Agenda 9A Rating Agency Upgrades

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: March 27, 2020

To: Great Lakes Water Authority Audit Committee

From: Nicolette N. Bateson, CPA, Chief Financial Officer & Treasurer

Re: Rating Agency Upgrades – March 2020

Background: In March 2020, the Great Lakes Water Authority (GLWA) received positive ratings actions from Fitch Ratings, Moody's Investor Service, and Standard & Poor's.

Great Lakes Water Authority Water & Sewerage System Bonds
Ratings History (Prior to January 1, 2016 the debt was obligation was in the name of DWSD)

Recent rating agency actions are in green.

(All ratings are for water and sewage disposal system unless denoted with "W" or "S" respectively.)

Rating Agency	Standard & Poor's					Moody's			Fitch				
	Rating	Senior		Second		Rating	Senior	Second	Rating	Senior		Second	
Outlook		Stable		Stable			Stable	Stable		Stable		Stable	
Investment Grade													
Strongest	AAA					Aaa			AAA				
	AA+					Aa1			AA+				
	AA					Aa2			AA				
	AA-	**3/13/2020**	(1)			Aa3			AA-				
	A+	S - 9/5/2018		**3/13/2020**	(2)	**A1**	**3/13/2020**		**A+**	**3/13/2020**			
	A			S - 9/5/2018		**A2**	9/4/2018	**3/13/2020**	**A**	9/30/2016	(4)	**3/13/2020**	
	A-	9/30/2016	(3)			A3	9/30/2016	9/4/2018	A-			9/30/2016	(4)
	BBB+	8/25/2014		9/30/2016 8/25/2014	(3)	Baa1	2/9/2016	9/30/2016	BBB+				
	BBB					Baa2		2/9/2016	BBB	9/3/2015			
	BBB-					Baa3	8/27/2015		BBB-	8/25/2014		9/3/2015	
Non-Investment Grade													
	BB+					Ba1		8/27/2015	**BB+**	2/28/2014		8/25/2014	
	BB					Ba2	8/25/2014		BB			2/28/2014	
	BB-					Ba3		8/25/2014	BB-				
	B+					B1			B+				
	B					B2			B				
	B-					B3			B-				
	CCC+					Caa1			CCC+				
	CCC	3/25/2014		3/25/2014		Caa2			CCC				
	CCC-					Caa3			CCC-				
	CC					Ca			CC				
Weakest	C					C			C				
	D								D				

(1) 9/5/2018 Water Rating Affirmed 3/13/2020
(2) 3/13/2020 Rating for Sewer Senior and Second Lien upgraded to same level as water
(3) DWSD Rating of 11.9.2015 affirmed for GLWA on 5.23.2016 and affirmed on 9.30.2016
(4) 9/30/2016 Rating Affirmed 9/4/2018

Updated 3.13.2020

Analysis: This is good news for as GLWA contemplates a refunding transaction in 2020.

1. Fitch Press Release – Water & Sewer
2. Fitch Credit Report – Water & Sewer
3. Moody's Press Release – Water
4. Moody's Press Release – Sewer
5. Moody's Credit Opinion – Water & Sewer
6. Standard & Poor's Research Report – Water
7. Standard & Poor's Research Report – Sewer

Proposed Action: Receive and file report.

FitchRatings

Fitch Upgrades Great Lakes Water Auth, MI's Water & Sewer Revs to 'A+' Sen/'A' Sub; Outlook Stable

Fitch Ratings - Austin - 13 March 2020:

Fitch Ratings has assigned the following ratings to revenue bonds issued by the Great Lakes Water Authority, MI (GLWA or the authority):

--Approximately $39,670,000 Water Supply System Revenue Senior Lien Bonds, Series 2020A, 'A+';

--Approximately $39,670,000 Water Supply System Revenue Second Lien Bonds, Series 2020B, 'A';

--Approximately $324,300,000 Water Supply System Revenue Refunding Senior Lien Bonds, Series 2020C (Federally Taxable), 'A+';

--Approximately $47,000,000 Water Supply System Revenue Refunding Second Lien Bonds, Series 2020D (Federally Taxable), 'A';

--Approximately $535,975,000 Sewage Disposal System Revenue Refunding Senior Lien Bonds, Series 2020A (Federally Taxable), 'A+';

--Approximately and $160,280,000 Sewage Disposal System Revenue Refunding Second Lien Bonds, Series 2020B (Federally Taxable), 'A'.

All bonds are scheduled to sell [via negotiation the week of March 16, 2020]. Proceeds will be used to refund certain GLWA sewer system and water system (the systems) debt for interest savings, fund certain water system capital expenditures and pay costs of issuance.

In addition, Fitch has upgraded the following outstanding GLWA bonds, including bonds previously issued by the city of Detroit (the city) and the Michigan Finance Authority, MI on behalf of the Detroit Water and Sewerage Department (DWSD) and assumed by GLWA (all pre-refunding):

--$1.6 billion in senior lien water revenue bonds to 'A+' from 'A';

--$668 million in second lien water revenue bonds to 'A' from 'A-';

--$1.9 billion in senior lien sewer revenue bonds to 'A+' from 'A';

--$746 million in second lien sewer revenue bonds to 'A' from 'A-'.

The Rating Outlook is revised to Stable from Positive.

SECURITY

Senior lien water and sewer bonds are separately secured by a first lien on net revenues of each respective system. Second lien bonds are separately secured by a second lien on the net revenues of each respective system after payment of senior lien bonds.

KEY RATING DRIVERS

UPGRADES REFLECT IMPROVED FINANCIALS: The upgrades reflect sustained improvements to the authority's financial profile. Changes in rate-setting practices in recent years as well as accumulation of reserves under the master bond ordinances have enhanced prospects for achieving or beating forecast expectations and help to adequately insulate GLWA from high city of Detroit retail delinquencies.

LEASE REINFORCES SEPARATE OPERATIONS: All system funds and accounts are separate and distinct from other city funds, including Detroit's general fund. The lease of the systems by GLWA provides further assurance that system operations will remain independent of the city.

HIGHLY LEVERAGED DEBT PROFILE: The systems' debt load is expected to remain elevated for the foreseeable future as a result of legacy issuance and moderate ongoing borrowing. However, some shorter-term improvements are possible as the use of pay-as-you-go capital funding should help to moderate debt levels.

EXPANSIVE SERVICE TERRITORY: The systems provide essential services to a broad area. The water system covers almost 40% of Michigan's population, while the sewer system includes about 30% of Michigan's population. The majority of GLWA's revenues come from suburban customers.

STRONG RATE-ADJUSTMENT HISTORY: The governing bodies have instituted annual rate hikes in support of financial and capital needs. Continued annual adjustments are included in the forecast and will be needed to meet rising debt service and sustain financial performance.

RATING SENSITIVITIES

Developments that May, Individually or Collectively, Lead to a Positive Rating Action:

--A decline in leverage metrics coupled with sustained improvements to the authority's operational and financial profiles.

Developments that May, Individually or Collectively, Lead to a Negative Rating Action:

--Increases in debt issuance levels due to revisions in the capital plan or reductions in operating cash flow would be viewed unfavorably given the already high leverage of both systems.

--Failure to maintain the improved operational and financial performance of the authority's water and sewer utilities due to insufficient revenue recovery or higher than expected costs.

CREDIT PROFILE

GLWA entered into 40-year leases of DWSD's water and sewer systems (except for the local city infrastructure), as well as a water and sewer services agreement (combined lease agreements) with the city in

June 2015. The lease agreements became effective on Jan. 1, 2016, at which point GLWA assumed operational control of all leased assets of the regional water and sewer systems; the leases also conveyed an interest in all revenues of both the water and sewer systems (including both the regional and local city retail systems). At the same time, GLWA assumed all liabilities of the water and sewer systems, including all outstanding indebtedness of the city related to the respective systems.

IMPROVED FINANCIALS DRIVE UPGRADES

Audited fiscal 2019 results for the water system yielded Fitch-calculated senior debt service coverage (DSC) of approximately 2.2x, total DSC of 1.6x, and coverage of full obligations of 1.4x (including the DWSD lease-payment transfer and other transfers required under the lease agreements) and liquidity of 718 days cash. Fitch's calculations include both GLWA and DWSD operating revenues and expenses given the requirements under the trust indenture.

Similarly, audited fiscal 2019 results for the sewer system yielded Fitch-calculated senior DSC of approximately 2.3x, total DSC of 1.4x and coverage of full obligations of 1.2x (which includes transfers). Fiscal 2019 days cash was more than six months of operational costs. Financial results for both systems are very favorable for a wholesale provider under Fitch's criteria.

Forecasts provided by the issuer, which Fitch deems reasonable, show sustained improvements in DSC for both systems. Actual results have typically outperformed management forecasts over the past several years, aided by changes to the rate structures (as discussed below), gains in operational efficiencies, and strong cost control. Fitch notes that management's current forecast does not include expected savings from the current transactions, which enhance forecast expectations.

SYSTEM LEVERAGE REMAINS HIGH

Leverage for both systems is elevated and Fitch expects it to remain so for the foreseeable future. This said, leverage ratios should demonstrate some improvements over the next two to five years based on moderating capital improvement plan (CIP) spending and the use of more pay-go funding.

Fiscal 2019 ended with GLWA's long-term debt per capita (inclusive of the lease-related obligations) at a high $800 for water and $1,360 for sewer (compared to Fitch's equivalent 'A' median of $784). For the same period, debt to net plant assets was also elevated for both systems (at 163% and 142% for water and sewer, respectively). Lastly, debt to funds available for debt service was 11.6x and 11.3x for water and sewer versus Fitch's 'A'-median equivalent of 7.6x.

GLWA's revenues fund the DWSD CIPs through the aforementioned lease payments (described further below), debt issued by GLWA for the local projects (including the new money portion related to this sale), and revenue-generated Improvement and Extension Fund contributions. The consolidated GLWA regional and DWSD local 2020-2024 CIPs, including regional budgeted capital outlays and taking into account expected actual spending for GLWA's portion, total $959 million for water and $772 million for sewer.

CIP spending is mostly comparable to recent CIPs reviewed by Fitch, though somewhat higher on the water side. Funding for the consolidated CIPs is expected to be provided by approximately 50% debt proceeds and 50% pay-go for the water system and 40% debt/60% pay-go for the sewer system, with the amount of pay-go representing a significant amount of current resources for a wholesale entity.

The goal of GLWA's CIP is implementation of the water and sewer master plans. The water plan's primary focus has been the decommissioning of one of the water treatment plants (accounting for over 15% of system capacity) in order to "right size" the system, along with other system optimization. Although it has created upfront costs, longer-term operational efficiencies are expected. The more recently finalized sewer master plan identifies five outcomes, including focusing on, among other things, public health and safety.

RATES CONTRIBUTE TO IMPROVED FINANCES

Effective fiscal 2016, GLWA revised its water-rate structure to shift to an increasing amount of fixed monthly charge recovery (60% versus 40% the prior year). These changes were similar to the implementation of a rate simplification initiative for suburban sewer customers effective for fiscal 2015 that identifies each customer's proportionate costs based on historical average shares, with such shares billed monthly and locked in for three years before being subject to recalculation. Although rates are elevated, the primarily fixed-rate nature of each has provided greater revenue stability and enhanced financial performance.

BROAD SERVICE AREA ENHANCES SYSTEM STABILITY

The water system is a regional provider serving around 3.8 million people or almost 40% of Michigan's population, including the city's population of around 675,000. The water system serves the city via DWSD on a retail basis and 112 communities through 87 service contracts and provides service to Genesee County Drain Commissioner through a reciprocal backup contract. The sewer system is also a regional provider serving around 2.8 million people or around 30% of Michigan's population, including the city.

Population and customer growth for both systems experienced annual declines for a number of years. However, recent estimates indicate that the population has stabilized. Wealth levels in the city are low (about 50% the US average), while poverty (36%) and unemployment levels (7.7% as of Dec 2019) are high. However, figures for the metropolitan area overall, which includes the city as well as the suburbs, are generally in line with state and national averages.

