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Contacts

Nicholas Lehman +1.617.535.7694
VP-Senior Analyst
nicholas.lehman@moodys.com

Leonard Jones +1.212.553.3806
MD-Public Finance
leonard.jones@moodys.com

Thomas Jacobs +1.212.553.0131
Senior Vice President
thomas.jacobs@moodys.com

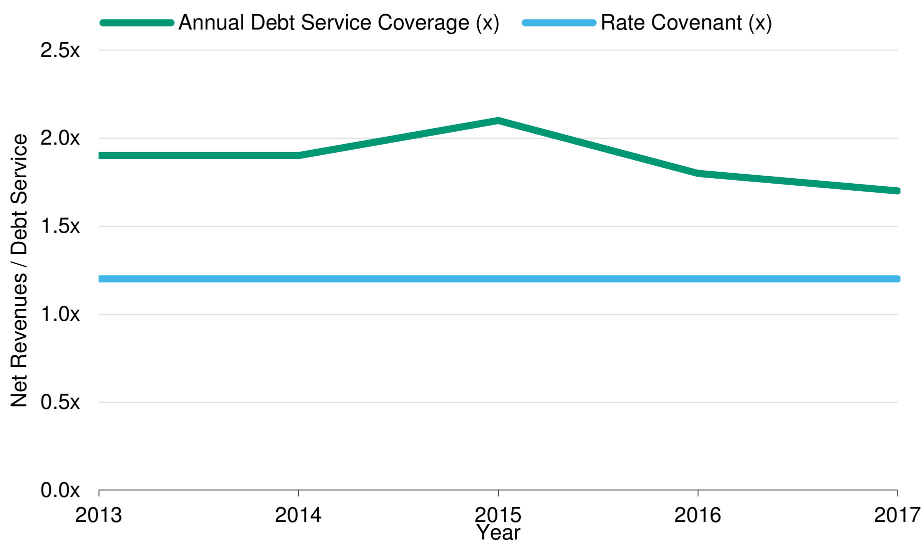
Massachusetts Water Resources Authority

Update to credit analysis

Summary

Massachusetts Water Resources Authority (MWRA, Aa1 stable) benefits from the strong credit profile of its service area, history of very stable annual debt service coverage, satisfactory liquidity, and comprehensive planning of long term capital needs. The authority's conservative and proactive management team help to mitigate a highly leveraged position that includes a sizeable variable rate component. The MWRA also has the ability to intercept member municipalities' state aid in the event of non-payment to the authority.

Exhibit 1
Stable debt service coverage highlights strong fiscal management



As of June 30 fiscal year end
Source: Moody's Investors Service and MWRA's audited financial statements

Credit strengths

» Strong credit quality and payment history of local government members

» Ability to intercept members' state aid to cure delinquencies

» Strong management of financial operations, capital planning and debt portfolio

» Well funded pension plan

Credit challenges

- Highly leveraged position
- Reliance on annual rate increases

Rating outlook

The stable outlook reflects our expectation that financial operations will remain balanced over the near term with manageable annual rate increases. The outlook also incorporates the ongoing strength of the service area and MWRA's conservative and comprehensive planning of long term capital needs.

Factors that could lead to an upgrade

- Substantial decline in debt relative to assets
- Positive trend in annual coverage for senior and total debt service

Factors that could lead to a downgrade

- Higher debt ratio with increased exposure to variable rate debt
- Narrowing trend in annual debt service coverage
- Failed remarketings leading to accelerated amortization of variable rate debt
- Deterioration of service area's credit profile

Key indicators

Exhibit 2

Massachusetts Water Resources Authority, MA					
System Characteristics					
Asset Condition (Net Fixed Assets / Annual Depreciation)	29 years				
System Size - O&M ($000)	$286,269				
Service Area Wealth: MFI % of US median	95.09%				
Legal Provisions					
Rate Covenant (x)	1.20x				
Debt Service Reserve Requirement	DSRF funded at less than the 3 prong test or a springing DSRF (A)				
Management					
Rate Management	Aaa				
Regulatory Compliance and Capital Planning	Aaa				
Financial Strength					
	2013	2014	2015	2016	2017
Operating Revenue ($000)	$623,213	$650,957	$671,544	$699,913	$719,716
System Size - O&M ($000)	$267,350	$273,504	$263,403	$272,038	$286,269
Net Revenues ($000)	$359,396	$389,698	$430,519	$485,341	$443,795
Net Funded Debt ($000)	$5,511,122	$5,383,345	$5,295,751	$5,306,007	$5,107,397
Annual Debt Service ($000)	$192,834	$203,338	$208,500	$272,570	$262,093
Annual Debt Service Coverage (x)	1.9x	1.9x	2.1x	1.8x	1.7x
Cash on Hand	170 days	168 days	180 days	179 days	168 days
Debt to Operating Revenues (x)	8.8x	8.3x	7.9x	7.6x	7.1x

