



Municipal Market Update and 2019 Outlook

Presented by:
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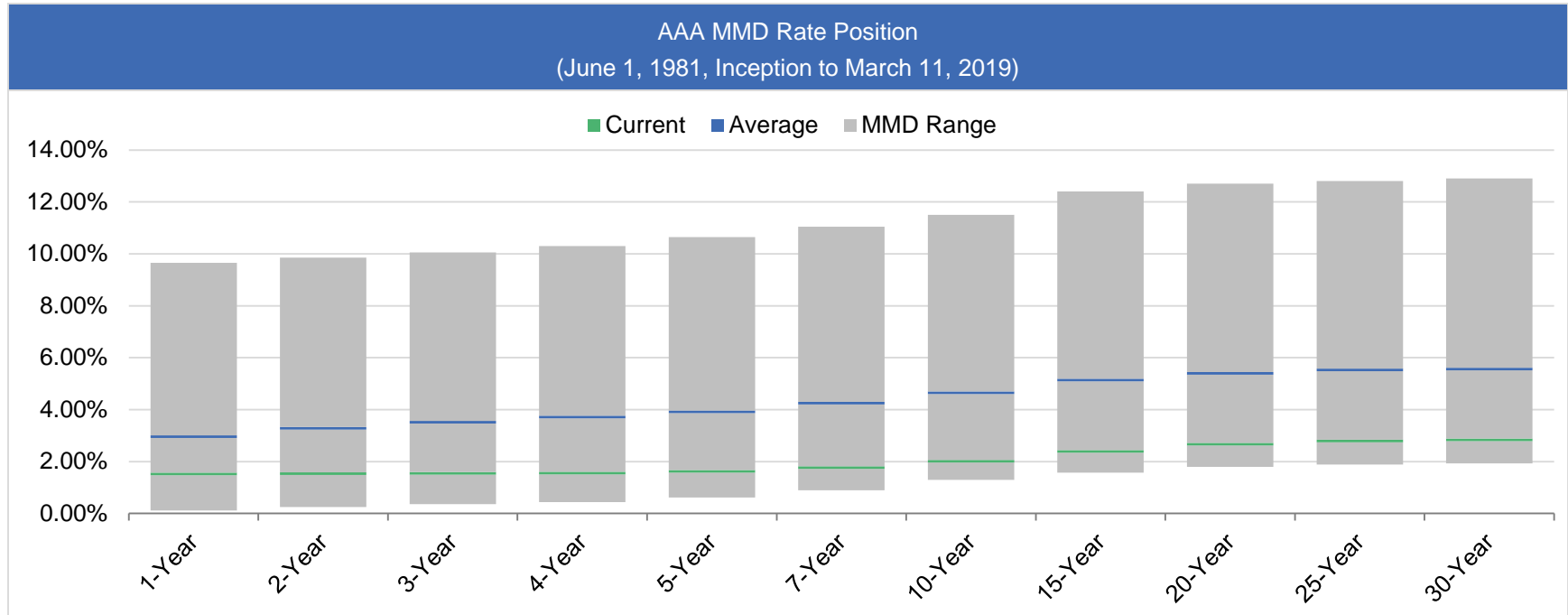
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Municipal Market Update



AAA MMD Position Since Inception



Summary of March 11, 2019 vs. Historical (since Inception) MMD Rates											
Statistic	1-Year	2-Year	3-Year	4-Year	5-Year	7-Year	10-Year	15-Year	20-Year	25-Year	30-Year
March 11, 2019	1.57%	1.58%	1.59%	1.61%	1.67%	1.82%	2.06%	2.44%	2.72%	2.84%	2.89%
Historical Average	3.01%	3.33%	3.57%	3.77%	3.96%	4.30%	4.70%	5.19%	5.45%	5.58%	5.61%
Spread to Average	-1.44%	-1.75%	-1.98%	-2.16%	-2.29%	-2.48%	-2.64%	-2.75%	-2.73%	-2.74%	-2.72%
Minimum	0.11%	0.25%	0.36%	0.44%	0.62%	0.89%	1.29%	1.57%	1.80%	1.88%	1.93%
Maximum	9.65%	9.85%	10.05%	10.30%	10.65%	11.05%	11.50%	12.40%	12.70%	12.80%	12.90%
% of Time Lower	31.67%	27.82%	24.63%	22.56%	19.72%	13.51%	9.04%	7.47%	7.54%	6.66%	6.24%

Source: Thomson Reuters



Current Interest Rate Snapshot

March 11, 2019

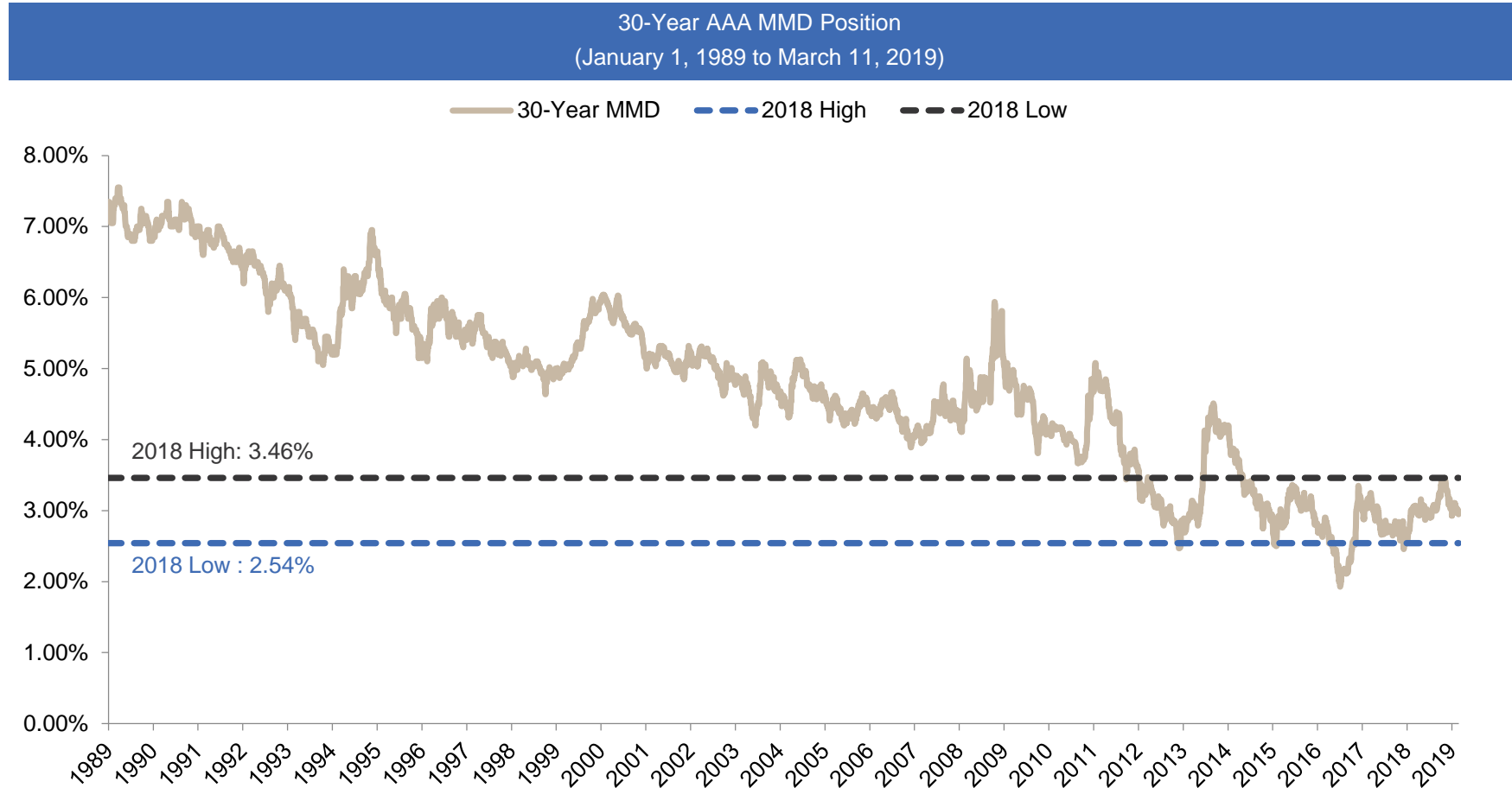
Year	Maturity	UST	AAA MMD	AA MMD	AA Spread	A MMD	A Spread	Year	Maturity	UST	AAA MMD	AA MMD	AA Spread	A MMD	A Spread
1-Year	2019	2.53%	1.57%	1.58%	0.01%	1.77%	0.20%	16-Year	2034	-	2.50%	2.70%	0.20%	2.99%	0.49%
2-Year	2020	2.48%	1.58%	1.60%	0.02%	1.83%	0.25%	17-Year	2035	-	2.56%	2.76%	0.20%	3.05%	0.49%
3-Year	2021	2.45%	1.59%	1.62%	0.03%	1.88%	0.29%	18-Year	2036	-	2.62%	2.83%	0.21%	3.12%	0.50%
4-Year	2022	-	1.61%	1.66%	0.05%	1.95%	0.34%	19-Year	2037	-	2.67%	2.88%	0.21%	3.17%	0.50%
5-Year	2023	2.44%	1.67%	1.73%	0.06%	2.04%	0.37%	20-Year	2038	2.93%	2.72%	2.93%	0.21%	3.22%	0.50%
6-Year	2024	-	1.75%	1.83%	0.08%	2.13%	0.38%	21-Year	2039	-	2.76%	2.97%	0.21%	3.27%	0.51%
7-Year	2025	-	1.82%	1.91%	0.09%	2.21%	0.39%	22-Year	2040	-	2.79%	3.00%	0.21%	3.30%	0.51%
8-Year	2026	-	1.90%	2.02%	0.12%	2.31%	0.41%	23-Year	2041	-	2.81%	3.02%	0.21%	3.32%	0.51%
9-Year	2027	-	1.97%	2.11%	0.14%	2.39%	0.42%	24-Year	2042	-	2.83%	3.04%	0.21%	3.34%	0.51%
10-Year	2028	2.64%	2.06%	2.22%	0.16%	2.49%	0.43%	25-Year	2043	-	2.84%	3.05%	0.21%	3.35%	0.51%
11-Year	2029	-	2.17%	2.36%	0.19%	2.61%	0.44%	26-Year	2044	-	2.85%	3.06%	0.21%	3.36%	0.51%
12-Year	2030	-	2.27%	2.46%	0.19%	2.72%	0.45%	27-Year	2045	-	2.86%	3.07%	0.21%	3.37%	0.51%
13-Year	2031	-	2.34%	2.54%	0.20%	2.80%	0.46%	28-Year	2046	-	2.87%	3.08%	0.21%	3.38%	0.51%
14-Year	2032	-	2.40%	2.60%	0.20%	2.86%	0.46%	29-Year	2047	-	2.88%	3.09%	0.21%	3.39%	0.51%
15-Year	2033	2.84%	2.44%	2.64%	0.20%	2.92%	0.48%	30-Year	2048	3.03%	2.89%	3.10%	0.21%	3.40%	0.51%

Source: Thomson Reuters



Interest Rates in 2018

Long-term interest rates in 2018 remained within a historically low range, with the 30-year MMD remaining between a maximum of 3.46% and a minimum of 2.54%

