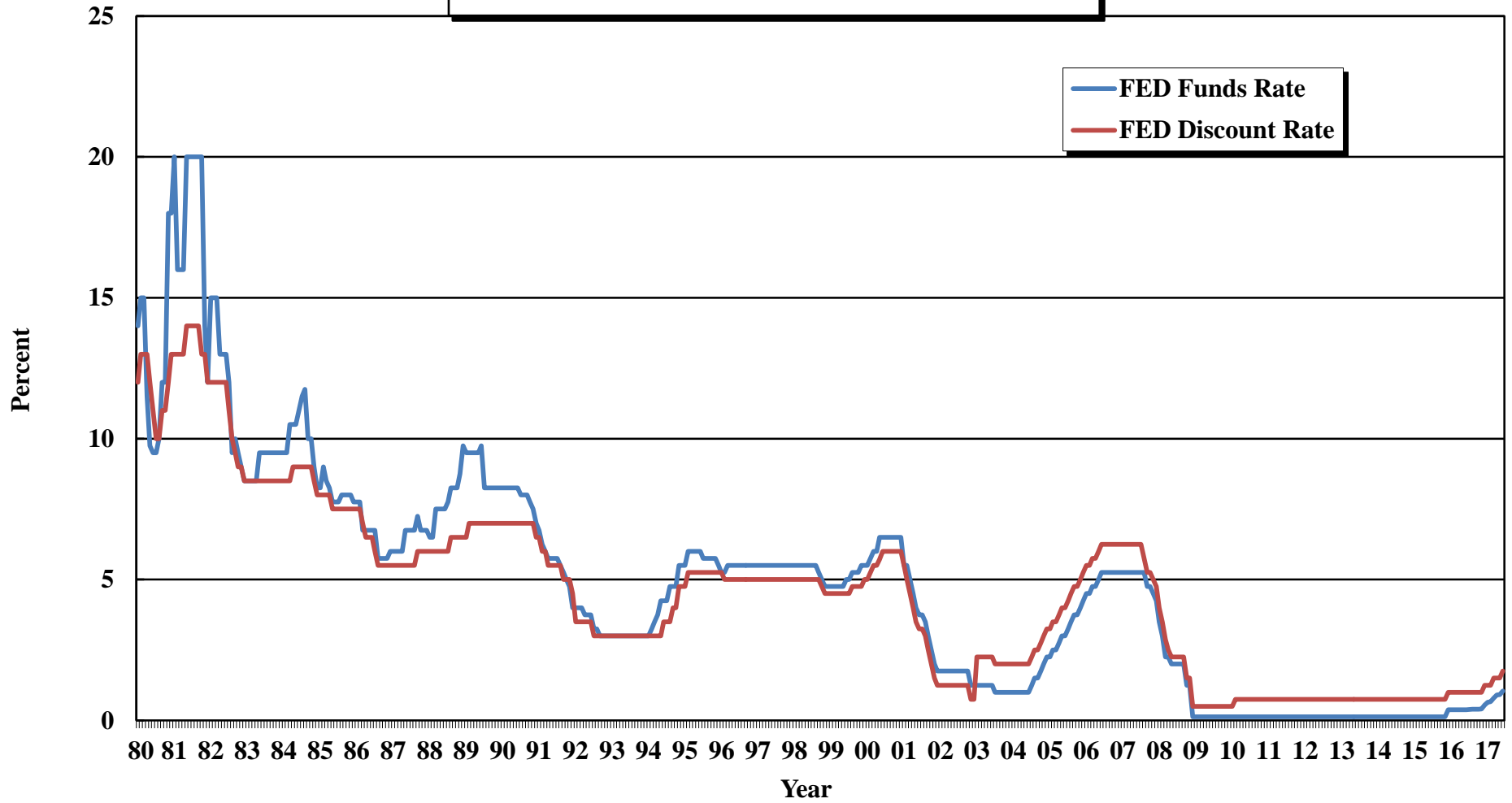
Federal Reserve Funds rate

<https://fred.stlouisfed.org/series/FEDFUNDS>

Note: Interest rates as of December 31 for each year are underlined.

Missouri-American Water Company  
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Federal Reserve Discount Rates and Federal Funds Rates  
1982 - 2017



**Missouri-American Water Company**  
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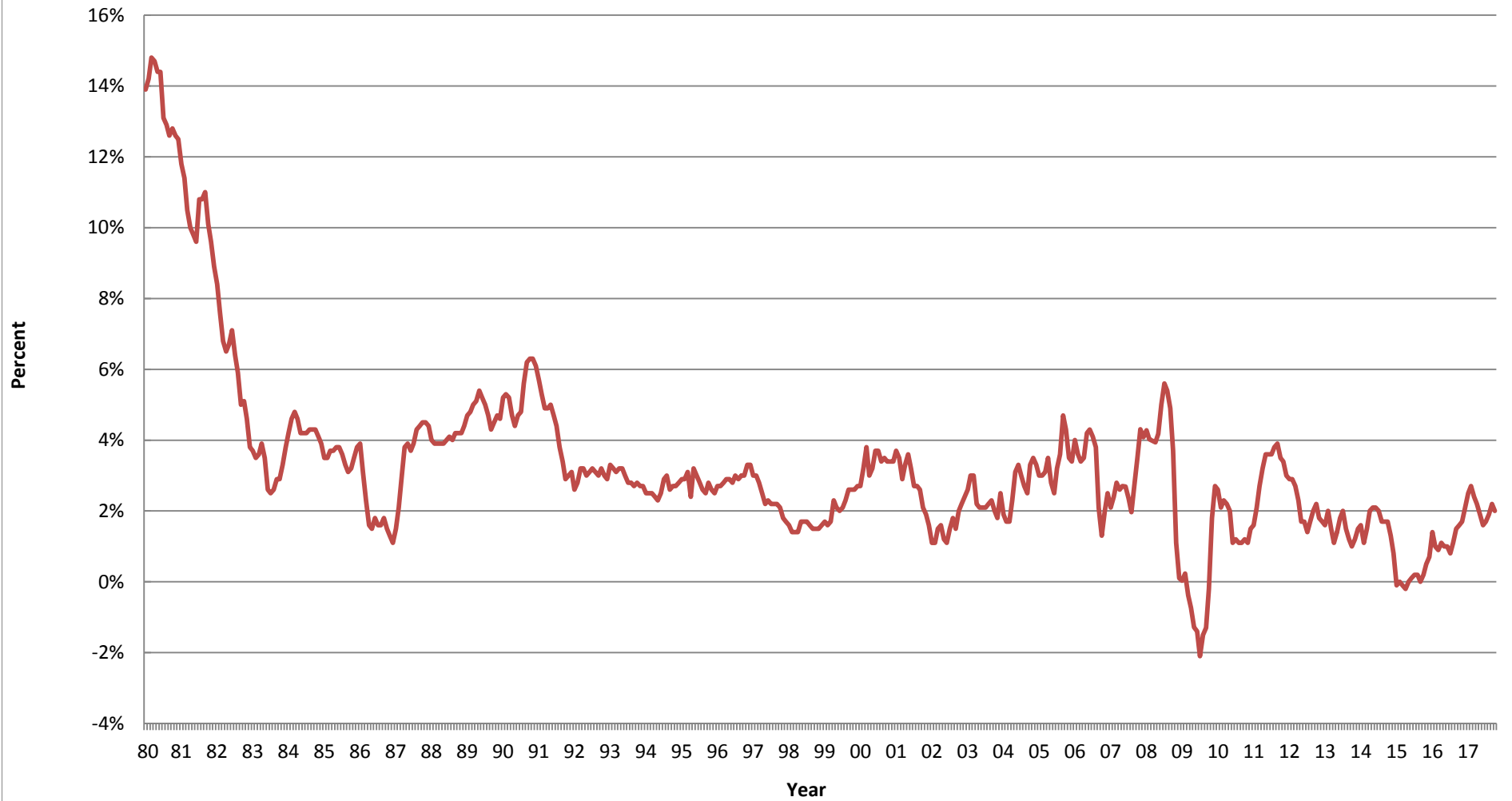
Rate of Inflation

