Great Lakes Water Authority
Audit Committee

Meeting Agenda

Friday, November 20, 2015 at 8:00 a.m.

5th Floor Board Room, Water Board Building
735 Randolph Street, Detroit, Michigan 48226
GLWater.org

AGENDA

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF AGENDA
4. APPROVAL OF MINUTES
   A. October 16, 2015 *(Page 1)*
5. PUBLIC PARTICIPATION
6. OLD BUSINESS
   A. Second Review of Proposed Risk Management Fund Policy *(Page 4)*
   Presenter: Michael Tilley, CPA, Risk Manager, DWSD
   Proposed Action: Motion that the Audit Committee recommend that the Great Lakes Water Authority Board adopt the Proposed Risk Management Fund Policy.
   B. Presentation: Actuarial Report for the City of Detroit General Retirement System (*Page 9)*
   Proposed Action: Receive and file report.
7. NEW BUSINESS
   A. Presentation of First Review Draft Proposed Debt Management Policy (*Page 49)*
   Presenter: Jon Wheatley, Public Manager
   Proposed Action: Receive report, provide comments, schedule second review.
8. COMMUNICATIONS
   A. ERP and HRIS/Payroll Implementation Verbal Update
   – Dan Rainey, IT Director, DWSD
   B. Chief Financial Officer Verbal Update
   - Work Plan Review; GLWA Standup Activities
9. OTHER MATTERS
   - Future Meeting Dates
10. ADJOURNMENT

Great Lakes Water Authority
Audit Committee

Meeting Minutes

Friday, November 6, 2015 at 8:00 a.m.

5th Floor Board Room, Water Board Building
735 Randolph Street, Detroit, Michigan 48226
GLWater.org

MINUTES

1. CALL TO ORDER

   Chairman Baker called the meeting to order at 8:11 AM.

2. ROLL CALL

   Chairman Brian Baker, Directors Robert Daddow, and Joseph Nardone

3. APPROVAL OF AGENDA

   Chairman Baker requested approval of the agenda.

MOTION BY:	ROBERT DADDOW
SUPPORT:	JOSEPH NARDONE
ACTION:	APPROVED

   Reference the Finance binder of November 6, 2015 for supplemental details.

4. APPROVAL OF MINUTES

   A. Chairman Baker requested approval of the minutes of October 16, 2015.

MOTION BY:	JOSEPH NARDONE
SUPPORT:	ROBERT DADDOW
ACTION:	APPROVED

5. PUBLIC PARTICIPATION

   None.

6. OLD BUSINESS

A. Presentation of Proposed Bifurcated FY 2016 Budget for GLWA
   Presenter: Jenny Casler, CPA, Financial Planning & Analysis Manager, DWSD and Bart Foster , The Foster Group **ITEM 6A**

   Proposed Action: Motion that the Audit Committee recommend that the Great Lakes Water Authority Board adopt the Proposed Bifurcated FY 2016 Budget.

MOTION BY:	JOSEPH NARDONE
SUPPORT:	ROBERT DADDOW
ACTION:	APPROVED

7. NEW BUSINESS
   A. Presentation of First Review Draft Proposed Risk Management Fund Policy
      Presenter: Michael Tilley, CPA, Risk Manager, DWSD **ITEM 7A**

      Proposed Action: Receive report, provide comments, schedule second review.

MOTION BY:	ROBERT DADDOW
SUPPORT:	JOSEPH NARDONE
ACTION:	RECEIVED AND FILED

   B. Proposed Procurement of Financial Asset Management Services with PFM Asset Management LLC – Presenter: Nicolette Bateson, CPA, Interim Chief Financial Officer/Treasurer **ITEM 7B**

MOTION BY:	ROBERT DADDOW
SUPPORT:	JOSEPH NARDONE
ACTION:	RECEIVED AND FILED

8. COMMUNICATIONS
   A. ERP and HRIS/Payroll Implementation Verbal Update
      – Dan Rainey, IT Director, DWSD
      - I cannot say enough about the top notch professionals (consultants) who are really focused on doing their best for this organization
      - Ceridian, 32 percent complete with testing, time clocks are being installed.
      - Benefits enrollment is going on – a major milestone.
      - Upgrades were made to DWSD-R time clocks to make them compatible with the city’s system.
      - ERP, regarding proposal for opting in to city’s platform – an all-day demo scheduled today. We have to decide what process we are going to use within the next week or so. Overall status is still red.

B. Chief Financial Officer Verbal Update

- Work Plan Review; GLWA Standup Activities
  - DWSD attrition schedule, same – DWSD will issue Monday.
  - As of Sept. 30, filled positions was at 1,313; as of Oct. 31, 1,291
  - Budgeted positions 1,358

9. OTHER MATTERS

- Future Meeting Dates

November 20, 2015 at 8:00 AM

10. ADJOURNMENT

MOTION BY:	ROBERT DADDOW
SUPPORT:	JOSEPH NARDONE
ACTION:	ADJOURNED

There being no further business, the meeting adjourned at 9:14 AM.

Great Lakes Water Authority
Financial Services Group
Audit Committee Communication

Date: November 20, 2015

To: Audit Committee

From: Michael J. Tilley, Risk Manager

Re: Second Review of Proposed Risk Management Fund Policy

Background: The target date for the Great Lakes Water Authority (the Authority) to assume operational control of the regional water supply and sewerage disposal systems is fast approaching. One of the operational objectives preceding the January 1 target date is the establishment of a *Risk Management Fund Policy*.

The risk management function has several initiatives underway related to the procurement of service providers and various insurance policies for risk transfer purposes (e.g., contract for a third-party administrator for workers' compensation, and the marketing of an "all risk" property insurance program for the regional water supply and sewerage disposal system). Funding of those initiatives would come from a newly established fund.

Risk management is an important function requiring the collective insight and cooperation of all operational areas in order to adequately assess and reduce the Authority's liability and exposure to risk. The establishment of a risk management committee promotes the fact that the responsibility for risk is not centered in one person or one department.

One element of risk management is to provide adequate funding. To that end, an approved Risk Management Fund Policy will establish the framework and the initial and ongoing funding for a designated fund within the operating fund of the Authority.

At its meeting on November 6, 2015, the Audit Committee reviewed the first draft of the Risk Management policy and scheduled a second review for November 20, 2015.

Analysis: The attached second draft of the policy is in red-lined format. The primary addition is Section 3.9, "Payment approval thresholds".

Proposed Action: Motion that the Audit Committee recommend that the Great Lakes Water Authority Board adopt the Proposed Risk Management Fund Policy.

GREAT LAKES WATER AUTHORITY
RISK MANAGEMENT FUND POLICY

Section 1: RISK MANAGEMENT COMMITTEE

Section. 1.1 Created.

The Risk Management Committee is comprised ~~(~~subject to modifications by the Chief Exective Officer (CEO) of:

1. Chief Executive Officer (acting Chair of the Committee)
2. Chief Financial Officer;
3. Chief Administrative and Compliance Officer;
4. ~~I. T.~~ Information Technology Director;
5. Chief Operating Officer;
6. Chief Planning Officer;
7. Chief Security and Integrity Officer, and
8. Organizational Development Director.

The Risk Management Committee is supported by the Risk Manager who is responsible for the daily operations of the Risk Management Division.

Section 2: DUTIES OF COMMITTEE

In addition to their regular duties, members of the Risk Management Committee shall have the following responsibilities:

1. Review and approve risk management policies, programs and activities to minimize the exposure or liability of the Great Lakes Water Authority to claims and damages;
2. Produce an annual report that summarizes its evaluation, monitoring and coordination of GLWA's comprehensive risk management strategy;
3. Prepare for the Board an annual strategic risk management report which evaluates the effectiveness of risk management functions within the GLWA including, but not limited to, an annual Total Cost of Risk (TCOR) analysis not later than 60 calendar days after the end of each calendar year;
4. Develop an annual report summarizing claims that have been paid by the Authority on risk related matters including, but not limited to, the settlement of lawsuits, general liability claims, and worker's compensation claims. The report shall provide recommendations for risk avoidance and liability exposure reduction measures related to these claims.

Section 3: RISK MANAGEMENT FUND

Section. 3.1 Created.

A designated fund, within the operating fund, shall be established by the Authority, to be designated "***Risk Management Fund of the Great Lakes Water Authority***," hereinafter in this division called the "Risk Management Fund."

Section 3.2 Initial and permanent funding; use; minimum balance.

(a) There shall be initially deposited into the Risk Management Fund a sum not to exceed five million dollars ($5,000,000), provided that an amount not to exceed four million dollars ($4,000,000) shall be used to fund: (i) the payment of losses by the Authority during the fiscal year, and (ii) the payment of the cost of any insurance policies or brokerage services deemed necessary by the Risk Management Committee.

(b) An amount equal to not less than one million dollars ($1,000,000), hereinafter in this division called the "minimum required balance," shall be maintained in the Risk Management Fund as permanent fund equity for the payment on behalf of the authority of all sums which the authority shall become legally obligated to pay. The Chief Financial Officer (CFO) may recommend, from time to time, subject to Board approval, an increase or reduction in the minimum required balance. The CFO shall timely advise the Board of any event or circumstance which would cause or result in a reduction of the balance in the Risk Management Fund to an amount less than the minimum required balance during any fiscal year, hereinafter called the "deficiency." In such event, the CFO shall also recommend an amendment to appropriations necessary to eliminate the deficiency.

(c) Accumulations to the Risk Management Fund by virtue of funding contributions may be used to pay all self-insured losses up to stop-loss limits, the cost of first and third-party liability insurance premiums to insure against losses and administrative costs incurred in connection with the payment of such losses, the procurement of third-party administrators for workers' compensation, general liability, and commercial vehicles, or the retention of a property & casualty insurance broker.

Section 3.3 Contributions and adjustments.

The Chief Financial Officer shall annually make a recommendation for inclusion in the budget, subject to the normal budget process, of the amounts to be contributed to the Risk Management Fund based upon a reasonable cost allocation methodology. Adjustments to such contributions may be made annually pursuant to the recommendations of the CFO as a budget amendment.

Approved by the Board of the Great Lakes Water Authoriity: month/date/year

In the event that the losses of any department in any fiscal year exceed any such department's contribution to the Risk Management Fund for that year, contributions by such department in future years may be increased to reflect fully the losses incurred as recommended by the CFO as a budget amendment.

The CFO is authorized to develop and administer guidelines, policies and procedures for funding the risk management activities. Those guidelines, policies and procedures shall be applied in a nondiscriminatory manner to, and shall be adhered to by, the departments so as to carry out the provisions of this division in as cost effective a manner as possible and to preserve the Risk Management Fund for the purposes for which it has been established. In making the recommendations as called for under this section, the CFO may take into account actuarial determinations based on the loss experiences of the departments.

Section 3.4 Investment of funds.

The Chief Financial Officer, subject to applicable laws, may from time to time invest, sell and reinvest the monies of the Risk Management Fund in investments. Earnings from such investments shall be credited to the Risk Management Fund.

Solely for the purposes of investment, the monies of the Risk Management Fund may be pooled with the monies of the operating fund, provided that the Chief Financial Officer shall account separately for the monies of the Risk Management Fund in pooled investments and the earnings thereon.

Section 3.5 Losses covered.

(a) Losses shall be paid from the Risk Management Fund. Should any loss or losses exceed the accumulated balance in the Risk Management Fund, any such deficiency in the Risk Management Fund shall be satisfied in accordance with applicable laws.

(b) The Risk Management Fund shall cover liability to third parties for any loss or damage whatsoever whether arising out of negligence, tort, contract or otherwise accruing payable by the GLWA and for which insurance coverage could be provided by a third party insurer, but for which the GLWA has determined to self-insure, including, without limitation, any obligation for which the GLWA may be held liable under Worker's Compensation or Disability Benefits Law, or under any similar laws, or for damage to property or personal injury, in accordance with applicable law.

Sec. 3.6 Payment.

The CFO shall pay losses from the Risk Management Fund, except for losses resulting from a consent judgment or decree. For the purpose of this section, a consent judgment or decree means an order or judgment issued by a judge based on an agreement between the parties to a lawsuit to settle the matter aimed at ending the litigation with a judgment or order that is enforceable.

Sec. 3.7 Additional insurance.

The Risk Management Fund shall be the sole provider of coverage for losses as defined in this division, provided that any department may petition the CFO for exception, which petition may not be unreasonably denied. No payment shall be made from the Risk Management Fund for losses covered by any purchased insurance within the limits of such insurance.

Sec. 3.8 Appropriations; annual reports.

The CFO shall make an annual report for the most recently completed fiscal year ending June 30 to the GLWA Board before the twentieth day of September of each year regarding the performance and the fiscal status of the Risk Management Fund.

The annual report shall include the loss experiences of the departments, respectively, as well as investment earnings with respect to the Risk Management Fund, together with a recommendation thereon as to the appropriations necessary to carry out the provisions of this division.

Such recommended appropriations may be included in the budget for the ensuing fiscal year, subject to the normal budget process, provided that such appropriations shall be prorated among the departments, respectively, on the basis of loss experiences.

Sec. 3.9 Payment approval thresholds.

Commented [NNB1]: This entire section is new for the second review by the GLWA Audit Committee based upon feedback from the first review.