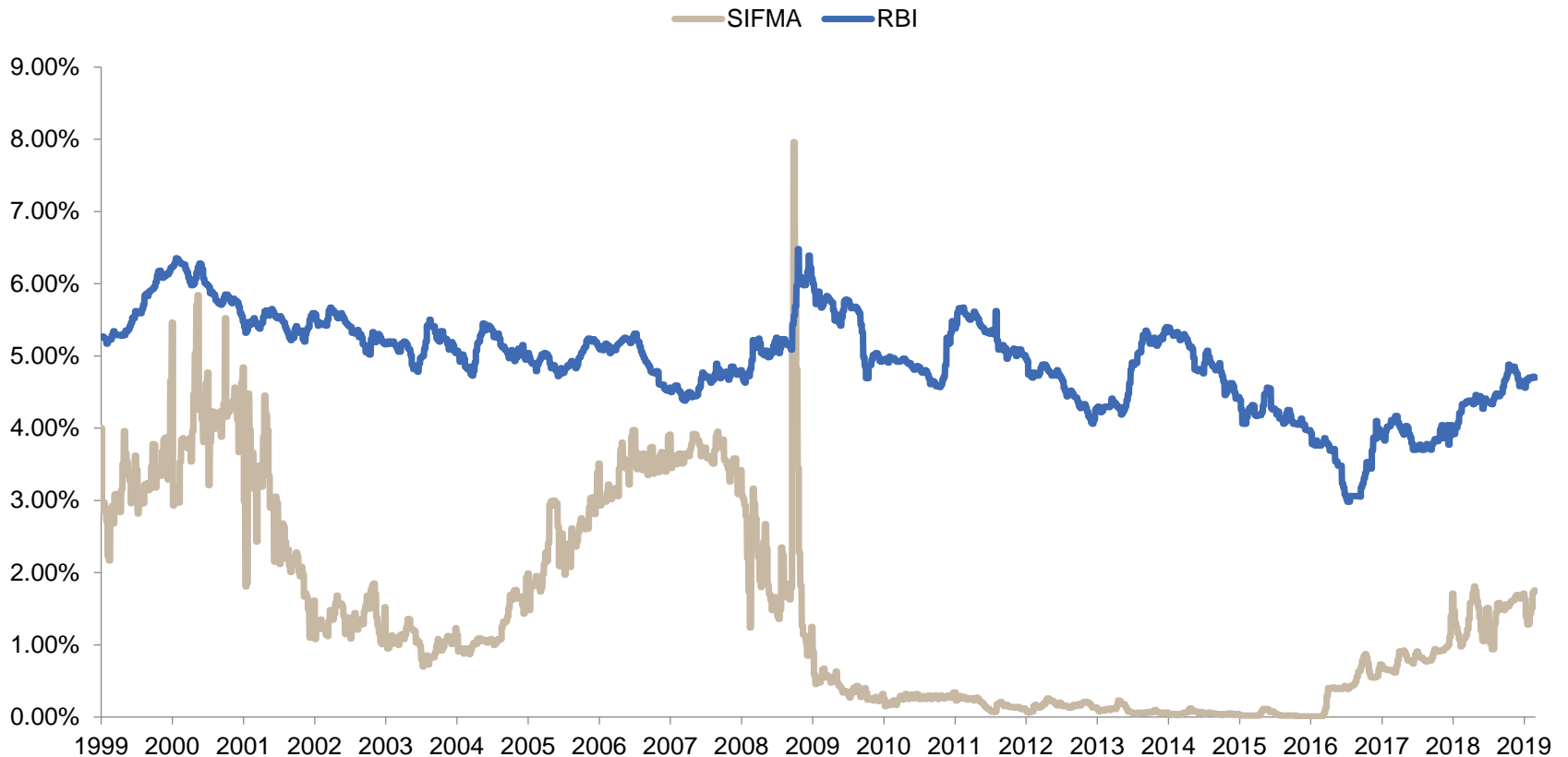




Short-Term and Long-Term Tax-Exempt Interest Rate History

SIFMA has remained at levels significantly below the Bond Buyer Revenue Bond Index since 2009, although short-term rates have ticked up over the last several years

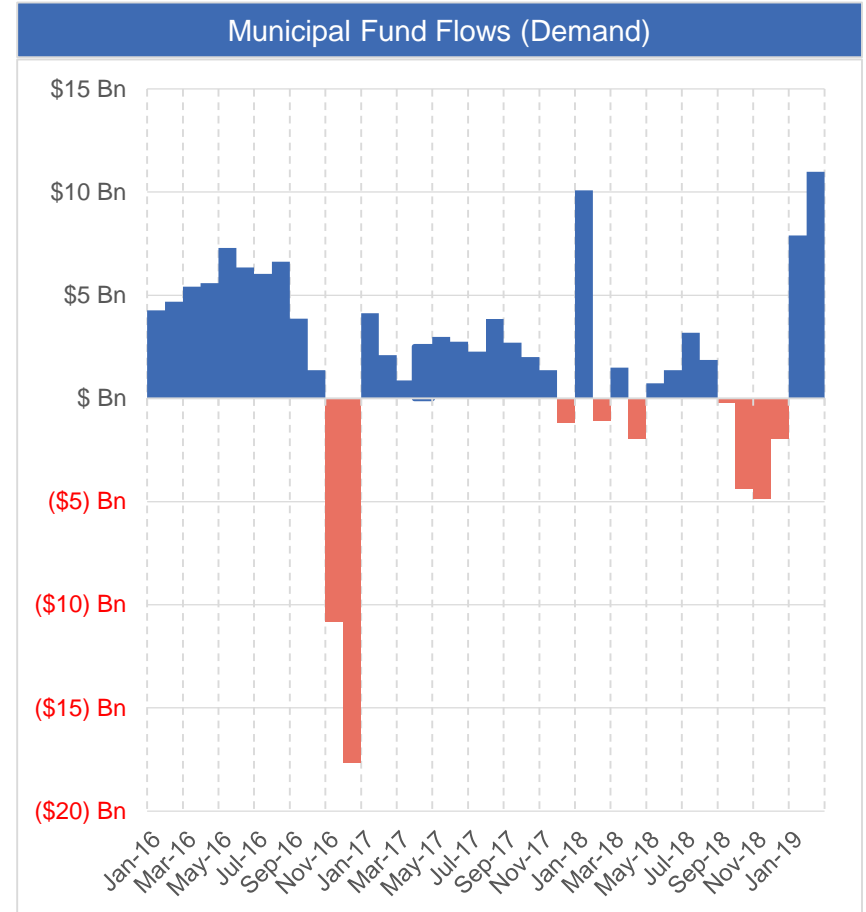
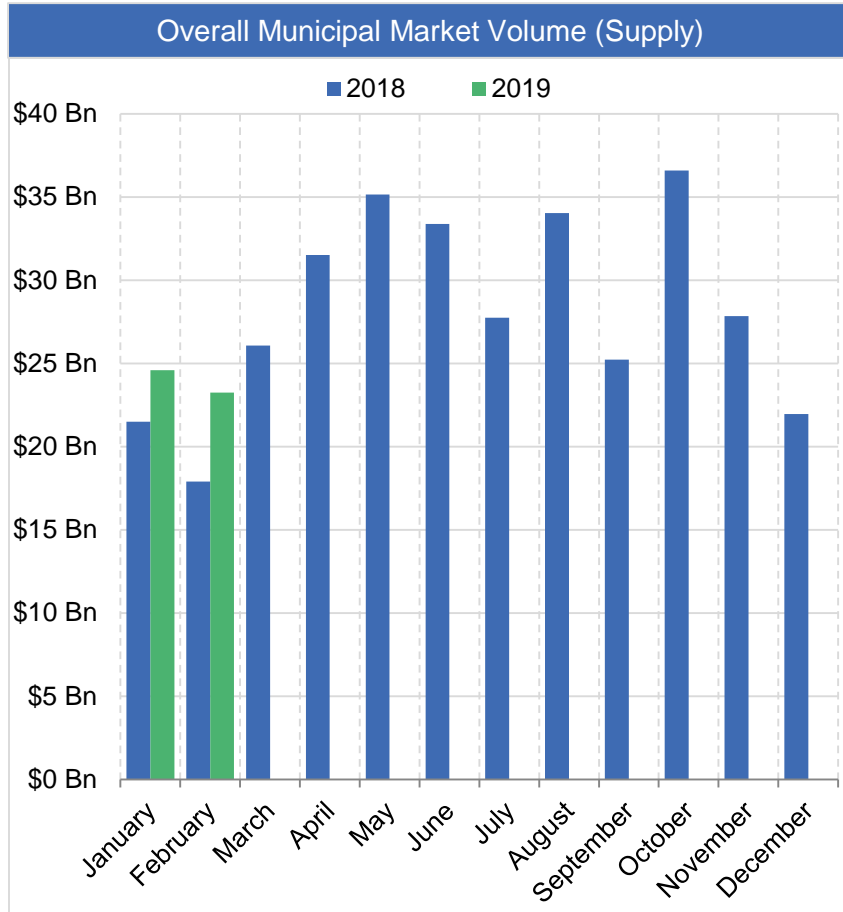
SIFMA vs. RBI (January 1, 1999 – March 11, 2019)





Municipal Market Supply & Demand

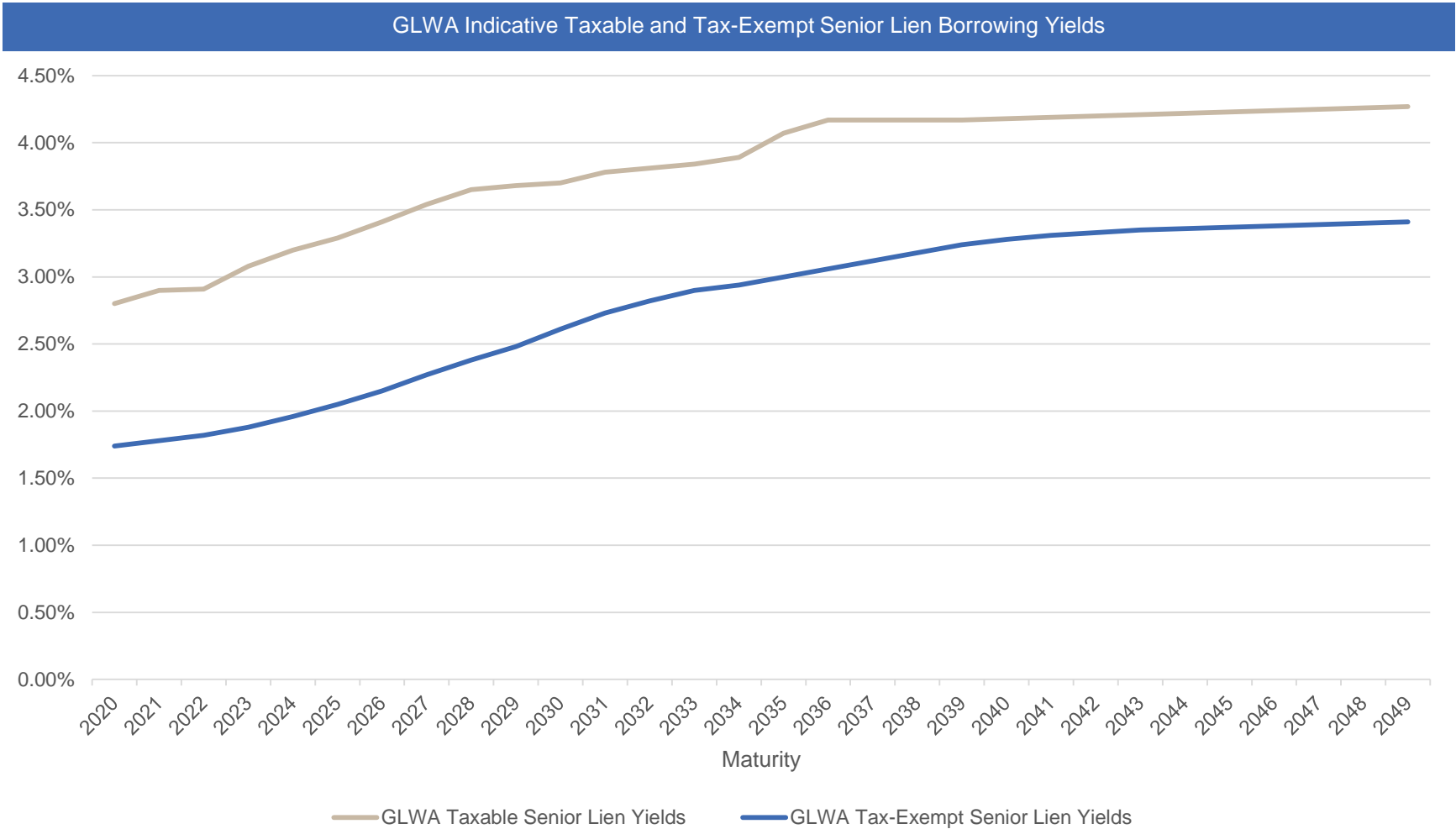
Municipal bond issuance was up 29.89% in February (year-over-year) and is up 21.43% year-to-date through the end of February.



Source: Bond Buyer, Investment Company Institute



GLWA Taxable and Tax-Exempt Borrowing Rates



Indicative interest rates as of February 27, 2019. Tax-exempt borrowing yields assume 5% premium coupon structure with a ten year par call. Taxable borrowing yields assume a par coupon structure with a make whole call.