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	13.90	Jan 1986	3.90	Jan 1992	2.60	Jan 1998	1.60	Jan 2004	1.90	Jan 2010	2.60	Jan 2016	1.40
Feb	14.20	Feb	3.10	Feb	2.80	Feb	1.40	Feb	1.70	Feb	2.10	Feb	1.00
Mar	14.80	Mar	2.30	Mar	3.20	Mar	1.40	Mar	1.70	Mar	2.30	Mar	0.90
Apr	14.70	Apr	1.60	Apr	3.20	Apr	1.40	Apr	2.30	April	2.20	Apr	1.10
May	14.40	May	1.50	May	3.00	May	1.70	May	3.10	May	2.00	May	1.00
Jun	14.40	Jun	1.80	Jun	3.10	Jun	1.70	Jun	3.30	Jun	1.10	Jun	1.00
Jul	13.10	Jul	1.60	Jul	3.20	Jul	1.70	Jul	3.00	Jul	1.20	Jul	0.80
Aug	12.90	Aug	1.60	Aug	3.10	Aug	1.60	Aug	2.70	Aug	1.10	Aug	1.10
Sep	12.60	Sep	1.80	Sep	3.00	Sep	1.50	Sep	2.50	Sep	1.10	Sep	1.50
Oct	12.80	Oct	1.50	Oct	3.20	Oct	1.50	Oct	3.30	Oct	1.20	Oct	1.60
Nov	12.60	Nov	1.30	Nov	3.00	Nov	1.50	Nov	3.50	Nov	1.10	Nov	1.70
Dec	12.50	Dec	1.10	Dec	2.90	Dec	1.60	Dec	3.30	Dec	1.50	Dec	2.10
Jan 1981	11.80	Jan 1987	1.50	Jan 1993	3.30	Jan 1999	1.70	Jan 2005	3.00	Jan 2011	1.60	Jan 2017	2.50
Feb	11.40	Feb	2.10	Feb	3.20	Feb	1.60	Feb	3.00	Feb	2.10	Feb	2.70
Mar	10.50	Mar	3.00	Mar	3.10	Mar	1.70	Mar	3.10	Mar	2.70	Mar	2.40
Apr	10.00	Apr	3.80	Apr	3.20	Apr	2.30	Apr	3.50	Apr	3.20	Apr	2.20
May	9.80	May	3.90	May	3.20	May	2.10	May	2.80	May	3.60	May	1.90
Jun	9.60	Jun	3.70	Jun	3.00	Jun	2.00	Jun	2.50	Jun	3.60	Jun	1.60
Jul	10.80	Jul	3.90	Jul	2.80	Jul	2.10	Jul	3.20	Jul	3.60	July	1.70
Aug	10.80	Aug	4.30	Aug	2.80	Aug	2.30	Aug	3.60	Aug	3.80	Aug	1.90
Sep	11.00	Sep	4.40	Sep	2.70	Sep	2.60	Sep	4.70	Sep	3.90	Sep	2.20
Oct	10.10	Oct	4.50	Oct	2.80	Oct	2.60	Oct	4.30	Oct	3.50	Oct	2.00
Nov	9.60	Nov	4.50	Nov	2.70	Nov	2.60	Nov	3.50	Nov	3.40		
Dec	8.90	Dec	4.40	Dec	2.70	Dec	2.70	Dec	3.40	Dec	3.00		
Jan 1982	8.40	Jan 1988	4.00	Jan 1994	2.50	Jan 2000	2.70	Jan 2006	4.00	Jan 2012	2.90		
Feb	7.60	Feb	3.90	Feb	2.50	Feb	3.20	Feb	3.60	Feb	2.90		
Mar	6.80	Mar	3.90	Mar	2.50	Mar	3.70	Mar	3.40	Mar	2.70		
Apr	6.50	Apr	3.90	Apr	2.40	Apr	3.00	Apr	3.50	Apr	2.30		
May	6.70	May	3.90	May	2.30	May	3.20	May	4.20	May	1.70		
Jun	7.10	Jun	4.00	Jun	2.50	Jun	3.70	June	4.30	Jun	1.70		
Jul	6.40	Jul	4.10	Jul	2.90	Jul	3.70	July	4.10	Jul	1.40		
Aug	5.90	Aug	4.00	Aug	3.00	Aug	3.40	Aug	3.80	Aug	1.70		
Sep	5.00	Sep	4.20	Sep	2.60	Sep	3.50	Sep	2.10	Sep	2.00		
Oct	5.10	Oct	4.20	Oct	2.70	Oct	3.40	Oct	1.30	Oct	2.20		
Nov	4.60	Nov	4.20	Nov	2.70	Nov	3.40	Nov	2.00	Nov	1.80		
Dec	3.80	Dec	4.40	Dec	2.80	Dec	3.40	Dec	2.50	Dec	1.70		
Jan 1983	3.70	Jan 1989	4.70	Jan 1995	2.90	Jan 2001	3.70	Jan 2007	2.10	Jan 2013	1.60		
Feb	3.50	Feb	4.80	Feb	2.90	Feb	3.50	Feb	2.40	Feb	2.00		
Mar	3.60	Mar	5.00	Mar	3.10	Mar	2.90	Mar	2.80	Mar	1.50		
Apr	3.90	Apr	5.10	Apr	2.40	Apr	3.30	Apr	2.60	Apr	1.10		
May	3.50	May	5.40	May	3.20	May	3.60	May	2.70	May	1.40		
Jun	2.60	Jun	5.20	Jun	3.00	Jun	3.20	Jun	2.70	Jun	1.80		
Jul	2.50	Jul	5.00	Jul	2.80	Jul	2.70	Jul	2.40	Jul	2.00		
Aug	2.60	Aug	4.70	Aug	2.60	Aug	2.70	Aug	2.00	Aug	1.50		
Sep	2.90	Sep	4.30	Sep	2.50	Sep	2.60	Sep	2.80	Sept	1.20		
Oct	2.90	Oct	4.50	Oct	2.80	Oct	2.10	Oct	3.50	Oct	1.00		
Nov	3.30	Nov	4.70	Nov	2.60	Nov	1.90	Nov	4.30	Nov	1.20		
Dec	3.80	Dec	4.60	Dec	2.50	Dec	1.60	Dec	4.10	Dec	1.50		
Jan 1984	4.20	Jan 1990	5.20	Jan 1996	2.70	Jan 2002	1.10	Jan 2008	4.30	Jan 2014	1.60		
Feb	4.60	Feb	5.30	Feb	2.70	Feb	1.10	Feb	4.00	Feb	1.10		
Mar	4.80	Mar	5.20	Mar	2.80	Mar	1.50	Mar	4.00	Mar	1.50		
Apr	4.60	Apr	4.70	Apr	2.90	Apr	1.60	Apr	3.90	Apr	2.00		
May	4.20	May	4.40	May	2.90	May	1.20	May	4.20	May	2.10		
Jun	4.20	Jun	4.70	Jun	2.80	Jun	1.10	Jun	5.00	Jun	2.10		
Jul	4.20	Jul	4.80	Jul	3.00	Jul	1.50	Jul	5.60	Jul	2.00		
Aug	4.30	Aug	5.60	Aug	2.90	Aug	1.80	Aug	5.40	Aug	1.70		
Sep	4.30	Sep	6.20	Sep	3.00	Sep	1.50	Sep	4.90	Sep	1.70		
Oct	4.30	Oct	6.30	Oct	3.00	Oct	2.00	Oct	3.70	Oct	1.70		
Nov	4.10	Nov	6.30	Nov	3.30	Nov	2.20	Nov	1.10	Nov	1.30		
Dec	3.90	Dec	6.10	Dec	3.30	Dec	2.40	Dec	0.10	Dec	0.80		
Jan 1985	3.50	Jan 1991	5.70	Jan 1997	3.00	Jan 2003	2.60	Jan 2009	0.00	Jan 2015	-0.10		
Feb	3.50	Feb	5.30	Feb	3.00	Feb	3.00	Feb	0.20	Feb	0.00		
Mar	3.70	Mar	4.90	Mar	2.80	Mar	3.00	Mar	-0.40	Mar	-0.10		
Apr	3.70	Apr	4.90	Apr	2.50	Apr	2.20	Apr	-0.70	Apr	-0.20		
May	3.80	May	5.00	May	2.20	May	2.10	May	-1.28	May	0.00		
Jun	3.80	Jun	4.70	Jun	2.30	Jun	2.10	Jun	-1.40	Jun	0.10		
Jul	3.60	Jul	4.40	Jul	2.20	Jul	2.10	Jul	-2.10	Jul	0.20		
Aug	3.30	Aug	3.80	Aug	2.20	Aug	2.20	Aug	-1.50	Aug	0.20		
Sep	3.10	Sep	3.40	Sep	2.20	Sep	2.30	Sep	-1.30	Sep	0.00		
Oct	3.20	Oct	2.90	Oct	2.10	Oct	2.00	Oct	-0.20	Oct	0.20		
Nov	3.50	Nov	3.00	Nov	1.80	Nov	1.80	Nov	1.80	Nov	0.50		
Dec	3.80	Dec	3.10	Dec	1.70	Dec	1.90	Dec	2.70	Dec	0.70		

Source: U.S. Dept of Labor, Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers, Change for 12-Month Period, Bureau of Labor Statistics, [http://www.bls.gov/schedule/archives/cpi\\_nr.htm](http://www.bls.gov/schedule/archives/cpi_nr.htm)

Missouri-American Water Company  
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**Rate of Inflation**  
**1980 - 2017**