- *Redemption of worker's compensation claims*

Redemption Value	Authority to Approve	Board Approval Required?
< $10,001	Third-party administrator	No
$10,001 – $100,000	GLWA Risk Manager	No
$100,001 - $500,000	General Counsel	Notice Only (Quarterly)
> $500,000	CEO	Yes (Monthly)

- *Redemption of general liability/commercial auto claims*

Redemption Value	Authority to Approve	Board Approval Required?
< $5,000	Third-party administrator	No
$5,000 – $50,000	GLWA Risk Manager	No
$50,001 - $100,000	General Counsel	Notice Only (Quarterly)
> $100,000	CEO	Yes (Monthly)

- *Property / Environmental / Cyber / Fiduciary / Public Officials & Employment Practices*

Claim Value	Authority to Approve	Board Approval Required?
< 10% of deductible	GLWA Risk Manager	No
10% - 50% of deductible	CEO	No
>50% of deductible	CEO	Notice Only (per occurrence)

Approved by the Board of the Great Lakes Water Authoriity: month/date/year

Great Lakes Water Authority
Financial Services Group
Audit Committee Communication

Date: November 20, 2015

To: Great Lake Water Authority Audit Committee

From: Nicolette Bateson, CPA, Chief Financial Officer

Re: Actuarial Report for the City of Detroit General Retirement System

Background: The Detroit Water & Sewerage Department (DWSD), as a department of the City of Detroit, provides a pension benefit to its employees. That pension benefit is administered by the City of Detroit General Retirement System (GRS). The GRS is an entity independent of the City of Detroit. Annually, the pension system obtains an actuarial analysis. The attached actuarial report as of June 30, 2014 was issued on October 27, 2015.

The actuarial report of the GRS is of interest to the Great Lakes Water Authority (GLWA) since a portion of the closed system DWSD pension liability will be funded by the GLWA.

Analysis: Noteworthy items from the actuarial report include the following.

- ✓ The GRS provides for two plans as a result of the bankruptcy plan of adjustment (POA). One outcome is that there are now two separate pension plans referred to as “Component I” and “Component II” effective July 1, 2014. Component I provides benefits for service rendered on and after July 1, 2014 and *Component II provides benefits for service rendered prior to July 1, 2014.* The attached report is related to Component II.

- ✓ This is the first actuarial report issued for the Component II plan since the City of Detroit exited from bankruptcy on December 10, 2014.

- ✓ The actuarial is based upon the assumed rate of investment return of 6.75% as set by the POA.

Proposed Action: Receive and file report.

Gabriel Roeder Smith & Company
Consultants & Actuaries

THE GENERAL RETIREMENT SYSTEM OF THE CITY OF DETROIT

ANNUAL ACTUARIAL VALUATION OF COMPONENT II
JUNE 30, 2014

GRS

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October 27, 2015

The Board of Trustees
The General Retirement System of the City of Detroit

Dear Board Members:

The City of Detroit filed for bankruptcy on July 18, 2013. A final Plan of Adjustment ("POA") was confirmed on November 7, 2014 and the official exit from bankruptcy was on December 10, 2014. In connection with the POA, very significant changes were made to the benefits that the General Retirement System provides and to the contributions that it will receive. In particular, the benefits provided by the Retirement System were divided into two separate plans, referred to as "Component I" and "Component II." The benefits provided in each component are effective July 1, 2014 and are described in detail in Emergency Manager Order No. 44, dated December 8, 2014. In very general terms, Component I provides benefits for service rendered on and after July 1, 2014 and Component II provides benefits for service rendered prior to July 1, 2014.

This report provides key results from the **76th Annual Actuarial Valuation** of the annuity and pension liabilities of the General Retirement System of the City of Detroit. The date of the valuation was **June 30, 2014.** The results provided herein relate solely to the **Component II** benefits. Component I benefits will be the subject of a separate report. The purposes of the valuation are to measure the funding progress of Component II in accordance with the terms of the POA and to provide actuarially determined contribution amounts, given POA conditions and assumptions for Fiscal Year 2016 for Component II for comparison with the contribution amounts provided in the POA. The results of the valuation are not applicable for other purposes. In particular, the information provided in this report is not suitable for financial reporting in connection with GASB Statement No. 67. Such information was provided in a separate report. Information regarding potential benefit restoration as allowed for in the POA will also be provided in a separate report.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The valuation was based upon records maintained and furnished by the Retirement System staff concerning active members, retirees and beneficiaries, and financial accounts as of the valuation date. Data was checked for year-to-year consistency, but was not otherwise audited by the actuary. We are not responsible for the completeness or accuracy of the data. Certain necessary data was not available in time to produce the results in this report and it was necessary for us to use approximations. Please see related discussion in the Comments section of this report.

The assumptions used in the valuations concerning future experience are summarized in Section D of this report. Except for the assumed rate of investment return, the actuarial assumptions used for the valuation are set by the Board based upon advice of the actuary and other parties. The assumed rate of investment return was set to 6.75% in the POA and is therefore a "prescribed assumption set by another party" as discussed in Actuarial Standard of Practice No. 4. In our judgement, all of the actuarial assumptions used for the valuation are reasonable for purposes of the measurement.

This report has been prepared by actuaries who have substantial experience valuing public sector retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with Actuarial Standards of Practice promulgated by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

David T. Kausch and Judith A. Kermans are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report does not evaluate the plan sponsor's ability or willingness to make contributions to the Retirement System. In particular, given the funded level of Component II, plan sponsor contributions are critical if further benefit reductions are to be avoided. Indeed the employer contributions set forth in the POA are expected to lead to a decrease in the funded status over the next 8 years (as contemplated by the POA); even if all assumptions are met.

This report replaces our draft report dated September 4, 2015 and reflects additional information regarding the allocation of a portion of the POA mandated DSWD contribution, as instructed by the System and its general counsel.

Respectfully submitted,

David T Kausch

David T. Kausch, FSA, EA, FCA, MAAA

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA

Kenneth G. Alberts

Kenneth G. Alberts

DTK:sc

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SECTION A

VALUATION RESULTS

VALUATION RESULTS

The expected contributions for FY 2015 and beyond are provided in the POA and are shown below.

Contribution Source
($ millions)

	For DWSD Liabilities		For Other Liabilities					
Fiscal Year	**DWSD**	**Transfers**	**UTGO**	**State**	**DIA**	**Other**	**Transfers from DWSD**	**Total**
2015	$ 65.4	$ (22.5)	$ 4.4	$ 98.8	$ 5.0	$ 14.6	$ 22.5	$ 188.2
2016	45.4	(2.5)	4.0	-	5.0	22.5	2.5	76.9
2017	45.4	(2.5)	4.0	-	5.0	22.5	2.5	76.9
2018	45.4	(2.5)	3.9	-	5.0	22.5	2.5	76.8
2019	45.4	(2.5)	3.7	-	5.0	22.5	2.5	76.6
2020	45.4	(2.5)	3.7	-	5.0	2.5	2.5	56.6
2021	45.4	(2.5)	3.6	-	5.0	2.5	2.5	56.5
2022	45.4	(2.5)	2.3	-	5.0	2.5	2.5	55.2
2023	45.4	(2.5)	2.0	-	5.0	2.5	2.5	54.9
Total	**$ 428.6**	**$ (42.5)**	**$ 31.6**	**$ 98.8**	**$ 45.0**	**$ 114.6**	**$ 42.5**	**$ 718.6**

We have assumed the contributions outlined in the POA will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards and, therefore, was not made.

In order to develop actuarial contribution rates in accordance with POA provisions and assumptions, we were instructed to allocate the above contributions to the various divisions. This was done by allocating DWSD transfer amounts to the General City division and remaining DWSD contributions to the DWSD division and allocating remaining contributions in accordance with unfunded liabilities of each remaining division. A different allocation procedure would produce different results. If a different allocation procedure should be used, please let us know.

The chart below shows this allocation.

	General	**D.O.T.**	**Library**	**Subtotal**	**DWSD**	**Totals**
	$ Thousands					
Unfunded Liabilities	$ 610,230	$ 217,114	$ 27,430	$ 854,774	$ 352,370	$ 1,207,144
% of Subtotal	71.4%	25.4%	3.2%	100.0%	N/A	
FY 2015 Contributions	$ 87,668	$ 31,191	$ 3,941	$ 122,800	$ 65,400	$ 188,200
Transfers	$ 22,500	$ -	$ -	$ 22,500	$ (22,500)	$ -
FY 2015 UAL Contributions	**$ 110,168**	**$ 31,191**	**$ 3,941**	**$ 145,300**	**$ 42,900**	**$ 188,200**

VALUATION RESULTS (CONTINUED)

Unfunded Actuarial Accrued Liability+

	($ millions)				
	General City	D.O.T.	DWSD	Library	System Total
UAAL* as of June 30, 2014	$ 610.2	$ 217.1	$ 352.4	$ 27.4	$ 1,207.1
Anticipated POA Contribution (EOY)	110.2	31.2	42.9	3.9	188.2
Anticipated Expenses@	-	-	-	-	-
Interest at 6.75%	41.2	14.7	23.8	1.9	81.5
Projected UAAL* as of June 30, 2015	$ 541.3	$ 200.6	$ 333.3	$ 25.3	$ 1,100.4
Anticipated POA Contributions for FY 2016	**24.7**	**8.2**	**42.9**	**1.0**	**76.9**
Estimated Employer Contributions for FY 2024 #	**$ 73.4**	**$ 28.1**	**$ 12.7**	**$ 3.6**	**$ 117.8**

Totals may not add due to rounding.

* *Unfunded Actuarial Accrued Liability*

@ *In accordance with Plan Document, the mandated 6.75% rate of return is net of investment and administrative expenses.*

\# *Assuming the POA contributions through 2023 and a 30-year level principal closed amortization thereafter. When determining the Fiscal Year 2024 illustrative amounts, only the total contributions and the DWSD contributions are stipulated in the POA. The remaining amounts were allocated to the other groups as described on page 1. A different allocation would result in different results by group.*

\+ *Because no service is being accrued in Component II, no normal cost contribution is needed.*

The POA contributions result in a defunding of the plan between now and June 30, 2023, which was contemplated by the POA. In fact, the anticipated POA contributions do not project benefit restoration even if all assumptions are met (including the POA mandated assumed rate of return of 6.75%). Also, the contributions only marginally exceed the amount of nominal interest that accrues on the UAAL. The Estimated Employer Contribution for FY 2024 is based on a projection of results assuming only the POA contributions are made and all future experience between the valuation date and FY 2024 is as assumed. Actual experience will result in changes to this estimate and the final result (from the June 30, 2023 actuarial valuation) could be materially different than shown above.

VALUATION RESULTS (CONTINUED)

At the request of the Board, in addition to the status valuation calculations on page 2, we illustrate what the funding requirements would be if the FY 2015 contributions were determined by an actuarial valuation.

In the chart below, we illustrate two alternate funding policies for FY 2016. The first policy is an illustration of funding the UAAL over the expected remaining active service life of this group. The second policy is similar to the Board's existing (pre-bankruptcy) policy, but slightly accelerated to prevent insolvency prior to the end of the funding period. The illustrations are intended to show that there are a broad range of possible policies, but are not intended to show a specific recommendation or a minimum (or maximum) level of contributions.

Funding Policy 1 is based on amortizing the UAAL over the average remaining service life of active members (7 years for DOT; 8 years for all other groups) using level dollar amortization.

Funding Policy 2 is based on amortizing the UAAL with level principal payments over a closed 30-year period plus interest. This method is also known as level principal declining interest amortization.

Illustrative Contribution Shortfall

	($ millions)				
	General City	D.O.T.	DWSD	Library	System Total
(1) Illustrative Contribution for FY 2016 (Funding Policy 1)	$ 89.8	$ 36.9	$ 55.3	$ 4.2	$ 186.1
(2) Illustrative Contribution for FY 2016 (Funding Policy 2)	54.6	20.2	33.6	2.6	111.0
(3) Actual Contributions for FY 2016 (POA)	24.7	8.2	42.9	1.0	76.9
Fiscal Year 2016 Shortfall - Funding Policy 1: (1) - (3)	$ 65.1	$ 28.7	$ 12.4	$ 3.2	$ 109.2
Fiscal Year 2016 Shortfall - Funding Policy 2: (2) - (3)	$ 29.9	$ 12.0	$ (9.3)	$ 1.6	$ 34.1

Recommendation: We recommend that additional contributions be made to the Component II Plan. Increasing contributions increases the benefit security of the members.

VALUATION RESULTS (CONTINUED)

Present Value	June 30, 2014
Accrued Pension Liabilities (Employer Financed)	
Retirees and beneficiaries	
Future pensions	$2,249,960,085
Mortality reserve	0
Total	2,249,960,085
Inactive members future deferred pensions	221,148,836
Active members	461,525,862
Total accrued pensions	2,932,634,783
Pension fund balances	1,649,943,355
Unfunded accrued pension liabilities	$1,282,691,428
Accrued Annuity Liabilities (Member Financed)	
Retirees and beneficiaries	
Future annuities	$ 115,773,089
Mortality reserve	0
Total	115,773,089
Member annuities & future refunds	267,783,724
Total accrued annuity liabilities	383,556,813
Annuity fund balances	365,264,524
Unfunded accrued annuity liabilities	$ 18,292,289
Annuity Claw-back Liability Reductions	
Retirees and beneficiaries	$ (80,190,596)
Inactive members	(3,585)
Active members	(13,645,339)
Total Reductions	$ (93,839,520)
Totals	
Actuarial Accrued Liabilities	**$3,222,352,076**
Accrued Assets	**2,015,207,879**
Unfunded Actuarial Accrued Liabilities	**$1,207,144,197**

VALUATION RESULTS (CONTINUED)

FUNDED RATIO - POA

		Defined Benefit	ASF	Total
A	Actuarial Accrued Liability	$2,968,213,691	$254,138,385	$3,222,352,076
B	Market Value of Assets	$1,761,069,494	$254,138,385	$2,015,207,879
C	Unfunded Actuarial Accrued Liability (A-B)	$1,207,144,197	$ 0	$1,207,144,197
D	Funded Ratio (B/A)	59.3%	100.0%	62.5%

The POA Liability amount above is an expected return-based measurement of the pension obligation. It is based upon the mandated 6.75% interest rate assumption (assumption prescribed by another party). It determines an amount that will be sufficient to provide benefits if the portfolio earns the expected 6.75% return on assets and all other assumptions are met. This measure is appropriate for assessing the need for or amount of future contributions if all assumptions are met. This measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation, in other words, of transferring the obligation to a third party in a market value type transaction.

