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CREDIT ANALYSIS

Pennichuck Water Works, Inc.

Merrimack, New Hampshire, United States

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This Credit Analysis provides an in-depth discussion of credit rating(s) for Pennichuck Water Works, Inc. and should be read in conjunction with Moody's most recent Credit Opinion and rating information available on Moody's website.

TABLE 1

Pennichuck Water Works, Inc.

	2008	2008	2010	2011	LTM 9/30/2012
Funds From Operations (FFO) / Debt	11.6%	14.1%	17.2%	19.2%	3.4%
FFO + Interest / Interest	3.3x	3.7x	4.2x	4.4x	1.6x
Debt / Capitalization	53.7%	46.6%	44.1%	41.4%	25.6%
RCF / Capex	0.4x	0.9x	0.8x	1.7x	0.2x

Company Profile

Pennichuck Water Works, Inc. (PWW, Baa3 senior unsecured, positive outlook) is a relatively small regulated water utility company based in Merrimack, New Hampshire. PWW is currently owned by Pennichuck Corporation (Corp), which also owns two other, considerably smaller water utilities, and has modest-sized investments in non-regulated activities. Corp is owned by the City of Nashua, NH. For the fiscal year-ended December 31, 2011, PWW reported revenues and funds from operations (FFO) of $28.7 million and $9.9 million, respectively. PWW also represents approximately 75% of Corp's consolidated revenues (2011).

Recent Events

On January 25, 2012, the City of Nashua, New Hampshire completed its acquisition of all outstanding common stock of Corp. The stock was purchased for $29/share and Corp ceases to be publicly traded on the NASDAQ.

Rating Rationale

PWW's Baa3 senior unsecured rating reflects the company's stable water utility operations, economically healthy customer base (approximately 67% residential), appropriate credit metrics for its rating category and historically constructive relationship with the New Hampshire Public Utility Commission (NH-PUC). Challenges for the company include its ongoing capital needs and small size, which can leave it negatively exposed to cool, wet weather conditions in any given year.

We note that the issuer of the Moody's rated PWW bonds is a tax-advantaged finance conduit. As background, in October 2005 PWW raised $50 million of 30-year tax-exempt "Water Facility Revenue Bonds" to help fund capital spending for its rate regulated operations over the next several years. The initial Aaa rating assigned to the $50 million of bonds, (issued by the Business Finance Authority of the State of New Hampshire) reflected the unconditional and non-cancelable insurance policy provided by AMBAC Assurance Corporation (AMBAC), to provide assurance of timely payment of principal and interest when due. PWW was the underlying obligor and source of cash flows for debt service and repayment of the bonds. Due to a series of downward rating actions on AMBAC, Moody's now views the operative rating assigned to the notes as solely reflecting the credit profile of PWW.

Of the initial $50 million offering in 2005, approximately $38 million was utilized to support capital projects in PWW's service area; the centerpiece of which was a $40 million water treatment project, now complete. The escrow balance of approximately $11 million was returned to investors on July 1, 2010.

Small But Stable Regulated Utility Operations

PWW is the largest of Pennichuck Corporation's three regulated water utility subsidiaries, providing service to approximately 26,000 customers in Nashua and 10 surrounding municipalities. However, with just $28.7 million of revenue in 2011 PWW is extremely small compared to the peer group of regulated water utilities rated by Moody's.

Offsetting the small size is the relative stability expected within the regulated framework. The NH-PUC regulates PWW's rates and the company has been active in recent years in seeking rate increases. In August 2009, the NH-PUC approved a 22% rate increase ($4.7 million) based on 2007 usage volume. We believe this was a constructive outcome given the elevated capital spending in the preceding years. However, the combination of cooler, wet weather, water conservation, and some economic slowing in 2009 led to reduced volumes, making it difficult for the company to realize the full benefit of the increased rate authorization.

In May 2010, the company sought a further annual increase of $3.9 million (16.2%) and in June 2011 the NH-PUC authorized an increase of $2.9 million. Importantly, the order also approved a pilot Water Infrastructure and Conservation Adjustment ("WICA") mechanism that will allow Pennichuck Water to recover, through a rate surcharge between rate cases, certain costs of replacing and rehabilitating aging water infrastructure assets as they are placed into service. Ultimately, we believe this will help to reduce regulatory lag on investment in new pipes and other infrastructure. The WICA charge is expected to allow PWW to increase its rates, based upon approved in-service projects, up to a maximum of 2% per year and 7.5% in total between rate cases beginning in 2013.

Appropriate Credit Metrics For Rating Category

Two key metrics for PWW are FFO to debt and FFO + interest / interest. For the LTM period ended September 30, 2012 PWW reported ratios of 3.4% and 1.6 times, respectively, for these metrics. These metrics are negatively affected by a non-reoccurring expense related to eminent domain proceedings and adjusting for that one-time expense FFO to debt and FFO + interest / interest are 10.0% and 2.8 times, respectively, for LTM September 30, 2012. The appropriate "Baa" range for these metrics in the regulated water sector would be in the ranges of 10-15% and 2.5-4.5 times, respectively. At the parent level the metrics are just slightly weaker (for example consolidated FFO to debt has averaged 15% at Corp compared to 17% at PWW from 2009-2011). Adding the debt the City of Nashua (Aa2 general obligation rating, stable outlook) raised to finance the purchase of Corp to PWW's metrics FFO to debt and FFO + interest / interest would be 2.5% and 1.7 times for LTM September 30, 2012.

Takeover By City Of Nashua Completed

Since 2002, the City of Nashua has attempted to acquire the assets of PWW primarily through the use of eminent domain. On November 12, 2010, the City and Corp announced that they had entered into an agreement whereby the city would purchase Corp in its entirety. This government ownership of a corporate entity was made possible by special legislation enacted in 2007. The acquisition closed on January 25, 2012 and the final price of $29/share or $138 million. The City of Nashua approved an independent board comprised of 7 to 13 directors to oversee the company. The city does not expect to change the operations of the utility but has reduced the number of executive level corporate employees. We expect the ownership by the City of Nashua to be positive for PWW, as the overhang of the pending acquisition has been resolved, freeing up resources previously dedicated to the takeover now being able to focus on the utility's operations.