LEASE AGREEMENTS PROVIDE FINANCIAL INSULATION

Fitch believes the leases and supporting documents effectively codify the legal separation between the systems and the city, and insulate the systems from being included in any future city bankruptcy proceedings, if one were to occur. DWSD continues to own and operate the city retail water and sewer systems and serves as GLWA's agent with regards to the rate setting, billing and collection of city retail accounts. However, GLWA can terminate DWSD's agent responsibilities in the event of nonperformance by DWSD as described in a Water and Sewer Service Agreement between the city and GLWA.

Key terms of the agreements, which are embedded in GLWA's financial projections, include a $50 million annual lease payment to the city, although such moneys may only be used at the city's option to fund pay-go capital improvements related to Detroit's local water and sewer systems or DWSD-related debt service associated with the local systems and/or GLWA regional systems. An assistance program is also funded and replenished annually as part of GLWA's budget for low-income customers throughout GLWA's service territory. In addition, a budget stabilization fund is funded from city retail customers to ensure moneys are available to meet the city's portion of GLWA's annual revenue requirement. Deposits required to fund the lease payment and other created accounts like the assistance account occur subsequent to payment of debt service; however, these are added costs that ratepayers must absorb.

Summary of Financial Adjustments

In its analysis, Fitch adjusted GLWA's 'Statement of Revenues, Expenses and Changes in Net Position' to include information from DWSD's 'Statement of Revenues, Expenses and Changes in Net Position'. Fitch also adjusted GLWA's 'Statement of Revenues, Expenses and Changes in Net Position' to treat expenses related to the lease payment, Water Residential Assistance Program, and pension payments as a transfer out. The adjustments are made to provide greater comparability of GLWA's financial position in accordance with the flow of funds under the bond ordinances and lease-related agreements.

In addition to the sources of information identified in the Revenue-Supported Rating Criteria, this action was additionally informed by information from Lumesis, GLWA, and its agents.

ESG Considerations

ESG issues are credit neutral or have only a minimal credit impact on the entity(ies), either due to their nature or the way in which they are being managed by the entity(ies). For more information on Fitch's ESG Relevance Scores, visit www.fitchratings.com/esg.

RATING ACTIONS

ENTITY/DEBT	RATING		PRIOR
Great Lakes Water Authority (MI) [Sewer]			
Great Lakes Water Authority (MI) /Sewer Revenues (2nd Lien)/1 LT	LT A Upgrade		A-
Great Lakes Water Authority (MI) /Sewer Revenues/1 LT	LT A+ Upgrade		A
Great Lakes Water Authority (MI) [Water]			
Great Lakes Water Authority (MI) /Water Revenues (2nd Lien)/1 LT	LT A Upgrade		A-
Great Lakes Water Authority (MI) /Water Revenues/1 LT	LT A+ Upgrade		A

Additional information is available on www.fitchratings.com

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Applicable Criteria

U.S. Water and Sewer Rating Criteria (pub. 29 Nov 2018)
Public Sector, Revenue-Supported Entities Rating Criteria (pub. 07 Nov 2019)

Additional Disclosures

Dodd-Frank Rating Information Disclosure Form
Solicitation Status
Endorsement Policy

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Great Lakes Water Authority, Michigan

Water Supply and Sewage Disposal System Revenue Bonds

New Issue Details

Sale Date: Expected to sell via negotiation the week of March 23, 2020.

Series: $39,670,000 Water Supply System Revenue Senior Lien Bonds, Series 2020A; $39,670,000 Water Supply System Revenue Second Lien Bonds, Series 2020B; $324,300,000 Water Supply System Revenue Refunding Senior Lien Bonds, Series 2020C (Federally Taxable); $47,000,000 Water Supply System Revenue Refunding Second Lien Bonds, Series 2020D (Federally Taxable); $535,975,000 Sewage Disposal System Revenue Refunding Senior Lien Bonds, Series 2020A (Federally Taxable); and $160,280,000 Sewage Disposal System Revenue Refunding Second Lien Bonds, Series 2020B (Federally Taxable).

Purpose: To refund certain Great Lakes Water Authority (GLWA, or the authority) sewer system and water system (the systems) debt for interest savings, fund certain water system capital expenditures and pay issuance costs.

Security: Senior lien water and sewer bonds are separately secured by a first lien on the net revenues of each respective system. Second lien bonds are separately secured by a second lien on the net revenues of each respective system after payment of senior lien bonds.

Key Rating Drivers

Upgrades Reflect Improved Financials: The upgrades reflect sustained improvement to the authority's financial profile. Changes in rate-setting practices in recent years, as well as accumulation of reserves under master bond ordinances, have enhanced the prospects for achieving or beating expectations and are helping to adequately insulate GLWA from high retail delinquencies in the City of Detroit (the city).

Lease Reinforces Separate Operations: All of the systems' funds and accounts are separate and distinct from other city funds, including Detroit's general fund. GLWA's lease of the systems provides further assurance that system operations will remain independent of the city.

Highly Leveraged Debt Profile: The systems' debt load is expected to remain elevated for the foreseeable future due to legacy issuance and moderate ongoing borrowing. However, some shorter term improvements are possible, as the use of pay-as-you-go capital funding is expected to help moderate debt levels.

Expansive Service Territory: The systems provide essential services to a broad area. The water and sewer systems cover almost 40% and 30% of Michigan's population, respectively. The majority of GLWA revenues come from suburban customers.

Strong Rate-Adjustment History: The governing bodies have instituted annual rate hikes to support financial and capital needs. Continuing annual adjustments are included in the forecast and will be needed to meet rising debt service and sustain financial performance.

Ratings

New Issue	
$39,670,000 Water Supply System Revenue Senior Lien Bonds, Series 2020A	A+
$39,670,000 Water Supply System Revenue Second Lien Bonds, Series 2020B	A
$324,300,000 Water Supply System Revenue Refunding Senior Lien Bonds, Series 2020C (Federally Taxable)	A+
$47,000,000 Water Supply System Revenue Refunding Second Lien Bonds, Series 2020D (Federally Taxable)	A
$535,975,000 Sewage Disposal System Revenue Refunding Senior Lien Bonds, Series 2020A (Federally Taxable)	A+
$160,280,000 Sewage Disposal System Revenue Refunding Second Lien Bonds, Series 2020B (Federally Taxable)	A
Outstanding Debt	
Water Supply System Senior Lien Bonds	A+
Water Supply System Second Lien Bonds	A
Sewage Disposal System Senior Lien Bonds	A+
Sewage Disposal System Second Lien Bonds	A

Rating Outlook

Stable

Applicable Criteria

Public Sector, Revenue-Supported Entities Rating Criteria (November 2019)

U.S. Water and Sewer Rating Criteria (November 2018)

Related Research

Fitch Upgrades Great Lakes Water Auth, MI's Water & Sewer Revs to 'A+' Sen/'A' Sub; Outlook Stable (March 2020)

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Rating Sensitivities

Developments that May, Individually or Collectively, Lead to a Positive Rating Action:

- a decline in leverage metrics coupled with sustained improvements to the authority's operational and financial profiles.

Developments that May, Individually or Collectively, Lead to a Negative Rating Action:

- increased debt issuance due to capital plan revisions or operating cash flow reductions when factoring the already high leverage of both systems.
- failure to maintain the improved operational and financial performance of the authority's water and sewer utilities due to insufficient revenue recovery or higher-than-expected costs.

Credit Profile

GLWA entered into 40-year leases with Detroit Water & Sewerage Department's (DWSD's) water and sewer systems (except for the local city infrastructure), as well as a water and sewer services agreement (combined lease agreements) with the city in June 2015. The lease agreements became effective on Jan. 1, 2016, at which point GLWA assumed operational control of all leased assets of the regional water and sewer systems. The leases also conveyed an interest in all revenues of both the water and sewer systems (including the regional and local city retail systems). At the same time, GLWA assumed all liabilities of the water and sewer systems, including all outstanding indebtedness of the city related to the respective systems.

Improved Financials Drive Upgrades

Audited fiscal 2019 results for the water system yielded Fitch Ratings-calculated senior debt service coverage (DSC) of approximately 2.2x, total DSC of 1.6x, coverage of full obligations of 1.4x (including the DWSD lease-payment transfer and other transfers required under the lease agreements) and liquidity of 718 days' cash. Fitch's calculations include both GLWA and DWSD operating revenues and expenses due to requirements under the trust indenture.

Similarly, audited fiscal 2019 results for the sewer system yielded Fitch-calculated senior DSC of approximately 2.3x, total DSC of 1.4x and coverage of full obligations of 1.2x (which includes transfers). Fiscal 2019 days' cash exceeded six months of operational costs. Financial results for both systems are very favorable for a wholesale provider under Fitch's criteria.

Forecasts provided by the issuer, which Fitch deems reasonable, show sustained DSC improvement for both systems. Actual results have typically outperformed management forecasts in recent years, aided by changes to rate structures (*as discussed below*), gains in operational efficiencies and strong cost control. Fitch notes that management's current forecast does not factor anticipated savings from the current transactions, which further enhances the forecast expectations.

System Leverage Remains High

Leverage for both systems is elevated, and Fitch expects it to remain so for the foreseeable future. Notwithstanding this, leverage ratios should demonstrate some improvement over the next two to five years based on moderating capital improvement plan (CIP) spending and the use of more pay-as-you-go funding.

Fiscal 2019 ended with GLWA's long-term debt per capita (inclusive of lease-related obligations) at a high $800 for water and $1,360 for sewer (compared to Fitch's equivalent 'A' median of $784). For the same period, debt to net plant assets was also elevated for both systems, at 163% and 142% for water and sewer, respectively. Lastly, debt to funds available for DSC was 11.1x and 11.4x for water and sewer, respectively, versus Fitch's 'A' median equivalent of 7.6x.

GLWA revenues fund the DWSD CIPs through the aforementioned lease payments (*described further below*), debt issued by GLWA for the local projects (including the new-money portion related to this sale) and revenue-generated Improvement and Extension Fund contributions. The consolidated GLWA regional and DWSD local 2020–2024 CIPs, including regional

Rating History — Water Supply System Senior Lien

Rating	Action	Outlook/ Watch	Date
A+	Upgraded	Stable	3/13/20
A	Affirmed	Positive	9/4/18
A	Upgraded	Stable	9/30/16
BBB	Affirmed	Stable	12/15/15
BBB	Upgraded	Stable	9/2/15
BBB–	Upgraded	Stable	9/3/14
BB+	Affirmed	Positive[a]	8/25/14
BB+	Affirmed	Negative[a]	5/30/14
BB+	Affirmed	Negative[a]	2/28/14
BB+	Downgraded	Negative[a]	11/27/13
BBB+	Affirmed	Negative[a]	6/14/13
BBB+	Downgraded	Negative	4/1/13
A	Downgraded	Stable	4/1/11
AA–	Revised	Stable	4/30/10
A+	Affirmed	Negative	4/18/08
A+	Affirmed	Stable	1/28/05
A+	Upgraded	—	10/29/99
A	Assigned	—	11/16/95

[a]Rating Watch.

Rating History — Water Supply System Second Lien

Rating	Action	Outlook/ Watch	Date
A	Upgraded	Stable	3/13/20
A–	Affirmed	Positive	9/4/18
A–	Upgraded	Stable	9/30/16
BBB–	Affirmed	Stable	12/15/15
BBB–	Upgraded	Stable	9/2/15
BB+	Upgraded	Stable	9/3/14
BB	Affirmed	Positive[a]	8/25/14
BB	Affirmed	Negative[a]	5/30/14
BB	Downgraded	Negative[a]	2/28/14
BBB	Affirmed	Negative[a]	11/27/13
BBB	Affirmed	Negative[a]	6/14/13
BBB	Downgraded	Negative	4/1/13
A–	Downgraded	Stable	4/1/11
A+	Revised	Stable	4/30/10
A	Affirmed	Negative	4/18/08
A	Affirmed	Stable	1/28/05
A	Upgraded	—	10/29/99
A–	Assigned	—	11/16/95

[a]Rating Watch.

budgeted capital outlays and factoring expected actual spending for GLWA's portion, total $959 million for water and $772 million for sewer.