Interest Rate Forecasts

- The Federal Reserve signaled a slowdown in rate increases in 2019, with the following language first included in the January FOMC statement:
 - *“In light of global economic and financial developments and muted inflation pressures, the Committee will be patient as it determines what future adjustments to the target range for the federal funds rate may be appropriate to support these outcomes”*

Bond Yield Forecast (As of March 11, 2019)							
Average Forecasts	Current	Q1 19	Q2 19	Q3 19	Q4 19	Q1 20	Q2 20
30-Year UST	3.03%	3.10%	3.17%	3.25%	3.29%	3.36%	3.39%
10-Year UST	2.64%	2.82%	2.91%	2.99%	3.03%	3.08%	3.09%
5-Year UST	2.44%	2.65%	2.77%	2.83%	2.87%	2.92%	2.96%
2-Year UST	2.47%	2.63%	2.74%	2.81%	2.86%	2.88%	2.91%
3M LIBOR	2.60%	2.72%	2.81%	2.89%	2.95%	2.99%	2.99%
Fed Funds Target Rate (Upper)	2.50%	2.50%	2.60%	2.70%	2.80%	2.80%	2.80%
Fed Funds Target Rate (Lower)	2.25%	2.25%	2.37%	2.46%	2.55%	2.54%	2.55%



Amendment to SEC Rule 15c2-12



Amendments to Rule 15c2-12

- On August 31, 2018 the SEC posted amendments for Rule 15c2-12 of the Securities Exchange Act to the Federal Register that became effective on February 27, 2019
- The Amendments add two new events to the list of reportable events for which issuers would be obligated through new continuing disclosure agreements to report on EMMA within 10 days of occurrence
 - 1) *“Incurrence of a **financial obligation** of the issuer or obligated person, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the issuer or obligated person, any of which affect security holders, if material”*
 - 2) *“Default, event of acceleration, termination event, modification of terms or other similar events under the terms of the **financial obligation** of the issuer or obligated person, any of which reflect financial difficulties.”*
- Definition of “financial obligation” becomes important for determining compliance with the amended rule
 - *“The term “financial obligation” means a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of (i) or (ii). The term financial obligation shall not include municipal securities as to which a final official statement has been provided to the MSRB consistent with this rule.”*
 - Includes direct placements and bank loans – but also captures other types of financial transactions, such as capital leases, interest rate swaps, guarantees, etc.
- SEC has declined to provide further clarity on materiality but did state that issuers should use the same analysis regularly made when preparing disclosure documents



Rationale and Background on the Amendments

- Concern that issuers were not properly disclosing the existence or terms of their bank loans and private placements initially highlighted in Securities and Exchange Commission (“SEC”) report issued in July 2012
- GASB requires some debt information to be disclosed in notes to financial statements, but not necessarily the level of detail about particular covenants, events of default, remedies, priority rights, etc. for market participants to make informed investment decisions
- Issuers may agree to terms when incurring financial obligations that were not previously required to be disclosed even though they could adversely affect existing bondholders
 - Bank loan covenants and events of default can be different from or set at higher levels than those applicable to outstanding bonds, thereby enabling the bank to assert remedies prior to other bondholders
 - Recent changes to federal tax laws have triggered provisions commonly found in direct placements relating to the rate at which a direct placement will bear interest

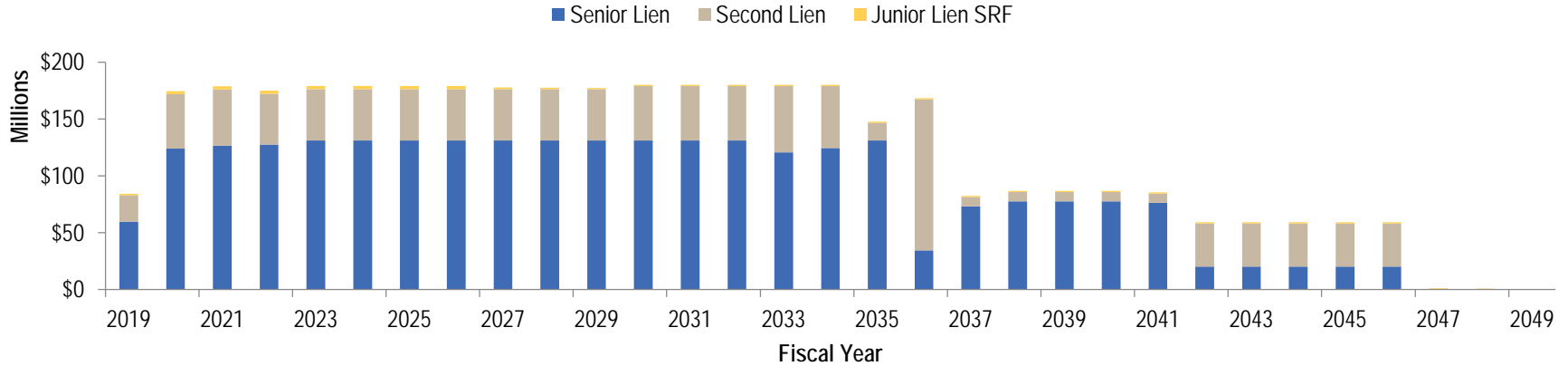


Status of GLWA Debt Profile

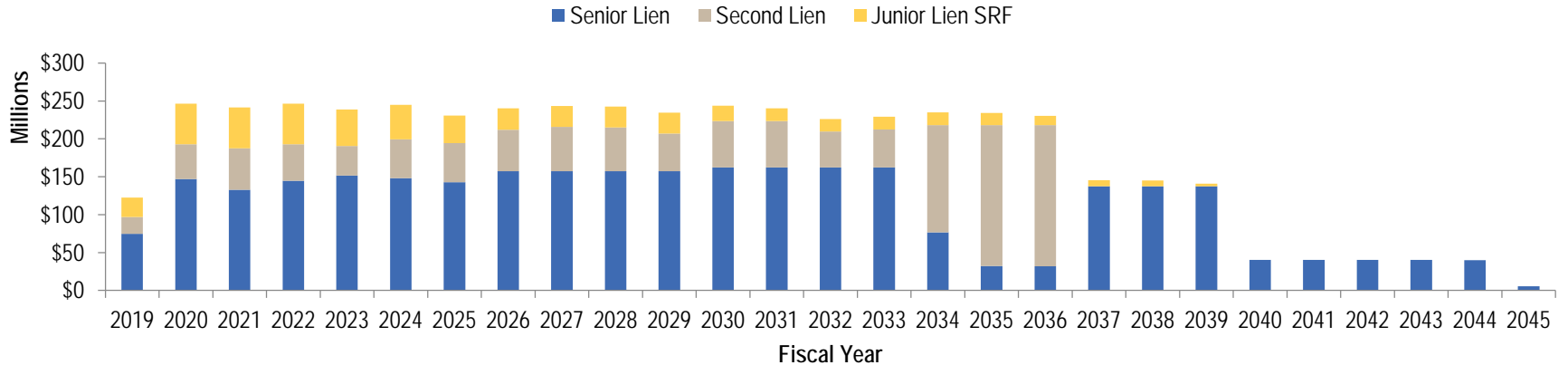


GLWA Current Debt Structure as of January 1, 2019

Water



Sewer

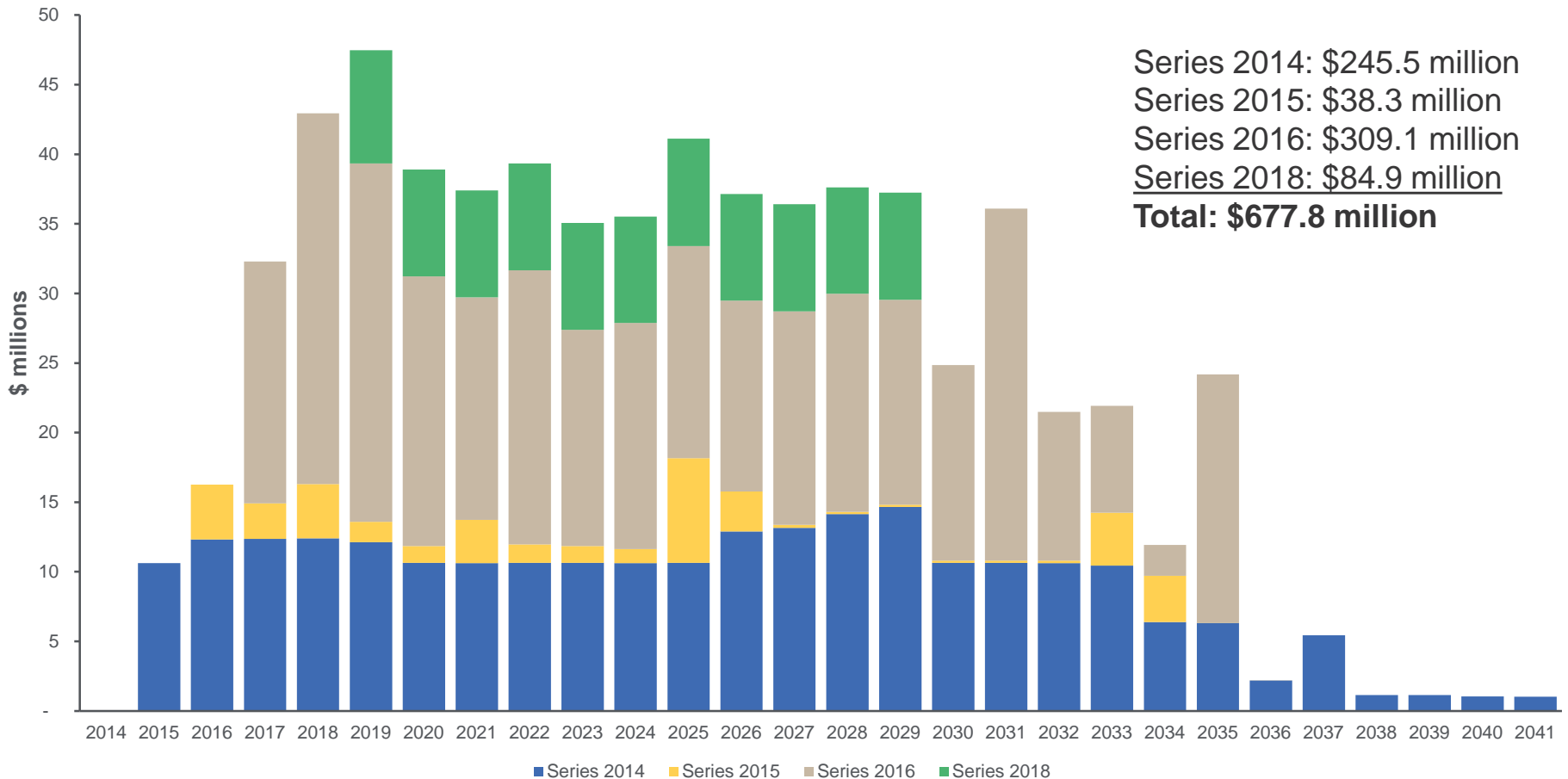


Note: Assumes Series 2006D Variable Rate Bonds calculated at 1.85% interest rate (GLWA planning rate). Funds for Estimated SRF Schedules have not been fully drawn. Debt service schedule reflects amortization of full authorized amount. Excludes FY2019 debt service paid through 1/1/2019.



History of Debt Service Savings Achieved Since 2014

Through the leadership of the Authority's management team, the financing team has been able to achieve nearly \$678 million of debt service savings for the systems since the tender and refunding transaction in 2014





GLWA Fixed Rate Callable Debt (Call Dates Through 2022)

Water						
Series Name	Indenture	Lien	Tax Status	Outstanding (\$000s)	Next Call Date	Callable Par (\$000s)
Series 2011A Senior	Water	Senior	Tax-Exempt	293,970	7/1/2021	289,605
Series 2011B Senior	Water	Senior	Taxable	3,950	7/1/2021	2,295
Series 2011C Senior	Water	Senior	Tax-Exempt	75,145	7/1/2021	74,125

Sewer						
Series Name	Indenture	Lien	Tax Status	Outstanding (\$000s)	Next Call Date	Callable Par (\$000s)
Series 2012A Senior	Sewer	Senior	Tax-Exempt	495,175	7/1/2022	437,795
Series 2014C-1 Senior	Sewer	Senior	Tax-Exempt	123,220	7/1/2022	123,200
Series 2014C-2 Senior	Sewer	Senior	AMT	27,470	7/1/2022	27,450
Series 2005A Sec.(Call Mod) ¹	Sewer	Second	Tax-Exempt	31,785	7/1/2021	31,785
Series 2006B Sec.(Call Mod) ²	Sewer	Second	Tax-Exempt	55,000	7/1/2021	55,000

Note: excludes series of debt with callable amounts of \$100,000 or less outstanding.

1. The call date on \$31.8 million of the series 2005A Sewer Bonds was modified to July 1, 2021.
2. The call date on \$55.0 million of the Series 2006B Sewer Bonds was modified to July 1, 2021.



Taxable Advance Refunding Candidate Summary

Refunded Series	Sewer System Debt Generating Savings (Taxable Advance Refunding)			Water System Debt Generating Savings (Taxable Advance Refunding)		
	Series	Call Date	Par (\$000s)	Series	Call Date	Par (\$000s)
Senior	2012A	7/1/2022	358,595	2011A	7/1/2021	289,605
				2011B	7/1/2021	2,295
				2011C	7/1/2021	74,125
Total Senior			358,595			366,025
Second	2005A	7/1/2021	31,785	-	-	-
	2006B	7/1/2021	30,870			
Total Second			62,655			-
Total Refunded			421,250			366,025

Note: Series 2012A Sewer Bonds partially funded Extraordinary Working Capital projects. The ability to refinance the portion of the Series 2012A Bonds related to the Extraordinary Working Capital on a tax-exempt basis is subject to opinion of Tax Counsel.



Refunding Opportunities in the Wake of Tax Reform

- The elimination of tax-exempt advance refundings and the subsequent dependence on taxable bonds to advance refund outstanding debt has generally led to increased cost and decreased the viability of issuing traditional advance refunding bonds
- Despite increased borrowing costs, savings is available to GLWA by issuing taxable advance refunding bonds
- While taxable advance refundings allow GLWA to generate debt service savings by taking advantage of current low interest rates, GLWA would forgo the benefit of tax-exempt financing
- If rates stayed the same as they are now, tax-exempt current refundings at the call dates could generate up to \$34 million of additional savings for Water and \$55 million of additional savings for Sewer on an NPV basis
- This represents an implied interest rate penalty of up to 150 basis points for “locking in” savings today vs waiting and taking on interest rate risk
- Current refundings (within 90 days of call date on refunded debt) will be more efficient than advance refundings (no additional escrow cost) and ultimately could afford more savings than tax-exempt advance refundings that are no longer permissible due to tax reform
- Does involve more interest rate risk for GLWA between now and current refunding date
- GLWA would get the benefit of “moving down the curve” for financing rates, and could always look at taxable advance refunding options
- Effective on March 1, Department of Treasury suspended the sale of SLGS as part of “extraordinary measures” to prevent the United States from defaulting on its obligations, which requires open market escrows for any defeasance or taxable refunding currently.