FUNDED RATIO - SOLVENCY

		Defined Benefit	ASF	Total
A	Market-Based Liability	$4,092,388,130	$254,138,385	$4,092,388,130
B	Market Value of Assets	$1,761,069,494	$254,138,385	$2,015,207,879
C	Unfunded Actuarial Accrued Liability (A-B)	$2,077,180,251	$0	$2,077,180,251
D	Funded Ratio (B/A)	43.0%	100.0%	49.2%

The Solvency value is a market-based measurement of the pension obligation. It represents the amount the plan would need to invest in low risk securities to provide the benefits with greater certainty. For this purpose, the solvency liability is computed at 4.29% as of June 30, 2014, based on the long-term municipal bond rate ("State & local bonds" rate from Federal Reserve statistical release (H.15) as of June 28, 2014). We are not able to assess the credit quality of the plan sponsor and, as such, no adjustment has been made for the credit quality of the plan sponsor. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures illustrates the savings the sponsor anticipates by taking on the risk in a diversified portfolio.

COMMENTS

Experience

During the prior year this plan experienced significant changes in structure, methods and assumptions which greatly overshadow the impact of any gains or losses during the year due to experience in specific risk areas. We were able to isolate a few of the major risk areas for this purpose. For example, investment experience during the year ended June 30, 2014 was favorable. The rate of return measured on a market value basis was 15.2%. Also, there were 307 retirements versus 226 expected, leading to an actuarial loss on retirement experience.

Asset Issues

The current method of allocation of investment income between divisions (as provided by Retirement System staff) results in each division recognizing a rate of return that may differ from the fund, in total. This has led to changes in divisional contribution rates that were not completely uniform. We recommend that staff continue to review the allocation procedures.

The Annuity Reserves (ASF plus ARF) reported to us included what appears to be a substantial amount of interest on the ASF balances. However, the staff indicated that the Board adopted a 0% rate of interest for FY 2014. Based on instruction from the staff, we estimated the amount of the reported investment return that should have been reported and adjusted the reported reserves for the valuation accordingly. See page 11 for the estimated changes included in the reserves.

ASF Interest Credits

The ASF fund cannot be credited with more than 5.25% (or the total fund earnings if less). We understand that any future arbitrage that may result will be transferred to Component I assets (to the extent needed for funding Transition Liabilities) and, therefore, we did not model any arbitrage as part of this valuation.

Data Issues and Approximations

The data provided for this valuation did not reflect the plan freeze or the various cuts that were instituted in connection with the POA. Consequently, it was necessary for us to use approximations to estimate the frozen accrued benefits and the effect of certain claw-backs. While in our judgement the approximations are reasonable, an estimate of the potential range of error in those approximations was outside the scope of this study. It is important that complete data be provided as soon as possible to minimize the probability of an important decision being made based upon wrong information. We would be pleased to redo this valuation with revised data if such can be made available.

Changes in Assumptions and Methods

- The actuarial cost method was changed in conjunction with the benefit freeze. All frozen benefits are assumed to be fully accrued, and hence there is no normal cost. This is a form of the actuarial cost method referred to as the Unit Credit Cost Method.
- The mortality table was updated to RP-2014 with blue collar adjustment, set-forward 1 year in conjunction with a study of mortality among plan participants covering the years 2008-2013 and dated February 4, 2015. Generational mortality improvement was assumed based on MP-2014.
- Investment return was lowered to 6.75% per annum, as prescribed by the POA.
- Assets were set to the market value as of the valuation date (no smoothing).
- This valuation of Component II does not depend on price inflation or wage inflation assumptions. For the prior annual actuarial valuation, the price inflation assumption was 3.0% and the wage inflation assumption was 4.0% per year respectively. We recommend reviewing and updating these assumptions prior to completing a valuation of Component I benefits.

For purposes of restoration, the plan document specifically states that the 6.75% assumed rate of return is net of administrative and investment expenses. However, the references to the assumed rate of return in the plan document are silent on this point. We have been instructed by the System that the assumed rate of return of 6.75% is net of administrative and investment expenses for purposes of this valuation.

COMMENTS

Restoration

This valuation assumes no future restoration of Component II benefits (consistent with the expectation of the POA). Any future restoration will be reflected beginning in the next valuation after being granted.

DWSD (Water/Sewer) Projections

Based on this valuation, the DWSD (Water/Sewer) division is not expected to be fully funded by 2024. As a result, their contributions will continue in FY 2024 (see page 2 for estimated FY 2024 contributions).

Future Results

While FY 2015 investment performance has not yet been provided to us, most public plans (for which information is available) earned less than 5% on assets. If the Retirement System's experience is similar, this will result in downward pressure on the funded status and upward pressure on the FY 2024 contribution requirements over and above what is shown in this report.

The POA mandated contributions for FY 2016 and beyond are expected to defund the Retirement System, even if all assumptions are realized. In FY 2016, the POA mandated contributions marginally exceed interest on the projected UAAL. This defunding was contemplated in the POA.

Recommendation 1

We recommend that every potential action be taken to generate contributions to the Retirement System above and beyond those provided in the POA.

Recommendation 2

We recommend that a study be undertaken to develop a funding policy for FY 2024 and beyond. The increase in contributions that is expected at that time is so significant that it cannot be ignored until then (even though this is contemplated in the POA). All stakeholders should agree on the funding method well before that date comes. If not, there could be a significant risk of contribution defaults and/or benefit insecurity.

Recommendation 3

We recommend that the System compute frozen accrued benefits as soon as possible and report them to the Actuary for the June 30, 2015 valuation. If important decisions are to be made based on this valuation, we recommend further that the valuation be redone based upon actual computed frozen accrued benefits.

Conclusion

The POA contributions fall short of contributions that would result from either of the funding policies illustrated in this report. Given those contributions, and the fact that FY 2015 will likely show an investment loss, the funding status is expected to decline in the next valuation. The FY 2024 contribution is expected to be very high compared to City contributions in the immediately preceding years. Planning for the FY 2024 contribution level is very important.

LIABILITY BY DIVISION - POA

	General	D.O.T.	DWSD	Library	Totals
Accrued Pension Liabilities					
Retirees and beneficiaries	$1,285,573	$304,957	$597,357	$ 62,073	$2,249,960
Inactive members future deferred pensions	144,115	29,535	42,872	4,628	221,150
Active members	214,051	74,338	143,636	29,501	461,526
Total accrued pension liabilities	1,643,739	408,830	783,865	96,202	2,932,636
Pension fund balances	993,256	180,615	409,575	66,497	1,649,943
Unfunded accrued pension liabilities	650,483	228,215	374,290	29,705	1,282,693
Accrued Annuity Liabilities					
Retirees and beneficiaries	64,529	11,030	36,188	4,024	115,771
Members annuities & future refunds	98,558	63,933	92,538	12,756	267,785
Total accrued annuity liabilities	163,087	74,963	128,726	16,780	383,556
Annuity fund balances	153,424	72,796	122,748	16,295	365,263
Unfunded accrued annuity liabilities	9,663	2,167	5,978	485	18,293
Estimated Annuity Claw-back Liability Reductions					
Retirees and beneficiaries	(41,728)	(11,788)	(24,462)	(2,213)	(80,191)
Inactive members	(2)	0	(1)	0	(4)
Active members	(8,185)	(1,480)	(3,434)	(547)	(13,645)
Total Reductions	(49,915)	(13,268)	(27,897)	(2,760)	(93,840)
Totals					
Actuarial Accrued Liabilities	1,756,911	470,525	884,694	110,222	3,222,352
Accrued Assets	1,146,680	253,411	532,323	82,792	2,015,206
Funded Ratio	65.3%	53.9%	60.2%	75.1%	62.5%
Unfunded Actuarial Accrued Liabilities	**$ 610,231**	**$ 217,114**	**$ 352,371**	**$ 27,430**	**$ 1,207,146**

Totals may be off slightly due to rounding.

SECTION B

FUND ASSETS

STATEMENT OF PLAN ASSETS
(REPORTED ASSETS AT MARKET VALUE)

Market Value - June 30, 2014	
Cash & equivalents	$ 25,742,786
Short-Term Investments	74,423,479
Mortgage Securities	21,970,772
Other Securities	84,643,123
Receivables & accruals	26,564,201
Contributions receivable	-
Stocks	1,058,090,820
Bonds & government securities	116,409,457
Real estate	211,811,951
Private equity	322,419,977
Mortgages	99,652,517
Securities lending	30,949,483
Pooled investments	7,870,265
Capital assets	1,333,145
Accounts payable	(66,674,097)
Total Current Assets	**$ 2,015,207,879**

MARKET VALUE OF ASSETS

Reserve Accounts
(Market Value)

Funds	Fund Balances June 30, 2014
Annuity Savings	$ 267,783,724
Annuity Reserve	97,480,800
Pension Accumulation	(1,613,518,388)
Pension Reserve	2,349,780,743
Accrued Liability Fund Reserve	913,681,000
Total Fund Balances	**$ 2,015,207,879**

Revenues and Expenditures
(Market Value)

	Pension Funds	Annuity Funds	Total Funds
Market Value July 1, 2013	$1,596,743,036	$502,278,918	$2,099,021,954
Revenues			
Member contributions	0	10,241,761	10,241,761
Employer contributions	25,126,131	0	25,126,131
Investment income	279,553,216	10,236,391	289,789,607
Transfers	0	0	0
Total	$ 304,679,347	$ 20,478,152	$ 325,157,499
Expenditures			
Benefit payments	242,939,732	10,743,462	253,683,194
Refund of member contributions	0	144,050,613	144,050,613
Expenses	8,539,297	2,698,470	11,237,767
Total	$ 251,479,028	$157,492,546	$ 408,971,574
Market Value June 30, 2014	$1,649,943,355	$365,264,524	$2,015,207,879
Market Value Rate of Return	18.8%	2.4%	15.2%

ALLOCATION OF ASSETS USED FOR VALUATION BY RESERVE ACCOUNT AND DIVISION

	June 30, 2014 Asset Values Provided by Detroit	Estimated Interest Adjustments to Reflect 0% on ASF and 7.9% on ARF	Proposed June 30, 2014 Asset Values After Interest Transfers
Annuity Savings Fund			
General	$ 126,130,712.38	$ (25,308,395.48)	$ 100,822,316.90
D.O.T.	$ 79,901,708.84	$ (15,969,143.76)	$ 63,932,565.08
Water	$ 94,543,598.13	$ (18,795,539.67)	$ 75,748,058.46
Sewage	$ 20,983,855.64	$ (4,193,830.30)	$ 16,790,025.34
Housing	$ (2,831,343.34)	$ 565,871.86	$ (2,265,471.48)
Library	$ 15,942,494.64	$ (3,186,264.63)	$ 12,756,230.01
Totals	$ 334,671,026.29	$ (66,887,301.98)	$ 267,783,724.31
Annuity Reserve Fund			
General	$ 49,229,700.79	$ 4,125,695.98	$ 53,355,396.77
D.O.T.	$ 8,178,769.49	$ 684,434.08	$ 8,863,203.57
Water	$ 26,843,972.87	$ 2,190,056.50	$ 29,034,029.37
Sewage	$ 1,034,754.11	$ 141,407.13	$ 1,176,161.24
Housing	$ 1,394,761.48	$ 118,354.18	$ 1,513,115.66
Library	$ 3,260,921.01	$ 277,972.07	$ 3,538,893.08
Totals	$ 89,942,879.75	$ 7,537,919.94	$ 97,480,799.69
Pension Accumulation Fund			
General	$ (836,010,031.20)		$ (836,010,031.20)
D.O.T.	$ (253,834,669.03)		$ (253,834,669.03)
Water	$ (261,491,532.41)		$ (261,491,532.41)
Sewage	$ (195,333,828.93)		$ (195,333,828.93)
Housing	$ (34,633,226.20)		$ (34,633,226.20)
Library	$ (32,215,100.57)		$ (32,215,100.57)
Totals	(1,613,518,388.3)		$ (1,613,518,388.34)
Pension Reserve Fund			
General	$ 1,285,359,062.76	$ 21,182,699.50	$ 1,306,541,762.26
D.O.T.	$ 297,398,828.57	$ 15,284,709.68	$ 312,683,538.25
Water	$ 536,193,426.92	$ 16,605,483.18	$ 552,798,910.09
Sewage	$ 71,987,475.96	$ 4,052,423.17	$ 76,039,899.13
Housing	$ 34,142,404.86	$ (684,226.05)	$ 33,458,178.81
Library	$ 65,350,162.19	$ 2,908,292.56	$ 68,258,454.74
Totals	$ 2,290,431,361.25	$ 59,349,382.04	$ 2,349,780,743.29
Accrued Liability Fund			
General	$ 523,899,000.00		$ 523,899,000.00
D.O.T.	$ 121,766,000.00		$ 121,766,000.00
Water	$ 227,151,211.06		$ 227,151,211.06
Sewage	$ 10,410,788.94		$ 10,410,788.94
Housing	$ -		$ -
Library	$ 30,454,000.00		$ 30,454,000.00
Totals	$ 913,681,000.00		$ 913,681,000.00
Retirement System Totals	$ 2,015,207,878.95		$ 2,015,207,878.95

The left hand column shows assets as originally reported which appeared to overstate the interest credited to the ASF Accounts. The middle column adjusts the reserves to account for the actual FY 2014 ASF interest credit of 0% based upon instructions from RSCD staff.