Liquidity

PWW is viewed to have an adequate liquidity profile. Externally, PWW's liquidity is currently supported by the availability of a $10 million revolving credit facility at the parent level that expires in June 2014. At December 19, 2012, the line was undrawn. Financial covenants associated with the bank line include Fixed Charge Coverage Ratio of 1.0x or greater, and an Equity Capitalization Ratio of 35% or greater. PWW has no maturities until 2018 when $7.5 million of revenue bonds come due.

What could Change the Rating Up?

The rating is positive and could be upgraded with the continued successful integration and operation by the City of Nashua. The ultimate number of notches upgraded will depend on our view on the impact, if any, on the Aa2 rating of the City of Nashua.

What could Change the Rating Down?

Given the recent acquisition by a higher rated entity, a downgrade is unlikely at this time. Though if the unregulated business grew significantly, or if there are major operational disruptions, a downgrade could result.

Rating Factors

Moody's also views PWW's rating within the context of our "Global Regulated Water Utilities" rating methodology (published December 2009). With this methodology, PWW's mapped unsecured rating is Baa1 using both historical and projected PWW metrics implying some cushion against the current Baa3 unsecured rating. When adding the acquisition debt to the metrics PWW's methodology implied rating falls to Baa3/Ba1.The attached grid details the mapping of PWW's profile to the sub-factors outlined in our methodology.

TABLE 2

Rating Factors

Pennichuck Water Works, Inc. (LTM Sep-2012)

Global Regulated Water Utilities	Aaa	Aa	A	Baa	Ba	B	Caa
Factor 1: Regulatory Environment and Asset Ownership (40%)							
a) Stability & Predictability of Regulatory Environment				X			
b) Asset Ownership Model			X				
c) Cost and Investment Recovery (Ability and Timeliness)				X			
d) Revenue Risk				X			
Factor 2: Operational Characteristics & Asset Risk (10%)							
a) Operational Efficiency				X			
b) Scale of Capital Program and Asset Condition				X			
Factor 3: Stability of Business Model and Financial Structure (10%)							
a) Ability & Willingness to Pursue Opportunistic Corporate Activity			X				
b) Ability & Willingness to Increase Leverage			X				
c) Prroportion of Revenues Outside Core Water and Wastewater		X					
Factor 4: Key Credit Metrics (40%) 3-Yr average							
a) FFO + Interest / Interest				X			
b) Debt / Capitalization		X					
c) FFO / Debt				X			
d) RCF / Capex					X		
Rating:							
Indicated Rating from Methodology				Baa1			
Actual Rating Assigned				Baa3			

Report Number: 148679

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Summary:

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Summary:

New Hampshire Business Finance Authority Pennichuck Water Works; Water/Sewer

Credit Profile		
US$23.375 mil wtr fac rev bnds (Pennichuck Water Works, Inc. (Amt) ser 2014 B due 07/01/2035		
Long Term Rating	A/Stable	New
US$20.025 mil wtr fac rev bnds (Pennichuck Water Works, Inc. Proj (Amt) ser 2014 A due 07/01/2035		
Long Term Rating	A/Stable	New
US$5.825 mil wtr fac rev bnds (Pennichuck Water Works, Inc.) (Federally Taxable) ser 2014 C due 07/01/2035		
Long Term Rating	A/Stable	New

Rationale

Standard & Poor's Ratings Services has assigned its 'A' rating to New Hampshire Business Finance Authority's pro forma $49.3 million series 2014 water facility revenue bonds, issued for Pennichuck Water Works (PWW). The outlook is stable.

Bond proceeds will finance a mix of refunding ($23.4 million) and capital ($25.9 million) purposes, the latter of which the utility will use for various projects, including upgrading water supply and rehabilitation and replacement projects. Following refunding, the system will have about $75 million in debt, including $6 million in state revolving fund loans.

The rating reflects our view of the following credit strengths:

- A strong service area economy with a stable population and low unemployment;
- Strong debt service coverage on a parity basis; and
- A diverse system with sufficient capacity to meet demand.

We believe offsetting factors include:

- A rate-setting process that lacks independent flexibility and that does not allow for immediate reaction to financial needs should it be necessary; and
- An inability to build significant liquidity due to a structure that requires repayments to the city for acquisition of the system by the city in 2012.

As the borrower, PWW will repay the authority from its funds available. We believe bond provisions are fairly standard. These include a 1.1x rate covenant, a 1.1x additional bonds test against maximum annual debt service on parity debt. However, there is no debt service reserve fund.

The service area centers on Nashua, which has an estimated population of 86,000 in Hillsborough County in southern New Hampshire, about 34 miles northwest of Boston. Its location near the Massachusetts border, coupled with New Hampshire's lack of a statewide sales tax, has fostered a strong commercial and retail presence in the city. Nashua's typically higher paying sectors contribute to its strong incomes, with projected per capita effective buying income at 125% of the national average. Meanwhile, the city's unemployment rate was 5.0% in August, above the 4.3% rate for the state but lower than the 5.7% national rate.

The City of Nashua owns Pennichuck Corp., which is PWW's parent. There are two main parts of the system, the core water system and various community water systems. The core system serves nearly 25,000 customers across five communities, and the community water systems serve almost 2,700 customers among 22 water systems in eight different communities. The core system is supplied by Pennichuck Brook and Merrimack River and supplemented with reservoir storage, with a single water treatment plant. Community systems are supplied through individual wells and purchases water from interconnections with local municipalities. Of the 27,400 customers, Nashua contributes 23,300, or 85% of the total. Meanwhile, we believe the system's customer base is diverse, with the top 10 accounting for 19% of revenues.

The New Hampshire Public Utilities Commission (PUC), which has ultimate rate-setting flexibility over PWW's rates, regulates the utility. For this reason, PWW must undergo an extensive and time-consuming rate-making case to the PUC any time it seeks to increase rates. We note that none of these past cases have failed, nor do we expect any to fail, owing to the experienced management team PWW employs. Due to PUC oversight, the utility may set rates at a level to meet all of its obligations, including capital and operating expenses, debt, and city repayment (known as the city bond fixed revenue requirement [CBFRR]), although not further than this. As such, PWW cannot build any significant liquidity, but has and will continue to retain a rate stabilization account of $5 million that may be accessed in the event of revenues insufficient to cover debt service.