Water – Senior Series 2011A/B/C (Taxable Advance Refunding)

Water – Senior Lien Series 2011A Refunding Screen (\$ in 000s)								
Candidate				New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
Maturity	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2027	3,930	5.25%	7/1/2021	3.54%	212	5.41%	82	72.2%
7/1/2031	14,540	5.00%	7/1/2021	3.70%	753	5.18%	347	68.5%
7/1/2036	27,855	5.00%	7/1/2021	4.03%	1,428	5.13%	842	62.9%
7/1/2037	20,845	5.75%	7/1/2021	4.17%	2,599	12.47%	692	79.0%
7/1/2041	222,435	5.25%	7/1/2021	4.18%	18,374	8.26%	7,375	71.4%
289,605					23,366	8.07%	9,338	71.4%

Water – Senior Lien Series 2011B Refunding Screen (\$ in 000s)								
Candidate				New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
Maturity	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2033	2,295	5.25%	7/1/2021	3.49%	213	9.28%	46	82.2%
2,295					213	9.28%	46	82.2%

Water – Senior Lien Series 2011C Refunding Screen (\$ in 000s)								
Candidate				New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
Maturity	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2023	2,000	5.25%	7/1/2021	3.08%	34	1.69%	23	59.0%
7/1/2024	10,490	5.25%	7/1/2021	3.20%	313	2.99%	148	67.9%
7/1/2025	9,645	5.25%	7/1/2021	3.29%	403	4.18%	153	72.4%
7/1/2027	5,000	5.25%	7/1/2021	3.54%	270	5.41%	104	72.2%
7/1/2027	4,585	4.50%	7/1/2021	3.54%	77	1.69%	94	45.1%
7/1/2041	42,405	5.00%	7/1/2021	4.18%	2,196	5.18%	1,401	61.1%
74,125					3,294	4.44%	1,924	63.1%

Assumptions: Matched lien refunding with Delivery Date of July 1, 2019; SLGS escrow; refunding bonds issued with par coupon structure and a make whole call; COI and UD of \$5/\$1000 and \$5/\$1000, respectively; uniform savings structure; no Debt Service Reserve Fund releases or deposits; Interest rates as of February 28, 2019; PV at Arbitrage Yield. Totals show sum of selected bonds.



Base Case Taxable Advance Refunding – Water System

Savings Summary

- Over \$42 million in gross cashflow savings can be achieved (>\$27 million present value)
- Potential to accelerate savings as desired

Refunding Candidates

- Includes all bonds generating >3% savings¹
- Refunding on a tax-exempt basis not an option under current tax law

Assumptions

- Uninsured, matched lien refunding
- Interest rates as of February 28, 2019
- Contribution of accrued interest from DS fund
- Conservatively assumes no DSRF release
- SLGS escrow as of February 28, 2019
- Savings structured for level aggregate savings by lien
- Par coupon structure
- Assumes make whole call option

Refunding Results	
Delivery Date:	7/1/2019
Call Date:	MWC
Advance Refunded Par (\$):	366,025,000
NPV Savings (\$):	27,665,093
NPV Savings as % :	7.56%
Negative Arbitrage (\$) ² :	(11,608,444)
Escrow Efficiency ² :	70.4%
TIC:	4.15%
WAM:	17.6 yrs
Refunded Bonds WAM:	18.0 yrs

Date	Prior Net Cashflow (\$)	Refunding DS (\$)	Savings (\$)
7/1/2020	19,091,363	17,180,959	1,910,404
7/1/2021	19,091,363	17,183,819	1,907,544
7/1/2022	19,296,363	17,388,869	1,907,494
7/1/2023	21,294,063	19,386,489	1,907,574
7/1/2024	29,626,163	27,717,909	1,908,254
7/1/2025	28,229,938	26,319,309	1,910,629
7/1/2026	18,037,475	16,127,704	1,909,772
7/1/2027	31,553,175	29,642,406	1,910,769
7/1/2028	21,258,125	19,349,990	1,908,135
7/1/2029	21,042,925	19,132,270	1,910,655
7/1/2030	20,293,075	18,383,886	1,909,189
7/1/2031	20,250,375	18,339,986	1,910,389
7/1/2032	20,095,825	18,187,412	1,908,413
7/1/2033	20,039,625	18,127,246	1,912,379
7/1/2034	19,746,925	17,835,822	1,911,103
7/1/2035	19,696,425	17,785,796	1,910,630
7/1/2036	28,909,175	27,001,278	1,907,897
7/1/2037	43,511,675	41,603,922	1,907,754
7/1/2038	73,184,588	71,272,517	1,912,071
7/1/2039	73,186,800	71,277,373	1,909,427
7/1/2040	73,191,225	71,281,729	1,909,497
7/1/2041	71,899,250	69,989,633	1,909,618
	712,525,913	670,516,321	42,009,592

1. Also includes several small refunding candidates (<\$5 million) generating positive savings less than 3% which mature shortly after the call date or represent the last outstanding principal amount for a particular series.
 2. Negative arbitrage and escrow efficiency calculated for illustrative purposes assuming earnings cap on investments at refunding bond yield.



Sewer – Senior Series 2012A (Taxable Advance Refunding)

Sewer – Senior Lien Series 2012A Refunding Screen (\$ in 000s)								
Maturity	Candidate			New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2023	17,985	5.00%	7/1/2022	3.08%	(213)	-1.18%	326	-
7/1/2026	9,170	5.25%	7/1/2022	3.41%	210	2.29%	255	45.1%
7/1/2027	2,310	5.25%	7/1/2022	3.54%	63	2.74%	73	46.4%
7/1/2032	65,730	5.00%	7/1/2022	3.78%	2,253	3.43%	2,517	47.2%
7/1/2039	292,865	5.25%	7/1/2022	4.17%	14,655	5.00%	14,554	50.2%
7/1/2039	49,735	5.00%	7/1/2022	4.17%	1,228	2.47%	2,464	33.3%
	358,595				16,907	4.71%	17,071	49.8%

Assumptions: Matched lien refunding with Delivery Date of July 1, 2019; SLGS escrow; refunding bonds issued with par coupon structure and a make whole call; COI and UD of \$5/\$1000 and \$5/\$1000, respectively; uniform savings structure; no Debt Service Reserve Fund releases or deposits; Interest rates as of February 28, 2019; PV at Arbitrage Yield. Totals show sum of selected bonds.



Sewer – Second Series 2005A / 2006B (Taxable Advance Refunding)

Sewer – Second Lien Series 2005A Refunding Screen (\$ in 000s)								
Maturity	Candidate			New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2034	15,490	5.00%	7/1/2021	3.99%	835	5.39%	456	64.7%
7/1/2035	16,295	5.00%	7/1/2021	4.17%	602	3.69%	536	52.9%
	31,785				1,437	4.52%	992	59.2%

Sewer – Second Lien Series 2006B Refunding Screen (\$ in 000s)								
Maturity	Candidate			New Yield	PV Savings		Negative Arb. (\$ in 000s)	Savings Efficiency
	Par (\$ in 000s)	Rate	Call Date		\$ in 000s	%		
7/1/2034	7,890	5.00%	7/1/2021	3.99%	425	5.39%	232	64.7%
7/1/2035	22,980	5.00%	7/1/2021	4.17%	849	3.69%	756	52.9%
7/1/2036	24,130	5.00%	7/1/2021	4.27%	684	2.83%	840	44.9%
	30,870				1,274	4.13%	988	56.3%

Assumptions: Matched lien refunding with Delivery Date of July 1, 2019; SLGS escrow; refunding bonds issued with par coupon structure and a make whole call; COI and UD of \$5/\$1000 and \$5/\$1000, respectively; uniform savings structure; no Debt Service Reserve Fund releases or deposits; Interest rates as of February 28, 2019; PV at Arbitrage Yield. Totals show sum of selected bonds.



Base Case Taxable Refunding – Sewer System

Savings Summary

- Nearly \$30 million in gross cashflow savings can be achieved (>\$20 million present value)
- Potential to accelerate savings as desired

Refunding Candidates

- Includes all bonds generating >3% savings¹
- Refunding on a tax-exempt basis not an option under current tax law

Assumptions

- Uninsured, matched lien refunding
- Interest rates as of February 28, 2019
- Contribution of accrued interest from DS fund
- Conservatively assumes no DSRF release
- SLGS escrow as of February 28, 2019
- Savings structured for level aggregate savings by lien
- Par coupon structure
- Assumes make whole call option

Refunding Results	
Delivery Date:	7/1/2019
Call Date:	MWC
Advance Refunded Par (\$):	421,250,000
NPV Savings (\$):	20,652,291
NPV Savings as % :	4.90%
Negative Arbitrage (\$) ¹ :	(19,025,527)
Escrow Efficiency ¹ :	52.0%
TIC:	4.14%
WAM:	16.8 yrs
Refunded Bonds WAM:	17.4 yrs

Date	Prior Net Cashflow (\$)	Refunding DS (\$)	Savings (\$)
7/1/2020	21,794,663	20,258,480	1,536,183
7/1/2021	21,794,663	20,255,130	1,539,533
7/1/2022	21,794,663	20,253,750	1,540,913
7/1/2023	21,794,663	20,260,733	1,533,930
7/1/2024	21,794,663	20,257,773	1,536,890
7/1/2025	21,794,663	20,255,798	1,538,865
7/1/2026	21,794,663	20,260,107	1,534,556
7/1/2027	21,794,663	20,259,631	1,535,032
7/1/2028	27,809,663	26,273,989	1,535,674
7/1/2029	23,013,913	21,478,714	1,535,199
7/1/2030	27,817,913	26,281,379	1,536,534
7/1/2031	34,882,913	33,345,509	1,537,404
7/1/2032	58,418,663	56,883,544	1,535,119
7/1/2033	18,508,163	16,971,830	1,536,333
7/1/2034	43,358,163	41,821,839	1,536,324
7/1/2035	57,976,988	56,438,157	1,538,831
7/1/2036	16,622,638	15,322,507	1,300,131
7/1/2037	106,489,138	105,189,696	1,299,442
7/1/2038	106,458,788	105,159,094	1,299,694
7/1/2039	106,418,275	105,117,947	1,300,328
	802,132,513	772,345,604	29,786,909

1. Negative arbitrage and escrow efficiency calculated for illustrative purposes assuming earnings cap on investments at refunding bond yield.



Rating Agency Water & Sewer Sector Views and Scorecards



Moody's Water & Sewer Sector Outlook

- Anticipate **overall stability** in 2019 supported by strong rate management and liquidity, balanced by significant capital needs driven by deferred investment
- Strengthening debt service coverage levels, with growing net revenues outpacing debt service costs; although a credit positive, this is unlikely unsustainable in the long run as utilities address deferred investments
- Liquidity, pivotal to the sector's stability, will continue to strengthen as utilities accumulate reserves for future rate stabilization, unexpected system shocks and capital needs
- While strong debt service coverage and liquidity better equip systems to meet immediate operating challenges, Moody's expects large capital needs to accumulate as the rate of sector infrastructure investment remains low
 - Incremental investment continues to lag system depreciation, evidenced by a declining trend in the median useful life of all systems
 - Sufficient funding of system investment is becoming an increasingly important factor within the sector
- Accelerating large-scale capital investment will require expansion of low-interest financing options, as increasing rates at a pace that fully addresses capital funding needs could be politically untenable

Source: Moody's Report, "2019 outlook stable as debt service coverage strengthens but capital needs rise" December 5, 2018.



Fitch's Water & Sewer Sector Outlook

- **Stable outlook**, with the key factors in the sector's performance stability being essentiality of the services, lack of competition, and generally autonomous rate-setting authority
- Fitch expects revenues will climb between 2% and 4% in 2019 based on anticipated adjustments by rated credits, flat consumption patterns and moderate economic expansion nationally, helping to offset rising operating and debt costs and preserve good coverage and robust reserves
- Despite slight increase in capital spending anticipated in 2019, sustained capital investment increases will be necessary to preserve service levels and meet future demands over the intermediate term
- Affordability cushion lower than in prior years but remains overall
 - With utilities anticipating ongoing rate adjustments that continue to outpace CPI, affordability is becoming an increasing focus and could pressure finance and debt ratios over time
- With user charges continuing to outpace inflationary growth, the issue of affordability is becoming an increasing focus among sector stakeholders and could pressure finance and debt ratios beyond the outlook period
- Low cost of capital is a credit positive and should remain favorable over the near-term
- Regulatory environment is expected to remain stable, although delayed revisions to the Lead & Copper Rule expected to be released in Q12019 could have significant implications for water utilities
- Increased volatility in weather extremes has potential to escalate sector capital needs

Source: Fitch "2019 Outlook: Water and Sewer Sector" December 6, 2018. 'Sector Briefing: Water and Sewer' October 2018.