**Missouri-American Water Company**  
**CASE NO. WR-2017-0285**

Average Yields on Moody's Public Utility Bonds

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	12.12	Jan 1986	10.66	Jan 1992	8.67	Jan 1998	7.03	Jan 2004	6.23	Jan 2010	5.83	Jan 2016	4.62
Feb	13.48	Feb	10.16	Feb	8.77	Feb	7.09	Feb	6.17	Feb	5.94	Feb	4.44
Mar	14.33	Mar	9.33	Mar	8.84	Mar	7.13	Mar	6.01	Mar	5.90	Mar	4.40
Apr	13.50	Apr	9.02	Apr	8.79	Apr	7.12	Apr	6.38	Apr	5.87	Apr	4.16
May	12.17	May	9.52	May	8.72	May	7.11	May	6.68	May	5.59	May	4.06
Jun	11.87	Jun	9.51	Jun	8.64	Jun	6.99	Jun	6.53	June	5.62	Jun	3.93
Jul	12.12	Jul	9.19	Jul	8.46	Jul	6.99	Jul	6.34	July	5.41	Jul	3.70
Aug	12.82	Aug	9.15	Aug	8.34	Aug	6.96	Aug	6.18	Aug	5.10	Aug	3.73
Sep	13.29	Sep	9.42	Sep	8.32	Sep	6.88	Sep	6.01	Sep	5.10	Sep	3.80
Oct	13.53	Oct	9.39	Oct	8.44	Oct	6.88	Oct	5.95	Oct	5.20	Oct	3.90
Nov	14.07	Nov	9.15	Nov	8.53	Nov	6.96	Nov	5.97	Nov	5.45	Nov	4.21
Dec	14.48	Dec	8.96	Dec	8.36	Dec	6.84	Dec	5.93	Dec	5.61	Dec	4.39
Jan 1981	14.22	Jan 1987	8.77	Jan 1993	8.23	Jan 1999	6.87	Jan 2005	5.80	Jan 2011	5.69	Jan 2017	4.24
Feb	14.84	Feb	8.81	Feb	8.00	Feb	7.00	Feb	5.64	Feb	5.82	Feb	4.25
Mar	14.86	Mar	8.75	Mar	7.85	Mar	7.18	Mar	5.86	Mar	5.74	Mar	4.30
Apr	15.32	Apr	9.30	Apr	7.76	Apr	7.16	Apr	5.72	Apr	5.76	Apr	4.19
May	15.84	May	9.82	May	7.78	May	7.42	May	5.60	May	5.57	May	4.19
Jun	15.27	Jun	9.87	Jun	7.68	Jun	7.70	Jun	5.39	June	5.52	Jun	4.01
Jul	15.87	Jul	10.01	Jul	7.53	Jul	7.66	Jul	5.50	July	5.61	Jul	4.06
Aug	16.33	Aug	10.33	Aug	7.21	Aug	7.86	Aug	5.51	Aug	5.26	Aug	3.92
Sep	16.89	Sep	11.00	Sep	7.01	Sep	7.87	Sep	5.54	Sep	5.01	Sep	3.93
Oct	16.76	Oct	11.32	Oct	6.99	Oct	8.02	Oct	5.79	Oct	5.11	Oct	3.97
Nov	15.50	Nov	10.82	Nov	7.30	Nov	7.86	Nov	5.88	Nov	5.00		
Dec	15.77	Dec	10.99	Dec	7.33	Dec	8.04	Dec	5.83	Dec	4.96		
Jan 1982	16.73	Jan 1988	10.75	Jan 1994	7.31	Jan 2000	8.22	Jan 2006	5.77	Jan 2012	4.97		
Feb	16.72	Feb	10.11	Feb	7.44	Feb	8.10	Feb	5.83	Feb	4.99		
Mar	16.07	Mar	10.11	Mar	7.83	Mar	8.14	Mar	5.98	Mar	5.13		
Apr	15.82	Apr	10.53	Apr	8.20	Apr	8.14	Apr	6.28	Apr	5.05		
May	15.60	May	10.75	May	8.32	May	8.55	May	6.39	May	4.84		
Jun	16.18	Jun	10.71	Jun	8.31	Jun	8.22	June	6.39	Jun	4.67		
Jul	16.04	Jul	10.96	Jul	8.47	Jul	8.17	July	6.37	Jul	4.56		
Aug	15.22	Aug	11.09	Aug	8.41	Aug	8.05	Aug	6.20	Aug	4.71		
Sep	14.56	Sep	10.56	Sep	8.65	Sep	8.16	Sep	6.03	Sep	4.75		
Oct	13.88	Oct	9.92	Oct	8.88	Oct	8.08	Oct	6.01	Oct	4.69		
Nov	13.58	Nov	9.89	Nov	9.00	Nov	8.03	Nov	5.82	Nov	4.53		
Dec	13.55	Dec	10.02	Dec	8.79	Dec	7.79	Dec	5.83	Dec	4.28		
Jan 1983	13.46	Jan 1989	10.02	Jan 1995	8.77	Jan 2001	7.76	Jan 2007	5.96	Jan 2013	4.45		
Feb	13.60	Feb	10.02	Feb	8.56	Feb	7.69	Feb	5.91	Feb	4.49		
Mar	13.28	Mar	10.16	Mar	8.41	Mar	7.59	Mar	5.87	Mar	4.45		
Apr	13.03	Apr	10.14	Apr	8.30	Apr	7.81	Apr	6.01	Apr	4.19		
May	13.00	May	9.92	May	7.93	May	7.88	May	6.03	May	4.36		
Jun	13.17	Jun	9.49	Jun	7.62	Jun	7.75	June	6.34	Jun	4.70		
Jul	13.28	Jul	9.34	Jul	7.73	Jul	7.71	July	6.28	Jul	4.90		
Aug	13.50	Aug	9.37	Aug	7.86	Aug	7.57	Aug	6.28	Aug	5.00		
Sep	13.35	Sep	9.43	Sep	7.62	Sep	7.73	Sep	6.24	Sep	5.05		
Oct	13.19	Oct	9.37	Oct	7.46	Oct	7.64	Oct	6.17	Oct	4.94		
Nov	13.33	Nov	9.33	Nov	7.40	Nov	7.61	Nov	6.04	Nov	5.04		
Dec	13.48	Dec	9.31	Dec	7.21	Dec	7.86	Dec	6.23	Dec	4.89		
Jan 1984	13.40	Jan 1990	9.44	Jan 1996	7.20	Jan 2002	7.69	Jan 2008	6.08	Jan 2014	4.72		
Feb	13.50	Feb	9.66	Feb	7.37	Feb	7.62	Feb	6.28	Feb	4.64		
Mar	14.03	Mar	9.75	Mar	7.72	Mar	7.83	Mar	6.29	Mar	4.63		
Apr	14.30	Apr	9.87	Apr	7.88	Apr	7.74	Apr	6.36	Apr	4.52		
May	14.95	May	9.89	May	7.99	May	7.76	May	6.38	May	4.37		
Jun	15.16	Jun	9.69	Jun	8.07	Jun	7.67	Jun	6.50	Jun	4.42		
Jul	14.92	Jul	9.66	Jul	8.02	Jul	7.54	Jul	6.50	Jul	4.35		
Aug	14.29	Aug	9.84	Aug	7.84	Aug	7.34	Aug	6.48	Aug	4.29		
Sep	14.04	Sep	10.01	Sep	8.01	Sep	7.23	Sep	6.59	Sep	4.40		
Oct	13.68	Oct	9.94	Oct	7.76	Oct	7.43	Oct	7.70	Oct	4.24		
Nov	13.15	Nov	9.76	Nov	7.48	Nov	7.31	Nov	7.80	Nov	4.29		
Dec	12.96	Dec	9.57	Dec	7.58	Dec	7.20	Dec	6.87	Dec	4.18		
Jan 1985	12.88	Jan 1991	9.56	Jan 1997	7.79	Jan 2003	7.13	Jan 2009	6.77	Jan 2015	3.83		
Feb	13.00	Feb	9.31	Feb	7.68	Feb	6.92	Feb	6.72	Feb	3.91		
Mar	13.66	Mar	9.39	Mar	7.92	Mar	6.80	Mar	6.85	Mar	3.97		
Apr	13.42	Apr	9.30	Apr	8.08	Apr	6.68	Apr	6.90	Apr	3.96		
May	12.89	May	9.29	May	7.94	May	6.35	May	6.83	May	4.38		
Jun	11.91	Jun	9.44	Jun	7.77	Jun	6.21	June	6.54	Jun	4.60		
Jul	11.88	Jul	9.40	Jul	7.52	Jul	6.54	July	6.15	Jul	4.63		
Aug	11.93	Aug	9.16	Aug	7.57	Aug	6.78	Aug	5.80	Aug	4.54		
Sep	11.95	Sep	9.03	Sep	7.50	Sep	6.58	Sep	5.80	Sep	4.68		
Oct	11.84	Oct	8.99	Oct	7.37	Oct	6.50	Oct	5.64	Oct	4.63		
Nov	11.33	Nov	8.93	Nov	7.24	Nov	6.44	Nov	5.71	Nov	4.73		
Dec	10.82	Dec	8.76	Dec	7.16	Dec	6.36	Dec	5.86	Dec	4.69		

Source: Mergent Bond Record (through November 2010); BondsOnline (December 2010 - November 2013); Mergent Bond Record (December 2013 - Present).



**Missouri-American Water Company**  
**CASE NO. WR-2017-0285**

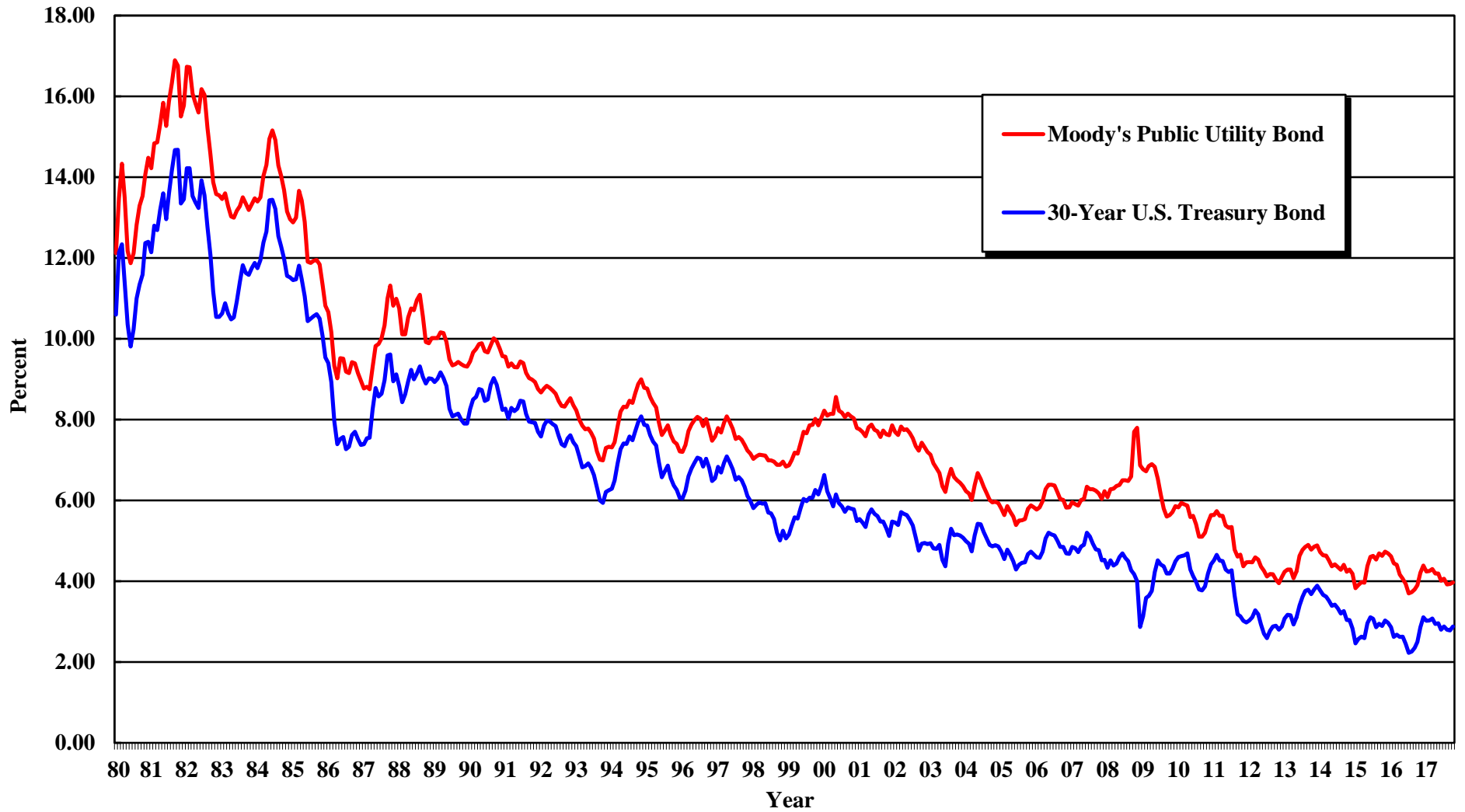
Average Yields on Thirty-Year U.S. Treasury Bonds