CIP spending is mostly comparable to recent CIPs reviewed by Fitch, although somewhat higher on the water side. Funding for the consolidated CIPs is expected to originate from roughly 58% debt proceeds and 42% pay-as you-go for the water system coupled with 53% debt/47% pay-as-you-go for the sewer system, with the pay-as-you-go amount representing a significant amount of current resources for a wholesale entity.

The goal of GLWA's CIP is to implement the water and sewer master plans. The water plan's primary focus has been to decommission one of the water treatment plants (accounting for over 15% of system capacity) to "right size" the system, along with other system optimization. Although this has created upfront costs, longer-term operational efficiencies are expected. The more recently finalized sewer master plan identifies five outcomes, including a focus on public health and safety, among other objectives.

Rates Contribute to Improved Finances

Effective fiscal 2016, GLWA revised its water-rate structure to shift to an increasing amount of fixed monthly charge recovery (60% versus 40% for the prior year). These changes were similar to a rate simplification initiative introduced for suburban sewer customers (effective fiscal 2015) that identifies each customer's proportionate costs based on historical average shares, with such shares billed monthly and locked in for three years before being subject to recalculation. Although rates are elevated, the primarily fixed-rate nature of each has provided greater revenue stability and enhanced financial performance.

Broad Service Area Enhances System Stability

The water system is a regional provider, serving about 3.8 million people (or almost 40% of Michigan's population), including the city's population of roughly 675,000. The water system serves the city via DWSD on a retail basis and 112 communities through 87 service contracts, as well as the Genesee County Drain Commissioner through a reciprocal backup contract. The sewer system is also a regional provider, serving around 2.8 million people (or approximately 30% of Michigan's population), including the city.

Population and customer growth for both systems experienced annual declines for a number of years, although recent estimates indicate the population has stabilized. Wealth levels in the city are low (about 50% of the national average), while poverty (36%) and unemployment (7.7% as of December 2019) are high. However, overall figures for the metropolitan area, including the city and its suburbs, are generally in line with state and national averages.

Lease Agreements Provide Financial Insulation

Fitch believes the leases and supporting documents effectively codify the legal separation between the systems and the city, and insulate the systems from being included in any future city bankruptcy proceedings, if such were to occur. DWSD continues to own and operate the city retail water and sewer systems and serves as GLWA's agent for rate-setting, billing and collection of city retail accounts. However, GLWA can terminate DWSD's agent responsibilities in the event of nonperformance by DWSD, as described in a water and sewer service agreement between the city and GLWA.

Key terms of the agreements, which are embedded in GLWA's financial projections, include a $50 million annual lease payment to the city. However, such moneys may only be used at the city's option to fund pay-go capital improvements related to Detroit's local water and sewer systems or DWSD-related debt service associated with the local systems and/or GLWA regional systems. An assistance program is also funded and replenished annually as part of GLWA's budget for low-income customers throughout GLWA's service territory. In addition, a budget stabilization reserve is funded with proceeds from city retail customers to ensure moneys are available to meet the city portion of GLWA's annual revenue requirement. Deposits necessary to fund the lease payment and other created accounts, such as the assistance account, occur subsequent to debt service payment; however, these are added costs that ratepayers must absorb.

Rating History — Sewage Disposal System Senior Lien

Rating	Action	Outlook/ Watch	Date
A+	Upgraded	Stable	3/13/20
A	Affirmed	Positive	9/4/18
A	Upgraded	Stable	9/30/16
BBB	Affirmed	Stable	12/15/15
BBB	Upgraded	Stable	9/2/15
BBB–	Upgraded	Stable	9/3/14
BB+	Affirmed	Positive[a]	8/25/14
BB+	Affirmed	Negative[a]	5/30/14
BB+	Downgraded	Negative[a]	2/27/14
BBB+	Affirmed	Negative[a]	11/27/13
BBB+	Affirmed	Negative[a]	6/14/13
BBB+	Downgraded	Negative	4/1/13
A–	Downgraded	Stable	5/29/12
A	Downgraded	Stable	4/1/11
AA–	Revised	Stable	4/30/10
A+	Affirmed	Negative	4/18/08
A+	Affirmed	Stable	1/28/05
A+	Upgraded	—	10/29/99
A	Assigned	—	11/16/95

[a]Rating Watch.

Rating History — Sewage Disposal System Second Lien

Rating	Action	Outlook/ Watch	Date
A	Upgraded	Stable	3/13/20
A–	Affirmed	Positive	9/4/18
A–	Upgraded	Stable	9/30/16
BBB–	Affirmed	Stable	12/15/15
BBB–	Upgraded	Stable	9/2/15
BB+	Upgraded	Stable	9/3/14
BB	Affirmed	Positive[a]	8/25/14
BB	Affirmed	Negative[a]	5/30/14
BB	Downgraded	Negative[a]	2/27/14
BBB+	Upgraded	Negative[a]	11/27/13
BBB	Affirmed	Negative[a]	6/14/13
BBB	Downgraded	Negative	4/1/12
BBB+	Downgraded	Stable	5/29/12
A–	Downgraded	Stable	4/1/11
A+	Revised	Stable	4/30/10
A	Affirmed	Negative	4/18/08
A	Affirmed	Stable	1/28/05
A	Upgraded	—	10/29/99
A–	Assigned	—	11/16/95

[a]Rating Watch.

Financial Summary — Water Supply System

($000, Audited Years Ended June 30)	2015	2016	2017	2018	2019
Balance Sheet					
Unrestricted Cash and Investments	99,145	167,293	267,336	317,090	347,205
Other Unrestricted Current Assets	129,800	117,317	96,900	102,032	111,245
Available Restricted Cash and Investments	1,095	4,363	5,790	15,652	16,474
Current Liabilities Payable from Unrestricted Assets	(202,839)	(151,106)	(136,374)	(139,062)	(145,625)
Net Working Capital	**27,201**	**137,867**	**233,652**	**295,710**	**329,298**
Net Fixed Assets	1,949,697	2,143,613	2,039,477	1,933,804	1,858,596
Total Debt	2,515,343	2,977,404	3,078,206	3,115,909	3,038,250
Operating Statement					
Operating Revenues	364,278	432,204	459,925	453,332	433,125
Non-Operating Revenues Available for Debt Service	10,039	392	(450)	5,585	14,869
Total Revenues Available for Debt Service	**374,318**	**432,596**	**459,474**	**458,917**	**447,994**
Operating Expenditures (Excluding Depreciation)	127,758	151,942	181,028	199,004	185,003
Depreciation	124,371	122,045	160,505	161,804	161,110
Net Revenues Available for Debt Service	246,560	280,653	278,446	259,913	262,991
Senior ADS	134,821	128,178	134,235	127,687	119,231
All-In ADS	178,924	171,139	175,010	172,550	167,966
Required Transfers	(9,675)	(32,839)	(35,260)	(33,859)	(30,442)
Financial Statistics					
Senior ADS	1.83	2.19	2.07	2.04	2.21
All-In ADS	1.38	1.64	1.59	1.51	1.57
Days' Cash on Hand	286	412	551	610	718
Days' Working Capital	78	331	471	542	650
Debt/Net Plant (%)	129	139	151	161	163
Debt/Funds Available for Debt Service (x)	13.3	12.9	10.6	10.6	11.1
Outstanding Long-Term Debt Per Customer ($)	662	784	810	820	800
Free Cash/Depreciation (%)	47	63	42	33	40

Notes: Fitch has reclassified certain financial statement items for analytical purposes. Fiscal 2015 reflects DWSD financials. Fiscal years 2016–2019 reflect GLWA only in relation to "Balance Sheet" items and both GLWA/DWSD in relation to "Operating Statement" items.
ADS – Annual debt service.
Sources: Fitch Ratings, GLWA and DWSD.

Financial Summary — Sewer System

($000, Audited Years Ended June 30)	2015	2016	2017	2018	2019
Balance Sheet					
Unrestricted Cash and Investments	197,070	188,063	205,179	208,563	236,057
Other Unrestricted Current Assets	241,429	146,602	99,583	105,063	88,158
Available Restricted Cash and Investments	—	8,408	9,101	16,837	21,227
Current Liabilities Payable from Unrestricted Assets	(276,396)	(172,737)	(181,761)	(144,064)	(181,342)
Net Working Capital	162,103	170,336	132,103	186,399	164,100
Net Fixed Assets	2,869,146	2,995,767	2,869,310	2,756,460	2,675,593
Total Debt	3,533,419	4,019,827	3,867,814	3,789,625	3,805,363
Operating Statement					
Operating Revenues	505,672	635,958	779,495	764,713	767,824
Non-Operating Revenues Available for Debt Service	(928)	1,089	(3,993)	4,557	5,542
Total Revenues Available for Debt Service	504,743	639,047	775,502	769,270	773,366
Operating Expenditures (Excluding Depreciation)	195,079	288,339	436,462	445,349	437,829
Depreciation	119,848	152,825	194,349	200,604	180,525
Net Revenues Available for Debt Service	309,665	350,708	339,040	323,921	335,538
Senior ADS	132,541	140,191	140,854	141,719	145,796
All-In ADS	232,613	228,571	234,555	232,492	239,242
Required Transfers	(28,715)	(30,290)	(43,322)	(36,410)	(41,495)
Financial Statistics					
Senior ADS	2.34	2.50	2.41	2.29	2.30
All-In ADS	1.33	1.53	1.45	1.39	1.40
Days' Cash on Hand	369	249	179	185	214
Days' Working Capital	303	216	110	153	137
Debt/Net Plant (%)	123	134	135	137	142
Debt/Funds Available for Debt Service (%)	15.1	13.2	11.4	11.5	11.4
Outstanding Long-Term Debt Per Customer ($)	1,262	1,436	1,381	1,353	1,359
Free Cash/Depreciation (%)	40	60	31	27	30

Notes: Fitch has reclassified certain financial statement items for analytical purposes. Fiscal 2015 reflects DWSD financials. Fiscal years 2016–2019 reflect GLWA only in relation to "Balance Sheet" items and both GLWA/DWSD in relation to "Operating Statement" items.
ADS – Annual debt service.
Sources: Fitch Ratings, GLWA and DWSD.

The ratings above were solicited and assigned or maintained at the request of the rated entity/issuer or a related third party. Any exceptions follow below.

MOODY'S
INVESTORS SERVICE

Rating Action: Moody's upgrades Great Lakes Water Authority, MI's water revenue bonds to A1 and A2; outlook stable

13 Mar 2020

New York, March 13, 2020 -- Moody's Investors Service has upgraded to A1 from A2 and to A2 from A3 the senior and second lien water revenue ratings, respectively, of the Great Lakes Water Authority (GLWA), MI Water Enterprise. Concurrently, Moody's has assigned an A1 rating to GLWA's $39.7 million Water Supply System Revenue Senior Lien Bonds, Series 2020A, and $324.3 million Water Supply System Revenue Refunding Senior Lien Bonds, Series 2020C (Federally Taxable). Moody's has also assigned A2 ratings to the authority's $40 million Water Supply System Revenue Second Lien Bonds, Series 2020B, and $47 million Water Supply System Revenue Refunding Second Lien Bonds, Series 2020D (Federally Taxable). The outlook is stable. Inclusive of the current sales, GLWA has $1.6 billion of senior lien water revenue bonds, $633.4 million of second lien water revenue bonds, and $79.5 million of non-rated junior lien state revolving fund (SRF) loans outstanding.

RATINGS RATIONALE

The upgrade of the senior lien revenue debt to A1 reflects continuation of strong operating performance that has resulted in healthy annual debt service coverage and liquidity. Additionally factored are the system's large scale of operations, independent rate setting authority, and sound legal provisions of outstanding revenue debt. At the upgraded rating, these strengths continue to balance the water system's elevated debt burden, as well as its reliance on revenue derived from retail operations within the City of Detroit (Ba3 positive). The upgrade of the second lien water revenue bonds to A2 incorporates the same factors while the lower rating reflects a subordinate claim on pledged net revenue.

RATING OUTLOOK

The stable outlook incorporates our expectation that the system will sustain sound financial metrics despite the likelihood of further borrowing to finance capital improvements.