Operating revenues = water and sewer revenue plus change in derivative related accounts; O&M = operations, maintenance, and engineering, general & administrative, and PILOTs; Net revenues = gross revenues and income - O&M; Gross revenues and income = operating revenues, interest income, capital grants & contributions
Source: Moody's Investors Service and MWRA's audited financial statements and disclosure statements

Profile

MWRA is a regional water and sewer enterprise system, providing wholesale water and wastewater services to the Boston (Aaa stable) metro-area and eastern Massachusetts (Aa1 stable).

Detailed credit considerations

Service area and system characteristics: Large regional system providing essential service to member communities with strong credit characteristics

MWRA provides wholesale water and wastewater services to 61 communities in eastern Massachusetts (Aa1 stable), serving approximately 3 million people, or 44% of the commonwealth's population. Incorporated in the long-term ratings are the authority's strong collection of member assessments supported by historical receipt of 100% of assessments within the levy year, 31% of which come from the Boston Water and Sewer Commission (BWSC, Aa1 stable). Including BWSC, the top five largest customers provide 47.1% of 2018 total assessments. After BWSC, the rest of the top 5 are the Cities of Newton (4.8%, Aaa stable), Quincy (4.6%, Aa3 negative), Cambridge (3.4%, Aaa stable) and Somerville (3.4%, Aa1). Additional credit strength is provided by: MWRA's ability to intercept the majority of the members' monthly state aid payments; the authority's stable membership with lack of alternative sources; independent rate-setting authority; and the essential nature of the services provided.

MWRA derives water it supplies to 52 local entities primarily from the Quabbin Reservoir, located 65 miles west of Boston (Aaa stable) and the Wachusett Reservoir, located 35 miles west of Boston, with a combined capacity of 477 billion gallons. Demand consistently falls below the safe yield level of 300 million gallons per day and capacity is expected to be sufficient for at least 20 years due to continued improvements in water use efficiency. Treatment of much of the system's water by ozonation, UV light and chlorination is provided at the system's John J. Carroll Treatment Plant. Transmission and covered storage facilities include the 17.6-mile MetroWest Water Supply Tunnel and the 115 million gallon Norumbega Covered Storage Facility.

Wastewater collection and treatment are provided to 43 communities, with a major treatment facility located on Deer Island in Boston Harbor. The $3.8 billion Deer Island plant and 9.5-mile effluent outfall tunnel were phased into service between 1996 and 2000, and allow for average flow of 310 million gallons per day (with peak capacity of 1,270 MGD). Sludge is piped to the authority's pelletization plant in Quincy where it is processed into commercially available fertilizer.

Debt service coverage and liquidity: Healthy coverage and liquidity bolstered by long history of stable operations

Financial operations will remain stable over the near term due to continued adoption of regular rate increases that are critical to generating annual operating surpluses and healthy debt service coverage. From fiscal 2014 through 2018, the combined five year average annual rate increase has been 3.4%. Expected combined rate increases average 3.7% through 2023 to offset increased costs for debt service and operations. We expect the authority to continue to approve predictable and sustainable annual rate increases that will result in strong assessment collections and stable operations.

Fiscal 2017 senior lien coverage under the resolution was 1.9 times while total debt service coverage also remained stable at 1.2 times. Senior coverage under Moody's definition of operations was at 1.7 times, bringing the five year average down slightly to 1.9 times. The authority's debt service coverage, as defined by its bond resolution, allows for the recognition of annual transfers from reserves in net revenues. MWRA has not included transfers from reserves in net revenues since 2014.

Operations typically generate sizeable annual surpluses which are usually employed to defease outstanding debt related to future spikes in debt service in order to reduce the need for large rate increases in the future. MWRA also maintains healthy reserves for operations, insurance, and renewal and replacement that provide additional operating flexibility.

The fiscal 2018 current expense budget increased 3.3% over 2017 driven by a 3.7% increase in capital financings, 2.7% increase in direct expenses and 2.4% increase of indirect expenses. The budget was balanced with a 3.2% rate increase and no use of rate stabilization reserve funds. As of February 2018, expenditures are trending 0.9% under budget (including planned use of $5.3 million in surplus to be designated for bond defeasance) and revenues are up 1.2%. Projected senior lien debt service coverage year-to-date indicates continued stability at just under 2 times.