Separation of Assets into ASF and Defined Benefit (DB) Portions by Unit

	Total Assets	ASF Assets Initial	ASF Assets Adjustment	ASF Assets Final	DB Portion
	1	2	3	4=2-3	5=1-4
General	$1,148,608,445	$100,822,317	$ (8,184,624)	$ 92,637,693	$1,055,970,752
Housing	(1,927,403)	(2,265,471)	-	(2,265,471)	338,068
D.O.T.	253,410,638	63,932,565	(1,479,602)	62,452,963	190,957,675
Water	623,240,677	75,748,058	(3,434,211)	72,313,847	550,926,830
Sewage	(90,916,954)	16,790,025	-	16,790,025	(107,706,980)
Library	82,792,477	12,756,230	(546,901)	12,209,329	70,583,148
Totals	**$2,015,207,879**	**$267,783,724**	**$(13,645,339)**	**$254,138,385**	**$1,761,069,494**

Separation of Assets into ASF and Defined Benefit (DB) Portions by Divison

	Total Assets	ASF Assets Initial	ASF Assets Adjustment	ASF Assets Final	DB Portion
	1	2	3	4=2-3	5=1-4
General+Housing	$1,146,681,042	$ 98,556,845	$ (8,184,624)	$ 90,372,221	$1,056,308,820
D.O.T.	253,410,638	63,932,565	(1,479,602)	62,452,963	190,957,675
DWSD (Water/Sewage)	532,323,722	92,538,084	(3,434,211)	89,103,872	443,219,850
Library	82,792,477	12,756,230	(546,901)	12,209,329	70,583,148
Totals	**$2,015,207,879**	**$267,783,724**	**$(13,645,339)**	**$254,138,385**	**$1,761,069,494**

The plan sponsor contribution rates determined in this valuation and the contribution specified in the Plan of Adjustment are related only to the funding of Defined Benefits, and not to the funding of the ASF. Therefore, it is necessary to separate ASF assets from other assets in order to complete the valuation. The financial data that was provided to Gabriel, Roeder, Smith & Company did not reflect the POA mandated claw-back of ASF interest with respect to certain active ASF accounts, leading to the $13 Million reduction in ASF assets that is shown above. We have treated this amount as a reduction in ASF assets, although in reality it is possible that it may at least partially be a reduction in defined benefit liability. This would happen because some affected individuals may not have sufficient assets in their accounts to pay the claw-back. In that case they may be subject to a reduction in their defined benefit when they draw it.

SECTION C

PARTICIPANT DATA

SUMMARY OF MEMBER DATA
JUNE 30, 2014

Active Members

	General	D.O.T.	DWSD	Library	Totals
Number	2,324	813	1,430	314	4,881
% Change in active members	(10.1)%	(7.6)%	(8.7)%	(5.4)%	(9.0)%
Annual payroll ($ millions)	$ 100.6	$ 29.2	$ 60.8	$ 12.9	$ 203.5
Average pay	$43,295	$35,876	$42,505	$41,212	$41,694
% Change in average pay	8.0 %	0.3 %	2.7 %	2.5 %	4.9 %

Retired Members and Survivor Beneficiaries

	General	D.O.T.	DWSD	Library	Totals
Number	7,436	1,677	2,593	320	12,026
Annual benefits ($ millions) #	$ 141.9	$ 32.1	$ 61.7	$ 7.1	$ 242.7
Average benefits #	$19,076	$19,120	$23,777	$22,297	$20,182
% Change in average benefit	(2.2)%	(0.9)%	(2.4)%	(2.7)%	(2.0)%

 # Includes Annuities. Does not include reductions resulting from the annuity claw-backs.

Inactive Vested Members

	General	D.O.T.	DWSD	Library	Totals
Number	1,788	363	506	71	2,728
Annual benefits ($ millions)	$ 18.6	$ 3.8	$ 5.3	$ 0.5	$ 28.2
Average benefits	$10,391	$10,383	$10,475	$7,453	$10,329
% Change in average benefit	(2.1)%	(6.3)%	(4.3)%	(6.0)%	(3.1)%

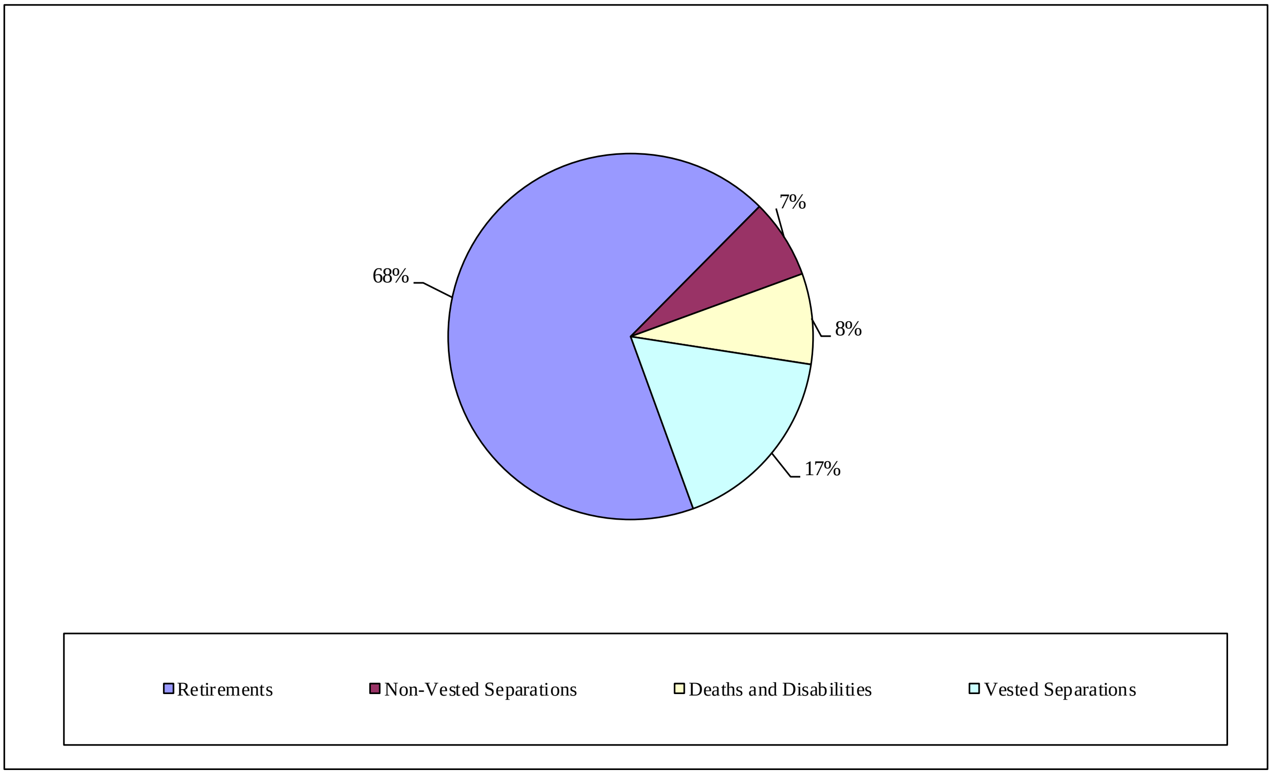
ACTIVE MEMBERS AS OF JUNE 30, 2014
BY ATTAINED AGE AND YEARS OF SERVICE
RETIREMENT SYSTEM TOTALS

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	2							2	$ 52,998
20-24	41	8						49	1,313,879
25-29	83	29	3					115	3,793,913
30-34	71	62	61	10				204	7,297,355
35-39	85	89	140	70	6			390	14,964,395
40-44	94	98	180	198	34	4		608	24,684,789
45-49	58	114	180	294	128	95	3	872	37,541,531
50-54	74	84	190	300	191	256	35	1,130	47,606,303
55-59	41	67	153	229	166	243	84	983	42,035,594
60-64	37	37	61	68	51	91	34	379	17,267,440
65-69	11	9	19	26	9	15	16	105	5,092,990
70-74	3	2	11	9	1	4	6	36	1,547,402
75-79	1	1	3	1	0	0	2	8	308,490
Totals	**601**	**600**	**1,001**	**1,205**	**586**	**708**	**180**	**4,881**	**$203,507,079**

Group Averages:

Age:	49.2 years
Service:	16.0 years
Annual Pay:	$41,694

EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS



The chart shows the expected future development of the present population in simplified terms. The Retirement System presently covers 4,881 active members. Eventually, 327 people are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 4,168 people are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 386 people are expected to become eligible for death-in-service or disability benefits.

Actual verses expected retirements for the 2014 fiscal year is shown below:

Year Ended June 30,	Expected	Actual
2014	226	307

RETIREES AND BENEFICIARIES JUNE 30, 2014
TABULATED BY ATTAINED AGES
RETIREMENT SYSTEM TOTALS

Attained Ages	Age & Service# No.	Age & Service# Monthly Allowances	Disability No.	Disability Monthly Allowances	Death-in-Service No.	Death-in-Service Monthly Allowances	Totals No.	Totals Monthly Allowances
Under 20*	12	$ 17,311	1	$ 504	7	$ 3,350	20	$ 21,165
20-24	3	3,758					3	3,758
25-29	6	2,065					6	2,065
30-34	6	5,536	4	1,390			10	6,926
35-39	7	6,711	8	4,516	1	788	16	12,015
40-44	22	17,799	30	17,400	1	430	53	35,629
45-49	123	201,395	66	41,251	8	10,266	197	252,912
50-54	465	963,175	155	105,266	28	32,524	648	1,100,965
55-59	1,098	2,607,025	266	261,693	38	47,179	1,402	2,915,897
60-64	2,025	4,063,566	214	269,447	46	70,577	2,285	4,403,590
65-69	1,940	3,569,732	175	196,229	34	56,414	2,149	3,822,375
70-74	1,374	2,208,563	83	71,610	41	47,633	1,498	2,327,806
75-79	1,007	1,437,427	57	48,610	35	39,190	1,099	1,525,227
80-84	973	1,198,451	37	27,663	63	57,796	1,073	1,283,910
85-89	882	994,824	43	35,054	46	36,683	971	1,066,561
90-94	429	439,535	12	8,377	35	28,178	476	476,090
95 and Over	112	81,678	2	1,322	6	3,317	120	86,317
Totals	**10,484**	**$17,818,551**	**1,153**	**$1,090,332**	**389**	**$434,325**	**12,026**	**$19,343,208**

* *May include records with defective birth dates.*
\# *Includes survivor beneficiaries of deceased retirees.*

RETIREES AND BENEFICIARIES JUNE 30, 2014
TABULATED BY YEAR OF RETIREMENT

Year of Retirement	No.	Monthly Allowances Total	Monthly Allowances Average
1950 & before	2	$ 3,244	$ 1,622
1951-1955	1	3,530	3,530
1956-1960	5	1,935	387
1961-1965	22	9,136	415
1966-1970	55	25,777	469
1971-1975	254	156,392	616
1976-1980	533	441,585	828
1981-1985	965	1,030,428	1,068
1986-1990	966	1,122,123	1,162
1991-1995	1,567	2,031,858	1,297
1996-2000	1,625	2,616,868	1,610
2001-2005	2,212	4,369,973	1,976
2007	390	691,952	1,774
2008	390	782,248	2,006
2009	501	981,640	1,959
2010	471	991,226	2,105
2011	605	1,288,292	2,129
2012	801	1,573,345	1,964
2013	452	812,980	1,799
2014	209	408,676	1,955
Totals	**12,026**	**$19,343,208**	**$1,608**

SECTION D

METHODS AND ASSUMPTIONS

SUMMARY OF ASSUMPTIONS AND METHODS USED FOR ACTUARIAL VALUATIONS ADOPTED BY BOARD OF TRUSTEES

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies where noted.

Economic Assumptions

The investment return rate used in making the valuation was 6.75% per year, compounded annually (net after investment and administrative expenses). This assumption is prescribed by the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit (POA).

Non-Economic Assumptions

The mortality table used to measure retired life mortality was 100% of the RP-2014 Blue Collar Annuitant Table for set-forward 1 year for males and 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Pre-retirement mortality is based on the corresponding Employee tables. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2014 (which was published and intended to be used with RP-2014). This table was first used as of June 30, 2014. For disabled members, the same tables are used. The rationale for the mortality assumption is based on the 2008-2013 Mortality Experience Study issued February 4, 2015.

The probabilities of retirement for members eligible to retire are shown on pages 21 and 22. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

The probabilities of separation from service (including *death-in-service* and *disability*) are shown for sample ages on page 23. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

SUMMARY OF ASSUMPTIONS AND METHODS USED FOR ACTUARIAL VALUATIONS ADOPTED BY BOARD OF TRUSTEES

Funding Methods

The unit credit cost method was used in determining age & service pension liabilities, vesting liabilities, and casualty pension liabilities. Under this method, there is no normal cost since benefits are frozen and there are no future accruals and actuarial accrued liability is the present value of each individual's accrued benefit.