FACTORS THAT COULD LEAD TO AN UPGRADE

- Sustained expansion and diversification of the service area's economic base

- Growth in revenue that continues to outpace borrowing to moderate leverage of pledged resources

- Improved credit profile of the City of Detroit

FACTORS THAT COULD LEAD TO A DOWNGRADE

- Renewed economic stress that pressures consumption and revenue trends

- Material reduction to the system's liquidity or debt service coverage ratios

- Growth in leverage of the water system's net revenue

LEGAL SECURITY

Outstanding water revenue bonds are secured by either a senior lien or second lien on revenue, net of operating and maintenance expenses, of GLWA's water enterprise operations.

USE OF PROCEEDS

Proceeds from the Series 2020A and Series 2020B bonds will provide financing for capital improvement to the local water system. Proceeds from the sale of the Series 2020C and Series 2020D bonds will be used to refund certain maturities of GLWA's outstanding Water Supply System Revenue Bonds, Series 2011A, 2011B, and 2011C for debt service savings.

PROFILE

The Great Lakes Water Authority (GLWA) is the regional wholesale provider of water and sewer services to southeast Michigan (Aa1 stable). Fully established in 2016, GLWA is an incorporated municipal authority operating under the guidance of a six-member board consisting of one appointee each of the counties of Macomb (Aa1 stable), Oakland (Aaa stable), and Wayne (Baa1 stable), two appointees of the Mayor of Detroit, and one of the Governor of Michigan. The water enterprise treats water from Lake Huron, Lake St. Clair and the Detroit River and distributes it to a service area population of approximately 3.8 million.

METHODOLOGY

The principal methodology used in these ratings was US Municipal Utility Revenue Debt published in October 2017. Please see the Rating Methodologies page on www.moodys.com for a copy of this methodology.

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MOODY'S
INVESTORS SERVICE

Rating Action: Moody's upgrades Great Lakes Water Authority, MI's sewer revenue bonds to A1 and A2; outlook stable

13 Mar 2020

New York, March 13, 2020 -- Moody's Investors Service has upgraded to A1 from A2 and to A2 from A3 the senior and second lien sewer revenue ratings, respectively, of the Great Lakes Water Authority (GLWA), MI Sewer Enterprise. Concurrently, Moody's has assigned an A1 rating to GLWA's $536 million Sewage Disposal System Revenue Refunding Senior Lien Bonds, Series 2020A (Federally Taxable). Moody's has also assigned an A2 rating to the authority's $160.3 million Sewage Disposal System Revenue Refunding Second Lien Bonds, Series 2020B (Federally Taxable). The outlook is stable. Inclusive of the current sales, GLWA has $1.8 billion of senior lien sewer revenue bonds, $819.6 million of second lien sewer revenue bonds, and $494 million of non-rated junior lien state revolving fund (SRF) loans outstanding

RATINGS RATIONALE

The upgrade of the senior lien revenue debt to A1 reflects continuation of strong operating performance that has resulted in healthy annual debt service coverage and liquidity. Additionally factored are the system's large scale of operations, independent rate setting authority, and sound legal provisions of outstanding revenue debt. At the upgraded rating, these strengths continue to balance the sewer system's elevated debt burden, as well as the large share of system-wide revenue generated by retail operations within the City of Detroit (Ba3 positive). The upgrade of the second lien sewer revenue bonds to A2 incorporates the same factors while the lower rating reflects a subordinate claim on pledged net revenue.

RATING OUTLOOK

The stable outlook incorporates our expectation that the system will sustain sound financial metrics despite the likelihood of further borrowing to finance capital improvements.

FACTORS THAT COULD LEAD TO AN UPGRADE

- Sustained expansion and diversification of the service area's economic base

- Growth in revenue that continues to outpace borrowing to moderate leverage of pledged resources

- Improved credit profile of the City of Detroit

FACTORS THAT COULD LEAD TO A DOWNGRADE

- Renewed economic stress that pressures consumption and revenue trends

- Material reduction to the system's liquidity or debt service coverage ratios

- Growth in leverage of the sewer system's net revenue

LEGAL SECURITY

Outstanding sewer revenue bonds are secured by either a senior lien or second lien on revenue, net of operating and maintenance expenses, of GLWA's sewer enterprise operations.

USE OF PROCEEDS

Proceeds from the Series 2020A and Series 2020B bonds will be used to refund certain maturities of GLWA's outstanding Sewage Disposal System Revenue & Refunding Senior Lien Bonds, Series 2012A, Sewage Disposal System Revenue Refunding Bonds, Series 2014C, and Sewerage Disposal System Revenue Second Lien Bonds, Series 2005A and Series 2006B for debt service savings.

PROFILE

The Great Lakes Water Authority (GLWA) is the regional wholesale provider of water and sewer services to southeast Michigan. Fully established in 2016, GLWA is an incorporated municipal authority operating under the guidance of a six-member board consisting of one appointee each of the counties of Macomb (Aa1 stable), Oakland (Aaa stable), and Wayne (Baa1 stable), two appointees of the Mayor of Detroit, and one of the Governor of Michigan (Aa1 stable). The sewer enterprise collects, treats and disposes of wastewater produced by a service area population of approximately 2.8 million.

METHODOLOGY

The principal methodology used in these ratings was US Municipal Utility Revenue Debt published in October 2017. Please see the Rating Methodologies page on www.moodys.com for a copy of this methodology.

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CREDIT OPINION
16 March 2020

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Great Lakes Water Authority, MI

Update following upgrades of water and sewer revenue debt

Summary

The Great Lakes Water Authority's (GLWA) water and sewer enterprises (both senior liens rated A1 stable; both subordinate liens rated A2 stable) have demonstrated strong operating trends and will likely sustain current performance. Both systems have maintained satisfactory annual debt service coverage on senior and subordinate lien revenue debt, and hold healthy liquidity. The authority's experienced management team remains committed to measured revenue growth through annual revenue requirement increases, while at the same time maintaining an affordable rate structure for users. Furthermore, positive economic indicators across each system's service area, including in the City of Detroit (Ba3 positive), should contribute to customer base resiliency despite ongoing weakness in certain segments. Each system's healthy coverage and strong liquidity balance very high debt burdens. While we anticipate additional borrowing in coming years for capital maintenance and upgrades, sustained financial performance should allow for cash financing a portion of the each system's capital improvement plan, thus moderating any increase in debt.

On March 13, 2020, we upgraded the authority's senior lien water revenue and senior lien sewer revenue debt to A1 from A2. The second lien revenue debt of each system was raised to A2 from A3. The outlook on both systems is stable.

Credit strengths

» Very large utility systems that provide essential water and wastewater services to a significant portion of the state's population

» Commitment to annual revenue enhancements to support sound debt service coverage and healthy liquidity

» Implementation of operational efficiencies, including right-sizing of personnel and treatment capacity

Credit challenges

» Declining usage trends given economic and demographic weaknesses in portions of the service area, as well as general conservation efforts

» High leverage will moderate slowly given outstanding capital needs and plans to issue additional debt

» High combined operating needs and fixed costs leave little margin to miss revenue targets in order to maintain strong liquidity and expand pay-go capital financing

Rating outlook

The stable outlook incorporates our expectation that each system will sustain sound financial metrics despite the likelihood of further borrowing to finance capital improvements.

Factors that could lead to an upgrade

» Sustained expansion and diversification of the service area's economic base

» Growth in revenue that continues to outpace borrowing so as to moderate leverage of pledged resources

» Improved credit profile of the City of Detroit

Factors that could lead to a downgrade

» Renewed economic stress that pressures consumption and revenue trends

» Material reduction to the water or sewer system's liquidity or debt service coverage ratios

» Growth in leverage of the water or sewer system's net revenue

Key indicators

Exhibit 1

Great Lakes Water Authority, MI Water Enterprise			
System Characteristics			
Asset Condition (Net Fixed Assets / Annual Depreciation)	14 years		
System Size - O&M ($000)	$163,519		
Service Area Wealth: MFI % of US median	96.80%		
https://mth-cms-meth01-tom-			
Rate Covenant (x)	1.20x		
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test		
Management			
Rate Management	Aa		
Regulatory Compliance and Capital Planning	A		
Financial Strength			
	2017	2018	2019
Operating Revenue ($000)	$428,044	$425,245	$407,231
System Size - O&M ($000)	$145,627	$153,910	$163,519
Net Revenues ($000)	$282,417	$271,335	$243,712
Outstanding Revenue Debt ($000)	$2,358,137	$2,310,261	$2,250,181
Annual Debt Service ($000)	$175,010	$172,550	$167,966
Annual Debt Service Coverage (x)	1.6x	1.6x	1.5x
Cash on Hand	670 days	752 days	775 days
Debt to Operating Revenues (x)	5.5x	5.4x	5.5x

Fiscal 2017 reflects the first year of operations for the Great Lakes Water Authority.
Sources: Audited financial statements of Great Lakes Water Authority and the City of Detroit Water Fund

Exhibit 2

Great Lakes Water Authority, MI Sewer Enterprise			
System Characteristics			
Asset Condition (Net Fixed Assets / Annual Depreciation)	16 years		
System Size - O&M ($000)	$244,468		
Service Area Wealth: MFI % of US median	96.80%		
https://mth-cms-meth01-tom-			
Rate Covenant (x)	1.20x		
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test		
Management			
Rate Management	Aa		
Regulatory Compliance and Capital Planning	A		
Financial Strength			
	2017	2018	2019
Operating Revenue ($000)	$557,396	$561,784	$550,399
System Size - O&M ($000)	$206,554	$250,577	$244,468
Net Revenues ($000)	$350,842	$311,207	$305,931
Outstanding Revenue Debt ($000)	$3,144,592	$3,076,993	$3,093,347
Annual Debt Service ($000)	$234,555	$232,281	$239,172
Annual Debt Service Coverage (x)	1.5x	1.3x	1.3x
Cash on Hand	363 days	304 days	352 days
Debt to Operating Revenues (x)	5.6x	5.5x	5.6x

See the coverage section under Debt Service Coverage and Liquidity for more details about what is included in revenues, expenditures, and debt service, and how coverage is calculated under the bond resolution.
Sources: Audited financial statements of Great Lakes Water Authority and the City of Detroit Sewer Fund

Profile

The Great Lakes Water Authority (GLWA) is the regional wholesale provider of water and sewer services to southeast Michigan (Aa1 stable). Fully established in 2016, GLWA is an incorporated municipal authority operating under the guidance of a six-member board consisting of one appointee each of the counties of Macomb (Aa1 stable), Oakland (Aaa stable), and Wayne (Baa2 stable), two appointees of the Mayor of Detroit, and one of the Governor of Michigan. The water enterprise treats water from Lake Huron, Lake St. Clair and the Detroit River and distributes treated water to a service area population of approximately 3.8 million. The sewer enterprise collects, treats and disposes of wastewater produced by a service area population of approximately 2.8 million.

Detailed credit considerations

Service area and system characteristics: very large service area in southeast Michigan

Each system's large service area and scale of operations are key credit strengths as these attributes result in a broad and diverse customer base. The two systems are leased from the City of Detroit pursuant to lease agreements which stipulate that the term of the lease shall automatically coincide with the life of outstanding debt owed by GLWA. The regional water supply system covers a vast 1,700 square miles in southeast Michigan, providing treated water to 112 communities, while the sewer system covers 950 square miles, providing wastewater services to 79 communities. Approximately 40% of the state's population is serviced by the water utility, while the sewer utility services approximately 30% of the state's roughly 10 million residents.

Each system is a wholesale enterprise whose articles of incorporation allow for direct retail service. Residents and businesses within Detroit are retail customers of the Detroit Water and Sewerage Department (DWSD). Residential and business activity within the City of Detroit has accounted for roughly 20% of annual water revenue over the last three fiscal years (2017-2019), and roughly 45% of sewer revenue. The remainder of water sales are to suburban customers via 87 wholesale customer contracts, while sewer revenue is collected from municipalities via 18 wholesale customer contracts.