Standard & Poor's Water & Sewer Sector Outlook

- Status of the sector is currently strong in spite of political and economic turmoil
 - Credit increases still outpace credit downgrades in 2018
- Bill affordability and debt service coverage are two factors most likely to erode in 2019 and are most likely to impact ratings
- Increasing fixed costs and increasing personnel costs for current and retired employees are leading causes
- Management and governance is an area that can stabilize or relieve utilities under ratings stress
- **Willingness to raise rates** - which remain the sole source of operating revenues for nearly every utility - is cited as an ever-important issue

S&P Credit Risks and Opportunities	
Risks	Opportunities
<ul style="list-style-type: none">• A federal infrastructure package, if any, that keeps the focus on surface and air transportation	<ul style="list-style-type: none">• Highly rated and well-run state revolving funds (SRFs) remaining a popular alternative to municipal bonds for many borrowers
<ul style="list-style-type: none">• Succession planning in a tight labor market, increasing personnel costs	<ul style="list-style-type: none">• Very low likelihood of new or stronger environmental regulations
<ul style="list-style-type: none">• Bearish and volatile equity markets that aren't helping close pension funding gaps	<ul style="list-style-type: none">• Some recent federal legislation that was or is likely to be helpful
<ul style="list-style-type: none">• Rising interest rates possibly curtailing non-mandatory capital expenditures (capex), increasing the risk of deferred maintenance	

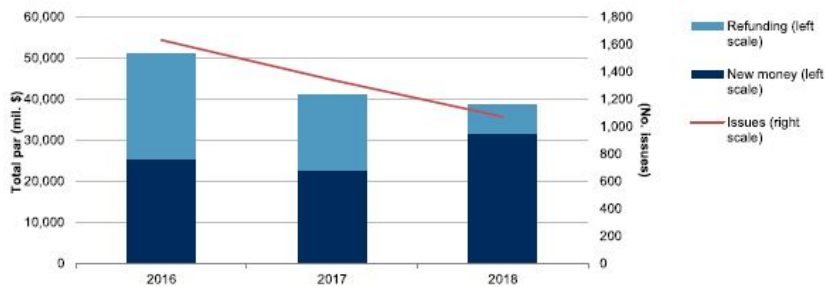
Source: S&P Report, "U.S. Municipal Water and Sewer Utilities 2019 Sector Outlook: Stable, Although Potential Disruptions Are Not Making Planning Easy" January 15, 2019.



Standard & Poor's Water & Sewer Sector Outlook (cont'd)

- Slowing economy unlikely to hurt utility credit quality under anything but extreme circumstances
- If utilities receive more flexibility in implementing corrective action, debt use and rate increases would be more spread out
- Even with tight state budgets, state bond banks and federal SRF's remain highly rated and well capitalized

Revenue Bond Trends

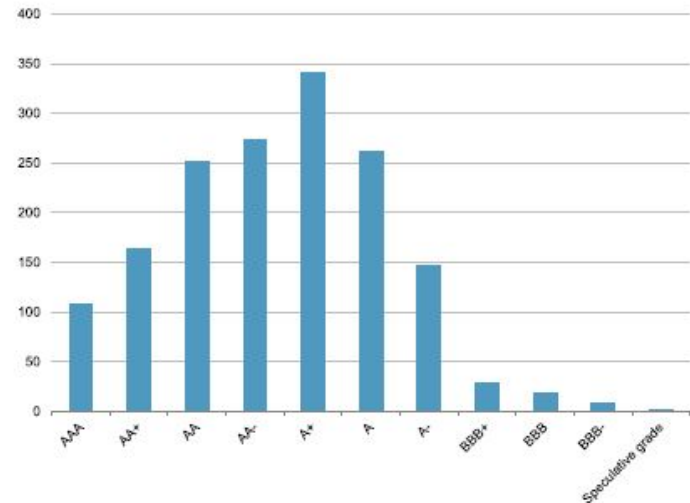


Source: Bond Buyer municipal market data and S&P Global Ratings.
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S&P Rating Trends

	2013	2014	2015	2016	2017	2018
Ratings outstanding	1,509	1,568	1,638	1,650	1,578	1,605
% ratings that changed during the year	3.90%	4.40%	8.61%	13.94%	7.79%	4.78%
Upgrades to downgrades	2.9x	2.0x	2.1x	1.9x	1.8x	1.8x
Positive outlooks	26	23	31	14	4	12
Non-stable outlooks	49	55	70	42	10	27

Ratings Distribution



Source: S&P Global Ratings. Data as of Dec. 31, 2018.
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Source: S&P Report, "U.S. Municipal Water and Sewer Utilities 2019 Sector Outlook: Stable, Although Potential Disruptions Are Not Making Planning Easy" January 15, 2019.



Current Water and Sewer Ratings

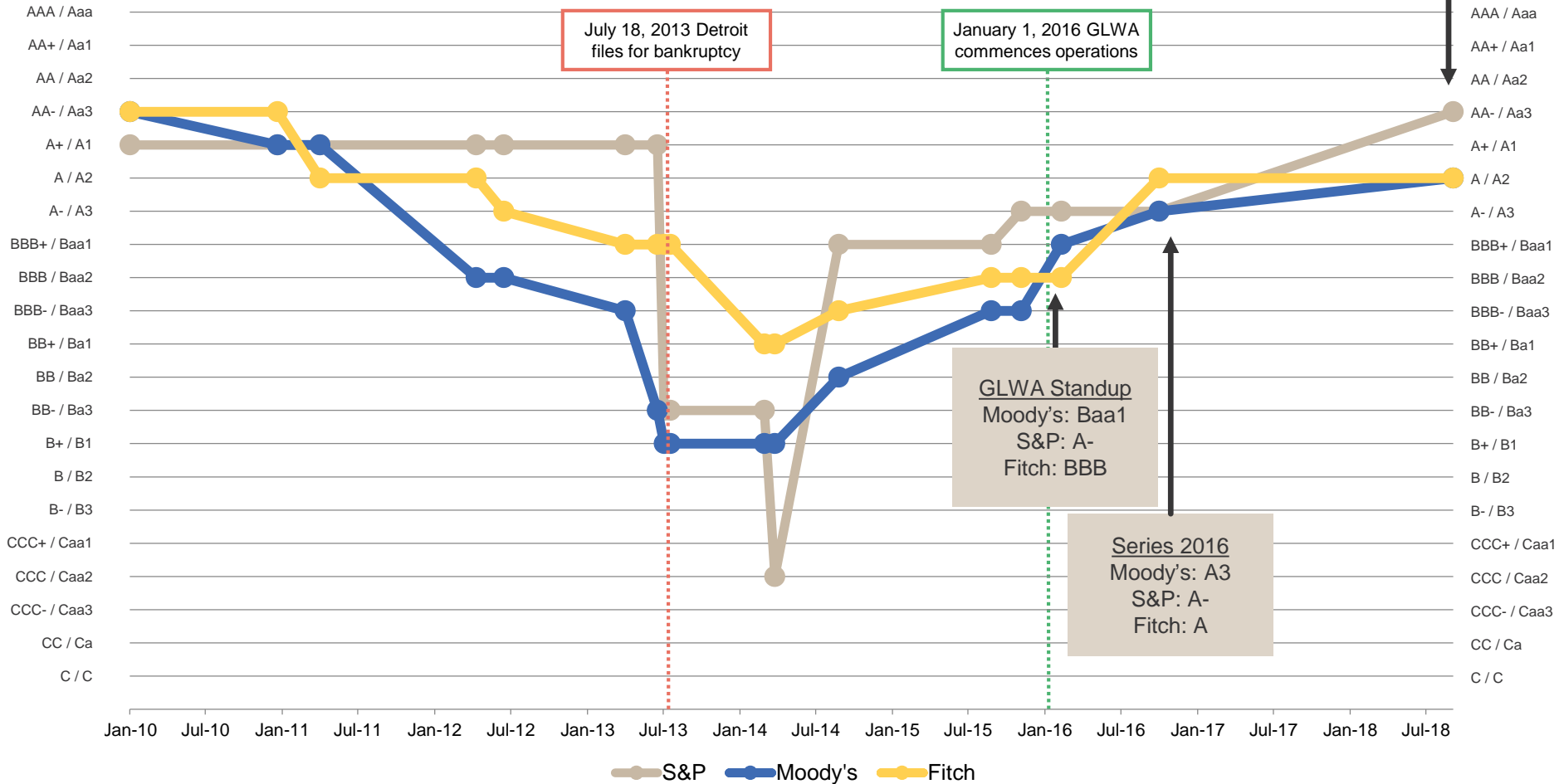
Water			
	Moody's	S&P	Fitch
Senior Lien	A2	AA-	A
Second Lien	A3	A+	A-
Outlook	Stable	Stable	Positive

Sewer			
	Moody's	S&P	Fitch
Senior Lien	A2	A+	A
Second Lien	A3	A	A-
Outlook	Stable	Positive	Positive



History of Senior Lien Water and Sewer Ratings

GLWA Senior Lien Ratings History (DWSD Prior to January 1, 2016)



Note: in cases where a rating agency rates Water Senior and Sewer Senior Lien differently, chart displays highest of the two ratings.



Current Rating Agency Views

Summary of Rating Agency Views		
Moody's Investors Service Andrew Van Dyke Dobos / Matt Butler	Standard & Poor's Scott Garrigan / Ted Chapman	Fitch Ratings Doug Scott / Eva Rippeteau
A2 (Sr.) / A3 (2nd) Stable Outlook	Water: AA- (Sr.) / A+ (2nd); Sewer: A+ (Sr.) / A- (2nd) Positive Outlook	A (Sr.) / A- (2nd) Positive Outlook
Strengths		
<ul style="list-style-type: none"> — Very wide service area that includes a population of 3.8 million — Commitment to revenue enhancements will likely support sound debt service coverage and healthy liquidity — GLWA management team has implemented operating adjustments to cut costs and improve financial metrics, and is committed to continued efforts — Simplified monthly fixed rate structure mitigates declining usage while providing stable cash flow throughout the year 	<ul style="list-style-type: none"> — Diverse revenue stream from a large number of wholesale customers — Revenues from both wholesale customers and the DWSD retail system that are mostly fixed — Oversight through an agency relationship and cooperation with DWSD — Strong overall management and governance functions, including comprehensive internal policies and controls — Financial performance continues to exceed projections — GLWA is not under any regulatory-driven capital costs from consent orders or consent decrees — Limited future exposure to pension cost escalation from legacy Detroit obligations 	<ul style="list-style-type: none"> — Essential service provider in expansive service territory — Strong rate adjustment history in support of financial and capital needs — Over 75% of operating revenues coming from suburban customers with higher wealth metrics — All system funds and accounts are separate and distinct Detroit funds including the city's general fund — Changes in rate setting practices and reserve accumulation should help to insulate GLWA from high city retail delinquencies
Challenges		
<ul style="list-style-type: none"> — Declining water consumption trend — High leverage will moderate slowly given outstanding capital improvement needs and plans to issue debt — High combined operating needs and fixed costs leave little margin to miss revenue targets — Economic and demographic weaknesses in portions of the service area 	<ul style="list-style-type: none"> — Ongoing negative revenue variances from the DWSD local sewer system — Significant economic stress and a "very weak economy" in Detroit, which could continue to place downward pressure on utility collection rates — Large amount of accounts receivable and high allowances for doubtful accounts — Significantly less affordable rates for customers living in Detroit compared to suburban residents — System leverage that is high and unlikely to abate significantly 	<ul style="list-style-type: none"> — Debt load is expected to remain elevated for the foreseeable future — Continued annual rate adjustments are needed to meet rising debt service obligations and sustain financial performance

Source: Moody's reports dated September 4, 2018; S&P reports dated September 5, 2018; Fitch report dated September 13, 2018.



Moody's Water & Sewer Utility Scorecard (Water System)

			Scoring on Moody's Municipal Utility Methodology							
Factor	Description	Weight	Aaa 0.50-1.49	Aa 1.50-2.49	A 2.50-3.49	Baa 3.50-4.49	Ba 4.50-5.49	GLWA Input	Category Score	GLWA Score
System Characteristics (30%)	Asset Condition - Remaining Useful Life (Net Fixed Assets / Annual Depreciation)	10%	> 75 Years	75 years ≥ n > 25 years	25 years ≥ n > 12 years	12 years ≥ n > 9 years	9 years ≥ n > 6 years	14 years	3	0.300
	System Size: (O&M in 000s)	7.5%	> \$65 million	\$65 M ≥ n > \$30 M	\$30 M ≥ n > \$10 M	\$10 M ≥ n > \$3 M	\$3 M ≥ n > \$1 M	\$167.0 million	1	0.075
	Service Area Wealth: MFI	12.5%	> 150% of US median	150% to 90% of US Median	90% to 75% of US Median	75% to 50% of US Median	50% to 40% of US Median	101.2%	2	0.250
Financial Strength and Liquidity (40%)	Annual Debt Service Coverage	15%	> 2.00x	2.00x ≥ n > 1.70x	1.70x ≥ n > 1.25x	1.25x ≥ n > 1.00x	1.00x ≥ n > 0.70x	1.5x	3	0.450
	Days Cash on Hand	15%	> 250 days	250 days ≥ n > 150 days	150 days ≥ n > 35 days	35 days ≥ n > 15 days	15 days ≥ n > 7 days	693 days	1	0.150
	Debt to Operating Revenues	10%	Less than 2.00x	2.00x < n ≤ 4.00x	4.00X < n ≤ 7.00X	7.00X < n ≤ 8.00X	8.00X < n ≤ 9.00X	5.4x	3	0.300
Management of System (20%)	Rate Management	10%	Excellent rate setting; no material political, practical, or regulatory limit to rate increases	Strong rate setting; little material political, practical, or regulatory limit to rate increases	Average rate setting; some material political, practical, or regulatory limit to rate increases	Adequate rate setting; political, practical, or regulatory impediments place material limits to rate increases	Below average rate setting; political, practical, or regulatory impediments place material limits to rate increases	Average rate setting	3	0.300
	Regulatory Compliance and Capital Planning	10%	Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Addressing compliance Issues	3	0.300
Legal Provisions (10%)	Rate Covenant	5%	>1.30x	1.30x ≥ n > 1.20x	1.20x ≥ n > 1.10x	1.10x ≥ n > 1.00x	≤ 1.00x	1.20x	3	0.150
	Debt Service Reserve Requirement	5%	DSRF funded at MADS	DSRF funded at lesser of standard 3 prong test	DSRF funded at less than 3 prong test	No explicit DSRF	No explicit DSRF	Lesser of 3 test	2	0.100
								(Aa3 = 2.17 to 2.50; A1 = 2.50 to 2.83)		2.375

Source: Moody's Municipal Utility Debt Methodology, October 2017. Data from Series 2018 Moody's Report and Moody's Financial Ratio Analysis database as of February 27, 2019, updated where available with GLWA FY18 results.