Owing to Nashua's acquisition of PWW via Pennichuck Corp., (thereby creating a public corporation) through issuance of city general obligation debt, the corporation must pay the city approximately $7.5 million annually through 2044, essentially with PWW-generated revenue. This repayment is after all operating expenses, parity debt, and subordinate debt, if any. As such, we expect continued strong debt service coverage (DSC), which was about 3.5x in 2012 and 2013. Projections call for parity DSC no lower than 2.4x over the next five years. Meanwhile, we treat the city repayment essentially as a subordinate lien, resulting in combined DSC at sufficiency only, which is how the governance structure and rate-setting process intends for it to work.

As stated, the system's capital plan focuses on upgrading its water supply, replacement and rehabilitation projects, and numerous other minor projects. There are no additional debt plans for the five-year capital program.

Outlook

The stable outlook reflects our expectation that parity DSC will remain strong, largely due to the CBFRR. Given the structure, an inability to build significant cash, and the extensive rate-setting process, we do not expect to raise our rating within our two-year outlook period. We could lower our rating if the rate-setting process is not amply anticipated, resulting in a breach of the rate-stabilization account to pay any obligations.

Related Criteria And Research

Related Criteria

- USPF Criteria: Key Water And Sewer Utility Credit Ratio Ranges, Sept. 15, 2008
- USPF Criteria: Standard & Poor's Revises Criteria For Rating Water, Sewer, And Drainage Utility Revenue Bonds, Sept. 15, 2008
- USPF Criteria: Methodology: Definitions And Related Analytic Practices For Covenant And Payment Provisions In U.S. Public Finance Revenue Obligations, Nov. 29, 2011

Related Research

- U.S. State And Local Government Credit Conditions Forecast, Oct. 15, 2014
- U.S. Municipal Water And Sewer Utilities 2014 Sector Outlook: Learning To Do More With Less, Jan. 9, 2014
- 2014 Review Of U.S. Municipal Water And Sewer Ratings: How They Correlate With Key Economic And Financial Ratios, May 12, 2014

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Summary:

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Summary:

New Hampshire Business Finance Authority Pennichuck Water Works Inc.; Water/Sewer

Credit Profile		
US$14.175 mil wtr fac rev bnds (Pennichuck Water Works, Inc.) ser 2015 A due 10/01/2035		
Long Term Rating	A/Stable	New
US$7.495 mil wtr fac rev bnds (Pennichuck Wtr Works, Inc) ser 2015 B due 01/01/2035		
Long Term Rating	A/Stable	New
New Hampshire Bus Fin Auth, New Hampshire		
Pennichuck Wtr Works, Inc, New Hampshire		
New Hampshire Bus Fin Auth (Pennichuck Corporation) wtr fac rev bnds (Pennichuck Corporation) (Amt) ser 2014 A due 07/01/2035		
Long Term Rating	A/Stable	Affirmed

Rationale

Standard & Poor's Ratings Services has assigned its 'A' rating to New Hampshire Business Finance Authority's $24 million series 2015 water facility revenue bonds, issued for Pennichuck Water Works Inc. (PWW). At the same time, Standard & Poor's affirmed its 'A' rating on the utility's parity debt outstanding. The outlook is stable.

Bond proceeds will finance a mix of refunding ($14.2 million alternative minimum tax [AMT] and $2.3 million non-AMT) and capital ($7.5 million) purposes. PWW is assessing a direct purchase for the non-AMT component. The utility will use the $7.5 million for replacing operations facilities. Following refunding, the system will have about $83 million in debt, including $12 million in state revolving fund loans.

The rating reflects our view of the following credit strengths:

- A strong service area economy with a stable population and low unemployment;
- Strong debt service coverage (DSC) on a parity basis; and
- A diverse system with sufficient capacity to meet demand.

We believe offsetting factors include:

- A rate-setting process that lacks independent flexibility and that does not allow for immediate reaction to financial needs if necessary; and
- An inability to build significant liquidity due to a structure that requires repayments to the city for acquisition of the system by the city in 2012.

As the borrower, PWW will repay the authority from its funds available. We believe bond provisions are fairly standard. These include a 1.1x rate covenant and a 1.1x additional bonds test against maximum annual debt service (MADS) on parity debt. However, there is no debt service reserve fund.

The service area centers on Nashua, which has an estimated population of 86,000 in Hillsborough County in southern New Hampshire, about 34 miles northwest of Boston. Its location near the Massachusetts border, coupled with New Hampshire's lack of a statewide sales tax, has fostered a strong commercial and retail presence in the city. Nashua's typically higher paying sectors contribute to its strong incomes, with projected per capita effective buying income at 117% of the national average. Meanwhile, the city's unemployment rate was 4.2% in May, above the 3.6% rate for the state but lower than the 5.3% national rate.

Nashua owns Pennichuck Corp., which is PWW's parent. There are two main parts of the system, the core water system and various community water systems. The CEO has announced his retirement as of November 2015 and the current CFO will be named CEO. Full succession plans for senior and mid-level management and operational personnel are being updated.

The PWW system serves nearly 25,000 customers across five communities, and the community water systems serve almost 2,700 customers among 22 water systems in eight different communities. The core system is supplied by Pennichuck Brook and Merrimack River and supplemented with reservoir storage, with a single water treatment plant. Community systems are supplied through individual wells and purchased water from interconnections with local municipalities. Of the 27,400 customers, Nashua contributes 23,300, or 85% of the total. Meanwhile, we believe the system's customer base is diverse, with the top 10 accounting for 18% of revenues, with many of those, though, being municipal entities.

The New Hampshire Public Utilities Commission (PUC), which has ultimate rate-setting flexibility over PWW's rates, regulates the utility. For this reason, PWW must undergo an extensive and time-consuming rate-making case with the PUC any time it seeks to increase rates. We note that none of these past cases have failed, nor do we expect any to fail, owing to the experienced management team PWW employs. Additionally, PWW is currently granted a pilot program to allow for infrastructure- and conservation-related increases between rate cases, so long as the increases do not exceed 2% annually or 7.5% between filings. PWW has been taking advantage of this pilot and expects to need another filing in either fiscal year 2016 or 2017.

Owing to Nashua's acquisition of PWW via Pennichuck Corp., (thereby creating a public corporation) through issuance of city general obligation (GO) debt, the corporation must pay the city approximately $7.5 million annually through 2044. This repayment is after all operating expenses, parity debt, and subordinate debt, if any. We therefore expect continued strong DSC, which was about 3.0x and 2.8x in 2014 and 2013, respectively. Projections call for parity DSC no lower than 2.1x over the next five years. Meanwhile, we treat the city repayment essentially as a subordinate lien, resulting in combined DSC at sufficiency only, which is how the governance structure and rate-setting process intend for it to work.