Since 2008, 82 of GLWA's wholesale water customers, and 11 of its wholesale sewer customers have signed new model contracts with 30-year terms and automatic 10-year renewals. Water customers that are not on a model contract comprise less than 10% of wholesale billings. The remaining seven wholesale sewer customers not under a model contract are served pursuant to separate long-term contracts that range in term from 10 years to infinite. Customers must provide notice of intent to terminate five years in advance of the end of the contract term. Effective December 1, 2017 the City of Flint entered into the 30-year model contract, which will provide the city with a stable source of quality treated water. The contract was signed in conjunction with a master agreement and regional collaboration among the city and GLWA, as well as the Genesee County Drain Commissioner (GCDC), Karegnondi Water Authority (KWA; A2 stable), and the State of Michigan. The agreement provides for reciprocal backup water supply from GCDC and GLWA's use of Flint's KWA raw water rights.

Although the creation of the KWA resulted in the exit of GCDC as a wholesale customer, we anticipate the model contracts will ensure a stable customer base for both systems going forward. Stabilization of the regional economy should further support the resiliency of each system's customer base. Since peaking at 15.1% in 2009, the Detroit MSA's unemployment rate has fallen to 3.9% as of December 2019. Median family income has also gradually improved, and is now estimated at 96.8% of the national figure.

Similar to many water systems in the Midwest, usage rates are falling. From 2010 to 2019 the volume of water billed dropped by roughly 16%. At the same time, non-revenue volume produced by the water utility remains very high, driven mainly by leaks or major breaks in the transmission and distribution systems. Over the past five years non-revenue water accounted for approximately a quarter of water produced. Production volumes, however, are not metered, and the previously conducted cost of service study indicates production volumes are likely overstated.

Declining usage can be traced to several factors, including weather trends and conservation efforts. While this trend may stabilize over the long term, sustained upticks in usage are unlikely absent the expansion of the system into new wholesale contract communities. Population in the Detroit MSA fell nearly 4% between 2000 and 2010, and while recent estimates point to flat trends in the service area since, material growth may be unlikely. GLWA has adjusted its rate structure to increase fixed rate charges, which will continue to mitigate downward effects of consumption decline.

Wastewater trends have been more stable as compared to water usage trends. The sewer system's total amount of wastewater treated was 13% higher in 2019 as compared to 2010. Approximately 60% of the treated wastewater comes from wholesale and suburban customers, while the remaining 40% is a result of infiltration. Just like the water systems, GLWA has implemented a simplified sewer rate approach that will eliminate effects of usage fluctuation.

Debt service coverage and liquidity: financial metrics expected to remain healthy

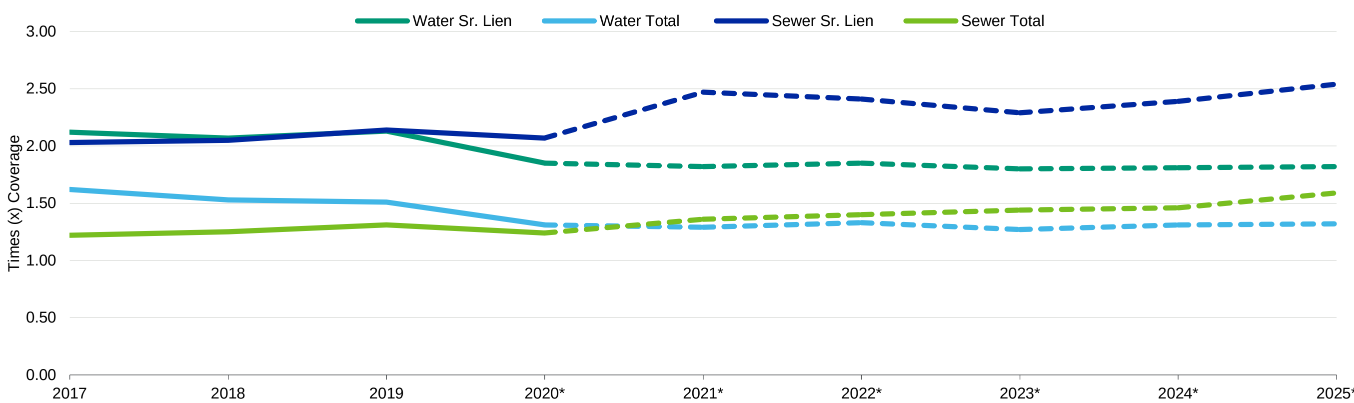
We expect both system's will continue to operate effectively, resulting in the maintenance of sound annual debt service coverage and ample system liquidity. The authority is committed to limiting annual growth in its water and sewer system revenue requirements by 4%, but will adjust service charges, as needed, to meet bond covenants. Reliability of budget estimates are enhanced by the fact that 60% of wholesale water revenue is generated by a fixed monthly charge, as compared to commodity charges which accounts for 40%

of wholesale revenue. A 100% fixed charge structure is in place for wholesale sewer customers. Each year GLWA conducts an extensive study of both its wholesale service charges and allocated annual revenue requirement to retail water customers, with the purpose of adjusting revenue to reflect the cost of operations, depreciation expense, and return on the rate base.

Significant growth in retail rates in Detroit could challenge the capacity of some of DWSD's customers to pay. Delinquent Detroit retail accounts have remained high, though DWSD has enhanced both collection efforts and customer assistance programs, including participating in GLWA's water residential assistance program (WRAP). Additionally, DWSD funds a budget reserve, per the bond ordinance, to cover shortfalls in retail collections. The significant portion of annual revenue derived from Detroit retail operations remains a key credit challenge that could affect debt service coverage and liquidity. However, in conjunction with GLWA's commitment to manageable revenue requirement increases, DWSD's efforts should limit growth in delinquent retail accounts, especially if moderate economic growth continues.

Fiscal 2019 marked GLWA's third full year in operation. Over the three years the water system's net revenues have provided an average of 1.55x coverage of annual debt service, inclusive of senior lien, second lien, and junior lien revenue debt. Sewer net revenue averaged a slightly lower 1.26x coverage for the same period. Pro forma projections through fiscal 2025 forecast stable coverage levels throughout (see exhibit 3). The projections do not include additional borrowing until 2023, with the exception of a relatively modest amount of subordinate state loans that have already been approved. Additional assumptions include wholesale charges and retail rate increases of 3% annually.

Exhibit 3
Debt service coverage for both systems are projected to remain stable

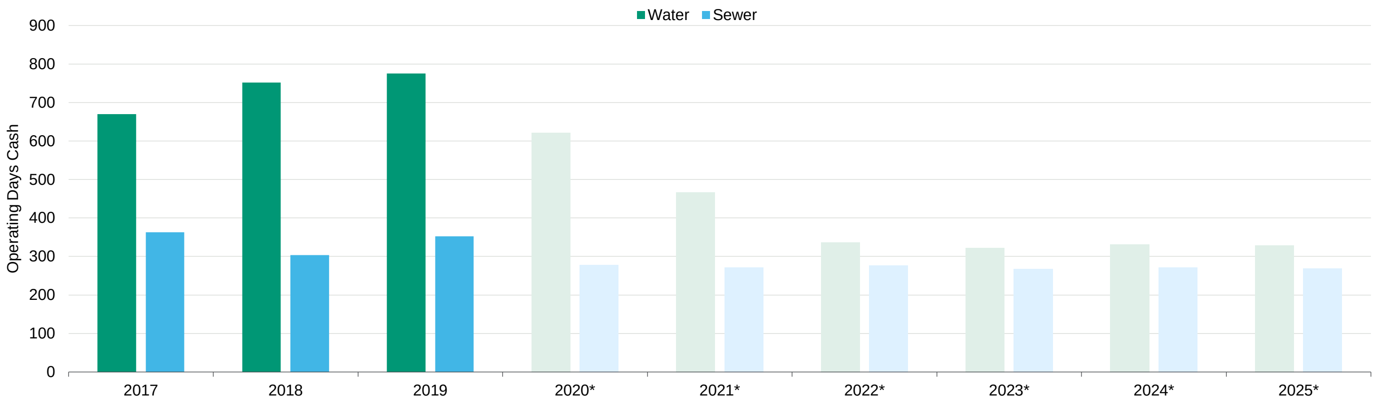


*Projected
Sources: Great Lakes Water Authority audited financial statements and pro forma projections

Per the master bond ordinance, net revenue includes all money collected from the regional wholesale and local retail water customer payments deposited to a lockbox administered by a third-party trustee. O&M expenses are defined as cash transfers made to the GLWA's and DWSD's respective operation and maintenance funds. The revenue and O&M expenses related to GLWA is reported in its segregated business funds while the revenues and expenses of DWSD are accounted for in Detroit's water and sewer funds, respectively. The bifurcated accounting requires adjustments from reported figures in order to assess coverage under the master bond ordinance.

LIQUIDITY
System liquidity is strong in both enterprise funds and will remain so despite planned spending for capital investments. At the close of fiscal 2019 the water fund had an unrestricted cash and investment balance of $347.2 million, equivalent to 775 days of water system O&M. The sewer fund had an unrestricted cash and investment balance of $236.1 million, equivalent to 352 days of sewer system O&M. The two funds also has significant restricted cash assets held for budget stabilization, debt service, and capital. The authority anticipates the water fund and sewer fund will maintain cash at or above $160 million and $200 million, respectively through 2025. Each fund plans to use a portion of its cash reserves over the next several years for pay-go capital. This includes roughly $440 million in pay-go funding for the water system, and $480 million for the sewer system.

Exhibit 4
System liquidity will remain robust despite planned use of cash for pay-go capital



*Projected
Sources: Great Lakes Water Authority audited financial statements and pro forma projections

Debt and legal covenants: high debt burden could moderate with sustained revenue growth

Leverage of pledged water and sewer revenue is high. The authority is preparing to sell a total of $80 million in water supply system revenue bonds to finance upgrades to the local system. Additionally, GLWA will be refunding approximately $390 million in outstanding water revenue debt, and $740 million of sewer revenue debt that is expected to yield significant savings, and in turn improve future net revenue coverage of annual debt service. Following the issuance of upcoming bonds, both the water and sewer systems' long-term debt leverage across all liens will stand at above average 5.7x fiscal 2019 operating revenue.

Additional capital needs through 2025 include roughly $1 billion in projects for the water system and $870 million for the sewer system. In addition to financing these improvements with reserves and surplus revenue, GLWA plans to issue approximately $450 million in water system revenue bonds and $255 million in sewer system revenue bonds over the next five years. GLWA's capital improvement plan (CIP) also projects taking on roughly $275 million in state revolving fund loans. The increase in debt for both systems will be somewhat offset by the amount paid down over the next five years. While we expect each system's debt burden will remain high, sustained revenue growth would make leverage less of a credit challenge going forward.

The authority helps to finance capital projects undertaken in the local systems by issuing bonds on behalf of DWSD. The DWSD owed debt is accounted for as a contractual obligation receivable due to GLWA. Proportional allocation of debt was agreed upon and settled by the memorandum of understanding (MOU) dated June 27, 2018.

DEBT STRUCTURE

Inclusive of the upcoming revenue bond sales, GLWA will have $1.6 billion of senior lien water revenue bonds, $712 million of second lien water revenue bonds, and $79.5 million of junior lien state revolving fund (SRF) loans outstanding. The sewer system is responsible for $1.8 billion of senior lien sewer revenue bonds, $745 million of second lien sewer revenue bonds, and $494 million junior lien state revolving fund (SRF) loans.

All water revenue debt of GLWA is fixed rate. With the exception of the outstanding Series 2006D senior lien bonds, all debt paid from net sewer revenue is fixed rate. The Series 2006D bonds are floating rate notes and make up a modest 8% of total debt paid by sewer revenue.

Legal covenants applied to both systems' revenue debt are equal to one another. GLWA's rate covenant requires net revenue coverage of debt service equal to 120% for senior lien bonds, 110% for second lien bonds, and 100% for any subordinate lien debt. Senior and second lien bonds benefit from debt service reserve funds (DSRF) sized at lessor of the standard three-prong test. As of July 1, 2019, only a modest percentage of each system's senior and second lien DSRF requirements were satisfied with cash. The balances of each are satisfied with various surety or insurance policies.

DEBT-RELATED DERIVATIVES

GLWA is not party to any derivative agreements associated with its pledge of net water or sewer revenue.