Moody's Water & Sewer Utility Scorecard (Sewer System)

Scoring on Moody's Municipal Utility Methodology										
Factor	Description	Weight	Aaa 0.50-1.49	Aa 1.50-2.49	A 2.50-3.49	Baa 3.50-4.49	Ba 4.50-5.49	GLWA Input	Category Score	GLWA Score
System Characteristics (30%)	Asset Condition - Remaining Useful Life (Net Fixed Assets / Annual Depreciation)	10%	> 75 Years	75 years ≥ n > 25 years	25 years ≥ n > 12 years	12 years ≥ n > 9 years	9 years ≥ n > 6 years	15 years	3	0.300
	System Size: (O&M in 000s)	7.5%	> \$65 million	\$65 M ≥ n > \$30 M	\$30 M ≥ n > \$10 M	\$10 M ≥ n > \$3 M	\$3 M ≥ n > \$1 M	\$265.3 million	1	0.075
	Service Area Wealth: MFI	12.5%	> 150% of US median	150% to 90% of US Median	90% to 75% of US Median	75% to 50% of US Median	50% to 40% of US Median	101.2%	2	0.250
Financial Strength and Liquidity (40%)	Annual Debt Service Coverage	15%	> 2.00x	2.00x ≥ n > 1.70x	1.70x ≥ n > 1.25x	1.25x ≥ n > 1.00x	1.00x ≥ n > 0.70x	1.3x	3	0.450
	Days Cash on Hand	15%	> 250 days	250 days ≥ n > 150 days	150 days ≥ n > 35 days	35 days ≥ n > 15 days	15 days ≥ n > 7 days	287 days	1	0.150
	Debt to Operating Revenues	10%	Less than 2.00x	2.00x < n ≤ 4.00x	4.00X < n ≤ 7.00X	7.00X < n ≤ 8.00X	8.00X < n ≤ 9.00X	5.4x	3	0.300
Management of System (20%)	Rate Management	10%	Excellent rate setting; no material political, practical, or regulatory limit to rate increases	Strong rate setting; little material political, practical, or regulatory limit to rate increases	Average rate setting; some material political, practical, or regulatory limit to rate increases	Adequate rate setting; political, practical, or regulatory impediments place material limits to rate increases	Below average rate setting; political, practical, or regulatory impediments place material limits to rate increases	Average rate setting	3	0.300
	Regulatory Compliance and Capital Planning	10%	Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Addressing compliance Issues	3	0.300
Legal Provisions (10%)	Rate Covenant	5%	>1.30x	1.30x ≥ n > 1.20x	1.20x ≥ n > 1.10x	1.10x ≥ n > 1.00x	≤ 1.00x	1.20x	3	0.150
	Debt Service Reserve Requirement	5%	DSRF funded at MADS	DSRF funded at lesser of standard 3 prong test	DSRF funded at less than 3 prong test	No explicit DSRF	No explicit DSRF	Lesser of 3 test	2	0.100
									(Aa3 = 2.17 to 2.50; A1 = 2.50 to 2.83)	2.375

Source: Moody's Municipal Utility Debt Methodology, October 2017. Data from Series 2018 Moody's Report and Moody's Financial Ratio Analysis database as of February 27, 2019, updated where available with GLWA FY18 results.



S&P Retail Water & Sewer Utility Ratings Framework

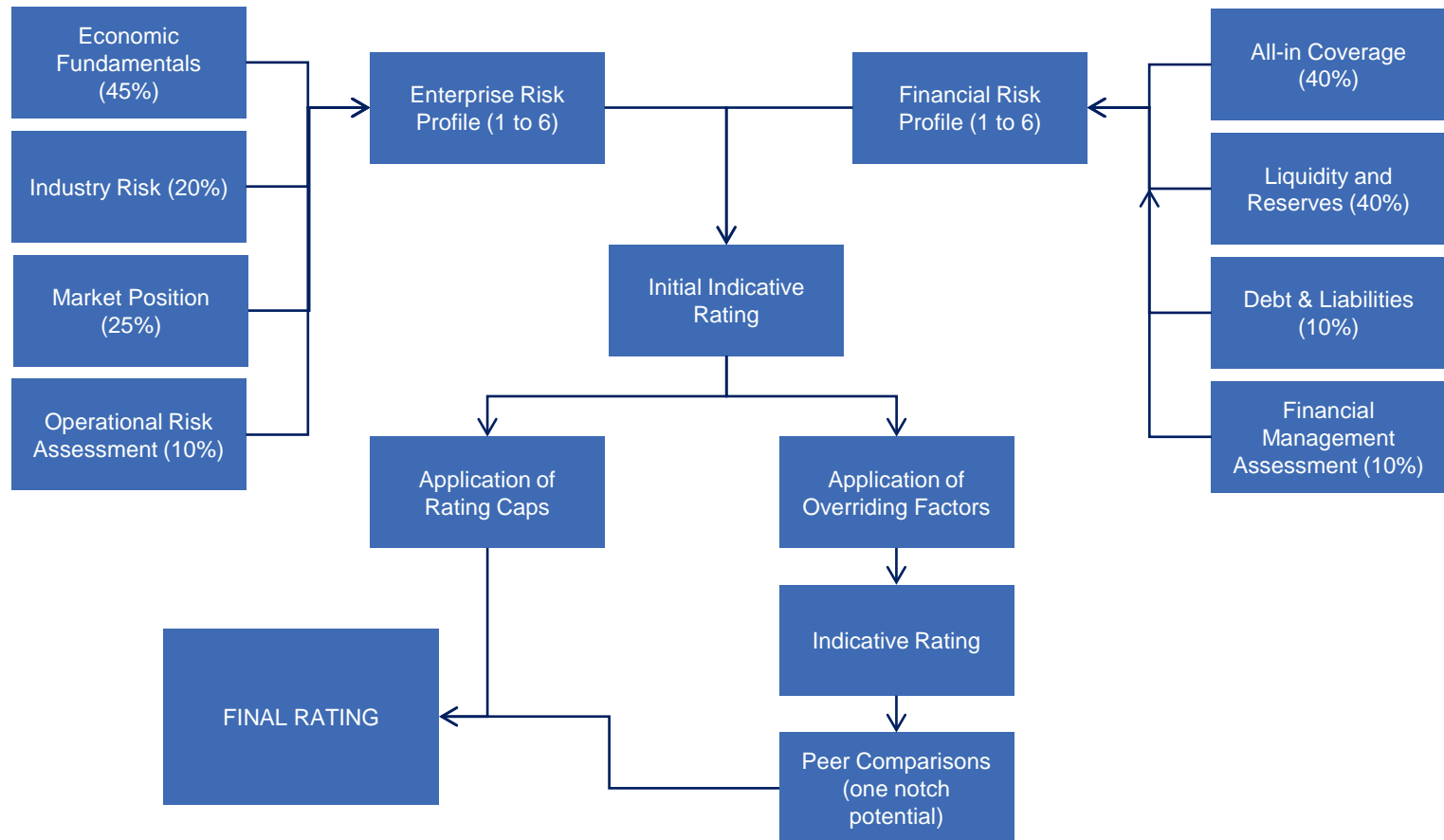
- S&P uses a hybrid approach to the rating process for GLWA, whereby retail metrics are considered but within the context of the Wholesale Utility Criteria
- Rating caps and overriding factors are applied after initial score calculated and can result in a substantially different final rating from initial indicative rating
- The weighted average of the two individual factors are rounded to the nearest whole number and the interaction between the Enterprise Risk Profile and the Financial Risk Profile determines the initial indicative rating for the Utility issuer (see table below)

		Financial Risk Profile					
		Extremely Strong 1	Very Strong 2	Strong 3	Adequate 4	Vulnerable 5	Highly Vulnerable 6
Enterprise Risk Profile	Extremely Strong 1	AAA	AA+	AA-	A	BBB+ / BBB	BB+ / BB
	Very Strong 2	AA+	AA / AA-	A+	A-	BBB / BBB-	BB / BB-
	Strong 3	AA-	A+	A	BBB+ / BBB	BBB- / BB+	BB-
	Adequate 4	A	A / A-	A- / BBB+	BBB / BBB-	BB	B+
	Vulnerable 5	BBB+	BBB / BBB-	BBB- / BB+	BB	BB-	B
	Highly Vulnerable 6	BBB-	BB	BB-	B+	B	B-

Source: S&P U.S. Public Finance Waterworks; Sanitary Sewer, And Drainage Utility Systems: Methodology & Assumptions" January 19, 2016.



S&P Retail Water & Sewer Utility Scorecard Calculation



Source: S&P U.S. Public Finance Waterworks; Sanitary Sewer, And Drainage Utility Systems: Methodology & Assumptions" January 19, 2016.



S&P Retail Water & Sewer Utility Scorecard

Enterprise Risk Profile									
Description	Weight	1	2	3	4	5	6	Pos / Neg	GLWA
Enterprise Risk Profile		Extremely Strong	Very Strong	Strong	Adequate	Vulnerable	Highly Vulnerable	Notching Factors	Score
Economic Fundamentals	45%	Stronger than US rate of GDP growth and/or >100%/125% of US median household effective buying income	Same/weaker rate than US rate of GDP growth and/or >100%/125% of US median household effective buying income	Same as US rate of GDP growth and 75-100% of US median household effective buying income	Same or weaker rate of US GDP growth and 50-75% of US median household effective buying income	Weaker rate of US GDP growth and 35-75% of US median household effective buying income	Weaker rate of US GDP growth and <35% of US median household effective buying income	Economies of scale	(3 - 1) = 2
Industry Risk	20%	Very low competitive risk of "1" applied to most utilities, given monopolies with autonomy over rates	-	-	-	-	-		1
Market Position	25%	Utility bill less than 2.25% of Median Household Effective Buying Income and less than 10% of service population living in poverty	Utility bill less than 2.25-4.50% of Median Household Effective Buying Income and less than 20% of service population living in poverty	Utility bill 4.50%+ of Median Household Effective Buying Income and less than 30% of service population living in poverty	Utility bill 4.50%+ of Median Household Effective Buying Income and less than 30% of service population living in poverty	Utility bill more than 2.00% of Median Household Effective Buying Income and more than 20-30% of service population living in poverty	Utility bill more than 2.00% of Median Household Effective Buying Income and more than 30% of service population living in poverty		Retail Metric
Operational Management Assessment	10%	Strong management, including secure water supply and system capacity. Mgmt communicates long term needs and strategic goals. Multi year, preapproved rate actions.	Strong management, with water supply and system capacity sufficient for existing customer base. Public out reach and transparency on planning. Rate actions done year to year.	Good management, with water supply and system capacity sufficient for existing customer base. Public out reach and transparency on planning. Rate actions done year to year.	Adequate management, with water supply and system capacity needs in 10-20 years. Management depth and breadth limited. Rate actions driven by legal covenants.	Management capabilities limited, with water supply and system capacity not sufficient current. Management depth limited, with reliance on outside parties. Rate actions only driven by weak condition.	-		2

Note: S&P uses a hybrid approach to the rating process for GLWA, whereby retail metrics are considered but within the context of the Wholesale Utility Criteria

Source: S&P U.S. Public Finance Waterworks; Sanitary Sewer, And Drainage Utility Systems: Methodology & Assumptions" January 19, 2016. Certain data from Series 2018 Rating Report. Indicative scores are PFM's interpretation of methodology; actual implementation may differ.