Due to PUC oversight, the utility may set rates at a level to meet all of its obligations, including capital and operating expenses, debt, and city repayment (known as the city bond fixed revenue requirement [CBFRR]), although not beyond this. As such, PWW cannot build any significant liquidity, but has and will retain a reserve fund account of $5 million that may be tapped if revenues are insufficient to cover debt service. The fund is accessed and replenished monthly, providing sufficient liquidity for operations. Including the reserve fund, the days' cash on hand is equal to 118 days at 2014 fiscal year-end (Dec. 31).

As stated, the system's capital plan focuses on upgrading its water supply, replacement and rehabilitation projects, and numerous other minor projects. There are no additional debt plans for the five-year capital program.

Outlook

The stable outlook reflects our expectation that parity DSC will remain strong, largely due to the CBFRR. Given the structure, an inability to build significant cash, and the extensive rate-setting process, we do not expect to raise our rating within our two-year outlook period. We could lower our rating if the rate-setting process is not amply anticipated, resulting in a breach of the rate-stabilization account to pay any obligations.

Related Criteria And Research

Related Criteria

USPF Criteria: Key Water And Sewer Utility Credit Ratio Ranges, Sept. 15, 2008

- USPF Criteria: Standard & Poor’s Revises Criteria For Rating Water, Sewer, And Drainage Utility Revenue Bonds, Sept. 15, 2008
- USPF Criteria: Methodology: Definitions And Related Analytic Practices For Covenant And Payment Provisions In U.S. Public Finance Revenue Obligations, Nov. 29, 2011
- USPF Criteria: Assigning Issue Credit Ratings Of Operating Entities, May 20, 2015
- Criteria: Use of CreditWatch And Outlooks, Sept. 14, 2009

Related Research

- U.S. State And Local Government Credit Conditions Forecast, April 2, 2015
- U.S. Municipal Water And Sewer Utilities 2014 Sector Outlook: Learning To Do More With Less, Jan. 9, 2014
- 2014 Review Of U.S. Municipal Water And Sewer Ratings: How They Correlate With Key Economic And Financial Ratios, May 12, 2014

Ratings Detail (As Of August 18, 2015)		
New Hampshire Bus Fin Auth, New Hampshire		
Pennichuck Wtr Works, Inc, New Hampshire		
New Hampshire Bus Fin Auth (Pennichuck Corporation) wtr fac rev bnds (Pennichuck Corporation) (Amt) ser 2014 B due 07/01/2035		
Long Term Rating	A/Stable	Affirmed
New Hampshire Bus Fin Auth (Pennichuck Corporation) wtr fac rev bnds (Pennichuck Corporation) (Federally Taxable) ser 2014 C due 07/01/2035		
Long Term Rating	A/Stable	Affirmed

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Summary:

New Hampshire Business Finance Authority Pennichuck Water Works; Water/Sewer

Credit Profile		
US$4.595 mil wtr fac rev bnds (Pennichuck Wtr Works, Inc) (Amt) ser 2018A due 01/01/2048		
Long Term Rating	A+/Stable	New
US$1.09 mil wtr fac rev bnds (Pennichuck Wtr Works, Inc) (Taxable) ser 2018B dtd 03/28/2018 due 01/01/2029		
Long Term Rating	A+/Stable	New
New Hampshire Bus Fin Auth, New Hampshire		
Pennichuck Wtr Works, Inc, New Hampshire		
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Stable	Affirmed
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Stable	Affirmed
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Stable	Affirmed

Rationale

S&P Global Ratings assigned its 'A+' long-term rating to New Hampshire Business Finance Authority's series 2018A and 2018 bonds issued for Pennichuck Water Works (PWW). At the same time, S&P Global Ratings affirmed its 'A+' rating on parity debt outstanding. The outlook is stable.

The ratings reflect our view of an extremely strong enterprise risk profile and a strong financial risk profile, coupled with just-sufficient all-in debt service coverage (DSC).

The enterprise risk profile reflects our view of the utility's:

- Service area in and around Nashua, N.H., with a diverse economy and low unemployment;
- Strong position as the primary provider of utility services within its boundaries;
- Rates at 2.0 % of median household income;
- A rate-setting process that lacks independent flexibility but has been amended recently to allow more adjusting for capital needs and providing additional liquidity; and
- Good operational management policies and practices.

The financial risk profile reflects our view of the utility's:

- Sufficient all-in DSC that we believe will continue based on PWW's multiyear forecast;
- Strong liquidity position when including a reserve fund account of $5 million;

- Moderate leverage, based on a debt-to-capitalization ratio of about 41%; and
- Good financial management policies and practices.

Bond proceeds will finance various capital improvements to PWW's water supply and water distribution systems. We believe bond provisions are fairly standard. These include a 1.1x rate covenant and a 1.1x additional bonds test against maximum annual debt service (MADS) on parity debt.

Enterprise risk profile

Our assessment of the system's enterprise risk profile as extremely strong reflects PWW's stable and predictable revenue and cash flow streams from low-risk water and sewer service, a natural monopoly in its service area, and a good operational management framework.

The service area centers on the City of Nashua, the second-largest city in New Hampshire, with a population of about 88,000. Nashua owns Pennichuck Corp., PWW's parent. The system includes the core water system and four wholesale community water systems. The local economy is a diverse mix of commercial and retail businesses, within the Manchester-Nashua MSA and just 34 miles north of Boston. Nashua's per capita effective buying income is 115% of the national average. The city's unemployment rate, at 2.6%, is below the national average and reflects the area's diverse economy and job opportunities.

The PWW system serves over 28,000 customers across 11 New Hampshire communities, and Tyngsboro, Mass., through a wholesale arrangement. Pennichuck Brook and the Merrimack River supply the core system, supplemented with reservoir storage, and there is a single water treatment plant. Individual wells and purchased water from interconnections with local municipalities supply the community systems. The system has a capacity of 31.2 million gallons per day (mgd), which compares favorably to an average daily demand of 12.3 mgd over the past four years. Of the customers, Nashua contributes 24,080, or 85%. We believe the system's customer base is diverse, with the top 10 (many of those being municipal entities, including the utility-owning Nashua) accounting for 18.6% of 2017 revenues. Excluding the city, the other nine only account for 8.3% of 2017 revenues.