Unfunded Actuarial Accrued Liabilities Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Employer contribution dollars were assumed to be paid at the end of the employer fiscal year.

Present assets are set equal to the Market Value.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

SINGLE LIFE RETIREMENT VALUES

BASED ON RP-2014 BLUE COLLAR
100% OF MALE RATES SET-FORWARD 1 YEAR
100% OF FEMALE RATES SET-FORWARD 1 YEAR

Sample Attained Ages in 2014	Future Life Expectancy (years)	
	Men	**Women**
45	38.14	41.51
50	33.20	36.48
55	28.48	31.60
60	23.97	26.87
65	19.70	22.30
70	15.72	18.00
75	12.10	14.07
80	8.94	10.59

PROBABILITIES OF AGE/SERVICE RETIREMENT FOR MEMBERS ELIGIBLE TO RETIRE

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year with Unreduced Benefits		
	EMS	**D.O.T.**	**Others**
45	25%		
46	25%		
47	25%		
48	22%		
49	20%		
50	18%	55%	50%
51	15%	50%	50%
52	15%	50%	45%
53	15%	50%	45%
54	15%	55%	40%
55	15%	50%	30%
56	15%	50%	30%
57	15%	50%	30%
58	15%	50%	30%
59	15%	55%	40%
60	40%	40%	25%
61	30%	30%	25%
62	30%	30%	25%
63	30%	30%	25%
64	30%	30%	25%
65	30%	30%	35%
66	30%	30%	30%
67	30%	30%	25%
68	30%	50%	25%
69	30%	50%	25%
70	100%	100%	20%
71			20%
72			20%
73			20%
74			20%
75			20%
76			20%
77			20%
78			20%
79			20%
80			100%
Ref	537	1648	1647

Rationale for assumption is 2002 to 2007 Experience Study.

PROBABILITIES OF EARLY RETIREMENT FOR MEMBERS ELIGIBLE FOR EARLY RETIREMENT

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year with Reduced Benefits
55	7%
56	8%
57	9%
58	10%
59	12%
60	12%
61	12%
62	12%
63	12%
64	12%
Ref	1649

Rationale for assumption is 2002 to 2007 Experience Study.

SAMPLE RATES OF SEPARATION FROM ACTIVE EMPLOYMENT BEFORE RETIREMENT

Sample Ages	Years of Service	% of Active Members Separating Within Next Year — Withdrawal			
				Others	
		EMS	D.O.T.	Men	Women
ALL	0	11.00%	18.00%	18.00%	20.00%
	1	10.00%	16.00%	15.00%	16.00%
	2	8.00%	14.00%	13.00%	14.00%
	3	8.00%	11.00%	11.00%	12.00%
	4	7.00%	9.00%	10.00%	10.00%
25	5 & Over	6.70%	8.00%	7.60%	7.60%
30		5.90%	7.60%	7.22%	7.22%
35		5.20%	5.56%	5.28%	5.28%
40		4.40%	4.26%	4.05%	4.05%
45		3.40%	3.69%	3.51%	3.51%
50		2.40%	3.50%	3.33%	3.33%
55		2.00%	3.50%	3.33%	3.33%
60		0.00%	3.50%	3.33%	3.33%
Ref		338	143	584	188
		1068	212	212 x 0.95	212 x 0.95

Sample Ages	% of Active Members Becoming Disabled Within Next Year			
	D.O.T.		Others	
	Ordinary	Duty	Ordinary	Duty
25	0.02%	0.03%	0.01%	0.25%
30	0.05%	0.08%	0.04%	0.29%
35	0.14%	0.21%	0.11%	0.34%
40	0.27%	0.42%	0.21%	0.39%
45	0.51%	0.79%	0.40%	0.45%
50	0.66%	1.03%	0.51%	0.52%
55	0.76%	1.18%	0.59%	0.60%
60	0.86%	1.34%	0.67%	0.70%
Ref	23 x 0.45	23 x 0.70	23 x 0.35	423 x 0.90

Rationale for assumption is 2002 to 2007 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service Exact Fractional service is used to determine the amount of benefit payable.

Decrement Operation Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.

Decrement Timing Decrements of all types are assumed to occur mid-year.

Eligibility Testing Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.

Forfeitures None.

Incidence of Contributions Contributions are assumed to be received at the end of the year.

Marriage Assumption 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.

Normal Form of Benefit Straight life is the normal form of benefit.

Service Credit Accruals Service accruals stop as of June 30, 2014 for measurement of end of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II.

Administrative Expenses The investment return assumption is mandated to be net of administrative expense in the plan document. No other provision for administrative expenses is included in this valuation.

Sick Leave As of June 30, 2014, this information was included in the 2014 AFC amounts.

AFC Adjustment Reported 2014 AFC amounts were increased by 2.0% for active members due to data discrepancies related to the reported AFC.

Rationale for assumption is 2002 to 2007 Experience Study, modified as necessary for changes in data or administration.

SECTION E

PLAN PROVISIONS

SUMMARY OF BENEFIT PROVISIONS EVALUATED

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future cost-of-living adjustments ("COLA's") were eliminated. Benefits resulting from the Annuity Savings Fund and benefits paid from the Annuity Reserve Fund were subject to a separate reduction described as a "Claw-back." Details of the claw-back provision are complicated and can be found in the Eighth Amended Plan of Adjustment. The benefits evaluated in this report are the frozen reduced benefits after the claw-back. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below does not have legal standing and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below, and appropriate legal documents, the latter necessarily govern.

Age and Service Pension

Eligibility - Any age (minimum age 55 for non-EMS members hired after 1995) with 30 years of service (25 for EMS members), or age 60 with 10 years of service, or age 65 with 8 years of service.

***Annual Amount* – EMS Members:** Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to 2.0% of AFC multiplied by years of service. Maximum benefit is 90% of AFC. **Other Members:** Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to the first 10 years of service multiplied by 1.6% of AFC, plus 1.8% of AFC for each year of service greater than 10 years up to 20 years, plus 2.0% of AFC for each year of service greater than 20 years up to 25 years, plus 2.2% of AFC for each year of service greater than 25 years. Future benefit accruals for certain active members (depending on bargaining unit) were reduced to 1.5% of final average compensation per year of service.

Type of Average Final Compensation (AFC) - Highest 3 consecutive years out of the last 10. Pension benefits will not be diminished if compensation is reduced because of a fiscal emergency. Effective July 1, 1999, in computing the AFC, a member shall have the option of adding the value of 25% of unused accrued sick leave to the earnings used in computing the AFC. Longevity is added to AFC in accordance with the following schedule: $150 after 5 years, $300 after 10 years, $450 after 15 years, $600 after 20 years, and $750 after 25 years.

Early Retirement

Eligibility - Any age with 25 or more years of service (min. age 55 for members hired after 1995).

Annual Amount - Same as regular retirement but actuarially reduced.

SUMMARY OF BENEFIT PROVISIONS EVALUATED (CONTINUED)

Deferred Retirement (Vested Benefit)

Eligibility - Hired prior to 7-1-80: Age 40 with 8 years of service. Hired on or after 7-1-80: Any age with 10 years of service.

Benefit Commencement - APTE hired prior to July 1, 1988: Benefit begins at the age the member would have become eligible for regular retirement if service had continued. ***SAAA, Non-Union and lawyers hired prior to June 30, 1986:*** Benefit begins at the age the member would have become eligible for regular retirement. ***Others:*** Benefits based on service rendered by June 30, 1986 begin at the age the member would have become eligible for regular retirement. Benefits based on service rendered after July 1, 1986 begin at age 62.

Annual Amount - Same as regular retirement but based on average final compensation and service at the time of termination.

Duty Disability Retirement

Eligibility - Service related disability before age 60. No service requirement.

Annual Amount - An annuity which is the actuarial equivalent of the accumulated contributions at date of disability plus a pension of two-thirds of average final compensation at time of disability. The maximum annual pension is $9,000. At the earliest of when the member would have accrued 30 years of service credit (25 for EMS) or age 60, the annuity is recomputed assuming contributions would have continued at a salary level equal to final compensation. The pension is recomputed with additional service credit granted from the date of disability to age 60 (or 30 years of service credit) with no maximum.

Non-Duty Disability Retirement

Eligibility - Disability from any cause before age 60 with 10 or more years of service.

Annual Amount - Computed in the same manner as a regular retirement benefit. Maximum annual pension to age 60 is $6,000. Benefit is recomputed at age 60 with no maximum.

Duty Death Before Retirement

Eligibility - Death from service related causes. No age or service requirements.

Annual Amount - One-third of final compensation to the surviving spouse for life or until remarriage, plus an equal share of 1/4 of final compensation to each unmarried child under age 18. If there is no eligible spouse, eligible children each receive 1/4 of final compensation; if there are more than 2 such children, each child shares an equal part of 1/2 of final compensation. Maximum total amount for spouse and children is $9,000 annually. If there is no eligible spouse or children, dependent parents each receive 1/6 of deceased's final compensation, to a total maximum of $600 annually.

SUMMARY OF BENEFIT PROVISIONS EVALUATED (CONCLUDED)

Non-Duty Death Before Retirement

Eligibility - Death-in-service at any age with 15 years of service; or after age 60 with 10 years of service; or after age 65 with 8 years of service.

Annual Amount - To Surviving Spouse: Computed as a regular retirement benefit but reduced in accordance with a 100% joint and survivor election for members with 20 or more years of service. For members with 15 years of service but less than 20, benefit is reduced in accordance with a 50% joint and survivor election. To Dependent Children if no Surviving Spouse: $9,000 payable to age 19 of the youngest child or for life if child is physically or mentally impaired for members with 20 or more years of service ($6,000 if less than 20 years of service).

Post-Retirement Cost-of-Living Adjustments

Benefit is increased annually by 2.25% of the **original** pension amount at retirement. Post-retirement cost-of-living increases were eliminated on future accruals for certain active members (depending on bargaining unit).

Member Contributions

Members have the option of choosing one of four contribution amounts: (1) 0%; (2) 3.0% of compensation up to the Social Security wage base, plus 5.0% of compensation in excess of the Social Security wage base; (3) 5.0% of total compensation; or (4) 7.0% of total compensation. Member contributions can be paid as a lump sum or annuitized at retirement to provide an annuity in addition to the pension (which is not affected by the level of member contributions).

SECTION F

GLOSSARY

GLOSSARY

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

AFC. Average Final Compensation.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

APTE. Association of Professional and Technical Employees.

GLOSSARY

Contribution Budgeting Liability. An expected return based measure of pension obligation.

D.O.T. Department of Transportation.

EMS. Emergency Medical Service.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

GASB. The Governmental Accounting Standards Board.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

POA. The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.

POC. Pension Obligation Certificates.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

SAAA. Senior Accountants, Analysts, and Appraisers Association.

Solvency Liability. A market-based measure of the present value of accrued benefits at a municipal bond discount rate unadjusted for the credit quality of the plan sponsor.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes.

Great Lakes Water Authority
Financial Services Group
Audit Committee Communication

Date: November 20, 2015

To: Great Lake Water Authority Audit Committee

From: Jon Wheatley, Public Finance Manager

Re: Draft Debt Management Policy

Background: In preparing for the operational stand-up of the Great Lakes Water Authority (GLWA) on January 1, 2016, it is recommended that the GLWA Board adopt a Debt Management Policy. This policy was drafted with the cooperation of GLWA's Municipal Advisor, Public Financial Management, Inc. ("PFM") and benchmarked against several debt management policies from large scale utility providers across the country. This draft policy will help ensure that financings undertaken by GLWA satisfy clear objective standards which will allow GLWA to protect its financial resources in order to meet its long-term capital needs. Debt policies and procedures are tools which ensure that financial resources are adequate to meet GLWA's long-term planning objectives. In addition, this policy shall govern the issuance and management of all bonds and other forms of indebtedness of the GLWA and formally establishes parameters for issuing debt and managing a debt portfolio which considers GLWA's specific capital improvement needs, ability to repay financial obligations, and the existing legal, economic, financial and debt market conditions.

Highlights: In reviewing the included draft policy, management would like to highlight some important sections:

- Pages 2 and 3 outline the types of debt that may be issued by GLWA and the methods of issuance that will be considered;
- Page 4 indicates that no derivative instruments will not be used unless GLWA Board adopts a separate derivatives policy;
- Pages 6 and 7 demonstrate the provisions of, and compliance with, the GLWA Master Bond Ordinances; and
- Pages 9 and 10 outline the procedures for ongoing debt administration, to ensure compliance with continuing disclosure, investment and IRS requirements.

Budget Impact: None.

Proposed Action: Receive draft policy, provide comments, and schedule second review.

Great Lakes Water Authority
Debt Management Policy

Adopted November __, 2015

Table of Contents

Introduction

The Great Lakes Water Authority ("GLWA") is an independent Authority of the State of Michigan. GLWA was formed on November 26, 2014 by the City of Detroit (the "City"), the Charter County of Wayne, the County of Oakland, and the Charter County of Macomb (collectively, the "Incorporating Municipalities"), pursuant to Act No. 233, Public Acts of Michigan, 1955, as amended, in order to lease the Leased Sewer Facilities and the Leased Water Facilities and to operate the Regional Sewer System and the Regional Water System and maintain the Leased Sewer Facilities and the Leased Water Facilities pursuant to separate leases of the respective facilities, between the City and GLWA. Pursuant to the Lease, GLWA has assumed all of the City's obligations related to the Regional Sewer System, including, but not limited to, the City's obligations to pay debt service on all of the City's Department of Water and Sewerage ("DWSD") Water and Sewer Bonds.