PENSIONS AND OPEB

Current employees of GLWA are participants in a defined contribution benefit plan, though many are scheduled to receive accrued pension benefits from the City of Detroit's frozen defined benefit General Retirement System (GRS). Pursuant to the City of Detroit's bankruptcy settlement, GLWA will contribute $45.4 million annually to GRS through fiscal 2023 to accelerate amortization of the GRS unfunded liability associated with GLWA employees. Less than half of the annual GRS payment is considered O&M and senior to debt service.

Beyond 2023, GLWA's payments to GRS will be based on the actuarial needs of the plan and sized to amortize any unfunded liability associated with GLWA employees. GLWA makes no payments toward accrued retiree healthcare liabilities as the City of Detroit's bankruptcy settlement eliminated those benefits. GLWA established a new defined contribution retiree healthcare savings plan, resulting in no potential unfunded liability.

ESG considerations

ENVIRONMENT

Environmental considerations play a major factor in the credit profile of both utility systems operated by GLWA. The water system benefits greatly from its readily available access to a vast amount of relatively easily treatable fresh water. The sewer system includes one of the largest single site wastewater treatment plants in the world and treated water discharged from the plant is often cleaner than the surrounding water in the receiving body. Both systems are subject to extensive regulation pursuant to the federal Clean Water Act, the Clean Air Act, the Michigan Natural Resources and Environmental Protection Act, and various administrative rules and regulations. The authority is in material compliance with all existing permits relating to the operation of the regional water and sewer systems.

SOCIAL

Social considerations are a major factor in each system's credit profile. Charge structure adjustments and payment assistance to low-income retail customers should support revenue stability. Additionally, the number of wholesale model contracts entered into points to increased regional collaboration.

GOVERNANCE

Great Lakes Water Authority is governed by a six-member board. While the DWSD retains ownership of all water and sewer enterprise assets throughout the city and suburban service area, it has leased the majority of those assets to GLWA. The authority manages the suburban service territory, while DWSD, as an agent of the GLWA, will continue to manage the retail system in the City of Detroit, including identification of repairs and capital improvements. The current lease term is 40 years, with an option to renew and extend. Crucially, the lease will automatically extend to correspond with scheduled repayment of newly issued revenue debt. Via master bond ordinance, GLWA has assumed all debt obligations previously issued by the City of Detroit and previously secured by DWSD revenue. Pursuant to the lease, the City of Detroit has irrevocably assigned its right, title and interest in all revenue of the sewer and water enterprises to the GLWA. Payments from retail customers within the City of Detroit are deposited directly with the bond trustee

The board has full authority to set service charges on municipal customers. Rates charged to retail customers in the City of Detroit will be established by the city's Board of Water Commissioners pursuant to an agency agreement with GLWA. A shared services agreement grants the GLWA board the ability to override the city's authority of retail rates and collections should the city not make adjustments sufficient to meet annual revenue requirements. All wholesale customers retain responsibility for levying local charges sufficient to cover costs charged by the GLWA. Pursuant to the memorandum of understanding between GLWA and the DWSD, GLWA assumes an annual increase of not more than 4% in the revenue requirements through fiscal 2025.

The DWSD was under federal court oversight from May 6, 1977 until March 23, 2013. Strategic improvements that began under federal court oversight, and continued thereafter, accelerated once the current management team took control of the DWSD in 2012. That same management team remains in place at GLWA. The management of GLWA has made strides in enhancing operational efficiencies and regional cooperations since its formation. To that end GLWA dramatically right-sized its workforce, reducing full time employees by over 1,000 over the past several years. Additionally, since system capacity exceeds demand, management has de-rated parts of its treatment plants. This allows the each system to reduce capital costs while preserving flexibility to put the facilities back to use.

REPORT NUMBER 1189233

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

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Great Lakes Water Authority, Michigan; Water/Sewer

Credit Profile		
US$324.305 mil wtr supply sys rev (Rfdg Sr Ln Bnds) ser 2020C due 07/01/2050		
Long Term Rating	AA-/Stable	New
US$47.0 mil wtr supply sys rev (Rfdg 2nd Ln Bnds) ser 2020D due 07/01/2050		
Long Term Rating	A+/Stable	New
US$40.0 mil wtr supply sys rev (2nd Ln Bnds) ser 2020B due 07/01/2050		
Long Term Rating	A+/Stable	New
US$40.0 mil wtr supply sys rev (Sr Ln Bnds) ser 2020A due 07/01/2050		
Long Term Rating	AA-/Stable	New
Great Lakes Wtr Auth wtr (2nd lien)		
Long Term Rating	A+/Stable	Affirmed

Rationale

S&P Global Ratings has assigned its 'AA-' rating to the Great Lakes Water Authority, Mich.'s (GLWA) series 2020A and B water supply system revenue senior-lien bonds, its 'AA-' rating to GLWA's series 2020C water supply system revenue refunding senior-lien bonds, and its 'A+' rating to the authority's series 2020D water supply system revenue refunding second-lien bonds. We have also affirmed our 'AA-' ratings on the authority's existing senior-lien bonds and our 'A+' rating on its existing second-lien bonds. The outlook is stable.

The ratings reflect the application of our wholesale utility criteria following a system approach since GLWA has, in our view, additional financial strengths that could be used to support debt payments if a single participant does not fulfil its payment obligations. These strengths include pledged reserves and unrestricted liquidity available at the wholesaler GLWA level, the ability to adjust revenue requirements to participants as its cost structure changes, and strong management policies related to both the regional and local Detroit systems. The fact that GLWA's service base is large and serves a large percentage of the state's population also supports our view that the ratings should reflect that diversity, with overall economic considerations playing a more prominent role in the credit analysis.

We believe the system's revenue source is unlikely to result in materially delayed collections or significant revenue volatility in the current environment related to COVID-19. While we continue to monitor these events, we do not currently expect it to affect GLWA's ability to maintain budgetary balance and pay debt service costs. For more information, see our article, "COVID-19's Potential Effects In U.S. Public Finance Vary By Sector" (published March 5, 2020 on RatingsDirect).

Credit overview

Also supporting the rating at its current level are the following:

- Oversight through an agency relationship and cooperation with the Detroit Water and Sewer Department (DWSD) and its governing Board of Water Commissioners that we view as strong and supportive of credit quality. Because of Detroit's economy that we view as very weak and historical collections and bad debt issues, we view both the existence and continuation of these functions as key to the maintenance of the rating at its current level.

- Overall management and governance functions that we also view as supportive of credit quality at the current rating level. GLWA management maintains active communication with both the DWSD retail system and its wholesale customers and has a comprehensive set of internal policies related to, among other things, maintenance of certain financial targets, key performance indicators for both financial and operational metrics, and internal controls.
- Actual financial performance has continued to meet expectations from prior feasibility studies. Now that GLWA has three full fiscal years (2017-2019) of operating as a separate entity from DWSD, and that the effects of various reconciliations and adjustments related to the separation are continuing to decline, we would expect that future variances to the feasibility studies may continue this trend. Given GLWA's comprehensive budgeting practices and strong budgetary oversight of DWSD's operations, we would expect that future financial performance should be largely consistent with the most current projections.
- GLWA is not under any regulatory-driven capital costs from consent orders or decrees. While we view the GLWA system as highly leveraged, the fact that all of the capital improvement plan (CIP) is forward-looking and not mostly being used to cure regulatory infractions is a key credit strength that is supportive of the current rating level.
- Limited future exposure to pension cost escalation from legacy Detroit obligations resulting from prior bankruptcy negotiations. It is our understanding that after the 2023 fiscal year, both GLWA and DWSD pension costs related to legacy pension plans will drop from a total for both water and sewer systems of $45.4 million (which is a mandated contribution based on Detroit's bankruptcy plan of adjustment) to what is currently projected to be no more than $7.3 million. These additional payments would be used to retire the remaining unfunded liability from the closed/legacy pension plans that has arisen after the original payments were determined in 2014.
- It has a diverse revenue stream from a large number of wholesale customers.
- Revenues from both wholesale customers and the DWSD retail system that are mostly fixed, which, in our view, significantly insulate GLWA's financial performance from volatility caused by weather and flow variances.

Offsetting these strengths is Detroit's economy, which we consider very weak and which could continue to place downward pressure on utility collection rates in the city, and high system leverage, that we do not believe will abate significantly at least over the two-year outlook horizon.

Stable Two-Year Outlook

The stable outlook reflects our opinion that the rating should not change, at least over the two-year outlook horizon, due to several factors, including the following:

- Our expectation that the water supply system's financial metrics should remain at levels generally consistent with current projections due to GLWA's charge structure that provides a large amount of revenue stability;
- DWSD revenue variances should remain low, given both GLWA's and DWSD's continued efforts to improve collections; and
- Exposure to a large service base that extends beyond the boundaries of the immediate Detroit area, which should help continue to support stable usage trends.

Downside scenario

If economic stress or cost escalations lead to financial results measurably worse than that GLWA currently projects in its current feasibility study, then it could weaken either the outlook, the rating, or both.

Upside scenario

While possible, we currently do not expect to raise the rating in the foreseeable future, absent both financial performance well above what current projections indicate and economic indicators for Detroit that show significant improvement. We believe that both current and projected financial performance and service base characteristics are consistent with the current rating level.

Credit Opinion

Details of legal framework relevant to the credit rating

The bonds are secured by a statutory lien on pledged assets of the system, prioritized by the lien status, which include net revenues of GLWA's sewage disposal system, along with investments credited to the water system and earnings on those investments. The net revenue pledge is constituted from gross revenues of the DWSD retail and the GLWA regional systems, which cover both systems' operating and maintenance (O&M) expenses. A rate covenant stipulates that the GLWA board set rates to produce at least 1.2x coverage of senior-lien debt, 1.1x for second-lien bonds, and 1x for junior-lien bonds. The ability to issue additional bonds exists if net revenues for the previous fiscal year, or net revenues adjusted by approved rate increases and system expansion for the current or next fiscal year, produce coverage of maximum annual debt service (MADS; including the proposed bonds) of at least those levels indicated in the rate covenant for the particular liens.

There is also a debt service reserve (DSR) for senior-lien bonds equal to MADS or the lesser of the standard three-prong test, and for second-lien bonds equal to average annual debt service or the lesser of the three-prong test. On achieving approval from at least 51% of senior- and second-lien bondholders and having appropriate senior-lien ratings from two credit rating agencies no lower than 'AA-' or the equivalent, GLWA, through amendments to the master bond ordinance, has the option to eliminate this reserve requirement on its outstanding and future bonds on any lien for which approval has been granted. If this proposed amendment is approved, we currently view the effects as credit neutral; however, we consider the existence of DSRs as a credit strength to additionally offset any negative revenue variances from the Detroit retail customer class. While we understand the process in the MOU is designed to eliminate these negative variances, we view the existence of the sizable DSRs as additional credit protections given what we view to be the uncertainties related to the economic conditions in Detroit. At the fiscal year ended June 30, 2019, the senior-lien DSR totaled $122.9 million and the second-plus junior-lien DSRs totaled $50.9 million; DSR investments consist of cash, securities, and sureties. To date, GLWA has achieved bondholder approval for the above-mentioned amendment from about 34% and over 51% of senior- and second-lien bondholders, respectively.

The statutory lien on pledged assets is well established by state statute under Act 94 of 1933 (as amended).

Under the GLWA master bond ordinance, U.S. Bank N.A. is the trustee.

We view the numerous oversight and control functions that GLWA has over Detroit's retail system as supportive of both the overall legal framework and the ability of the GLWA regional system to help make the net revenues originating from Detroit's local system more predictable. This, in turn, results in an analysis that focuses more on this framework as opposed to one that benchmarks the rating specifically on our view of DWSD's creditworthiness. The primary three documents that place parameters around this operating relationship between the two entities are the water and sewer lease agreements, and both a service agreement and MOU between GLWA and the Detroit retail system.