Based on our operational management assessment, we view PWW to be a '2' on a scale of '1' to '6', '1' being the strongest. We view the system's operational management as good. The New Hampshire Public Utilities Commission (PUC), which has ultimate rate-setting authority over the utility, regulates the utility. For this reason, PWW must undergo an extensive and time-consuming case with the PUC any time it seeks to increase rates. Still, the regulatory relationship has been, and we expect will remain, supportive of continued operational improvements. In addition, PWW and PUC have agreed to a rate-setting methodology that we expect will provide timelier rate adjustments for capital and improved liquidity.

Financial risk profile

Our assessment of PWW's financial risk profile as strong reflects the utility's historically sufficient coverage and very strong liquidity position that we expect to continue, a manageable debt structure, and a good financial management framework.

The system's financial performance has been strong, in our view, during the past three fiscal years. Owing to Nashua's acquisition of PWW via Pennichuck Corp. through issuance of city general obligation (GO) debt in 2012, the system must pay the city approximately $7.5 million annually through 2042 to help offset the acquisition costs. This repayment (known as the city bond fixed revenue requirement [CBFRR]) is after all operating expenses, parity debt, and subordinate debt. We treat the CBFRR as a subordinate lien, resulting in an all-in DSC at sufficiency only, which is how the governance structure and rate-setting process intend for it to work. Based on projections, we anticipate financial performance will remain consistent over the next five years, with all-in DSC being sufficient-to-adequate.

Since the city acquisition in 2012, the PUC oversight has limited rate-setting to simply to meet PWW obligations, including capital and operating expenses, debt, and city repayment, although not beyond this. As such, the system has not been allowed to build any significant liquidity, but has retained a reserve fund account of about $5 million. Including the reserve fund, the days' cash on hand equals 104 days at unaudited fiscal year-end 2017 (Dec. 31), down from 142 days in 2016.

In November 2017, the PUC approved a rate-setting methodology that we believe could strengthen credit quality. Whereas the old process limited liquidity and generally was structured toward operational and coverage sufficiency, the new methodology allows for greater coverage and creates new stabilization funds (although initially funded with the proceeds in the $5 million reserve). Highlights of the new process include:

- The revenue component of the rate setting can equal 1.1x the sum of all period debt service payments.
- The test case period is no longer a single year, which could mean exposure to weather volatility, but is a five-year average for both revenues and expenses.
- There are new debt service and material operating expense rate-stabilization funds.
- The process allows for annual true-up of rates in March, accounting for a new capital surcharge program, started in February 2018, to help reimburse capital costs more rapidly.

Based on our financial management assessment (FMA), we view the district to be a '2' on a scale of '1' to '6', '1' being the strongest. We view the system's FMA as good, meaning policies are embedded and likely sustainable. Long-term financial planning is detailed and reasonable. The system's capital plan focuses on upgrading the water supply, replacement and rehabilitation projects, and other minor projects. The three-year capital program is about $32.5 million and requires no additional debt. In our view, the system's debt-to-capitalization ratio was moderate in fiscal 2017, at 41%.

Outlook

The stable outlook reflects our expectation that the strong economy and stable demand will allow PWW to continue to deliver positive operating results and maintain coverage above sufficiency.

Upside scenario

The new rate-setting methodology allowing for greater coverage and additional debt service reserve funds might change the utility's credit make-up. We would base an upgrade on significantly stronger all-in DSC metrics and liquidity measures.

Downside scenario

We could lower the rating if coverage metrics erode or should management spend down liquidity significantly in addressing capital needs.

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at www.standardandpoors.com for further information. Complete ratings information is available to subscribers of RatingsDirect at www.capitaliq.com. All ratings affected by this rating action can be found on the S&P Global Ratings' public website at www.standardandpoors.com. Use the Ratings search box located in the left column.

S&P Global
Ratings

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Summary:

New Hampshire Business Finance Authority
Pennichuck Water Works; Water/Sewer

Primary Credit Analyst:
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Summary:

New Hampshire Business Finance Authority Pennichuck Water Works; Water/Sewer

Credit Profile		
US$8.055 mil wtr fac rev bnds (AMT) pennichuck wtr wks in proj (Pennichuck Wtr Works, Inc) ser 2019A due 04/01/2049		
Long Term Rating	A+/Negative	New
US$0.175 mil wtr fac rev bnds pennichuck wtr wks in proj fed taxable (Pennichuck Wtr Works, Inc) ser 2019B		
Long Term Rating	A+/Negative	New
New Hampshire Bus Fin Auth, New Hampshire		
Pennichuck Wtr Works, Inc, New Hampshire		
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Negative	Outlook Revised
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Negative	Outlook Revised
New Hampshire Bus Fin Auth (Pennichuck Wtr Works, Inc) WTRSWR		
Long Term Rating	A+/Negative	Outlook Revised

Rationale

S&P Global Ratings has revised its outlook to negative from stable and affirmed its 'A+' rating on New Hampshire Business Finance Authority's debt issued for Pennichuck Water Works (PWW). At the same time, S&P Global Ratings assigned its 'A+' long-term rating and negative outlook to the authority's series 2019A alternative minimum tax (AMT) and 2019B (federally taxable) water facility revenue bonds issued for PWW.

The outlook revision reflects the utility's three-year trend of thinning liquidity; all-in coverage that, by our calculations, is sufficient but vulnerable; and uncertainty around a coming New Hampshire Public Utility Commission (PUC) rate filing. If, following the rate case, we believe the utility is likely to continue to produce financial results we consider only adequate, including low coverage and liquidity, we could lower the rating in the next two years.

The ratings reflects our view of an extremely strong enterprise risk profile and an adequate financial risk profile. We believe that finances could strengthen as management continues to work with the PUC as a municipal entity to balance operational needs with market liquidity expectations, but we expect liquidity could be thin for an extended period. To partially offset that risk, we believe that the utility's access to additional liquidity from lines of credit bolsters credit quality. After this issue, PWW will have about $212 million of debt outstanding, with about half of that associated with the city's original purchase of the utility.

The enterprise risk profile reflects our view of PWW's:

- Service area in and around Nashua, N.H., with a diverse economy and very low unemployment;

- Strong position as the primary provider of utility services within its service area boundaries;
- Rates at 1.0 % of median household income, which we consider affordable;
- A rate-setting process that is subject to PUC approval but has been amended recently to allow more adjusting for capital needs and providing additional liquidity; and
- Operational management policies and practices we consider good.