Purpose

To create and maintain a high quality debt management program, the GLWA has adopted the guidelines and policies set forth in this document titled "Debt Management Policy" (the "Policy"). The purpose of creating the Policy is to establish and codify the objectives and practices for debt management for GLWA and to assist parties in understanding GLWA's approach to debt management.

The Policy is intended to guide current and future decisions related to debt issued by GLWA. GLWA has the right to waive or modify any of the policies included herein but requires approval of the GLWA Board.

Since the guidelines contained in the Policy require regular updating in order to maintain relevance and to respond to the changes inherent in the capital markets and the water and sewer industry, GLWA plans to revisit the Policy from time to time.

Policy Statement

This policy shall govern the issuance and management of all bonds and other forms of indebtedness of the GLWA, together with any credit, liquidity, or other security instruments and agreements that may be executed in connection with the issuance of bonds and other forms of indebtedness. The Policy formally establishes parameters for issuing debt and managing a debt portfolio which considers GLWA's specific capital improvement needs, ability to repay financial obligations, and the existing legal, economic, financial and debt market conditions.

By implementing this policy, GLWA expects to realize financial benefits such as debt service savings and efficiencies.

Goals & Objectives

Debt policies and procedures are tools which ensure that financial resources are adequate to meet GLWA's long-term planning objectives. In addition, the Policy helps to ensure that financings undertaken by GLWA satisfy certain clear objective standards which allow GLWA to protect its financial resources in order to meet its long-term capital needs. The adoption of clear and comprehensive financial policies enhances the internal financial management of GLWA.

Specifically, the policies outlined in this document are intended to assist in the following:

1. Promote cooperation and coordination with all stakeholders in the financing and delivery of services by:

   - Seeking the lowest cost of capital reasonably available and minimizing financing costs for capital projects and other debt issuances.
   - Establishing criteria to determine use of financing sources (Long and Short-Term debt, Pay-As-You-Go (PAYGO) financing, grants and other Alternative Forms of Financing).

- Evaluating debt issuance options including the amount and type of debt.
- Minimizing the use of unplanned, Short-Term cash flow borrowings by maintaining adequate working capital and authorizing the minimum amount required to offset mismatches between available cash and cash outflows determined by cash flow analysis.

2. Promote sound financial management to maximize and best utilize future debt capacity by:

- Maximizing administrative and operating flexibility.
- Minimizing Legal and Financial Risk to current and future budgets.
- Protecting GLWA's credit ratings in order to maintain access, on the best available terms, to local, regional and national credit markets.
- Maintaining an appropriate level of operating cash reserves.
- Maintaining reasonable and justifiable levels of rates and fees that address the current and future needs of stakeholders.
- Improving the quality of decisions and parameters for justification on debt structure

Types of Debt

When GLWA determines that the use of debt is appropriate, the following criteria will be utilized to evaluate the type of debt to be issued.

1. **Long-Term Debt**. GLWA may issue long-term debt (revenue bonds) where it is deemed that capital improvements will not be financed from current revenues. Long-term borrowing will not be used to finance current operations or normal maintenance. Long-term debt will be self- supporting and structured such that financial obligations do not exceed the expected useful life of the project.

2. **State Revolving Fund Loan**. GLWA will seek to maximize its borrowing through available State Revolving Fund Loan programs, in which subsidized interests provide significant debt service savings to GLWA. Such program participation generally involves Long-Term Debt with a fixed rate through the Michigan Finance Authority.

3. **Short-Term Debt**. Short-term borrowing may be utilized subject to the following policies:

   a) **Bond Anticipation Notes (BANs)** may be issued instead of capitalizing interest to reduce the debt service during the construction period of a project or facility. The BANs may not mature more than the later of 3 years from the date of issuance or will mature 60 days after the expected date of issuance of the long-term municipal security that will finance the project or facility.

   d) **Other Short-Term Debt**, including commercial paper notes, may be used when it provides an interest rate advantage or as interim financing until market conditions are more favorable. GLWA will determine and utilize the least costly method for short-term borrowing. GLWA may issue short-term debt when there is a defined repayment source or amortization of principal.

4. **Lease Purchase Debt**. Lease purchase debt, including certificates of participation, may be considered as an alternative to long-term vendor leases. Such debt will be subject to annual appropriation. In order to reduce the cost of lease borrowing and to improve control over leases, GLWA may adopt a master lease program.

5. **Variable Rate Debt**. To maintain a predictable debt service burden, GLWA may give preference to debt that carries a fixed interest rate. GLWA, however, may consider variable rate debt. The percentage of variable rate debt outstanding (excluding debt which has been converted to synthetic fixed rate debt) may not exceed 20% of GLWA's total outstanding debt. Net variable rate exposure is calculated by including all variable rate debt, and then excluding variable rate bonds hedged by interest rate swaps in a synthetic fixed rate structure or by GLWA short-term assets earning variable interest income.

The following circumstances may result in the consideration of issuing variable rate debt:

a) *High Interest Rates.* Interest rates are above historical averages.

b) *Variable Revenue Stream.* The revenue stream for repayment is variable, and is anticipated to move in the same direction as market-generated variable interest rates, or the dedication of revenues allows capacity for variability.

c) *Adequate Safeguards Against Risk.* Financing structure and budgetary safeguards are in place to prevent adverse impacts from interest rate shifts; such structures could include, but are not limited to, interest rate caps and short–term cash investments in GLWA's General Fund.

d) *Municipal Advisor Analysis*. An analysis from GLWA's Municipal Advisor evaluating and quantifying the risks and returns involved in the variable rate financing and recommending variable rate as the lowest cost option.

e) *As a Component to Synthetic Fixed Rate Debt.* Variable rate bonds may be used in conjunction with a financial strategy, which results in synthetic fixed rate debt.

Methods of Issuance

GLWA will determine the method of issuance on a case-by-case basis.

1. **Competitive Sale**. In a competitive sale, GLWA's bonds will be awarded to the bidder providing the lowest true interest cost as long as the bid adheres to the requirements set forth in the official notice of sale.

2. **Negotiated Sale.** GLWA recognizes that certain securities are best sold through negotiation. For example, GLWA may be best served until its credit is fully established, and it has a financial history to use a negotiated sale method as the initial financings will require a strong pre-marketing effort. It is expected that all of GLWA's securities will be sold on a negotiated basis for at least a two to three year period after the initial transition to the GLWA credit structure.

3. **Private Placement**. From time to time GLWA may elect to privately place its debt. Such placement may only be considered if this method is demonstrated to result in a cost savings to GLWA relative to other methods of debt issuance.

Bond Structure

GLWA will establish all terms and conditions relating to the issuance of bonds, and will invest all bond proceeds pursuant to the terms of GLWA's Investment Policy. To the extent that GLWA issues bonds to fund the DWSD-R capital program, GLWA will identify the portion of any borrowing that is allocable to the DWSD-R system. GLWA will work in coordination with DWSD-R on the bond structuring elements of any borrowing for the DWSD-R local system, and will assist in the ongoing administration of the debt allocation.

Unless otherwise authorized by GLWA, the following will serve as bond requirements:

1. **Term**. All capital improvements financed through the issuance of debt will be financed for a period not to exceed the useful life of the improvements, but in no event will the term exceed forty (40) years.

2. **Capitalized Interest**. From time to time certain financings may benefit from the use of capitalized interest from the issuance date until GLWA has beneficial use and/or occupancy of the financed project. Interest may not be funded (capitalized) beyond three years or a shorter period if further restricted by statute. Interest earnings may, at GLWA's discretion, be applied to extend the term of capitalized interest but in no event beyond the term statutorily authorized.

3. **Debt Service Structure**. Debt issuance will be planned to achieve relatively level debt service while still matching debt service to the useful life of facilities. GLWA will avoid the use of bullet or balloon maturities except in those instances where these maturities serve to make existing overall debt service level.

4. **Call Provisions**. In general, GLWA's securities will include a call feature, which is no later than 10.5 years from the date of delivery of the bonds unless approved by bond counsel. GLWA will avoid the sale of non-callable bonds absent careful evaluation by GLWA with respect to the value of the call option.

5. **Original Issue Discount and Premium Bonds**. Discount and premium bonds are permitted if GLWA determines that such discount or premium bonds, including the impact on call option value, will result in a lower interest cost on the bonds.

6. **Debt Service Reserve Fund (the "DSRF"):** GLWA will consider providing a DSRF as market conditions dictate, if a funded DSRF will reduce the overall borrowing cost of GLWA. A DSRF can be established to support each individual series of bonds or as a common reserve that can support more than one series of bond's Debt Service. The DSRF may be funded with bond proceeds at the time of issuance, cash, Letter of Credit, or Surety Bonds, as permitted by law.

7. **Derivative Structures**. GLWA may not use derivative structures unless the Authority Board approves a separate policy related to the management of such derivative structures. Such policy will establish the authority and parameters for any use of derivatives by GLWA.

Refinancing Outstanding Debt

GLWA's Chief Financial Officer with assistance from GLWA's Municipal Advisor will have the responsibility to analyze outstanding bond issues for refunding opportunities. GLWA will consider the following issues when analyzing possible refunding opportunities:

1. **Debt Service Savings**. GLWA establishes a minimum present value savings threshold of 2.5% of the refunded bond principal amount. The present value savings will be net of all costs related to the refinancing. If present value savings are less than 2.5%, GLWA may consider the option value captured as a percent of total savings. If the present value savings are less than 2.5%, GLWA may opt to complete a refunding. A structure which takes savings on an upfront or deferred basis must be explicitly approved by GLWA. Aggregate debt service installment requirements for both the additional bonds and the current bonds of equal and higher priority lien must be less in the current fiscal year and each fiscal year thereafter until maturity following the refunding.

2. **Restructuring.** GLWA will refund debt when it is in the best financial interest of GLWA to do so. Such refunding will be limited to restructuring to meet unanticipated revenue expectations, achieve cost savings, mitigate irregular debt service payments, release reserve funds or remove unduly restrictive bond covenants.

3. **Term of Refunding Issues.** GLWA will refund bonds within the term of the originally issued debt. However, GLWA may consider maturity extension, when necessary to achieve a desired outcome, provided that such extension is legally permissible. GLWA may also consider shortening the term of the originally issued debt to realize greater savings. The remaining useful life of the financed facility and the concept of inter-generational equity should guide this decision.

4. **Escrow Structuring.** GLWA will utilize the least costly securities available in structuring refunding escrows. A certificate will be provided by a third party agent, who is not a broker-dealer stating that the securities were procured through an arms-length, competitive bid process (in the case of open market securities), that such securities were more cost-effective than State and Local Government Obligations (SLGS), and that the price paid for the securities was reasonable within Federal guidelines. Under no circumstances may an underwriter, agent or Municipal Advisor sell escrow securities to GLWA from its own account.

5. **Arbitrage.** GLWA will take all necessary steps to optimize escrows and to avoid negative arbitrage

in its refundings. Any resulting positive arbitrage will be rebated as necessary according to Federal guidelines.

Underwriter Selection

Senior Manager Selection. GLWA will select the senior manager for a proposed negotiated sale. The selection criteria will include, but not be limited to, the following:

- The firm's ability and experience in managing complex transactions
- Prior knowledge and experience with GLWA, if applicable
- The firm's willingness to risk capital and demonstration of such risk
- Quality and experience of personnel assigned to GLWA's engagement
- Financing plan presented
- Underwriting fees

Co-Manager Selection. Co-managers will be selected on the same basis as the senior manager. In addition to their qualifications, co-managers appointed to specific transactions will be a function of transaction size and the necessity to ensure maximum distribution of GLWA's bonds.

Selling Groups. GLWA may establish selling groups in certain transactions in order to broaden the reach to potential investors.

Underwriter's Counsel. In any negotiated sale of GLWA debt in which legal counsel is required to represent the underwriter, the appointment will be made by the Senior Manager while also being acceptable to GLWA.

Underwriter's Discount. GLWA's Municipal Advisor will evaluate the proposed underwriter's discount against comparable issues in the market. If there are multiple underwriters in the transaction, the Chief Financial Officer will determine the allocation of liabilities and fees among the underwriters, with input from GLWA's Municipal Advisor.

All fees and allocation of liability and fees will be determined prior to the sale date; a cap on management fee (if any), expenses and underwriter's counsel will be established and communicated to all parties by the Chief Financial Officer or GLWA's Municipal Advisor. The senior manager will submit an itemized list of expenses charged to members of the underwriting group. Any additional expenses must be substantiated.

Evaluation of Underwriter Performance. GLWA will evaluate each bond sale after completion to assess the following: costs of issuance including underwriters' compensation, pricing of the bonds in terms of the overall interest cost and on a maturity-by-maturity basis, the distribution of bonds, and sales credits.

Following each sale, the Chief Financial Officer or GLWA's Municipal Advisor will provide a report to the Finance Committee on the results of the sale.

Syndicate Policies. For each negotiated transaction, the Chief Financial Officer will, with input and advice from GLWA's Municipal Advisor, approve a syndicate policy that will describe the designation policies governing the upcoming sale.

Designation Policies. To encourage the pre-marketing efforts of each member of the underwriting team, orders for GLWA's bonds should be net designated whenever practical, unless otherwise expressly stated. GLWA will require the senior manager to:

- Equitably allocate bonds to other managers and the selling group
- Comply with MSRB regulations governing the priority of orders and allocations
- Within 10 working days after the sale date, submit to the Chief Financial Officer, and GLWA's Municipal Advisor, a detail of orders, allocations and other relevant information pertaining to GLWA's sale

Consultants

Municipal Advisor. GLWA will retain a Municipal Advisor (or advisors) to provide GLWA with a comprehensive analysis of options available to GLWA. The Financial Advisor(s) will advise on the structuring and execution of all debt and debt-related transactions and provide other services as defined by approved contracts.