LIQUIDITY

As of fiscal 2017 year end, unrestricted cash and investments (cash, investments and intergovernmental loans) represented a healthy 168 days cash on hand, bringing the five-year average to 173 days. While strong, MWRA has historically maintained a narrower cash position than the rating category median which is mitigated by strong management and consistent application of surplus to debt defeasance.

Additionally, MWRA maintains reserve accounts required under the bond resolution with portions allocated between unrestricted and restricted investments. As of fiscal 2017 year end, they have the following balances; rate stabilization ($36.5 million), bond redemption ($26.1 million), debt service reserve ($150.7 million), operating reserve ($39.2 million), insurance reserve ($14 million) and renewal and replacement reserve ($10 million).

Debt and legal covenants: modest covenants support highly leveraged position including variable rate exposure

The General Resolution includes a rate covenant of 1.2 times on senior lien debt service and 1.1 times on subordinate debt service. The resolution requires maintenance of a debt service reserve fund equal to the least of (i) 50% of maximum annual Adjusted Debt Service, (ii) 10% of original par, (iii) 125% of the average annual debt service, or (iv) the maximum annual debt service.

In support of significant capital investments, MWRA has issued a substantial amount of debt and remains highly leveraged with debt amounting to 76% of net fixed assets plus net working capital and 7.1 times fiscal 2017 operating revenues. The authority has $3.1 billion in senior lien general revenue bonds, $943 million in SRF loans (subordinate), and $781 million in subordinate variable rate revenue bonds. Additionally, MWRA is authorized to issue up to $250 million in tax-exempt commercial paper and draw on $100 million revolving loan with a combined $229 million currently outstanding.

Over the near term, we expect the debt ratio to remain high but at a reduced level compared to historical levels, given significant completion of compliance related projects and a shift to maintenance and repairs. However, the 2018 CIP does project that capital expenditures will begin to rise over the medium term in part due to a $1.4 billion redundancy project. The 2018 CIP budget was $179.4

million with actual costs of $107 million through February. The proposed 2019 CIP budgets for $207 million for 2019 capital needs and $1.2 billion in total improvements through 2023.

DEBT STRUCTURE

Variable rate debt currently represents 15.5% of total outstanding debt, down from over 20% in recent years. Variable rate demand bonds in the amount of $389 million are hedged with interest rate swaps while the balance of $442 million are unhedged. The authority actively manages its capital structure risks including staggering of mandatory tender dates, and diversification of bank and swap counterparties. The potential for debt acceleration is remote given MWRA's good headroom under its covenants and management's very careful attention to debt details.

DEBT-RELATED DERIVATIVES

MWRA has a large and complex interest rate swap portfolio, including five floating-to-fixed swaps. As of March 16, 2018, the entire swap portfolio had a market valuation of negative $88.5 million to MWRA. Early termination events are triggered if MWRA's underlying senior lien rating falls below Baa3.

Two Letters of Credit support the remaining unhedged VRDBs and expire in August and December 2020. The 2012 Series E and G bonds, 2014 Series A and B, and 2018 Series A were all issued through negotiated direct purchase agreements with a diverse group of lenders. TD Bank N.A. represents the largest share with 18%. A sixth direct purshase agreement is scheduled to close on May 31 under designation 2018 Series D.

PENSIONS AND OPEB

MWRA contributes to the Massachusetts Water Resources Authority Employees' Retirement Plan, a single-employer, defined benefit plan. The plan is well-funded with a small reported net pension liability of only $18 million as of January 1, 2017. The plan is currently 96.5% funded and is expected to be fully funded by 2024, well in advance of most enterprise systems as well as the Commonwealth's mandate of 2040.

The authority has also started to make larger contributions towards its OPEB liability, contributing 83% of the ARC in 2017 as well as additional payments into an OPEB trust. The unfunded liability is $120.6 million with an 8.2% funded ratio as of the January 1, 2016 valuation report.

Management and governance: Strong management team adhering to comprehensive planning and policies

MWRA benefits from a strong senior leadership team with comprehensive policies that address financial, capital and debt management. Management annually updates a ten-year capital plan, and maintains financial projections incorporating long term rate management strategy, use of reserves, and debt management including an approach to defeasance of debt.

The authority is governed by a diverse, 11-member board of directors, chaired by the Secretary of Energy and Environmental Affairs for the Commonwealth.

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