S&P Retail Water & Sewer Utility Scorecard (Cont'd)

Financial Risk Profile								GLWA
Description	Weight	1	2	3	4	5	6	Score
Financial Risk Profile		Extremely Strong	Very Strong	Strong	Adequate	Vulnerable	Highly Vulnerable	
All-in Annual Debt Service Coverage	40%	Greater than 1.60X	1.40X to < 1.60X (Water)	1.20X to < 1.40X (Sewer)	1.10X to < 1.20X	1.00X to < 1.10X	<1.00X	2 - 3
Liquidity and Reserves	40%	Greater than 150 days and more than \$75 million	90- 150 days and between \$20-\$75 million	60-90 days and between \$5-\$20 million	30-60 days and between \$1-\$5 million	15-30 days and \$1 million	<15 days and \$500,000	1
Debt and Liabilities	10%	Up to 20%	20% to 35%	35% to 50%	50% to 65%	65% to 80%	>80%	6
Financial Management Assessment	10%	Strong revenue and expense tracking and budget monitoring. Good long-term financial planning and assessment. Formal financial, investment and debt policies.	Revenue and expense tracking and budget monitoring but less robust. Good financial planning but limited in term. Formal financial, investment and debt policies, but may be lacking in certain areas.	Revenue and expense tracking done but with optimistic assumptions. Financial planning but limited updates. Some formal finance policies, but may be lacking in certain areas.	Revenue and expense projections exist, but with optimistic assumptions and limited testing. Financial planning done, but may not be realistic. Finance and investments driven by state requirements.	Revenue and expense projections ignore shortfalls, with no formal review. No long term financial planning done. Absence of formal or informal policies with use of riskier structures.	-	1

Note: S&P uses a hybrid approach to the rating process for GLWA, whereby retail metrics are considered but within the context of the Wholesale Utility Criteria

Source: S&P U.S. Public Finance Waterworks; Sanitary Sewer, And Drainage Utility Systems: Methodology & Assumptions" January 19, 2016. Certain data from Series 2018 Rating Report. Indicative scores are PFM's interpretation of methodology; actual implementation may differ.



Peer Comparison and Comparable Utility Metrics



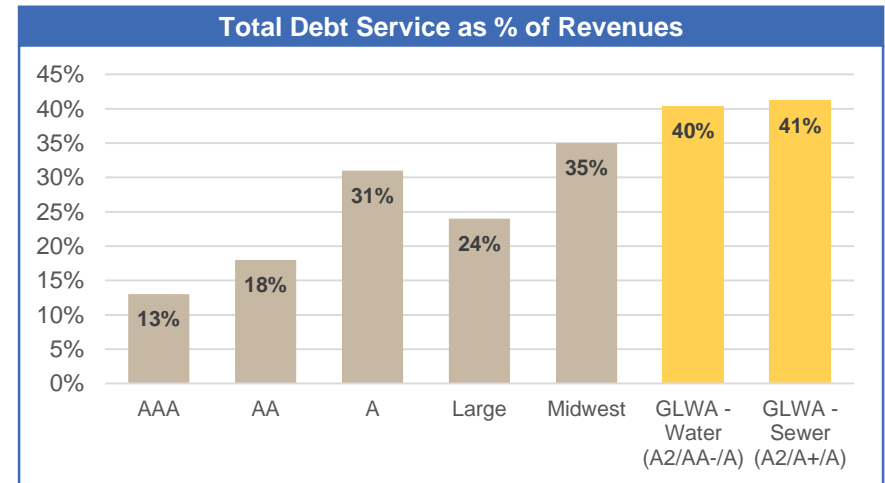
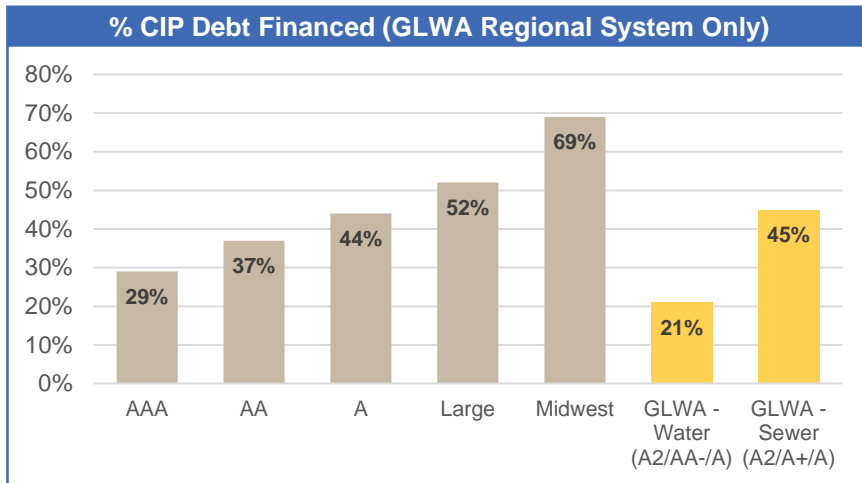
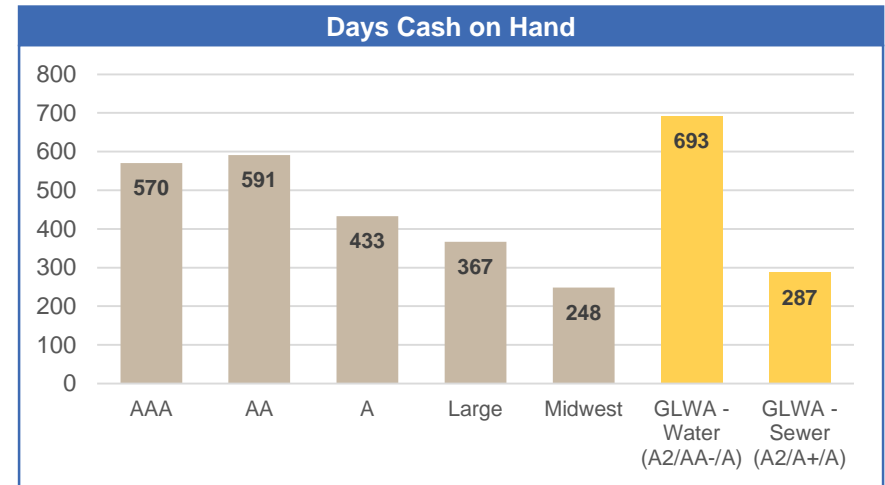
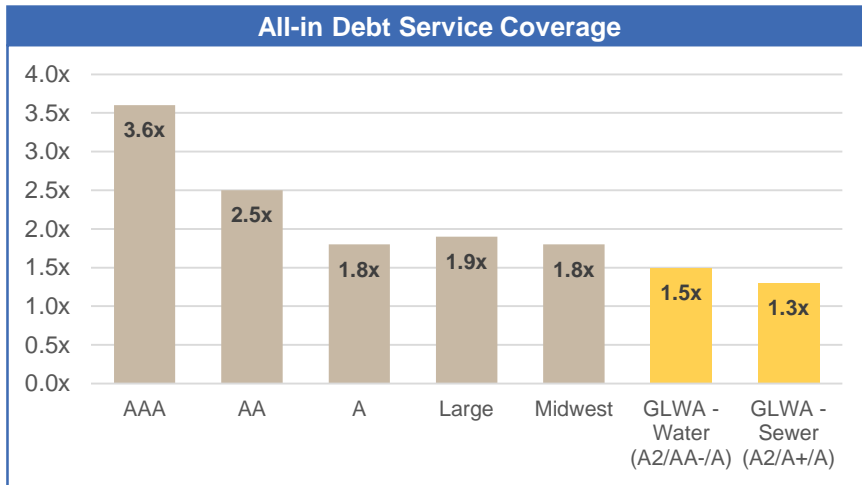
Key Financial Metrics for GLWA

The maintenance of key financial metrics is critically important to GLWA's ongoing positioning for rating upgrades and its objective of lowering GLWA's fixed costs for both the Water and Sewer enterprises.

- GLWA highest senior lien water and sewer ratings of A2/AA-/A remain among the lower half of utility ratings nationally
- GLWA continues to push forward with efforts to improve all bond ratings up to AA category ratings for both the water and sewer sectors, recognizing that debt service (for planned new money and refinancing bonds) accounts for close to 50% of the annual budget
- With continued improvement in senior lien bond ratings for water and sewer, significant reductions in fixed cost could be achieved relative to the maintenance of current ratings
- GLWA has identified a group of peer utilities against which it is benchmarking performance and establishing targets for key metric of debt service coverage and liquidity to improve bond ratings
- GLWA is also using rating agency medians on a broader range of variables to assess the progress for the upgrade of its senior lien bond ratings
- Ongoing benchmarking and continued progress in improving key financial metrics of GLWA are critical to the achievement of lower debt service cost and a path to higher credit quality



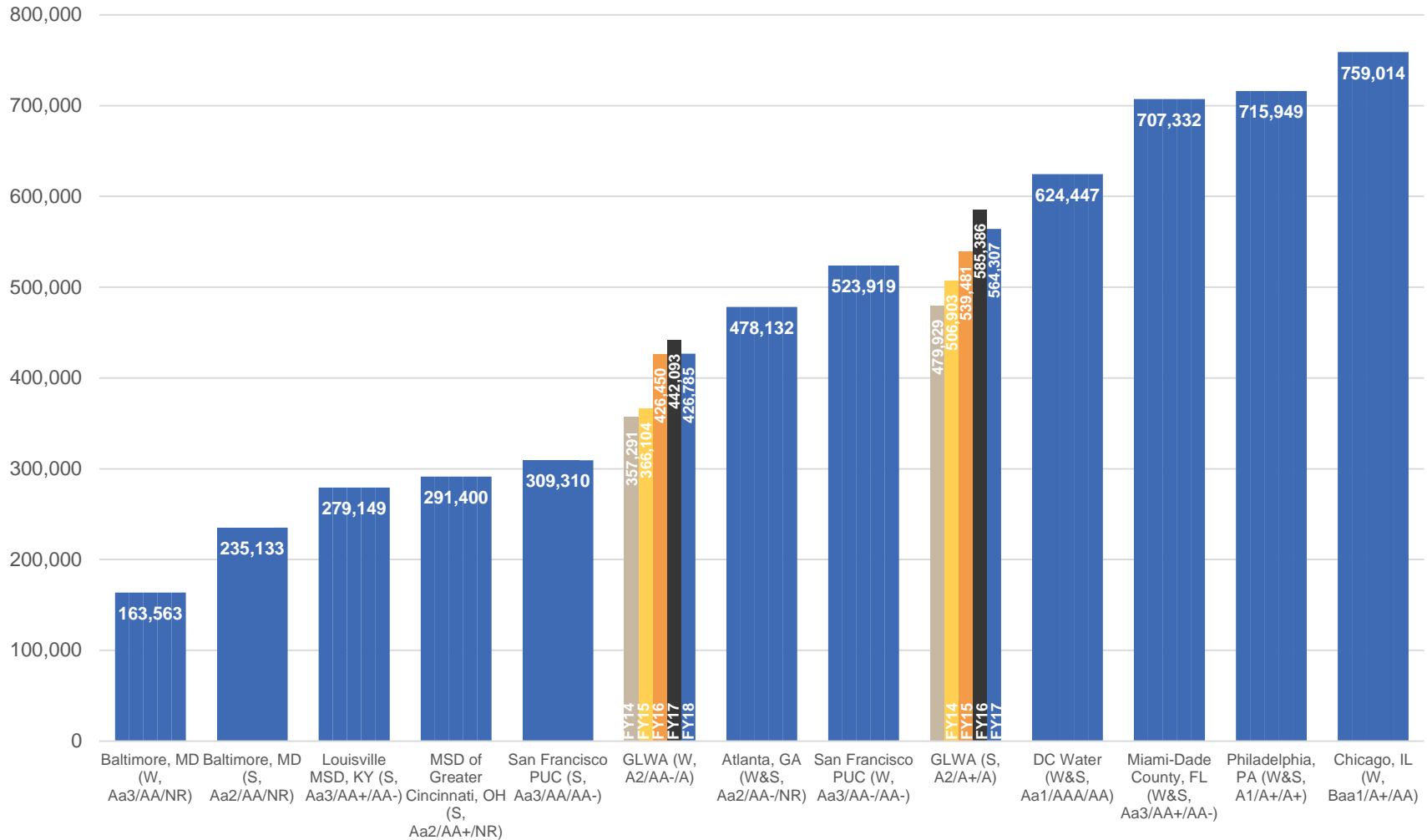
Financial Metrics Compared to 2018 Fitch Medians



Note: Fitch median data as provided by Fitch in "2019 Water and Sewer Medians" report, dated November 12, 2018. GLWA figures for All-in Debt Service Coverage, Days Cash on Hand, and Total Debt Services as % of Revenues data as of FY2018 and calculated based on FY2018 financial statements. % CIP Debt Financed data as proposed in FY20 and FY21 Biennial Budget as of February 15, 2019 and is for regional system only, excluding any capital expenditures and bond financings for DWSD.