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	10.60	Jan 1986	9.40	Jan 1992	7.58	Jan 1998	5.81	Jan 2004	4.99	Jan 2010	4.60	Jan 2016	2.86
Feb	12.13	Feb	8.93	Feb	7.85	Feb	5.89	Feb	4.93	Feb	4.62	Feb	2.62
Mar	12.34	Mar	7.96	Mar	7.97	Mar	5.95	Mar	4.74	Mar	4.64	Mar	2.68
Apr	11.40	Apr	7.39	Apr	7.96	Apr	5.92	Apr	5.14	Apr	4.69	Apr	2.62
May	10.36	May	7.52	May	7.89	May	5.93	May	5.42	May	4.29	May	2.63
Jun	9.81	Jun	7.57	Jun	7.84	Jun	5.70	Jun	5.41	Jun	4.13	Jun	2.45
Jul	10.24	Jul	7.27	Jul	7.60	Jul	5.68	Jul	5.22	Jul	3.99	Jul	2.23
Aug	11.00	Aug	7.33	Aug	7.39	Aug	5.54	Aug	5.06	Aug	3.80	Aug	2.26
Sep	11.34	Sep	7.62	Sep	7.34	Sep	5.20	Sep	4.90	Sep	3.77	Sep	2.35
Oct	11.59	Oct	7.70	Oct	7.53	Oct	5.01	Oct	4.86	Oct	3.87	Oct	2.50
Nov	12.37	Nov	7.52	Nov	7.61	Nov	5.25	Nov	4.89	Nov	4.19	Nov	2.86
Dec	12.40	Dec	7.37	Dec	7.44	Dec	5.06	Dec	4.86	Dec	4.42	Dec	3.11
Jan 1981	12.14	Jan 1987	7.39	Jan 1993	7.34	Jan 1999	5.16	Jan 2005	4.73	Jan 2011	4.52	Jan 2017	3.02
Feb	12.80	Feb	7.54	Feb	7.09	Feb	5.37	Feb	4.55	Feb	4.65	Feb	3.03
Mar	12.69	Mar	7.55	Mar	6.82	Mar	5.58	Mar	4.78	Mar	4.51	Mar	3.08
Apr	13.20	Apr	8.25	Apr	6.85	Apr	5.55	Apr	4.85	Apr	4.50	Apr	2.94
May	13.60	May	8.78	May	6.92	May	5.81	May	4.49	May	4.29	May	2.96
Jun	12.96	Jun	8.57	Jun	6.81	Jun	6.04	Jun	4.29	Jun	4.23	Jun	2.80
Jul	13.59	Jul	8.64	Jul	6.63	Jul	5.98	Jul	4.41	Jul	4.27	Jul	2.88
Aug	14.17	Aug	8.97	Aug	6.32	Aug	6.07	Aug	4.46	Aug	3.65	Aug	2.88
Sep	14.67	Sep	9.59	Sep	6.00	Sep	6.07	Sep	4.47	Sep	3.18	Aug	2.80
Oct	14.68	Oct	9.61	Oct	5.94	Oct	6.26	Oct	4.67	Oct	3.13	Sep	2.78
Nov	13.35	Nov	8.95	Nov	6.21	Nov	6.15	Nov	4.73	Nov	3.02	Oct	2.88
Dec	13.45	Dec	9.12	Dec	6.25	Dec	6.35	Dec	4.66	Dec	2.98		
Jan 1982	14.22	Jan 1988	8.83	Jan 1994	6.29	Jan 2000	6.63	Jan 2006	4.59	Jan 2012	3.03		
Feb	14.22	Feb	8.43	Feb	6.49	Feb	6.23	Feb	4.58	Feb	3.11		
Mar	13.53	Mar	8.63	Mar	6.91	Mar	6.05	Mar	4.73	Mar	3.28		
Apr	13.37	Apr	8.95	Apr	7.27	Apr	5.85	Apr	5.06	Apr	3.18		
May	13.24	May	9.23	May	7.41	May	6.15	May	5.20	May	2.93		
Jun	13.92	Jun	9.00	Jun	7.40	Jun	5.93	Jun	5.16	Jun	2.70		
Jul	13.55	Jul	9.14	Jul	7.58	Jul	5.85	Jul	5.13	Jul	2.59		
Aug	12.77	Aug	9.32	Aug	7.49	Aug	5.72	Aug	5.00	Aug	2.77		
Sep	12.07	Sep	9.06	Sep	7.71	Sep	5.83	Sep	4.85	Sep	2.88		
Oct	11.17	Oct	8.89	Oct	7.94	Oct	5.80	Oct	4.85	Oct	2.90		
Nov	10.54	Nov	9.02	Nov	8.08	Nov	5.78	Nov	4.69	Nov	2.80		
Dec	10.54	Dec	9.01	Dec	7.87	Dec	5.49	Dec	4.68	Dec	2.88		
Jan 1983	10.63	Jan 1989	8.93	Jan 1995	7.85	Jan 2001	5.54	Jan 2007	4.85	Jan 2013	3.08		
Feb	10.88	Feb	9.01	Feb	7.61	Feb	5.45	Feb	4.82	Feb	3.17		
Mar	10.63	Mar	9.17	Mar	7.45	Mar	5.34	Mar	4.72	Mar	3.16		
Apr	10.48	Apr	9.03	Apr	7.36	Apr	5.65	Apr	4.86	Apr	2.93		
May	10.53	May	8.83	May	6.95	May	5.78	May	4.90	May	3.11		
Jun	10.93	Jun	8.27	Jun	6.57	Jun	5.67	Jun	5.20	Jun	3.40		
Jul	11.40	Jul	8.08	Jul	6.72	Jul	5.61	Jul	5.11	Jul	3.61		
Aug	11.82	Aug	8.12	Aug	6.86	Aug	5.48	Aug	4.93	Aug	3.76		
Sep	11.63	Sep	8.15	Sep	6.55	Sep	5.48	Sep	4.79	Sep	3.79		
Oct	11.58	Oct	8.00	Oct	6.37	Oct	5.32	Oct	4.77	Oct	3.68		
Nov	11.75	Nov	7.90	Nov	6.26	Nov	5.12	Nov	4.52	Nov	3.80		
Dec	11.88	Dec	7.90	Dec	6.06	Dec	5.48	Dec	4.58	Dec	3.89		
Jan 1984	11.75	Jan 1990	8.26	Jan 1996	6.05	Jan 2002	5.44	Jan 2008	4.33	Jan 2014	3.77		
Feb	11.95	Feb	8.50	Feb	6.24	Feb	5.39	Feb	4.52	Feb	3.66		
Mar	12.38	Mar	8.56	Mar	6.60	Mar	5.71	Mar	4.39	Mar	3.62		
Apr	12.65	Apr	8.76	Apr	6.79	Apr	5.67	Apr	4.44	Apr	3.52		
May	13.43	May	8.73	May	6.93	May	5.64	May	4.60	May	3.39		
Jun	13.44	Jun	8.46	Jun	7.06	Jun	5.52	Jun	4.69	Jun	3.42		
Jul	13.21	Jul	8.50	Jul	7.03	Jul	5.38	Jul	4.57	Jul	3.33		
Aug	12.54	Aug	8.86	Aug	6.84	Aug	5.08	Aug	4.50	Aug	3.20		
Sep	12.29	Sep	9.03	Sep	7.03	Sep	4.76	Sep	4.27	Sep	3.26		
Oct	11.98	Oct	8.86	Oct	6.81	Oct	4.93	Oct	4.17	Oct	3.04		
Nov	11.56	Nov	8.54	Nov	6.48	Nov	4.95	Nov	4.00	Nov	3.04		
Dec	11.52	Dec	8.24	Dec	6.55	Dec	4.92	Dec	2.87	Dec	2.83		
Jan 1985	11.45	Jan 1991	8.27	Jan 1997	6.83	Jan 2003	4.94	Jan 2009	3.13	Jan 2015	2.46		
Feb	11.47	Feb	8.03	Feb	6.69	Feb	4.81	Feb	3.59	Feb	2.57		
Mar	11.81	Mar	8.29	Mar	6.93	Mar	4.80	Mar	3.64	Mar	2.63		
Apr	11.47	Apr	8.21	Apr	7.09	Apr	4.90	Apr	3.76	Apr	2.59		
May	11.05	May	8.27	May	6.94	May	4.53	May	4.23	May	2.96		
Jun	10.44	Jun	8.47	Jun	6.77	Jun	4.37	Jun	4.52	Jun	3.11		
Jul	10.50	Jul	8.45	Jul	6.51	Jul	4.93	Jul	4.41	Jul	3.07		
Aug	10.56	Aug	8.14	Aug	6.58	Aug	5.30	Aug	4.37	Aug	2.86		
Sep	10.61	Sep	7.95	Sep	6.50	Sep	5.14	Sep	4.19	Sep	2.95		
Oct	10.50	Oct	7.93	Oct	6.33	Oct	5.16	Oct	4.19	Oct	2.89		
Nov	10.06	Nov	7.92	Nov	6.11	Nov	5.13	Nov	4.31	Nov	3.03		
Dec	9.54	Dec	7.70	Dec	5.99	Dec	5.08	Dec	4.49	Dec	2.97		

Sources:  
<http://finance.yahoo.com/q/hp?s=^TYX>  
<http://research.stlouisfed.org/fred2/data/GS30.txt>