The major provisions of both lease agreements that we view as supportive of the overall legal and operational framework include the following:

- Explicit language that requires all revenues collected by Detroit be held in segregated accounts in trust and remitted within five days of receipt to a trustee-held pledged revenue account under the master bond ordinance.
- Requirements that both GLWA and Detroit retail maintain a biennial budget and a five-year CIP.
- In consideration of a lease payment from GLWA for use by the Detroit local system, the use of those funds are restricted to either repayment of debt or capital projects.
- GLWA has the exclusive and direct right to establish all rates and charges, including the retail users within Detroit (although through the service agreement, GLWA delegates its right to set rates to DWSD).
- All vendor and employee contracts related to GLWA operations are assigned to the authority.

The major provisions of the service agreement and MOU that we view as supportive of the overall legal and operational framework include the following:

- If certain performance standards are not met, GLWA can revoke its appointment of Detroit as its agent for collections of revenue requirements.
- GLWA will set revenue requirements for DWSD that are related to the costs for providing services, and, in turn, Detroit will set retail rates in a fashion that meets GLWA's revenue requirement.
- The procedure for resolution of budget shortfalls, as previously mentioned.
- All responsibilities for discharge permit and other environmental compliance requirements are explicitly allocated between Detroit retail and GLWA.
- DWSD is required to submit periodic budget and operational reporting requirements to GLWA and discuss these results at a Reconciliation Committee, which is also the initial mechanism to develop a plan for DWSD to cure any budget shortfalls it experiences.
- The service agreement has an explicit mechanism for dispute resolution.

Economic conditions and customer base

GLWA's water system serves a large population of about 3.8 million across Wayne, Washtenaw, St. Clair, Oakland, Monroe, Macomb, Lapeer, and Genesee counties, covering about 38% of Michigan's population.

We consider Detroit's economy very weak, but the revenue base for both water and sewer is well diversified geographically beyond the city limits. The large amount of inactive accounts in Detroit exacerbates the need for ongoing collection efforts and could affect the large amount of accounts receivable. Management is actively working to lower its uncollectible accounts, but 48% of Detroit retail accounts are inactive, which we view as a significant number. We note, however, that collections efforts have increased, in our view, since GLWA was formed in 2016, including the introduction of payment plans and GLWA's water residential assistance program (WRAP) for low-income residents.

Looking at the metropolitan area as a whole, however, average economic indicators are much better, with median household effective buying income at about 100% of the U.S. average, and according to the U.S. Bureau of Labor Statistics, the city of Detroit's annual average unemployment rate was under 10% for 2017, the first time since 2001, and was 9.0% for 2018. We believe the metrics for a regional utility indicate a better overall economic base for the service area than looking at the city's economic indicators alone.

A weakening of economic metrics could weaken the credit rating, especially if this were to occur on a more regional scale. A general regional weakening economy would lessen the positive effects that the more diversified revenue and customer base has had on the rating profile.

GLWA charge structure and collection issues

The implementation of model contracts and moving wholesale customers' revenue requirements to a higher level of fixed-cost recovery, is, in our view, a credit strength because it will help prevent revenue fluctuations based solely on metered flow and will help stabilize revenue collections; GLWA's water rate structure has 60% fixed and 40% variable rate components. Management has also maintained a wholesale customer outreach program since 1997.

Management is committed to moderate annual rate increases intended to produce a 4% increase in overall annual revenues, instead of the wide swings in rates in the past. We understand it is hoping to achieve this through implementation of fixed-cost recovery, continued cost reductions, labor force reductions, and the use of cash for capital when appropriate.

A credit weakness is the large amount of past due and inactive accounts in Detroit. DWSD management has a dedicated shut-off program that has been implemented by an outside contractor, although meaningful results will take time, in our view. One benchmark we will look at involves overall budget variances for the DWSD local system as one indication of the progress DWSD is making on collection efforts. GLWA's WRAP is designed to both provide bill assistance and arrange for household water audits to all qualified residents within municipalities that have adopted it (currently including Detroit).

Finances and liquidity

The historical DWSD financial performance has been somewhat volatile, in our view, due primarily to changes in billed versus budgeted volumes and exacerbated by economic stress. Still, in recent years, each system has been able to generate net revenues that cover fixed costs by at least 1x.

For GLWA, our fixed-charge coverage analysis generally follows the presentation in GLWA's master bond ordinance calculation for junior-lien debt service coverage, with additional revenue offsets due to pension payments made to Detroit for its frozen general retirement system expenses and additional fixed costs due to pension note payments made to Detroit for its B and C note payments. Our calculation focuses on how net revenues are covering all of GLWA's fixed costs instead of reporting coverage based on master bond ordinance definitions of operating and nonoperating expenses. We generally view the historical fixed-charge coverage as adequate to good, with the expectation that coverage will remain relatively steady and generally consistent with recent trends due to the implementation of fixed-cost recovery rates and various management initiatives.

Liquidity of the system has fluctuated, but has generally stayed at levels we would consider good. Projections show a steady unrestricted liquidity position of about $165 million-$175 million for the foreseeable future, which takes into account operating reserves, budget stabilization, emergency repair, and improvement and extension fund balances. Because the master bond ordinance allows for any monies in these funds to be used for either O&M expense requirements or debt service shortfalls, we view them as unrestricted liquidity.

Capital and debt

The size and scope of the CIP are credit neutral. We expect that capital costs will continue to be distributed between Detroit's retail system and the regional system as appropriate, and in a manner consistent with the lease and service agreements' allocate costs.

The water system is highly leveraged. We do not expect this condition to abate in the near term and generally view the debt profile as a credit weakness. Total debt service from all revenue bonds and state revolving fund loans currently represents about 100% of O&M expenses, and we do not see this number falling significantly in the near future since additional debt is layered in to fund the CIP.

Ratings Detail (As Of March 16, 2020)		
Great Lakes Wtr Auth wtr supply sys rev rfdg (2nd lien bnds) ser 2005-D due 07/01/2029		
Long Term Rating	NR	
Great Lakes Wtr Auth wtr supp sys rev (Sr Lien) ser 1997-A dtd 08/01/1997 due 07/01/1999-2017 2021 2027		
Unenhanced Rating	NR(SPUR)	
Great Lakes Wtr Auth wtr supp sys 2nd lien rfdg bnds ser 2001 C&D dtd 04/01/2001 due 07/01/2033		
Long Term Rating	NR	
Great Lakes Wtr Auth wtr (BAM) (SECMKT		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien)		
Long Term Rating	AA-/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien)		
Long Term Rating	AA-/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien)		
Long Term Rating	AA-/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien) (AGM)		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien) (MBIA) (National)		
Unenhanced Rating	NR(SPUR)	

Ratings Detail (As Of March 16, 2020) (cont.)		
Great Lakes Wtr Auth wtr (Sr lien) (National) (MBIA)		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr lien) 2005B (BHAC)		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (Sr Lien)		
Long Term Rating	AA-/Stable	Affirmed
Great Lakes Wtr Auth wtr (2nd lien) (wrap of insured) (AGM & BHAC) (SEC MKT)		
Unenhanced Rating	NR(SPUR)	
Great Lakes Wtr Auth wtr (2nd lien) (AGM)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (2nd lien) (AGM)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (2nd lien) (MBIA)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Great Lakes Wtr Auth wtr (2nd lien) (MBIA) (National)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Michigan Fin Auth, Michigan		
Great Lakes Wtr Auth, Michigan		
Michigan Fin Auth (Great Lakes Wtr Auth) wtr		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) wtr (AGM)		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) wtr (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) wtr (National)		
Unenhanced Rating	A+(SPUR)/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	AA-/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	A+/Stable	Affirmed
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR (AGM)		
Unenhanced Rating	AA-(SPUR)/Stable	Affirmed

Many issues are enhanced by bond insurance.

S&P Global
Ratings

RatingsDirect®

Great Lakes Water Authority, Michigan; Water/Sewer

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Great Lakes Water Authority, Michigan; Water/Sewer

Credit Profile		
US$536.09 mil swg disp sys rev (Rfdg Sr Ln Bnds) ser 2020A due 07/01/2050		
Long Term Rating	AA-/Stable	New
US$160.375 mil swg disp sys rev (Rfdg 2nd Ln Bnds) ser 2020B due 07/01/2050		
Long Term Rating	A+/Stable	New
Great Lakes Wtr Auth swg (Sr lien)		
Long Term Rating	AA-/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien)		
Long Term Rating	A+/Stable	Upgraded

Rating Action

S&P Global Ratings has assigned its 'AA-' rating to the Great Lakes Water Authority, Mich.'s (GLWA) series 2020A sewage disposal system revenue refunding bonds senior lien and its 'A+' rating to GLWA's series 2020B sewage disposal system revenue refunding second-lien bonds. We have also raised our ratings on the authority's existing senior-lien bonds to 'AA-' from 'A+' and its existing second-lien bonds to 'A+' from 'A'. The outlook is stable.

The upgrade reflects resolution of negative revenue variances from the Detroit Water and Sewer Department (DWSD) local sewer system during the 2018 fiscal year that totaled about $19.8 million. While future variances could occur, GLWA and DWSD implemented--through a Memorandum of Understanding (MOU) agreed to in 2018--a process to cure any DWSD cumulative negative budgetary variance of more than 2% by repaying the shortfall to GLWA in annual installments over a period not to exceed three years with an additional surcharge based off the U.S. Treasury rate plus 150 basis points. We view this as an important credit factor because GLWA's overall sewage disposal revenue requirements for all of its customer classes are designed to be fixed. Resolving this negative variance, in our view, provides additional certainty that revenue variances from the Detroit retail customer class will be made up in a timely manner. Accumulated shortfalls through 2018 are being amortized over the period ending in the 2022 fiscal year.

The ratings reflect the application of our wholesale utility criteria following a system approach since GLWA has, in our view, additional financial strengths that could be used to support debt payments if a single participant does not fulfil its payment obligations. These strengths include pledged reserves and unrestricted liquidity available at the wholesaler GLWA level, the ability to adjust revenue requirements to participants as its cost structure changes, and strong management policies related to both the regional and the local Detroit systems. The fact that GLWA's service base is large and serves a large percentage of the state's population also supports our view that the ratings should reflect that diversity, with overall economic considerations playing a more prominent role in the credit analysis.

We believe the system's revenue source is unlikely to result in materially delayed collections or significant revenue volatility in the current environment related to COVID-19. While we continue to monitor these events, we do not presently expect it to affect GLWA's ability to maintain budgetary balance and pay debt service costs. For more information, see our article, "COVID-19's Potential Effects In U.S. Public Finance Vary By Sector" (published March 5, 2020 on RatingsDirect).

Credit overview

Also supporting the rating at its current level are the following:

- Oversight through an agency relationship and cooperation with DWSD and its governing Board of Water Commissioners that we view as strong and supportive of credit quality. Because of Detroit's economy that we view as very weak and historical collections and bad debt issues, we view both the existence and continuation of these functions as key to the maintenance of the rating at its current level.
- Overall management and governance functions that we also view as supportive of credit quality at the current rating level. GLWA management maintains active communication with both the DWSD retail system and its wholesale customers and has a comprehensive set of internal policies related to, among other things, maintenance of certain financial targets, key performance indicators for both financial and operational metrics, and internal controls.
- Actual financial performance has continued to meet expectations from prior feasibility studies. Now that GLWA has three full fiscal years (2017-2019) of operating as a separate entity from DWSD, and that the effect of various reconciliations and adjustments related to the separation is continuing to decline, we would expect that future variances to the feasibility studies may continue this trend. Given GLWA's comprehensive budgeting practices and strong budgetary oversight of DWSD's operations, we would expect that future financial performance should be largely consistent with the most current projections.
- GLWA is not under any regulatory-driven capital costs from consent orders or decrees. While we view the GLWA system as highly leveraged, the fact that all of the capital improvement plan (CIP) is forward-looking and not mostly being used to cure regulatory infractions is a key credit strength that is supportive of the current rating level.
- Limited future exposure to pension cost escalation from legacy Detroit obligations resulting from prior bankruptcy negotiations. It is our understanding that after the 2023 fiscal year, both GLWA and DWSD pension costs related to legacy pension plans will drop from a total for both water and sewer systems of $45.4 million (which is a mandated contribution based on Detroit's bankruptcy plan of adjustment) to what is currently projected to be no more than $7.3 million. These additional payments would be used to retire the remaining unfunded liability from the closed/legacy pension plans that has arisen after the original payments were determined in 2014.
- It has a diverse revenue stream from a large number of wholesale customers.
- Revenues from both wholesale customers and the DWSD retail system that are mostly fixed, which, in our view, significantly insulate GLWA's financial performance from volatility caused by weather and flow variances.