The financial risk profile reflects our view of the utility's:

- Sufficient all-in DSC that we believe will continue based on PWW's multiyear forecast;
- Adequate liquidity position, with 48 days cash at 2018 year-end, but with additional access to lines of credit of $4 million for operating and $10 million of capital;
- Moderate leverage, based on a debt-to-capitalization ratio of about 43%; and
- Financial management policies and practices we consider good.

Bond proceeds will finance various capital improvements to PWW's water supply and water distribution systems. We believe bond provisions are fairly standard. These include a 1.1x rate covenant and a 1.1x additional bonds test against maximum annual debt service on parity debt.

Enterprise risk profile

Our assessment of the system's enterprise risk profile as extremely strong reflects PWW's stable and predictable revenue and cash flow streams from low-risk water and sewer service, a natural monopoly in its service area, and a good operational management framework.

The service area centers on the City of Nashua, the second-largest city in New Hampshire, with a population of about 88,000. Nashua owns Pennichuck Corp., PWW's parent. The system includes the core water system and four wholesale community water systems. The local economy is a diverse mix of commercial and retail businesses, within the Manchester-Nashua metropolitan statistical area and just 34 miles north of Boston. Nashua's median household effective buying income is 123% of the national average. The city's December 2018 unemployment rate, at 2.3%, is below the national average and reflects the area's diverse economy and job opportunities.

Pennichuck Brook and the Merrimack River supply the core system, supplemented with reservoir storage, and there is a single water treatment plant. Individual wells and purchased water from interconnections with local municipalities supply the community systems. The system has a capacity of 31.2 million gallons per day (mgd), which compares favorably to a relatively stable average daily demand of 12.3 mgd over the past four years (2015-2018). The PWW system serves over 28,700 customers across 11 New Hampshire communities, and Tyngsboro, Mass., through a wholesale arrangement. Nashua's 24,293 connections is 85% of the total customer base. A recent groundwater contamination event affecting private wells has increased the PWW customer base by over 100, but overall the region experiences slow organic growth.

We believe the system's customer base is diverse, with the top 10 retail customers accounting for 7.3% of 2018 revenues. The largest retail customer is Anheuser Busch Inc. at 2.5% of total revenues; no other customer in the top 10 contributes over 1%.

Based on our operational management assessment, we view PWW as a '2' on a scale of '1' to '6', '1' being the strongest. We view the system's operational management as good. The PUC, which has ultimate rate-setting authority over the utility, regulates the utility. For this reason, PWW must undergo an extensive and time-consuming rate case with the PUC any time it seeks to increase rates. Since the city acquired the system in 2012, the PUC's oversight has limited rate-setting to simply to meet PWW obligations, including capital and operating expenses, debt, and city repayment, although not beyond this. Still, the regulatory relationship has been, and we expect will remain, supportive of continued operational improvements. In addition, PWW and PUC have agreed to a rate-setting methodology that we expect will provide timelier rate adjustments for capital and improved liquidity. Also, the utility has applied for a material operational cost adjustment mechanism to ease inflationary costs between rate cases. If approved, this would be the first of its kind in New Hampshire, and we believe could mitigate the risk of regulatory lag in the rate-setting process.

Financial risk profile

Our assessment of PWW's financial risk profile as adequate reflects the utility's historic all-in coverage just above sufficiency, adequate liquidity position, manageable debt structure given capital needs, and a good financial management framework. Like many utilities, weather can affect performance, and PWW reports that the very wet summer in 2018 reduced revenues by over $1 million.

Even with the impacts of weather, the system's financial performance has been strong, in our view, during the past three fiscal years, but despite this, the liquidity position has weakened. Owing to Nashua's acquisition of PWW (the obligor) via Pennichuck Corp. (the non-obligated parent) through issuance of general obligation debt in 2012, the system must pay the city approximately $7.5 million annually through 2042 to help offset the acquisition costs. This repayment (known as the city bond fixed revenue requirement [CBFRR]) is after all operating expenses, parity debt, and subordinate debt. We treat the CBFRR as a subordinate lien, resulting in an all-in DSC at sufficiency only, which is how the governance structure and rate-setting process intend for it to work. Based on projections, we anticipate financial performance will remain consistent over the next five years, with all-in DSC being vulnerable-to-adequate.

The utility operates in a more corporate parent-child relationship than other municipally owned systems in the region. Therefore, management operates to close each fiscal year with an audited cash position of just $6,000. In the indenture, written at the time of the city purchasing the system, a $5 million reserve fund was established. In the 2016 rate case, that amount fell to $3.92 million, because a portion was allocated to a sister non-obligated utility (Pennichuck East Utility). But under the terms of the indenture, the $3.92 million can be tapped between rate cases to maintain rates, and PWW has done that in 2017 and 2018, reducing that amount to $1.27 million at year-end 2018. Combining the $1.27 million rate-stabilization fund and $1.25 million from both a material operating expense revenue reserve fund and a debt service revenue reserve, cash on hand is weak, at 48 days at unaudited fiscal year-end 2018 (Dec. 31), down from 103 days in 2017 and 142 days in 2016. Management intends to request in the next rate case, being filed near June 2018, to fully replenish the rate stabilization fund back to the indenture allowed $3.92 million in the next rate filing, but it could take three years to rebuild the amount. Therefore, although management expects this trend of deteriorating days' cash on hand to begin to reverse with the new rate case approval, we expect to see this thin liquidity could continue. Management, however, can operate with these thin margins, because a $4 million line of credit with the parent organization, the Pennichuck Corp., provides additional liquidity. This operating cash level is still below that of many regional peers.

Based on our financial management assessment (FMA), we view the district to be a '2' on a scale of '1' to '6', '1' being the strongest. We view the system's FMA as good, meaning policies are embedded and likely sustainable. Long-term financial planning is detailed and reasonable. The system's capital plan focuses on upgrading the water supply, replacement and rehabilitation projects, and other minor projects. The three-year capital program through fiscal 2021 is about $39.2 million. A line of credit, replenished with occasional long-term bonds, will finance the projects. The largest single project is a $5.5 million deep water intake on the Merrimack River, followed by a $3.3 million dollar tank farm replacement. In our view, the system's debt-to-capitalization ratio was moderate in fiscal 2018, at 43%.