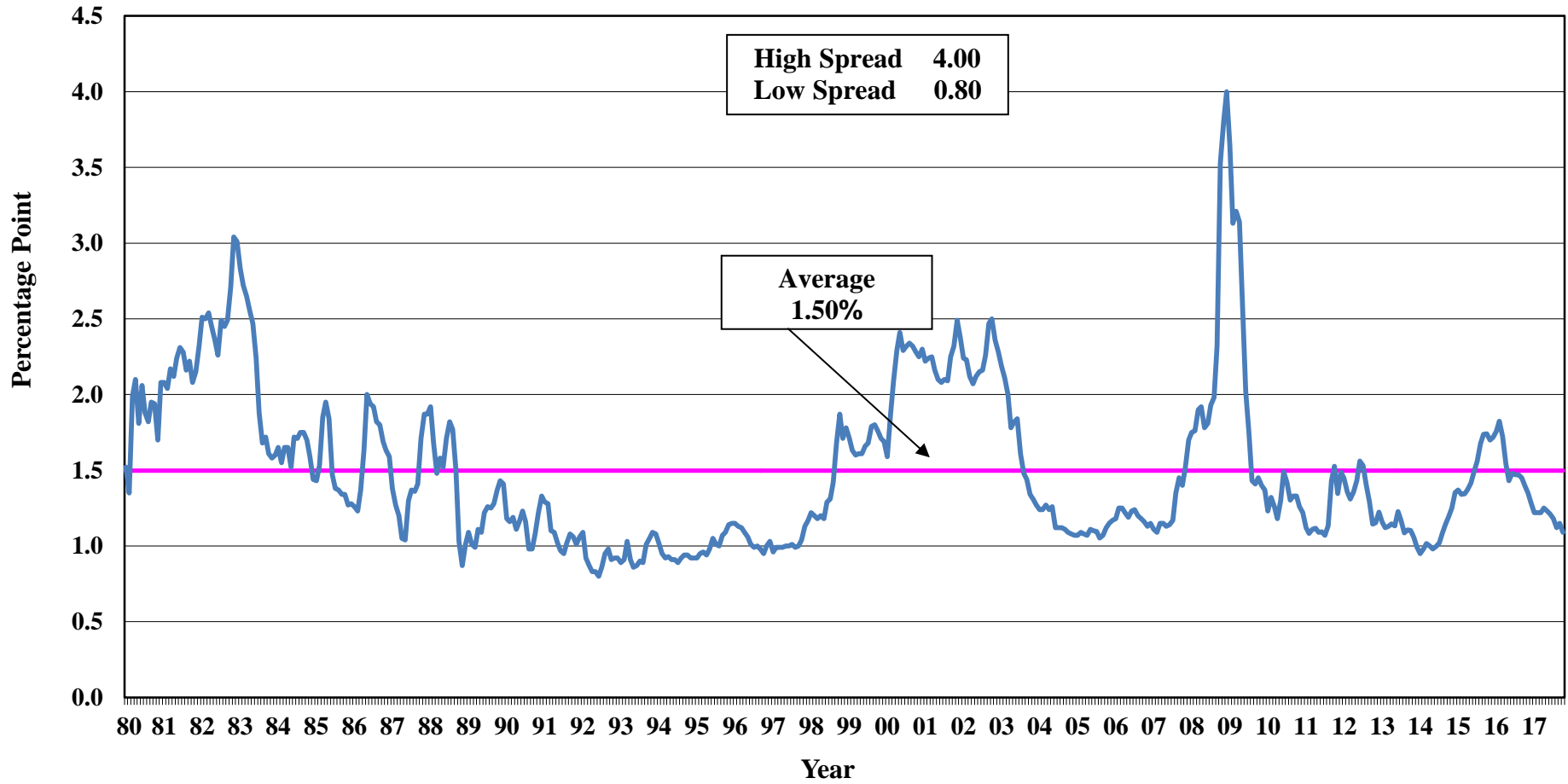
Missouri-American Water Company  
CASE NO. WR-2017-0285

Average Yields on Moody's Public Utility Bonds and  
Thirty-Year U.S. Treasury Bonds (1980 - 2017)



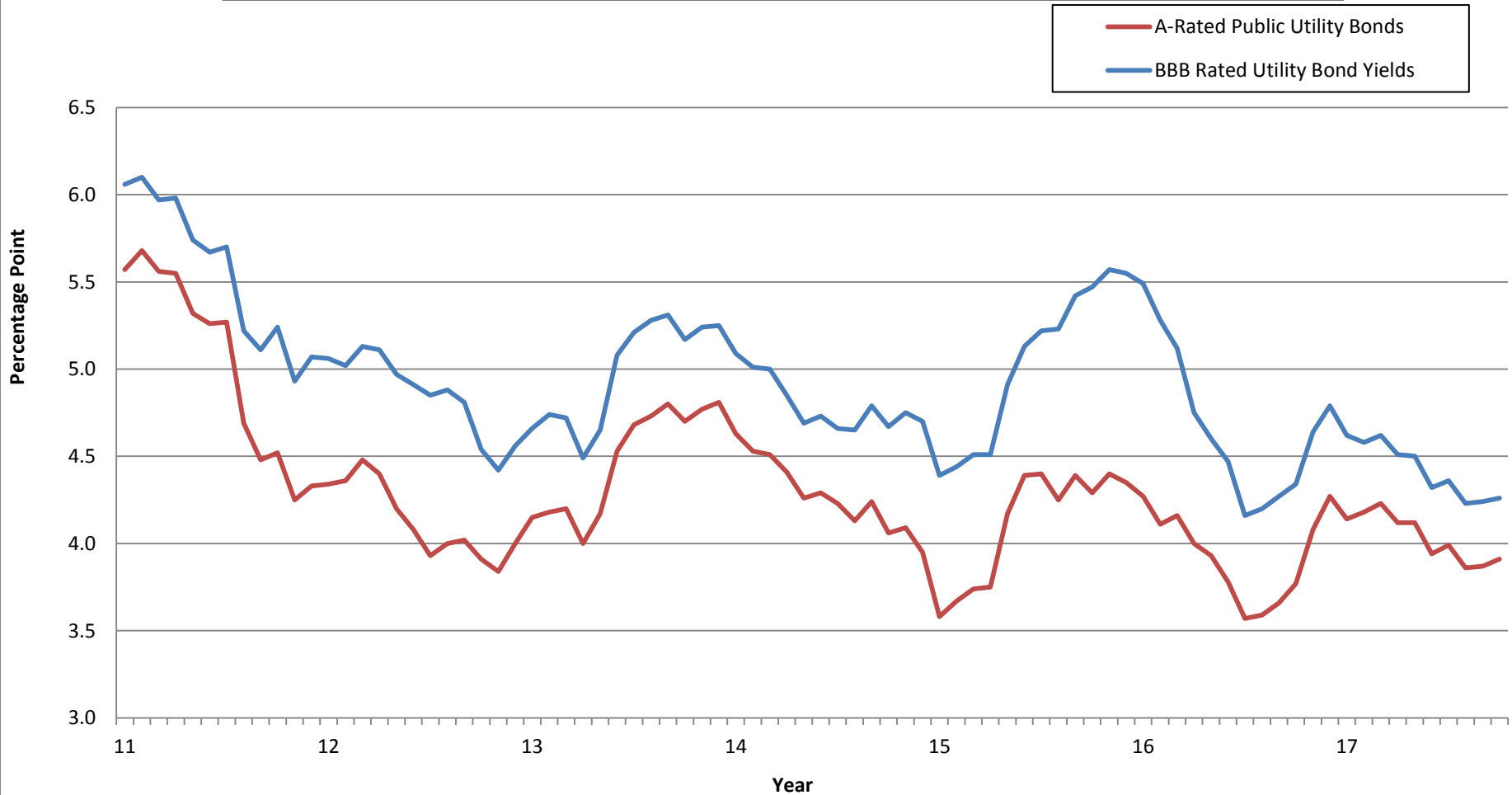
Missouri-American Water Company  
CASE NO. WR-2017-0285

Monthly Spreads Between Yields on Moody's Public Utility Bonds and  
Thirty-Year U.S. Treasury Bonds (1980 - 2017)



Missouri-American Water Company  
CASE NO. WR-2017-0285

**Average Yields on A-rated Utility Bonds and BBB-rated Utility Bonds  
From (2011- 2017)**



**Missouri-American Water Company  
Case No. WR-2017-0285**

**Historical Consolidated Capital Structures for  
American Water**

*(Dollars in thousands)*

Capital Components	2007	2008	2009	2010	2011
Common Equity	\$4,542,046.0	\$4,102,001.0	\$4,000,859.0	\$4,127,725.0	\$4,235,837.0
Preferred Stock	\$28,864.0 <sup>2,3</sup>	\$28,707.0 <sup>2,3</sup>	\$28,503.0 <sup>2,3</sup>	\$27,818.0 <sup>2,3</sup>	\$25,684.0 <sup>2,3</sup>
Long-Term Debt	\$4,771,292.0 <sup>1</sup>	\$4,799,885.0 <sup>1</sup>	\$5,342,248.0 <sup>1</sup>	\$5,455,031.0 <sup>1</sup>	\$5,368,805.0 <sup>1</sup>
	<u>\$9,342,202.0</u>	<u>\$8,930,593.0</u>	<u>\$9,371,610.0</u>	<u>\$9,610,574.0</u>	<u>\$9,630,326.0</u>
<b>Capital Components</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Common Equity	\$4,443,268.0	\$4,727,804.0	\$4,915,591.0	\$5,049,000.0	\$5,218,000.0
Preferred Stock	\$20,581.0 <sup>2,3</sup>	\$17,177.0 <sup>2,3</sup>	\$15,501.0 <sup>2,3</sup>	\$12,000.0 <sup>2,3</sup>	\$10,000.0 <sup>2,3</sup>
Long-Term Debt	\$5,306,428.0 <sup>1</sup>	\$5,227,055.0 <sup>1</sup>	\$5,493,876.0 <sup>1</sup>	\$5,916,000.0 <sup>1</sup>	\$6,323,000.0 <sup>1</sup>
	<u>\$9,770,277.0</u>	<u>\$9,972,036.0</u>	<u>\$10,424,968.0</u>	<u>\$10,977,000.0</u>	<u>\$11,551,000.0</u>

**Historical Consolidated Capital Structures for  
Missouri-American**

*(Dollars in thousands)*

Capital Components	2007	2008	2009	2010	2011
Common Equity	\$298,926.0	\$336,785.0	\$377,129.0	\$413,150.0	\$435,152.0
Preferred Stock	\$2,620.0 <sup>3</sup>	\$2,620.0 <sup>3</sup>	\$2,608.0 <sup>3</sup>	\$2,596.0 <sup>3</sup>	\$2,295.0 <sup>3</sup>
Long-Term Debt	\$316,037.0 <sup>1</sup>	\$385,870.0 <sup>1</sup>	\$410,156.0 <sup>1</sup>	\$409,276.0 <sup>1</sup>	\$433,834.0 <sup>1</sup>
Total	<u>\$617,583.0</u>	<u>\$725,275.0</u>	<u>\$789,893.0</u>	<u>\$825,022.0</u>	<u>\$871,281.0</u>
<b>Capital Components</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Common Equity	\$446,793.0	\$474,431.0	\$485,204.0	\$526,454.00	\$569,572.4
Preferred Stock	\$2,000.0 <sup>3</sup>	\$1,750.0 <sup>3</sup>	\$1,500.0 <sup>3</sup>	\$1,250.00 <sup>3</sup>	\$1,000.0 <sup>3</sup>
Long-Term Debt	\$448,494.0 <sup>1</sup>	\$468,450.0 <sup>1</sup>	\$468,461.0 <sup>1</sup>	\$517,822.00 <sup>1</sup>	\$566,963.9 <sup>1</sup>
Total	<u>\$897,287.0</u>	<u>\$944,631.0</u>	<u>\$955,165.0</u>	<u>\$1,045,526.0</u>	<u>\$1,137,536.3</u>

Note: 1. Includes current maturities on long-term debt.  
2. Includes redeemable preferred stock.  
3. Includes current maturities on preferred stock.