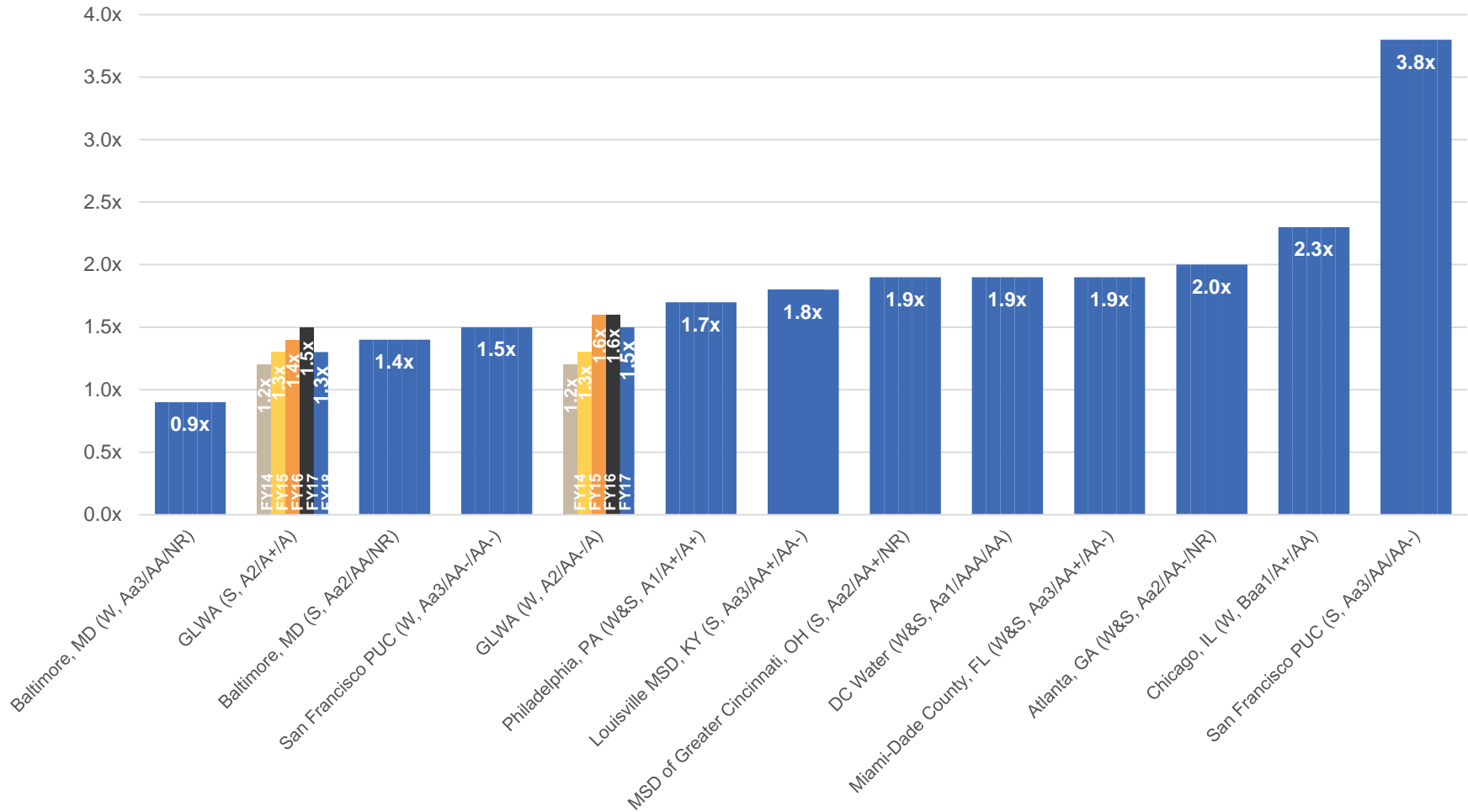
Peer Comparison of Total Operating Revenues



Source: Moody's Financial Ratio Analysis database, as of February 28, 2019. FY2018 GLWA data calculated based on FY2018 financial statements. Chicago, DC Water, Miami-Dade County, Baltimore Water, Baltimore Sewer, MSD of Greater Cincinnati, and Philadelphia data as of FY2017. All other data as of FY2018. DWSD Data shown as GLWA for FY14-15. FY16 and on includes combined data for GLWA and DWSD.



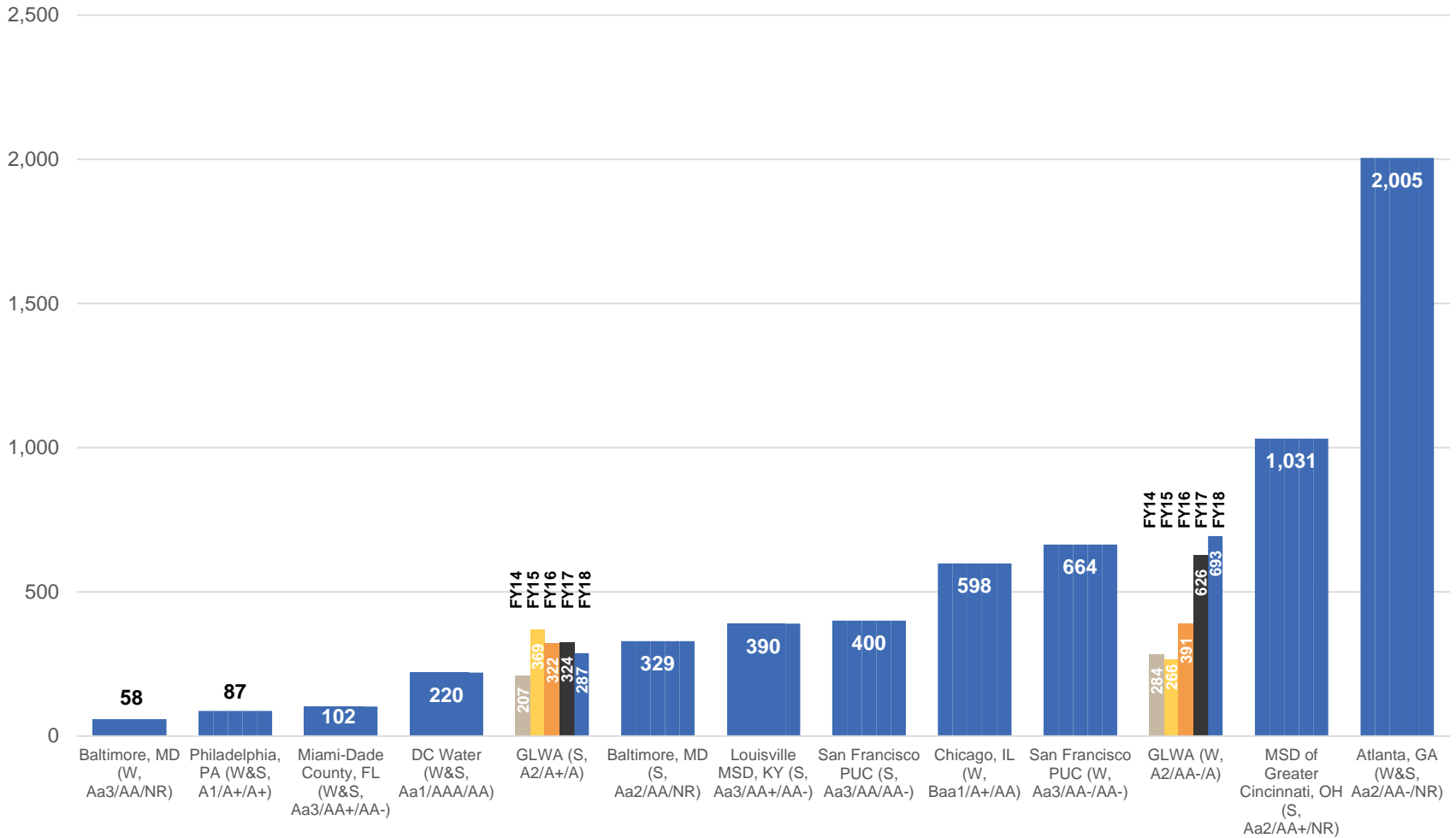
Peer Comparison of Total Debt Service Coverage



Source: Moody's Financial Ratio Analysis database, as of February 28, 2019. FY2018 GLWA data calculated based on FY2018 financial statements. Chicago, DC Water, Miami-Dade County, Baltimore Water, Baltimore Sewer, MSD of Greater Cincinnati, and Philadelphia data as of FY2017. All other data as of FY2018. DWSD Data shown as GLWA for FY14-15. FY16 and on includes combined data for GLWA and DWSD.



Peer Comparison of Unrestricted Days Cash and Investments



Source: Moody's Financial Ratio Analysis database, as of February 28, 2019. FY2018 GLWA data calculated based on FY2018 financial statements. Chicago, DC Water, Miami-Dade County, Baltimore Water, Baltimore Sewer, MSD of Greater Cincinnati, and Philadelphia data as of FY2017. All other data as of FY2018. DWSD Data shown as GLWA for FY14-15. FY16 and on includes combined data for GLWA and DWSD.



Summary of GLWA Liquidity (Moody's Methodology)

Source	Water System		Sewer System	
	FY 2018 Amount	Days Cash & Investments (days)	FY 2018 Amount	Days Cash & Investments (days)
Receiving Fund	\$36.8 million	81	\$24.9 million	34
Operations and Maintenance Fund	\$31.9 million	70	\$77.2 million	106
Extraordinary Repair and Replacement	\$27.5 million	60	\$44.0 million	61
Improvement & Extension Account - Regional	\$220.8 million	483	\$62.4 million	86
Total Unrestricted Liquidity	\$317.0 million	693	\$208.5 million	287

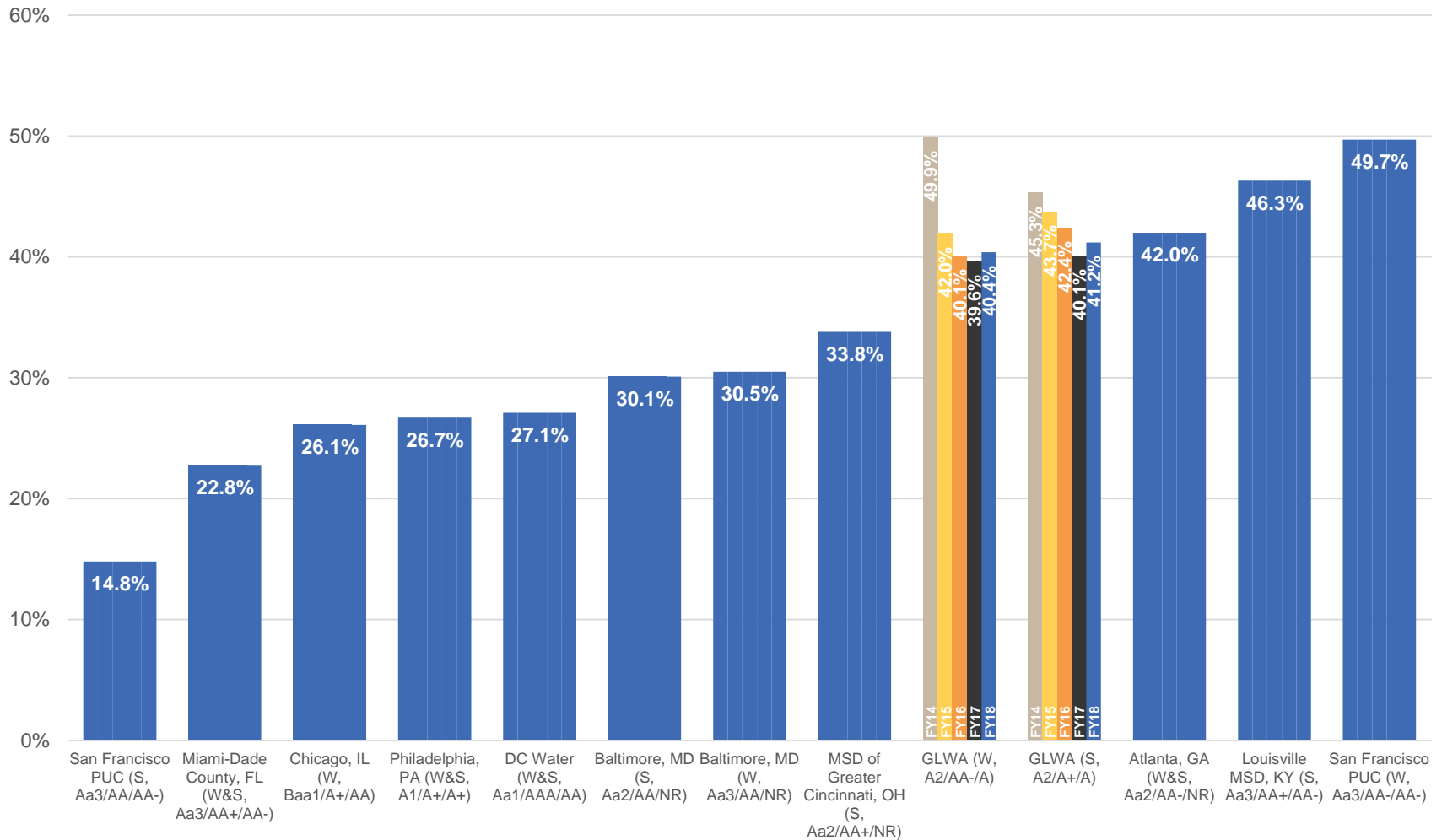
Operating Expense	FY 2018 Amount	FY 2018 Amount
Transfer to O&M Fund – Regional	\$127.6 million	\$201.9 million
Transfer to O&M Fund – Local	\$39.3 million	\$63.4 million
Total Operating Transfers	\$167.0 million	\$265.3 million

Source: FY2018 financial statements

Note: Moody's Days Cash Calculation includes O&M transfers related to the local system but excludes local system liquidity.



Peer Comparison of Debt Service as a % of Operating Revenues



Source: Moody's Financial Ratio Analysis database, as of February 28, 2019. FY2018 GLWA data calculated based on FY2018 financial statements. Chicago, DC Water, Miami-Dade County, Baltimore Water, Baltimore Sewer, MSD of Greater Cincinnati, and Philadelphia data as of FY2017. All other data as of FY2018. DWSD Data shown as GLWA for FY13-15. FY16 and on includes combined data for GLWA and DWSD.