Outlook

The negative outlook means we believe there is a one-in-three chance that we could lower the rating over the next two years. The outlook reflects the utility's thinning liquidity, all-in coverage that is sufficient but vulnerable, and uncertainty concerning the outcome of the 2019 rate filing.

Downside scenario

We could lower the rating if liquidity, recently spent down covering capital needs, does not improve to levels we consider strong over the near term, or if all-in DSC erodes to insufficient levels by our calculations.

Upside scenario

We could revise the outlook to stable with a successful rate case approval through the PUC that allows for replenishment of reserves to the indenture-allowed levels.

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at www.standardandpoors.com for further information. Complete ratings information is available to subscribers of RatingsDirect at www.capitaliq.com. All ratings affected by this rating action can be found on S&P Global Ratings' public website at www.standardandpoors.com. Use the Ratings search box located in the left column.

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How Credit Ratings Affect Bond Valuations

by AAII Staff

There is widespread misunderstanding about what credit ratings really mean, and how they affect the returns that you earn and the overall riskiness of your portfolio.

Investors generally rely on bond ratings to evaluate the credit quality of specific bonds. Credit ratings indicate on a scale of high to low the probability of default; that is, the probability that debt will not be repaid on time in full. Failure to redeem principal at maturity would constitute a default. Failure to make interest payments on time (that is, to pay coupons to bondholders) would also constitute a default. In plain English, ratings answer two questions: How likely am I to get my money back at maturity, and how likely am I to get my interest payments on time?

All bonds are not subject to default risk. Any security issued *directly* by the U.S. government is considered free of default risk. Although these bonds are not rated, they are considered the safest and highest-quality securities that you can buy because a default by the U.S. government is deemed impossible. This includes all Treasury securities, as well as savings bonds.

Bonds issued by entities other than the U.S. government, such as corporate bonds and municipal bonds, are rated by a number of agencies that specialize in evaluating credit quality. The best-known rating agencies are Moody's, Standard & Poor's (S&P), and Fitch (now Fitch IBCA). Bonds are rated when issuers initially come to market, and subsequently, as issuers bring additional issues to market. Issuers pay the agencies for the rating.

Table 1. Credit Quality Ratings and What They Mean

Moody's	**Standard & Poor's**	**Fitch IBCA**	
Aaa	AAA	AAA	Gilt edged. If everything that can go wrong does go wrong, they can still service debt.
Aa	AA	AA	Very high quality by all standards.
A	A	A	Investment grade; good quality.
Baa	BBB	BBB	Lowest investment-grade rating; satisfactory, but needs to be monitored.

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Ba	BB	BB	Somewhat speculative; low grade.
B	B	B	Very speculative.
Caa	CCC	CCC	Even more speculative. Substantial risk.
Ca	CC	CC	Wildly speculative. May be in default.
C	C	C	In default. Junk.

On a scale from the best credit quality to the lowest, Table 1 lists the symbols used by each of the major credit rating agencies. These symbols are on the left-hand side. The right-hand side of Table 1 is a translation into plain English of what the ratings mean. Standard & Poor's adds plus (+) and minus (-) signs to its ratings. A plus signifies higher quality; a minus signifies somewhat lower quality. For instance, a rating of B+ is slightly higher than a rating of B. A rating of B- is slightly lower than a B rating. Moody's adds a 1 to indicate slightly higher credit quality; for instance, a rating of A1 is a higher quality credit rating than an A rating.

In order to protect their investments, many individual investors limit their purchases to bonds that are at minimum rated "investment grade," which corresponds to BBB (Standard & Poor's) and Baa (Moody's). The term "investment grade" stems from the fact that fiduciary institutions, such as banks, are permitted by law to invest only in securities rated at the minimum "investment grade." That rating denotes a fair margin of safety. Note that some ads for bond funds use the term "investment grade" to imply extraordinarily high quality, which is misleading.

Why Ratings Change

Ratings are assigned on the basis of extensive economic analysis by the rating agencies mainly to determine revenues available to the issuer to cover debt service. The more money available to cover the debt service, the higher the rating.

When forecasting economic conditions for the next six months or for perhaps one year, experts stand on reasonably secure ground. But the further they predict into the future, the more imprecise and unreliable their forecasts become. Any prediction of economic conditions that goes out more than five years becomes guesswork. Bear in mind, however, that bonds are rated for their entire life, even if that is 30 years.

As a result, some forecasts turn out to be incorrect. When ratings are reviewed, they may change. As the economic fortunes of the issuer vary, so will the ratings.

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Over time, changes in ratings can be major. For example, State of Louisiana bonds were rated AAA in the mid-1980s. In early 1990, they were rated barely investment grade. Occasionally, changes in ratings are more sudden. For instance, State of Massachusetts ratings went from AA to barely investment grade within the space of one year.

More dramatic rating changes sometimes occur in the corporate bond sector. For example, if a company buys another with debt, the amount of debt may increase sharply virtually overnight. And that increase would cause the rating to deteriorate virtually overnight as well.

Ratings and Interest Rates

Above all, credit ratings affect the cost of borrowing—that is, the interest rate that will have to be paid by the issuer to attract buyers. The interest cost to the issuer is the coupon you will earn.

The principle for this is easy to explain. Think of a bond as a loan and imagine that you are a bank that is lending to a borrower. You would ask a lot of questions relating to the probability of repayment. To whom would you rather lend money: to a struggling businessman with no collateral who wants to start a business, or to IBM? The answer is obvious. Now suppose you are the struggling businessman or John Doe. Chances are that if your banker turns you down, you will find a different banker, who will charge you higher interest costs. You may even go to your neighborhood loan shark (or equivalent), who will lend you the money, but charge you a much higher interest rate than the bank.

This is also true for bonds. The most creditworthy issuers—say, large states with diverse economies, blue-chip corporations with very little debt, or the U.S. government—borrow at a lower cost. Less creditworthy clients have to pay higher interest. Consequently, bonds with the highest quality credit ratings always carry the lowest yields; bonds with lower credit ratings yield more. Note that the yield, in a sense, provides a scale of credit-worthiness: higher yields generally indicate higher risk-the higher the yield, the higher the risk.

Ratings Changes & Price

If bonds are downgraded (that is, if the credit rating is lowered), the bond price declines. If the rating is upgraded, the price goes up. In fact, bond prices sometimes change if there is even a strong possibility of an upgrade or a downgrade. This is because anxious investors sell bonds whose credit quality is declining and buy bonds whose credit quality is improving.