Sources: Missouri-American Water Company's response to Staff Data Request Nos. 159 and 229, as well as Schedule 6-1 in the Appendices to Staff's Cost of Service Report in Case No. WR-2015-0301.

**Missouri-American Water Company**  
**Case No. WR-2017-0285**

**Historical Consolidated Capital Structures for  
American Water**  
*(in percentages)*

<u>Capital Components</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Common Equity	48.62%	45.93%	42.69%	42.95%	43.98%
Preferred Stock	0.31% <sup>2,3</sup>	0.32% <sup>2,3</sup>	0.30% <sup>2,3</sup>	0.29% <sup>2,3</sup>	0.27% <sup>2,3</sup>
Long-Term Debt	51.07% <sup>1</sup>	53.75% <sup>1</sup>	57.00% <sup>1</sup>	56.76% <sup>1</sup>	55.75% <sup>1</sup>
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

<u>Capital Components</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Average</u>
Common Equity	45.48%	47.41%	47.15%	46.00%	45.17%	<b>45.54%</b>
Preferred Stock	0.21% <sup>2,3</sup>	0.17% <sup>2,3</sup>	0.15% <sup>2,3</sup>	0.11% <sup>2,3</sup>	0.09% <sup>2,3</sup>	<b>0.22%</b>
Long-Term Debt	54.31% <sup>1</sup>	52.42% <sup>1</sup>	52.70% <sup>1</sup>	53.89% <sup>1</sup>	54.74% <sup>1</sup>	<b>54.24%</b>
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

**Historical Consolidated Capital Structures for  
Missouri-American**  
*(in percentages)*

<u>Capital Components</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Common Equity	48.40%	46.44%	47.74%	50.08%	49.94%
Preferred Stock	0.42% <sup>3</sup>	0.36% <sup>3</sup>	0.33% <sup>3</sup>	0.31% <sup>3</sup>	0.26% <sup>3</sup>
Long-Term Debt	51.17% <sup>1</sup>	53.20% <sup>1</sup>	51.93% <sup>1</sup>	49.61% <sup>1</sup>	49.79% <sup>1</sup>
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

<u>Capital Components</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Average</u>
Common Equity	49.79%	50.22%	50.80%	50.35%	50.07%	<b>49.38%</b>
Preferred Stock	0.22%	0.19%	0.16%	0.12%	0.09% <sup>3</sup>	<b>0.25%</b>
Long-Term Debt	49.98%	49.59%	49.05%	49.53%	49.84% <sup>1</sup>	<b>50.37%</b>
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

Note: 1. Includes current maturities on long-term debt.  
2. Includes redeemable preferred stock.  
3. Includes current maturities on preferred stock.

Sources: Missouri-American Water Company's response to Staff Data Request Nos. 159 and 229, as well as Schedule 6-1 in the Appendices to Staff's Cost of Service Report in Case No. WR-2015-0301.

**Missouri-American Water Company**  
**Case No. WR-2017-0285**

**Capital Structure as of June 30, 2017**  
**for American Water**

Capital Component	Amount (in millions)	Percentage of Capital
Common Stock Equity <sup>1</sup>	\$5,384	43.99%
Preferred Stock <sup>2</sup>	10	0.09%
Long-Term Debt <sup>2</sup>	6,244	51.02%
Short-Term Debt <sup>3</sup>	600	4.91%
<b>Total Capitalization</b>	<b>\$12,239.17</b>	<b>100.00%</b>

**Capital Structure as of June 30, 2017**  
**for Missouri-American Water**

Capital Component	Amount (in millions)	Percentage of Capital
Common Stock Equity <sup>4</sup>	579	49.41%
Preferred Stock <sup>2</sup>	1	0.08%
Long-Term Debt <sup>2</sup>	567	48.41%
Short-Term Debt <sup>3</sup>	25	2.09%
<b>Total Capitalization</b>	<b>1,171</b>	<b>100%</b>

- Notes: 1. Based on American Water's Form 10-Q for the quarter period ended June 30, 2017.  
2. Based on MAWC's response to Staff DR No. 0182  
3. Based on short-term debt shown in excess of construction work in progress balance as of June 30, 2017. Net balance based on MAWC's response to Staff DR No. 175.  
4. Based on Missouri-American Water's response to Staff DR No. 0193

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Embedded Cost of Long-Term Debt as of June 30, 2017  
for American Water**

Total Annual Cost:	\$334,319,657
Total Carrying Value:	\$6,244,359,505
Embedded Cost = Total Annual Cost/Total Carrying Value	5.35%

Source: Missouri-American Water Company's response to Staff's Data Requests No. 0182.

**Embedded Cost of Long-Term Debt as of June 30, 2017  
for Missouri-American Water**

Total Annual Cost:	\$28,566,435
Total Carrying Value:	\$559,214,522
Embedded Cost = Total Annual Cost/Total Carrying Value	5.11%

Source: Missouri-American Water Company's response to Staff's Data Requests No. 0182.



**Missouri-American Water Company  
Case No. WR-2017-0285**

**Embedded Cost of Preferred Stock as of June 30, 2017  
for American Water**

Total Annual Cost:	\$905,643
Total Carrying Value:	\$10,446,017
Embedded Cost = Total Annual Cost/Total Carrying Value	8.67%

Sources: Missouri-American Water Company's response to Staff's Data Request No. 0182.

**Embedded Cost of Preferred Stock as of June 30, 2017  
for Missouri-American Water**

Total Annual Cost:	91,636
Total Carrying Value:	979,860
Embedded Cost = Total Annual Cost/Total Carrying Value	9.35%

Sources: Missouri-American Water Company's response to Staff's Data Request No. 0182.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Criteria for Selecting Comparable Water Utility Companies**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Water Utility Companies(Ticker)	Stock Publicly Traded	Information Provided by Value Line	5-Years of Data Available	At Least Investment Grade Credit Rating	Projected Growth Rate Available from Value Line or Reuters	At least 80% of Income from Regulated Utility Operations	At least 50% of Regulated Income from Water Utility Operations	No Reduced Dividend Since 2015	Comparable Company Met All Criteria
<b>American States Water Company (AWR)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>American Water Works Co. Inc. (AWK)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Aqua America Inc. (WTR)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Artesian Resources Corporation (ARTNA)	Yes	Yes	Yes	NR					
<b>California Water Service Group (CWT)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Connecticut Water Service, Inc. (CTWS)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Middlesex Water Company (MSEX)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>SJW Corporation (SJW)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>York Water Company (YORW)</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Sources: Columns 1, 2, 3, 4, 5, 6, and 9 = The Value Line Investment Survey: Ratings & Reports, July 14, 2017.  
 Column 5 = Standard & Poor's RatingsDirect.  
 Column 6 = Reuters and The Value Line Investment Survey: Ratings & Reports, July 14, 2017.  
 Column 7 and 8 = SEC Form 10-K Filings.

Notes: N.R.=Not Rated by Standard and Poor's

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Comparable Water Utility Companies  
for Missouri-American Water Company**

Number	Ticker Symbol	Company Name
1	AWR	American States Water Company
2	AWK	American Water Works Company
3	WTR	Aqua America
4	CWT	California Water Service Group
5	CTWS	Connecticut Water Service, Inc.
6	MSEX	Middlesex Water Company
7	SJW	SJW Corporation
8	YORW	York Water Company

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Ten-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Comparable Water Utility Companies**

	10-Year Annual Compound Growth Rates			Average of 10 Year Annual Compound Growth Rates
Company Name	DPS	EPS	BVPS	
American States Water Company	7.00%	10.00%	5.50%	7.50%
American Water Works Company	NA	NA	1.50%	NA
Aqua America	8.00%	8.50%	7.00%	7.83%
California Water Service Group	1.50%	4.00%	5.00%	3.50%
Connecticut Water Service, Inc.	2.50%	8.00%	6.00%	5.50%
Middlesex Water Company	1.50%	5.00%	4.00%	3.50%
SJW Corporation	4.00%	8.00%	5.50%	5.83%
York Water Company	3.50%	5.50%	5.00%	4.67%
<b>Average</b>	<b><u>4.00%</u></b>	<b><u>7.00%</u></b>	<b><u>4.94%</u></b>	<b><u>5.48%</u></b>

Source: The Value Line Investment Survey, October 13, 2017.

NA = Not Available

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Five-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Comparable Water Utility Companies**

Company Name	----- 5-Year Annual Compound Growth Rates -----			Average of 5 Year Annual Compound Growth Rates
	DPS	EPS	BVPS	
American States Water Company	10.50%	9.50%	5.00%	8.33%
American Water Works Company	9.00%	11.00%	4.00%	8.00%
Aqua America	8.00%	11.00%	7.50%	8.83%
California Water Service Group	2.00%	3.00%	5.00%	3.33%
Connecticut Water Service, Inc.	3.00%	12.00%	9.00%	8.00%
Middlesex Water Company	1.50%	8.00%	3.00%	4.17%
SJW Corporation	3.00%	20.50%	6.50%	10.00%
York Water Company	3.00%	6.00%	3.50%	4.17%
<b>Average</b>	<b><u>5.00%</u></b>	<b><u>10.13%</u></b>	<b><u>5.44%</u></b>	<b><u>6.85%</u></b>

Source: The Value Line Investment Survey, October 13, 2017.