Offsetting these strengths is Detroit's economy, which we consider very weak and which could continue to place downward pressure on utility collection rates in the city, and high system leverage that we do not believe will abate significantly at least over the two-year outlook horizon.

Stable Two-Year Outlook

The stable outlook reflects our opinion that the rating should not change, at least over the two-year outlook horizon, due to several factors, including the following:

- Our expectation that the sewage disposal system's financial metrics should remain at levels generally consistent with current projections due to GLWA's charge structure that provides a large amount of revenue stability;
- DWSD revenue variances should remain low, given both GLWA's and DWSD's continued efforts to improve collections; and
- Exposure to a large service base that extends beyond the boundaries of the immediate Detroit area, which should help continue to support stable usage trends.

Downside scenario

If economic stress or cost escalations lead to financial results measurably worse than that GLWA currently projects in its current feasibility study, this could then weaken either the outlook, the rating, or both.

Upside scenario

While possible, we currently do not expect to raise the rating in the foreseeable future, absent both financial performance well above what current projections indicate and economic indicators for Detroit that show significant improvement. We believe that both current and projected financial performance and service base characteristics are consistent with the current rating level.

Credit Opinion

Details of legal framework relevant to the credit rating

The bonds are secured by a statutory lien on pledged assets of the system, prioritized by the lien status, which include net revenues of GLWA's sewage disposal system, along with investments credited to the sewer system and earnings on those investments. The net revenue pledge is constituted from gross revenues of the DWSD retail and the GLWA regional systems, which cover both systems' operating and maintenance (O&M) expenses. A rate covenant stipulates that the GLWA board set rates to produce at least 1.2x coverage of senior-lien debt, 1.1x for second-lien bonds, and 1x for junior-lien bonds. The ability to issue additional bonds exists if net revenues for the previous fiscal year or net revenues adjusted by approved rate increases and system expansion for the current or next fiscal year, produce coverage of maximum annual debt service (MADS; including the proposed bonds) of at least those levels indicated in the rate covenant for the particular liens.

There is also a debt service reserve (DSR) for senior-lien bonds equal to MADS or the lesser of the standard three-prong test, and for second-lien bonds equal to average annual debt service or the lesser of the three-prong test. On achieving approval from at least 51% of senior- and second-lien bondholders and having appropriate senior-lien ratings from two credit rating agencies no lower than 'AA-' or the equivalent, GLWA, through amendments to the master bond ordinance, has the option to eliminate this reserve requirement on its outstanding and future bonds on any lien for which approval has been granted. If this proposed amendment is approved, we currently view the effects as credit neutral; however, we consider the existence of DSRs as a credit strength to additionally offset any negative revenue variances from the Detroit retail customer class. While we understand the process in the MOU is designed to eliminate these negative variances, we view the existence of the sizable DSRs as additional credit protections given what we view to be the uncertainties related to the economic conditions in Detroit. At the fiscal year ended June 30, 2019, the senior-lien DSR totaled $128.6 million and the second-plus junior-lien DSRs totaled $74.2 million; DSR investments consist of cash, securities, and sureties. To date, GLWA has achieved bondholder approval for the above-mentioned amendment from about 21% and over 40% of senior- and second-lien bondholders, respectively.

The statutory lien on pledged assets is well established by state statute under Act 94 of 1933 (as amended).

Under the GLWA master bond ordinance, U.S. Bank N.A. is the trustee.

We view the numerous oversight and control functions that GLWA has over Detroit's retail system as supportive of both the overall legal framework and the ability of the GLWA regional system to help make the net revenues originating from Detroit's local system more predictable. This, in turn, results in an analysis that focuses more on this framework as opposed to one that benchmarks the rating specifically on our view of DWSD's creditworthiness. The primary three documents that place parameters around this operating relationship between the two entities are the water and sewer lease agreements, and both a service agreement and MOU between GLWA and the Detroit retail system.

The major provisions of both lease agreements that we view as supportive of the overall legal and operational framework include the following:

- Explicit language that requires all revenues collected by Detroit be held in segregated accounts in trust and remitted within five days of receipt to a trustee-held pledged revenue account under the master bond ordinance.
- Requirements that both GLWA and Detroit retail maintain a biennial budget and a five-year CIP.
- In consideration of a lease payment from GLWA for use by the Detroit local system, the use of those funds are restricted to either repayment of debt or capital projects.
- GLWA has the exclusive and direct right to establish all rates and charges, including the retail users within Detroit (although through the service agreement, GLWA delegates its right to set rates to DWSD).
- All vendor and employee contracts related to GLWA operations are assigned to the authority.

The major provisions of the service agreement and MOU that we view as supportive of the overall legal and operational framework include the following:

- If certain performance standards are not met, GLWA can revoke its appointment of Detroit as its agent for collections of revenue requirements.
- GLWA will set revenue requirements for DWSD that are related to the costs for providing services, and, in turn, Detroit will set retail rates in a fashion that meets GLWA's revenue requirement.
- The procedure for resolution of budget shortfalls, as previously mentioned.
- All responsibilities for discharge permit and other environmental compliance requirements are explicitly allocated between Detroit retail and GLWA.
- DWSD is required to submit periodic budget and operational reporting requirements to GLWA and discuss these results at a Reconciliation Committee, which is also the initial mechanism to develop a plan for DWSD to cure any budget shortfalls it experiences.
- The service agreement has an explicit mechanism for dispute resolution.

Economic conditions and customer base

GLWA's sewer system serves a large population of about 2.8 million across Wayne, Oakland, and Macomb counties, which covers about 28% of Michigan's population.

We consider Detroit's economy very weak, but the revenue base for both water and sewer is well diversified geographically beyond the city limits. The large amount of inactive accounts in Detroit exacerbates the need for ongoing collection efforts and could affect the large amount of accounts receivable. Management is actively working to lower its uncollectible accounts, but 48% of Detroit retail accounts are inactive, which we view as a significant number. We note, however, that collections efforts have increased, in our view, since GLWA was formed in 2016, including the introduction of payment plans and GLWA's water residential assistance program (WRAP) for low-income residents.

Looking at the metropolitan area as a whole, however, average economic indicators are much better, with median household effective buying income at about 100% of the U.S. average, and according to the U.S. Bureau of Labor Statistics, the city of Detroit's annual average unemployment rate was under 10% for 2017, the first time since 2001, and was 9.0% for 2018. We believe the metrics for a regional utility indicate a better overall economic base for the service area than looking at the city's economic indicators alone.

A weakening of economic metrics could weaken the credit rating, especially if this were to occur on a more regional scale. A general regional weakening economy would lessen the positive effects that the more diversified revenue and customer base has had on the rating profile.

GLWA charge structure and collection issues

The implementation of model contracts and moving wholesale customers' revenue requirements to a higher level of fixed-cost recovery, is, in our view, a credit strength because it will help prevent revenue fluctuations based on metered flow and will help stabilize revenue collections. Management has also maintained a wholesale customer outreach program since 1997.

Management is committed to moderate annual rate increases intended to produce a 4% increase in overall annual revenues, instead of the wide swings in rates in the past. We understand it is hoping to achieve this through implementation of fixed-cost recovery, continued cost reductions, labor force reductions, and the use of cash for capital when appropriate.

A credit weakness is the large amount of past due and inactive accounts in Detroit. DWSD management has a dedicated shut-off program that has been implemented by an outside contractor, although meaningful results will take time, in our view. One benchmark we will look at involves overall budget variances for the DWSD local system as one indication of the progress DWSD is making on collection efforts. GLWA's WRAP is designed to both provide bill assistance and arrange for household water audits to all qualified residents within municipalities that have adopted it (which currently includes Detroit).

Finances and liquidity

The historical DWSD financial performance has been somewhat volatile, in our view, due primarily to changes in billed versus budgeted volumes and exacerbated by economic stress. Still, in recent years, each system has been able to generate net revenues that cover fixed costs by at least 1x.

For GLWA, our fixed-charge coverage analysis generally follows the presentation in GLWA's master bond ordinance calculation for junior-lien debt service coverage, with additional revenue offsets due to pension payments made to Detroit for its frozen general retirement system expenses and additional fixed costs due to pension note payments made to Detroit for its B and C note payments. Our calculation focuses on how net revenues are covering all of GLWA's fixed costs instead of reporting coverage based on master bond ordinance definitions of operating and nonoperating expenses. We generally view the historical fixed-charge coverage as adequate to good, with the expectation that coverage will remain relatively steady and generally consistent with recent trends due to the implementation of fixed-cost recovery rates and various management initiatives.

Liquidity of the system has fluctuated, but has generally stayed at levels we would consider good. Projections show a steady unrestricted liquidity position of about $210 million-$220 million for the foreseeable future, which takes into account operating reserves, budget stabilization, emergency repair, and improvement and extension fund balances. Because the master bond ordinance allows for any monies in these funds to be used for either O&M expense requirements or debt service shortfalls, we view them as unrestricted liquidity.

Capital and debt

The size and scope of the CIP are credit neutral. We expect that capital costs will continue to be distributed between Detroit's retail system and the regional system as appropriate, and in a manner consistent with the lease and service agreements' allocate costs.

The sewer system is highly leveraged. We do not expect this condition to abate in the near term and generally view the debt profile as a credit weakness. Total debt service from all revenue bonds and state revolving fund loans currently represents about 125% of O&M expenses, and we do not see this number falling significantly in the near future since additional debt is layered in to fund the CIP.

Ratings Detail (As Of March 16, 2020)		
Great Lakes Wtr Auth swg disp sys sr lien rev & rfdg bnds ser 2003A dtd 05/15/2003 due 07/01/2003-2026 2028 2032		
Unenhanced Rating	NR(SPUR)	
Great Lakes Wtr Auth swg (wrap of insured) (MBIA, National & ASSURED GTY) (SEC MKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (Sr lien)		
Long Term Rating	AA-/Stable	Upgraded
Great Lakes Wtr Auth swg (Sr lien) (AGM)		
Unenhanced Rating	AA-(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (Sr lien) (AGM) (SECMKT)		
Unenhanced Rating	AA-(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (Sr lien) (FGIC) (National)		
Unenhanced Rating	AA-(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (wrap of insured) (FGIC & AGM) (SEC MKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (wrap of insured) (FGIC) (MBIA) (SEC MKT) (National)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded

Ratings Detail (As Of March 16, 2020) (cont.)		
Great Lakes Wtr Auth swg (2nd lien) (wrap of insured) (FGIC, AGM & BHAC) (SEC MKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (AGM)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (AGM)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (BHAC)		
Unenhanced Rating	NR(SPUR)	
Great Lakes Wtr Auth swg (2nd lien) (MBIA) (National)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swg (2nd lien) (MBIA) (National)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth swr (wrap of insured) (FGIC) (ASSURED GTY - SEC MKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Great Lakes Wtr Auth WTRSWR (BHAC)		
Unenhanced Rating	NR(SPUR)	
Great Lakes Wtr Auth WTRSWR (National) (MBIA)		
Unenhanced Rating	NR(SPUR)	
Michigan Fin Auth, Michigan		
Great Lakes Wtr Auth, Michigan		
Michigan Fin Auth (Great Lakes Wtr Auth) swg		
Unenhanced Rating	AA-(SPUR)/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) swg disposal (AGM)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) swg disposal (BAM)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) swg (BAM) (SECMKT)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) swg (National)		
Unenhanced Rating	A+(SPUR)/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	AA-/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	AA-/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	AA-/Stable	Upgraded
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Unenhanced Rating	AA-(SPUR)/Stable	Upgraded

Ratings Detail (As Of March 16, 2020) (cont.)		
Michigan Fin Auth (Great Lakes Wtr Auth) WTRSWR		
Long Term Rating	A+/Stable	Upgraded

Many issues are enhanced by bond insurance.