Unless there is a genuine risk of default, however, price changes in response to upgrades or downgrades are far less major than those occurring due to changes in interest rate levels. With rare

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exceptions, ratings go up one notch or down one notch in the rating scale, and prices go up or down by perhaps 1% or 2% per bond in response to rating changes. The change in price corresponds to the amount necessary to bring the yield of a bond (and therefore its price) in line with other bonds rated at the same level. For bonds rated AA, for example, a downgrade to A+ may not make a noticeable difference in the price.

This point needs to be emphasized because many individual investors are needlessly worried about relatively minor downgrades and this fear is sometimes exacerbated by the financial press. For bonds that have very high credit quality (AA or AAA), a deterioration in the rating is not a major cause for concern. It would not result in a serious deterioration in the price of the bond. A more serious concern would be a series of downgrades, particularly if downgrades drop the credit rating to below investment grade.

There is one notable exception to the preceding statements. During the takeover craze of the 1980s, corporate bond prices were exceptionally volatile because of the possibility of downgrades due to takeovers.

Here are some questions and answers that deal with common investor concerns about bond credit ratings:

Doesn't a downgrade mean my bonds are no longer safe?

However, certain downgrades are more significant than others and should be viewed as red flags:

That is usually not the case. The rating scales used by the agencies are very conservative. Distinctions between rating levels are often based on nuances. Any bond rated investment grade or better continues to have good margins of safety, even after a downgrade.

- A downgrade that drops a bond rating to below investment grade;
- A downgrade of more than one notch (say from AA to A-);
- A string of downgrades in close succession.

If any of these occurs, you might want to review whether you wish to continue owning that security.

My bonds are insured, or AAA, or government guaranteed. Won't that guarantee that principal remains safe?

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No. What is guaranteed is that interest payments will be made on time and that principal will be redeemed in full at the bond's maturity. There is no connection between that guarantee and what happens to the price (or value) of bonds due to fluctuations in interest rates. Changes in interest rates affect all bonds, whether they are those of Fly-by-Night airlines or obligations of the U.S. government. If interest rates rise, the value of your bonds will decline. If interest rates decline, the value of your bonds will rise. Period. No exceptions.

How frequently do defaults occur?

Default rates for junk bonds, which by definition are bonds rated below investment grade, are higher.

Note, however, that even when defaults occur, bond investors seldom lose 100% of the principal value of the bond. Defaulted bonds usually have some salvage value. There is a good deal of speculation in the bonds of defaulted or bankrupt issuers. That is because such bonds may be purchased very cheaply, perhaps as little as 10 to 30 cents on the dollar. Many defaults have taken the form of a suspension of coupon payments. Such bonds are said to be trading flat. If coupon payments are resumed, the price of the bonds can soar. Bondholders may also benefit from the sale of assets of issuers under bankruptcy proceedings. Finally, some bankrupt companies emerge successfully from bankruptcy proceedings, leading to a bonanza for anyone who purchased the bonds while the company was in default.

There is a gradation in risk of default. Any bond that is a direct obligation of the U.S. government is deemed to have zero possibility of default. Bonds issued by federal agencies, or most types of mortgage-backed securities, are deemed to have almost equally high credit quality. Municipal bonds come in a wide variety of ratings, but in the aggregate they have low default rates. Corporates (particularly so-called junk bonds) are far less predictable. And debt of so-called emerging markets is highly speculative.

That depends, of course, on the type of bond under discussion. But overall, if you consider primarily bonds that are at least investment grade in credit quality, default rates are relatively low. Since the Second World War, and despite a few well-publicized defaults in the corporate sector, no bonds have ever defaulted while currently rated AA. Only two defaults have occurred to bonds rated A. Similar statistics prevail for municipal bonds. (While some bonds that were initially highly rated eventually defaulted, these had been downgraded prior to the actual default. Hence, it is prudent to monitor the ratings of bonds in your portfolio.)

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I want maximum income and maximum safety. My broker advises me to buy 30-year bonds with AAA ratings and just hold them to maturity. Isn't that the safest thing to do?

As a general rule, if you are concerned about safety of principal and predictable income, it is usually safer to buy bonds with maturities of five to 10 years, rated at least investment grade or somewhat higher (depending on your preferences and tolerance for risk). Interest income from such bonds is likely to be close to (and occasionally higher) than that of AAA-rated bonds with long maturities, so you will not be sacrificing income. But risk to principal is dramatically lower.

Not necessarily. That can be a costly and high-risk strategy. It is costly because AAA-rated bonds yield less than bonds with lower ratings but with similar maturities. You are therefore sacrificing income. And it is high-risk for two reasons: One is that, as we have just seen, interest rate risk is far higher for bonds with longer maturities. If you need to resell your bonds before they mature, you might have to take a very costly hit to principal. But in addition, it is very difficult to predict how much you will really earn on bonds with the longest maturities because that will largely be determined by varying reinvestment rates earned on interest income.

Does all of this mean that I should ignore credit ratings?

No. Remember that ratings are opinions. The rating agencies do not have any connection to actual debt service payments, which are made by the issuer. Nor do the ratings constitute any kind of recommendation either to buy or sell a particular security. A low rating does not mean that default will occur; and a high rating guarantees nothing, not even that a downgrade won't occur.

A Ratings Summary

Here is a summary of what you will want to remember concerning ratings:

- When you purchase bonds, you should check credit ratings by the major agencies. Most of the time, ratings issued by the different rating agencies are close. If they are not, then to be safe, assume the lowest rating is accurate.
- Buy bonds rated investment grade (or higher), depending on your risk tolerance. A rating of A or better represents a sound rating, particularly for bonds with maturities under five years.
- Be sure that you understand the main reasons for the rating. What sources of revenue will pay debt? What is the credit history of the issuer? Has it been upgraded or downgraded? Why?
- When you own a bond, monitor its rating. Ask your broker to let you know if any rating changes occur (and check periodically). If a significant downgrade occurs, and you feel uncomfortable

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holding, you may want to consider selling that security. Note that occasionally the price of some bonds drops in advance of a rating change. The market is sometimes ahead of the rating agencies in sniffing out that a particular security may face potential problems.

- Diversify. Don't put all your assets in one bond. If you have a total of $50,000 to invest, it is more prudent to buy five $10,000 lots than one $50,000 lot. Buy bonds of different issuers to diversify credit risk. And buy bonds with different maturities to diversify interest rate risk.