**Missouri-American Water Company**  
**Case No. WR-2017-0285**

**Average of Ten- and Five-Year Dividends Per Share, Earnings Per Share &  
Book Value Per Share Growth Rates for the Comparable Water Utility Companies**

Company Name	10-Year Average DPS, EPS & BVPS	5-Year Average DPS, EPS & BVPS	Average of 5-Year & 10-Year Averages
American States Water Company	7.50%	8.33%	7.92%
American Water Works Company	NA	8.00%	8.00%
Aqua America	7.83%	8.83%	8.33%
California Water Service Group	3.50%	3.33%	3.42%
Connecticut Water Service, Inc.	5.50%	8.00%	6.75%
Middlesex Water Company	3.50%	4.17%	3.83%
SJW Corporation	5.83%	10.00%	7.92%
York Water Company	4.67%	4.17%	4.42%
<b>Average</b>	<b><u>5.48%</u></b>	<b><u>6.85%</u></b>	<b><u>6.17%</u></b>

NA = Not Available

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Five-Year Projected Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Comparable Water Utility Companies**

	5-Year Projected Compound Growth Rates			
Company Name	DPS	EPS	BVPS	Average of 5 Year Annual Compound Growth Rates
American States Water Company	7.50%	6.50%	4.00%	6.00%
American Water Works Company	10.00%	8.50%	5.50%	8.00%
Aqua America	9.00%	7.00%	6.50%	7.50%
California Water Service Group	6.50%	9.00%	3.00%	6.17%
Connecticut Water Service, Inc.	4.50%	4.50%	2.50%	3.83%
Middlesex Water Company	4.50%	8.50%	4.50%	5.83%
SJW Corporation	6.00%	4.50%	4.00%	4.83%
York Water Company	7.00%	7.00%	4.50%	6.17%
<b>Average</b>	<b>6.88%</b>	<b>6.94%</b>	<b>4.31%</b>	<b>6.04%</b>

Source: The Value Line Investment Survey, October 13, 2017.

**Missouri-American Water Company**  
**Case No. WR-2017-0285**

**Projected EPS Growth Rates**  
**for the Comparable Water Utility Companies**

Company Name	(1) Projected 5-Year EPS Growth Reuters (Mean)	(2) Projected 3-5 Year EPS Growth Value Line	Average Projected EPS Growth
American States Water Company	4.90%	6.50%	5.70%
American Water Works Company	8.52%	8.50%	8.51%
Aqua America	6.87%	7.00%	6.94%
California Water Service Group	9.80%	9.00%	9.40%
Connecticut Water Service, Inc.	5.45%	4.50%	4.98%
Middlesex Water Company	NA	8.50%	8.50%
SJW Corporation	NA	4.50%	4.50%
York Water Company	NA	7.00%	7.00%
<b>Average</b>	<b>7.11%</b>	<b>6.94%</b>	<b>6.94%</b>

Sources:

Column 1 = Analyst Estimates Accessed from Reuters on September 7, 2017.

Column 2 = The Value Line Investment Survey, October 13, 2017.



**Missouri-American Water Company  
Case No. WR-2017-0285**

**Historical and Projected Growth Rates  
for the Comparable Water Utility Companies**

Company Name	(1)	(2)	(3)	(4)	(5)	
	10-Year Average DPS, EPS & BVPS	5-Year Average DPS, EPS & BVPS	Projected Growth Rate (DPS, EPS and BVPS)	Projected 5-Year EPS Growth Consensus Estimates (Mean)	Projected 3-5 Year EPS Growth Value Line	Average Projected EPS Growth
American States Water Company	7.50%	8.33%	6.00%	4.90%	6.50%	5.70%
American Water Works Company	NA	8.00%	8.00%	8.52%	8.50%	8.51%
Aqua America	7.83%	8.83%	7.50%	6.87%	7.00%	6.94%
California Water Service Group	3.50%	3.33%	6.17%	9.80%	9.00%	9.40%
Connecticut Water Service, Inc.	5.50%	8.00%	3.83%	5.45%	4.50%	4.98%
Middlesex Water Company	3.50%	4.17%	5.83%	NA	8.50%	8.50%
SJW Corporation	5.83%	10.00%	4.83%	NA	4.50%	4.50%
York Water Company	4.67%	4.17%	6.17%	NA	7.00%	7.00%
<b>Average</b>	<b>5.48%</b>	<b>6.85%</b>	<b>6.04%</b>	<b>7.11%</b>	<b>6.94%</b>	<b>6.94%</b>

**Proposed Range of Growth for Comparables: 4.0% - 5.0%**

Sources: Column 1 = Schedule 11-1

Column 2 = Schedule 11-2

Column 3 = Schedule 11-4

Column 4 = Schedule 11-5

Column 5 = Schedule 11-5

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Average High / Low Stock Price for August 2017 through October 2017.  
for the Comparable Water Utility Companies**

Company Name	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	-- Aug 2017 --		-- Sep 2017 --		-- Oct 2017 --		Average High/Low Stock Price (08/17 - 10/17)
	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price	High Stock Price	Low Stock Price	
American States Water Company	51.45	48.44	51.53	48.15	55.85	50.40	<b>50.97</b>
American Water Works Company	82.19	80.65	82.92	80.82	87.76	81.75	<b>82.68</b>
Aqua America	34.25	33.40	34.62	33.19	36.03	33.63	<b>34.19</b>
California Water Service Group	39.15	36.60	38.60	36.85	43.35	39.60	<b>39.02</b>
Connecticut Water Service, Inc.	58.03	54.04	59.47	53.59	63.50	60.38	<b>58.17</b>
Middlesex Water Company	40.08	37.51	40.15	37.63	45.83	40.47	<b>40.28</b>
SJW Corporation	56.23	53.51	57.43	55.08	65.38	57.60	<b>57.54</b>
York Water Company	35.05	32.35	35.20	32.45	36.80	34.95	<b>34.47</b>

Notes:

Column 7 = [ ( Column 1 + Column 2 + Column 3 + Column 4 + Column 5 + Column 6 / 6 ].

Source: Yahoo Finance

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Constant-Growth Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Water Utility Companies**

Company Name	(1) Expected Annual Dividend	(2) Average High/Low Stock Price	(3) Projected Dividend Yield
American States Water Company	\$1.03	\$50.97	2.03%
American Water Works Company	\$1.72	\$82.68	2.08%
Aqua America	\$0.84	\$34.19	2.45%
California Water Service Group	\$0.74	\$39.02	1.90%
Connecticut Water Service, Inc.	\$1.23	\$58.17	2.11%
Middlesex Water Company	\$0.86	\$40.28	2.14%
SJW Corporation	\$0.92	\$57.54	1.59%
York Water Company	\$0.69	\$34.47	2.00%
<b>Average</b>			<b><u>2.04%</u></b>

**Proposed Dividend Yield: 2.04%**

**Proposed Range of Growth: 4.00% - 5.00%**

**Indicated Cost of Common Equity: 6.14%-7.14%**

Notes: Column 1 = Estimated Dividend Declared per share is weighted by 1/4 for 2017 and 3/4 for 2018.

Column 3 = ( Column 1 / Column 2 ).

Sources: Column 1 = The Value Line Investment Survey, October 13, 2017

Column 2 = Schedule 12.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Capital Asset Pricing Model (CAPM) Costs of Common Equity Estimates  
Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasury  
for the Comparable Water Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)
			Arithmetic Average Market Risk Premium (1926-2016)	Geometric Average Market Risk Premium (1926-2016)	Arithmetic CAPM Cost of Common Equity (1926-2016)	Geometric CAPM Cost of Common Equity (1926-2016)
Company Name	Risk Free Rate	Company's Value Line Beta				
American States Water Company	2.82%	0.75	6.00%	4.50%	7.32%	6.20%
American Water Works Company	2.82%	0.60	6.00%	4.50%	6.42%	5.52%
Aqua America	2.82%	0.70	6.00%	4.50%	7.02%	5.97%
California Water Service Group	2.82%	0.75	6.00%	4.50%	7.32%	6.20%
Connecticut Water Service, Inc.	2.82%	0.65	6.00%	4.50%	6.72%	5.75%
Middlesex Water Company	2.82%	0.75	6.00%	4.50%	7.32%	6.20%
SJW Corporation	2.82%	0.70	6.00%	4.50%	7.02%	5.97%
York Water Company	2.82%	0.80	6.00%	4.50%	7.62%	6.42%
<b>Average</b>		<b>0.71</b>			<b>7.10%</b>	<b>6.03%</b>

Column 1 = The appropriate yield is equal to the average 30-year U.S. Treasury Bond yield for August, September, and October 2017 which was obtained from the St. Louis Federal Reserve website at <http://research.stlouisfed.org/fred2/series/GS30/22>.

Column 2 = Beta is a measure of the movement and relative risk of an individual stock to the market as a whole as reported by the Value Line Investment Survey: Ratings & Reports, October 13, 2017.

Column 3 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 6.00% based on an arithmetic average as calculated in Duff & Phelps' 2017 Valuation Handbook: Guide to Cost of Capital.

Column 4 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 4.50% based on a geometric average as calculated in Duff & Phelps' 2017 Valuation Handbook: Guide to Cost of Capital.

Column 5 = (Column 1 + (Column 2 \* Column 3)).

Column 6 = (Column 1 + (Column 2 \* Column 4)).