Bond Counsel. GLWA will retain Bond Counsel to issue an opinion as to the legality and tax status of all debt obligations. GLWA may also seek the advice of Bond Counsel on other types of financing an on any other questions involving local, state or federal law. Bond Counsel is also responsible for the preparation of the resolution authorizing the issuance of obligations, certain bond and closing documents necessary for the execution of the debt issuance, and the performance of other services as defined by contract approved by GLWA.

Conflicts of Interest. GLWA requires that its consultants and advisors provide objective advice and analysis, maintain the confidentiality of GLWA financial plans, and be free from any conflicts of interest.

Disclosure by Financing Team Members. All financing team members will be required to provide full and complete disclosure, relative to agreements with other financing team members and outside parties. The extent of disclosure may vary depending on the nature of the transaction. However, in general terms, no agreements will be permitted which could compromise the firm's ability to provide independent advice which is solely in GLWA's best interests or which could reasonably be perceived as a conflict of interest.

Compliance with Master Bond Ordinances

GLWA adopted its Master Water Bond Ordinance and Master Sewer Bond Ordinance on October 7, 2015 (the "Master Ordinances") which sets forth the security for its bonds and binds GLWA by certain covenants. It is GLWA's intention to comply with the provisions of its Master Ordinances. Two covenants in particular which impact GLWA's debt management are the Fixing and Revising Rates; Rate Covenant (Section 604) and the Additional Bonds (Section 207).

Rate Covenant: The Master Bond Ordinances contain a covenant to fix, charge and collect, or cause to be fixed, charged and collected, rates, fees and charges for the use and operation of the Sewage Disposal or Water System. Such rates, fees and charges shall be fixed and revised from time to time as may be expected to be necessary to produce the greater of:

1. The amounts required:
    a) To provide for the payment of Operation and Maintenance Expenses of the Sewage Disposal System or Water System; and

    b) To provide for the payment of all Debt Service Installment Requirements coming due during the Fiscal Year of calculation; and

    c) To provide for the creation and maintenance of reserves therefor as required by the Master Bond Ordinance; and

    d) To provide for the payment of the Lease Payment; and

    e) To provide for the deposit to the WRAP Fund; and

    f) To repay any withdrawals from the Extraordinary Repair and Replacement Fund; and

    g) To provide for such other expenditures and funds as the Master Bond Ordinances may require; and

2. Amounts so that the Rate Covenant Debt Service Coverage shall not be less than the Required Coverage (as defined below); and

3. Amounts required by Act 94.

The coverage requirements for determining the Required Coverage under the Master Bond Ordinances are the following percentages of Net Revenues divided by the Maximum Annual Debt Service requirements:

Priority of GLWA Bonds:	Percentage:
Senior Lien GLWA Bonds	120%
Second Lien GLWA Bonds	110%
SRF Junior Lien GLWA Bonds and Pension Junior Lien GLWA Bonds	100%

Additional Bonds: Before issuing new debt which will be paid from Net Revenues, GLWA must demonstrate compliance with the provisions of Section 207 of the Master Ordinances, entitled the "Additional Bonds."

Under the Master Bond Ordinances, GLWA may not incur any obligations payable from Pledged Assets except for GLWA Bonds, and no obligations of GLWA may be secured by a lien on Pledged Assets except as provided in the Sewer Master Bond Ordinance.

Coverage Requirements: Under the Master Bond Ordinances, prior to or concurrently with the issuance of GLWA Additional Bonds of any Priority of Lien, GLWA shall calculate a number equal to Projected Net Revenues in the then current or the next succeeding Fiscal Year, or Historical Net Revenues, all as determined by GLWA, divided by Maximum Annual Debt Service for such Priority of Lien and any higher Priority of Lien (the "Additional Bonds Debt Service Coverage"). GLWA may elect to determine Additional Bonds Debt Service Coverage on the basis of Projected Net Revenues or Historical Net Revenues. In determining Projected Net Revenues, GLWA shall engage the services of and be guided by a professionally qualified person, firm or corporation nationally recognized in the municipal water supply industry and of favorable reputation for skill and experience in performing the duties of providing consulting services to municipal water supply systems comparable in size and function to the Sewage Disposal System, including setting of rates and charges for the use of such systems (a "System Consultant"). In determining Historical Net Revenues, GLWA may engage the services of and be guided by a System Consultant if it is relying on audited financial statements without augmenting Net Revenues on the basis of changes in rates, fees or charges or repairs, extensions, enlargements, improvements, acquisitions, extensions or connections to the Sewage Disposal System. In determining Historical Net Revenues, GLWA shall engage the services of and be guided by a System Consultant if it is augmenting Net Revenues on such a basis.

General Authority: Under the Master Bond Ordinance, GLWA may issue GLWA Bonds of any Priority of Lien (the "GLWA Additional Bonds") for repairs, extensions, enlargements, and improvements to the Regional Sewer System or the Local Sewer System (including repaying amounts withdrawn from the Extraordinary Repair and Replacement Reserve Fund for the Regional Water System or the Local Water System), and/or refunding all or a part of any Outstanding GLWA Bonds and paying the costs of issuing such GLWA Additional Bonds, including deposits, if any, to be made to any Reserve Account established or to be established for such GLWA Additional Bonds or any other GLWA Bonds, if, but only if GLWA shall certify that the Additional Bonds Debt Service Coverage for each Priority of Lien (regardless of the Priority of Lien of the GLWA Additional Bonds) is not less than the Required Coverage. The determination in a Series Ordinance that the Additional Bonds Debt Service Coverage for each Priority of Lien is not less than the Required Coverage shall be conclusive.

Alternate Test for Refundings: Under the Master Bond Ordinances, GLWA may issue GLWA Bonds of any Priority of Lien, including a portion of a Series of GLWA Bonds, without regard to the above requirements for refunding all or part of GLWA Bonds then Outstanding and paying costs of issuing such GLWA Additional Bonds, including deposits which may be made to any Reserve Account established or to be established for such GLWA Additional Bonds or any other GLWA Bonds if, but only if the combined Debt Service required to be set aside in the Bond Fund in the current Fiscal Year and each Fiscal Year thereafter until maturity on (A) the GLWA Additional Bonds and (B) giving effect to the refunding, all Outstanding unrefunded GLWA Bonds of equal and higher Priority of Lien, is less than the combined Debt Service required to be set aside in the Bond Fund in the current Fiscal Year and each Fiscal Year thereafter until maturity on all equal and higher Priority of Lien GLWA Bonds, without giving effect to the refunding.

Credit Quality and Credit Enhancement

GLWA's debt management activities will be conducted to achieve, maintain and improve its credit ratings. GLWA will seek to obtain investment grade credit ratings on all of its borrowings to the extent possible, consistent with GLWA's financing objectives. GLWA will also strive to achieve "A" category ratings from all three national rating agencies – Fitch, Moody's and Standard & Poor's for both its senior and second lien borrowings. In general, GLWA will intend to use ratings from at least two of the three national rating agencies for its debt issuance in the capital markets. Under special circumstances, however, GLWA will consider certain financial transactions with no ratings, if approved by the Board and recommended by the Chief Financial Officer with the advice of its Municipal Advisor.

GLWA will consider the use of credit enhancement to fixed rate and variable rate debt on a case-by-case basis, evaluating the economic benefit versus cost for each case. Only when clearly demonstrable savings can be shown may an enhancement be considered. GLWA may purchase municipal bond insurance when such purchase is deemed prudent and advantageous for its fixed rate debt issuance, as documented by GLWA's Municipal Advisor or senior managing underwriter. GLWA will also consider the remaining bond insurance capacity as part of its consideration of utilization of credit enhancement for fixed rate bonds.

For variable rate debt transactions that require credit enhancement (such as Variable Rate Demand Bonds), GLWA will consider credit enhancement products such as a Letter of Credit, that are typically required by rating agencies to achieve the highest short-term ratings. GLWA will consider the cost and marketability implications of each variable rate product and supporting credit enhancement product prior to each transaction on a case-by-case basis. In addition, to manage business and counterparty risk, GLWA will consider a diversity of credit enhancement providers. Prior to entering into agreements with a letter of credit, liquidity facility or other credit enhancement, GLWA or its advisor will prepare and distribute a request for qualifications to qualified banks which includes terms and conditions that are acceptable to GLWA.

Documentation

The completion of a debt transaction requires the Financing Team to develop, review, and adopt/execute several documents. While not exhaustive, the following represents the key documents in a debt transaction:

1. *Authorizing Resolution:* A document, approved by the Board that authorizes GLWA to issue the bonds subject to several financial and other parameters as set forth in Authorizing Resolution as well as the Indenture and other Board Resolutions. Bond Counsel is the primary drafter of this document.

2. *Supplemental Indenture:* A document, approved by the Board that amends the terms of the Indenture to incorporate the provisions of the additional debt being issued. Bond Counsel is the primary drafter of this document.

3. *Official Statement:* The offering document that is used to disclose details about the transaction as well as GLWA's financial and operating information. The document, in preliminary form (the Preliminary Official Statement), is used to assist in marketing the transaction to investors prior to pricing. Disclosure Counsel is the primary drafter of this document.

4. *Bond Purchase Agreement (BPA):* The contract between the Underwriter and GLWA sets forth the final terms, prices and conditions upon which the Underwriter purchases a new issue of municipal securities in a Negotiated Sale. Underwriter's Counsel is the primary drafter of this document.

Communication and Disclosure

Rating Agencies. GLWA seeks to maintain the highest possible credit ratings it believes appropriate for its debt without compromising the delivery of its basic core services. The Director of Finance will manage relationships with the rating analysts assigned to GLWA.

Investors, Bond Insurers, Liquidity Providers. The Director of Finance will manage relationships using both informal and formal methods to disseminate information.

Continuing Disclosure. GLWA recognizes that accurate and complete disclosure is imperative to maintaining the high credit quality of its debt. GLWA will comply with all state and federal disclosure obligations and will meet its disclosure requirements in a timely and thorough manner.

Ongoing Debt Administration

The Chief Financial Officers is responsible for the investment of proceeds, as well as all post issuance and compliance activities.

1. **Investment of Bond Proceeds.** The Chief Financial Offer and GLWA Finance staff, after receipt of bond proceeds, will invest the funds based on the GLWA's Investment Policy and federal tax regulations.
2. **Project Compliance**
   - **Arbitrage**: GLWA does not pay federal income tax and generally GLWA's bondholders do not pay federal income tax on interest earned from bonds issued by GLWA. With the investment of bond proceeds, the treatment of interest earned on the permitted investments during this period is governed by IRS arbitrage rules designed to eliminate any arbitrage incentive to:

     - Issue more bonds than needed,
     - Issue bonds earlier than needed, and
     - Leave bonds outstanding longer than needed

     To accomplish the purpose of the bond issuance, GLWA must follow IRS rules governing the Yield restriction (when you may legally earn the Arbitrage Yield from investing bond proceeds) and Arbitrage rebate (when you must return the invested earnings above the Arbitrage Yield back to the IRS). The following guidelines apply:

     - The Tax Certificate for the transaction provides the relevant information.
     - GLWA may retain the services of a qualified arbitrage rebate agent to calculate any arbitrage due to the IRS on outstanding bond issuances with proceeds remaining.
     - Arbitrage consultant selected by a RFP or RFQ will be used to determine compliance and rebates

   - **Annual Review:** GLWA will review expenditures and reimbursements to determine if any private business use in facilities that were constructed using tax-exempt debt, except as specifically disclosed prior to sale of debt or as subsequently opined by nationally recognized Bond Counsel, do not impact the tax-exempt status of the debt.
   - **Bond Proceeds:** GLWA will track bond proceeds, ensuring expenditures are within the legally allowable construction period and other parameters to comply with legal requirements.
   - **Document Retention:** GLWA will retain documents related to the debt issue for the life of an issue or the life of the Refunding of the issue plus three years.
3. **Continuing Disclosure Compliance.** The Official Statement and the Continuing Disclosure Agreement for the transaction will detail what information is required to be disclosed and on what timeline. To meet these disclosure requirements:

- GLWA will use a Dissemination / Disclosure Agent whom shall be named as responsible for the required reporting for each debt issue requiring Continuing Disclosure under Securities and Exchange Commission Rule 15(c)(2)(12).
- Dissemination of the required information is accomplished through the Electronic Municipal Market Access system (EMMA).
- Finance staff will monitor required reporting dates to ensure annual and periodic reporting requirements are satisfied.
- Bond Counsel shall be consulted to determine compliance and updates in Continuing Disclosure.
- Compliance status shall be reported annually to the Board at a public meeting.

4. Refinancing Opportunities Monitoring

- The Chief Financial Officer, in conjunction with finance staff and with the Municipal Advisor, will periodically monitor refinancing opportunities including unsolicited proposal from third parties regarding the refinancing of outstanding GLWA debt.
- As refinancing opportunities are more further defined and achieve financial targets, this information shall be reported to the Board.

5. Municipal Advisor Rule Compliance.

- The Securities and Exchange Commission and the Municipal Securities Rulemaking Board, as mandated by the Dodd-Frank Wall Street Reform Act, are expected to issue the procedures and requirements associated with the registration and conduct of Municipal Advisors ("MA Rules") by January 1, 2016. The MA Rules ll generally impose additional requirements for Municipal Advisors to municipal entities, including GLWA's financial advisor. The MA Rules will also impact the way and manner in which GLWA relates and receives information and recommendations from municipal bond underwriters. GLWA will continue to monitor the implementation of the MA Rules and implement changes as necessary.