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Water Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
American States Water Company	\$0.97	5.70%	5.42%	5.13%	4.85%	4.57%	4.28%	4.00%	6.18%
American Water Works Company	\$1.66	8.51%	7.76%	7.01%	6.26%	5.50%	4.75%	4.00%	6.79%
Aqua America	\$0.77	6.94%	6.45%	5.96%	5.47%	4.98%	4.49%	4.00%	6.81%
California Water Service Group	\$0.72	9.40%	8.50%	7.60%	6.70%	5.80%	4.90%	4.00%	6.71%
Connecticut Water Service, Inc.	\$1.19	4.98%	4.81%	4.65%	4.49%	4.33%	4.16%	4.00%	6.24%
Middlesex Water Company	\$0.85	8.50%	7.75%	7.00%	6.25%	5.50%	4.75%	4.00%	6.91%
SJW Corporation	\$0.87	4.50%	4.42%	4.33%	4.25%	4.17%	4.08%	4.00%	5.54%
York Water Company	\$0.64	7.00%	6.50%	6.00%	5.50%	5.00%	4.50%	4.00%	6.33%
								<b>Average:</b>	<b>6.44%</b>

Sources: Column 1 = The Value Line Investment Survey: Ratings and Reports, October 13, 2017.

Column 2 = Schedule JLS-11-6.

Column 8 = Mid Point of Low End of Projected GDP Growth Rates Cited in Staff Cost of Service Report.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Water Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
American States Water Company	\$0.97	5.70%	5.45%	5.20%	4.95%	4.70%	4.45%	4.20%	6.35%
American Water Works Company	\$1.66	8.51%	7.79%	7.07%	6.36%	5.64%	4.92%	4.20%	6.96%
Aqua America	\$0.77	6.94%	6.48%	6.02%	5.57%	5.11%	4.66%	4.20%	6.97%
California Water Service Group	\$0.72	9.40%	8.53%	7.67%	6.80%	5.93%	5.07%	4.20%	6.88%
Connecticut Water Service, Inc.	\$1.19	4.98%	4.85%	4.72%	4.59%	4.46%	4.33%	4.20%	6.41%
Middlesex Water Company	\$0.85	8.50%	7.78%	7.07%	6.35%	5.63%	4.92%	4.20%	7.08%
SJW Corporation	\$0.87	4.50%	4.45%	4.40%	4.35%	4.30%	4.25%	4.20%	5.72%
York Water Company	\$0.64	7.00%	6.53%	6.07%	5.60%	5.13%	4.67%	4.20%	6.50%
								<b>Average:</b>	<b>6.61%</b>

Sources: Column 1 = The Value Line Investment Survey: Ratings and Reports, October 13, 2017.  
Column 2 = Schedule JLS-11-6.  
Column 8 = Mid Range of Projected GDP Growth Rates Cited in Staff Cost of Service Report.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Water Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
American States Water Company	\$0.97	5.70%	5.48%	5.27%	5.05%	4.83%	4.62%	4.40%	6.52%
American Water Works Company	\$1.66	8.51%	7.83%	7.14%	6.46%	5.77%	5.09%	4.40%	7.12%
Aqua America	\$0.77	6.94%	6.51%	6.09%	5.67%	5.25%	4.82%	4.40%	7.14%
California Water Service Group	\$0.72	9.40%	8.57%	7.73%	6.90%	6.07%	5.23%	4.40%	7.05%
Connecticut Water Service, Inc.	\$1.19	4.98%	4.88%	4.78%	4.69%	4.59%	4.50%	4.40%	6.58%
Middlesex Water Company	\$0.85	8.50%	7.82%	7.13%	6.45%	5.77%	5.08%	4.40%	7.25%
SJW Corporation	\$0.87	4.50%	4.48%	4.47%	4.45%	4.43%	4.42%	4.40%	5.90%
York Water Company	\$0.64	7.00%	6.57%	6.13%	5.70%	5.27%	4.83%	4.40%	6.67%
								<b>Average:</b>	<b>6.78%</b>

Sources: Column 1 = The Value Line Investment Survey: Ratings and Reports, October 13, 2017.

Column 2 = Schedule JLS-11-6.

Column 8 = High Range of Currently Projected GDP Growth Rate.

\*Also, Growth Rate Used in 2016 Electric Utility Rate Cases.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Electric Utility Companies<sup>1</sup>**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
Alliant Energy	\$1.26	6.36%	5.88%	5.41%	4.93%	4.45%	3.98%	3.50%	7.19%
Ameren Corp.	\$1.76	6.37%	5.89%	5.41%	4.94%	4.46%	3.98%	3.50%	7.19%
American Electric Power	\$2.36	4.70%	4.50%	4.30%	4.10%	3.90%	3.70%	3.50%	7.14%
CMS Energy Corp.	\$1.33	7.13%	6.53%	5.92%	5.32%	4.71%	4.11%	3.50%	7.15%
DTE Energy Company	\$3.30	5.77%	5.39%	5.01%	4.64%	4.26%	3.88%	3.50%	7.09%
Pinnacle West Capital	\$2.62	5.48%	5.15%	4.82%	4.49%	4.16%	3.83%	3.50%	7.01%
PNM Resources, Inc.	\$0.97	6.20%	5.75%	5.30%	4.85%	4.40%	3.95%	3.50%	6.36%
Portland General Electric Co.	\$1.36	3.96%	3.88%	3.81%	3.73%	3.65%	3.58%	3.50%	6.62%
Xcel Energy	\$1.44	5.56%	5.22%	4.87%	4.53%	4.19%	3.84%	3.50%	7.00%
								<b>Average</b>	<b>6.97%</b>

Sources: 1. See Schedule 14 in electric rate case Case No. ER-2016-0156  
Column 1 = SNL Financial  
Column 2 = SNL Financial  
Column 8 = See range of averages from Schedules 14-1 through Schedule 14-4.



**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Electric Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
Alliant Energy	\$1.26	6.36%	5.97%	5.57%	5.18%	4.79%	4.39%	4.00%	7.59%
Ameren Corp.	\$1.76	6.37%	5.98%	5.58%	5.19%	4.79%	4.40%	4.00%	7.59%
American Electric Power	\$2.36	4.70%	4.58%	4.47%	4.35%	4.23%	4.12%	4.00%	7.54%
CMS Energy Corp.	\$1.33	7.13%	6.61%	6.09%	5.57%	5.04%	4.52%	4.00%	7.55%
DTE Energy Company	\$3.30	5.77%	5.48%	5.18%	4.89%	4.59%	4.30%	4.00%	7.49%
Pinnacle West Capital	\$2.62	5.48%	5.23%	4.99%	4.74%	4.49%	4.25%	4.00%	7.41%
PNM Resources, Inc.	\$0.97	6.20%	5.83%	5.47%	5.10%	4.73%	4.37%	4.00%	6.78%
Portland General Electric Co.	\$1.36	3.96%	3.97%	3.97%	3.98%	3.99%	3.99%	4.00%	7.03%
Xcel Energy	\$1.44	5.56%	5.30%	5.04%	4.78%	4.52%	4.26%	4.00%	7.41%
								<b>Average</b>	<b>7.38%</b>

Sources: 1. See Schedule 14 in electric rate case Case No. ER-2016-0156

Column 1 = SNL Financial

Column 2 = SNL Financial

Column 8 = Mid Point of Low End of Projected GDP Growth Rates Cited in Staff Cost of Service Report.

**Missouri-American Water Company  
Case No. WR-2017-0285**

**Multiple-Stage Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Electric Utility Companies**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Company Name	Annualized Quarterly Dividend	Growth Years 1-5	6	7	Growth Years 8	9	10	Growth in Perpetuity	Cost of Equity
Alliant Energy	\$1.26	6.36%	6.03%	5.71%	5.38%	5.05%	4.73%	4.40%	7.91%
Ameren Corp.	\$1.76	6.37%	6.04%	5.71%	5.39%	5.06%	4.73%	4.40%	7.91%
American Electric Power	\$2.36	4.70%	4.65%	4.60%	4.55%	4.50%	4.45%	4.40%	7.87%
CMS Energy Corp.	\$1.33	7.13%	6.68%	6.22%	5.77%	5.31%	4.86%	4.40%	7.87%
DTE Energy Company	\$3.30	5.77%	5.54%	5.31%	5.09%	4.86%	4.63%	4.40%	7.82%
Pinnacle West Capital	\$2.62	5.48%	5.30%	5.12%	4.94%	4.76%	4.58%	4.40%	7.73%
PNM Resources, Inc.	\$0.97	6.20%	5.90%	5.60%	5.30%	5.00%	4.70%	4.40%	7.12%
Portland General Electric Company	\$1.36	3.96%	4.03%	4.11%	4.18%	4.25%	4.33%	4.40%	7.36%
Xcel Energy	\$1.44	5.56%	5.37%	5.17%	4.98%	4.79%	4.59%	4.40%	7.73%
								<b>Average</b>	<b>7.70%</b>

Sources: 1. See Schedule 14 in electric rate case Case No. ER-2016-0156

Column 1 = SNL Financial

Column 2 = SNL Financial

Column 8 = High Range of Currently Projected GDP Growth Rate.

\*Also, Growth Rate Used in 2016 Electric Utility Rate Cases.

**Missouri-American Water Company**  
**Case No. WR-2017-0285**

**Recommended Allowed Rate of Return as of June 30, 2017**  
**for Missouri-American Water Company**

Capital Component	Percentage of Capital	Embedded Cost	Allowed Rate of Return Common Equity Return of:		
			<b>8.50%</b>	<b>9.25%</b>	<b>9.50%</b>
Common Stock Equity	43.99%	-----	3.74%	4.07%	4.18%
Preferred Stock	0.09%	8.67%	0.01%	0.01%	0.01%
Long-Term Debt	51.02%	5.35%	2.73%	2.73%	2.73%
Short-Term Debt	4.91%	0.99%	0.05%	0.05%	0.05%
Total	<b>100.00%</b>		<b>6.53%</b>	<b>6.86%</b>	<b>6.97%</b>

Sources:

See Schedule 6 for the Capital Structure Ratios.

Missouri-American Water Company  
Case No. WR-2017-0285

<u>Company/State</u>	<u>Authorized ROE%</u>	<u>Authorized ROR%</u>	<u>Docket/Case No.</u>	<u>Effective Date</u>
New York-American Water Company	9.10%	6.56%	16-W-0259	June 1, 2017
Iowa-American Water Company	9.60%	8.28%	RPU-2016-0002	March 24, 2017
Illinois-American Water Company	9.79%	7.47%	16-0093	January 1, 2017
West Virginia-American Water Company	9.75%	7.31%	15-0676-W-42T	February 25, 2016
New Jersey-American Water Company	9.75%	7.55%	WR15010035	September 21, 2015
Maryland-American Water Company	10.00%	8.29%	9372	June 19, 2015