Glossary

Additional Bonds Debt Service Coverage. Projected Net Revenues or Historical Net Revenues, as determined by GLWA, divided by Maximum Annual Debt Service for such Priority of Lien and any higher Priority of Lien.

Arbitrage. The difference between the interest paid on the tax-exempt securities and the interest earned by investing the security proceeds in higher-yielding taxable securities. IRS regulations govern arbitrage on the proceeds from issuance of municipal securities.

Balloon Maturity. A later maturity within an issue of bonds which contains a disproportionately large percentage of the principal amount of the original issue.

Bond Anticipation Notes (BANs). Notes which are paid from the proceeds of the issuance of long-term bonds. Typically issued for capital projects.

Bond Fund. Collectively, the Bond Interest and Redemption Funds.

Bond Interest and Redemption Funds. Each fund for the payment of Debt Service for each series of bonds of the same Priority of Lien.

Bullet Maturity. A maturity for which there are no principal and/or sinking fund payments prior to the stated maturity date.

Call Provisions. The terms of the bond giving the issuer the right to redeem all or a portion of a bond prior to its stated date of maturity at a specific price, usually at or above par.

Capitalized Interest. A portion of the proceeds of a bond issue which is set aside to pay interest on the same bond issue for a specific period of time. Interest is commonly capitalized for the construction period of the project.

Commercial Paper. Very short-term, unsecured promissory notes issued in either registered or bearer form, and usually backed by a line of credit with a bank.

Competitive Sale. A sale/auction of securities by an issuer in which underwriters or syndicates of underwriters submit sealed bids to purchase the securities. Contrast to a negotiated sale.

Continuing Disclosure. The principle that accurate and complete information material to the transaction which potential investors would be likely to consider material in making investment decisions with respect to the securities be made available on an ongoing basis.

Credit Enhancement. Credit support purchased by the issuer to raise the credit rating of the issue. The most common credit enhancements consist of bond insurance, direct or standby letters of credit, and lines of credit.

Debt Service. With respect to bonds of each Priority of Lien, the amount scheduled to become due and payable annually on all outstanding bonds as (i) interest, exclusive of interest capitalized on such outstanding bonds and paid from the proceeds of a series of bonds or investment earnings on such capitalized interest, plus (ii) principal, plus (iii) mandatory redemption requirements.

Debt Service Installment Requirements. As of the first day of the month with respect to each priority of lien of outstanding bonds, the amounts calculated as described in the Master Ordinances.

Debt Service Reserve Fund. The fund in which moneys are placed which may be used to pay debt service if pledged revenues are insufficient to satisfy the debt service requirements.

Deep Discount Bonds. Bonds which are priced for sale at a substantial discount from their face or par value.

Derivatives. A financial product whose value is derived from some underlying asset value.

Designation Policies. Outline how an investor's order is filled when a maturity is oversubscribed when there is an underwriting syndicate. The senior managing underwriter and issuer decide how the bonds will be allocated among the syndicate. There are three primary classifications of orders which form the designation policy: Group Net orders; Net Designated orders and Member orders.

Escrow. A fund established to hold moneys pledged and to be used to pay debt service on an outstanding issue.

Expenses. Compensates senior managers for out-of-pocket expenses including: underwriters counsel, DTC charges, travel, syndicate expenses, dealer fees, overtime expenses, communication expenses, computer time and postage.

Extraordinary Repair and Replacement Fund. For any Fiscal Year, 15% of the budgeted Operation and Maintenance Expenses of the Regional Sewer System and the Local Sewer System or the Regional Water System and the Local Water System for such Fiscal Year, less any amount that is withdrawn in the Fiscal Year from the Extraordinary Repair and Replacement Reserve Fund for paying a major unanticipated repair or replacement to the Regional Sewer System, the Local Sewer System, the Regional Water System or the Local Water System pursuant to the Master Ordinances, but only in the Fiscal Year that such amount is withdrawn.

Fiscal Year. The fiscal year and operating year of GLWA which begins on July 1 and ends on the following June 30, as it may be modified

Historical Net Revenues. As defined in the Master Ordinances, (a) the Net Revenues of the Sewer System or the Water System for either (i) the immediately preceding Fiscal Year for which audited financial statements of GLWA are available, and if not, the audited financial statements of DWSD for such Fiscal Year may be used, or (ii) any audited Fiscal Year ending not more than sixteen months prior to the date of delivery of the Additional Bonds then being issued pursuant to the Master Ordinances, as determined by GLWA, plus, at the option of GLWA, (b) an amount determined by the GLWA in accordance with the Master Ordinances to equal the effect of any change in the rates, fees and charges of the Regional Sewer System and the Local Sewer System or the Regional Water System and the Local Water System authorized at or prior to the date of sale of the Additional Bonds then being issued pursuant to the Master Ordinances, as if the Sewer System's billings or the Water System's billings during such Fiscal Year had been at the increased rates, plus, at the option of GLWA, (c) an amount determined by the GLWA in accordance with the Master Ordinances to equal one hundred percent of the estimated increase in Net Revenues projected to accrue as a result of (i) the acquisition of the repairs, extensions, enlargements and improvements to the Sewer System or the Water System projected to be paid in whole or in part from the proceeds of the Additional Bonds then being issued pursuant to the Master Ordinances and (ii) any acquisition, extension or connection which was made subsequent to the end of such Fiscal Year. For purposes of determining Historical Net Revenues, if the first Fiscal Year of such determination is comprised of less than 12 months, then the combined Net Revenues of (i) Detroit Water and Sewerage Department as in existence immediately prior to the effective date and (ii) Detroit Water and Sewerage Department as in existence on and after the effective date and GLWA's partial years shall be used with adjustments to assure no duplication of Revenues in the calculation.

Interest Rate Swap. A contract between two parties to exchange interest rate payments at specified dates in the future. One party under the swap contract normally makes payments based on a fixed rate while the other party makes payments based on a variable (floating) rate.

Lease. Regional Sewage Disposal System Lease dated June 12, 2015, between the City, as lessor, and GLWA, as lessee, of the Leased Sewer Facilities and the Leased Water Facilities, as amended from time to time.

Lease Payment. The annual payment required to be made by GLWA for the benefit of the City pursuant to the Lease, in consideration for the leasing of the Leased Sewer Facilities or the Leased Water Facilities to

GLWA and the absolute and irrevocable assignment and transfer to GLWA of the Revenues as provided in the Lease and to be applied by the GLWA as provided in the Master Ordinances.

Leased Sewer Facilities. Collectively, all of the City's right, title and interest in and to that portion of the real and tangible personal property comprising a part of the Regional Sewer System and owned by the City and providing sewer service to the wholesale customers of the Regional Sewer System and Retail Sewer Customers up to the point of connection to the Detroit Local Sewer Facilities, including without limitation the land, buildings, basins, pump stations, outfalls, storage facilities, other structures, fixtures (including screens, meters, control gates, interceptors and collection lines), and improvements, and real property interests such as easements, access rights, rights of way, permits, licenses and leases, all as more fully set forth in Schedule A attached to the Lease (the "Real Property"), and any and all tangible personal property such as machinery, equipment, vehicles, furniture, office equipment, software, hardware, security systems, communications systems, other information technology systems and inventory used in connection with the Real Property, including without limitation the personal property that is described in Schedule A attached to the Lease (the "Personal Property"). Leased Sewer Facilities include all improvements and additions to and replacements of the foregoing described Real Property and Personal Property, but do not include the Detroit Local Sewer Facilities.

Leased Water Facilities. Collectively, all of the City's right, title and interest in and to that portion of the real and tangible personal property comprising a part of the Water System and owned by the City and providing water service to both the wholesale customers of the Regional Water System and Retail Water Customers up to the point of connection to the Detroit Local Water Facilities all as more fully set forth in the Water Lease.

Letters of Credit and Liquidity Facilities. A bank credit facility wherein the bank agrees to lend a specified amount of funds for a limited term.

Local Sewer System. That portion of the Sewer System that provides sewer service directly to Retail Sewer Customers, which on the Effective Date consists of the Detroit Local Sewer Facilities.

Local Water System. That portion of the Water System that provides water service directly to the Retail Water Customers, which on the Effective Date consists of the Detroit Local Water Facilities.

Maximum Annual Debt Service. With respect to any given Priority of Lien, the maximum Debt Service in any future Fiscal Year on Outstanding Bonds of such Priority of Lien and any Additional Bonds then being issued in accordance with Section 207 of the Master Ordinances. If any Additional Bonds (any of such, the "Refunding Bonds") are to be issued to refund Outstanding Bonds (the "Bonds to be Refunded"), the Debt Service to be used for determining Maximum Annual Debt Service shall be the Debt Service on the Refunding Bonds and not the Debt Service on the Bonds to be Refunded.

Management Fee. The fixed percentage of the gross spread which is paid to the managing underwriter for the structuring phase of a transaction.

Members. Underwriters in a syndicate other than the senior underwriter.

Negotiated Sale. A method of sale in which the issuer chooses one underwriter to negotiate terms pursuant to which such underwriter will purchase and market the bonds. Contrast to a competitive sale.

Net Revenue. For any period of time, all Revenues received during such period of time, except for those Revenues transferred to the Operation and Maintenance Fund.

Notional Amount. Used in the context of derivatives, the notional amount is the principal amount by which the swap rates are multiplied.

Operation and Maintenance Expenses. The reasonable expenses of administration, operation and maintenance of the Regional Sewer System or the Local Sewer System, or the Regional Water System or the Local Water System, as the case may be, but shall not include the Required Annual General Retirement System Payment

Original Issue Discount. The amount by which the original par amount of an issue exceeds its public offering price at the time it is originally offered to an investor.

Pay-As-You-Go. An issuer elects to finance a project with existing cash flow as opposed to issuing debt obligations.

Pledged Assets. The (i) Net Revenues; (ii) funds and accounts established by or pursuant to the Master Ordinances except for the Operation and Maintenance Fund, the Construction Fund and the Rebate Fund and any account of any such fund; and investments of amounts or any income or gain realized therefrom credited to any fund, account or subaccount that is a Pledged Asset.

Present Value. The current value of a future cash flow.

Priority of Lien. With respect to any particular Bonds, all other Bonds having a lien on Pledged Assets on parity with such Bonds

Private Placement. The original placement of an issue with one or more investors as opposed to being publicly offered or sold.

Projected Net Revenues. The Net Revenues of the Sewer System or the Water System for the then-current or next succeeding Fiscal Year, as determined by GLWA, which may include (a) in the case of Section 207 of the Master Ordinances for the purpose of determining the Additional Bonds Debt Service Coverage, one hundred percent of the estimated increase in Net Revenues projected to accrue as a result of the acquisition of the repairs, extensions, enlargements and improvements to the Sewer System and the Water System projected to be paid for in whole or in part from the proceeds of the Additional Bonds under Section 207 of the Master Ordinances, and (b) in the case of Section 604 of the Master Ordinances for the purpose of determining the Rate Covenant Debt Service Coverage, one hundred percent of the estimated increase in Net Revenues as a result of approved rate increases for the next succeeding Fiscal Year.

Rate Covenant Debt Service Coverage. A number equal to Projected Net Revenues for the Fiscal Year of calculation divided by the aggregate Debt Service Installment Requirements on Bonds for such Fiscal Year, net of funds on hand for accrued principal and interest, all for such Priority of Lien and any higher Priority of Lien.

Rebate. A requirement imposed by Tax Reform Act of 1986 whereby the issuer of tax-exempt bonds must pay the IRS an amount equal to its profit earned from investment of tax-exempt bond proceeds at rates exceeding the tax-exempt borrowing rate. The tax-exempt borrowing rate (or "bond yield") is calculated pursuant to the IRS code together with all income earned on the accumulated profit pending payment.

Regional Sewer System. That portion of the Sewer System that provides sewer service to the wholesale customers thereof and Retail Sewer Customers up to the point of connection to the Local Sewer System, which on the Effective Date consists of the Leased Sewer Facilities

Regional Water System. That portion of the Water System that provides water service to the wholesale customers thereof and Retail Customers up to the point of connection to the Local Water System, which on the Effective Date consists of the Leased Water Facilities.

Required Coverage. Means (a) for Senior Lien Bonds, 1.20, (b) for Second Lien Bonds, 1.10, and (c) for any Junior Lien Bonds other than Second Lien Bonds, 1.00.

Selling Groups. The group of securities dealers who participate in an offering not as underwriters but rather who receive securities less the selling concession from the managing underwriter for distribution at the public offering price.

Syndicate Policies. The contractual obligations placed on the underwriting group relating to distribution, price limitations and market transactions.

Underwriter. A dealer that purchases new issues of municipal securities from the Issuer and resells them to investors.

Underwriter's Discount. The difference between the price at which bonds are bought by the Underwriter from the Issuer and the price at which they are reoffered to investors.

Variable Rate Debt. An interest rate on a security which changes at intervals according to an index or a formula or other standard of measurement as stated in the bond contract.

WRAP Fund. The Water Residential Assistance Program Fund to be established pursuant to the MOU and created under Section 502(a)(10), which is a fund independently-administered on behalf of the Authority to provide assistance to indigent residential customers throughout the Water System and the Sewer System.

Yield. The annual rate of return on an investment, based on the purchase price of the investment, its coupon rate and the length of time the investment is held.