Los Angeles Department of Water and Power

Governmental Accounting Standards (GAS) 68
Actuarial Valuation Based on June 30, 2018
Measurement Date for Employer Reporting
as of June 30, 2019

This report has been prepared at the request of the LADWP to assist in preparing their financial report for their liabilities associated with the retirement plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the LADWP and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

Segal Consulting
180 Howard Street, Suite 1100, San Francisco, CA 94105
T 415.263.8200 www.segalco.com

August 27, 2019

Ms. Ann Santilli
Chief Financial Officer
Department of Water and Power – City of Los Angeles
111 North Hope Street, Room 450
Los Angeles, CA 90012

Dear Ann:

We are pleased to submit this Governmental Accounting Standard (GAS) 68 Actuarial Valuation based on a June 30, 2018 measurement date for employer reporting as of June 30, 2019. It contains various information that will need to be disclosed in order to comply with GAS 68.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Los Angeles Department of Water and Power (LADWP) to assist in preparing their financial report for the Water and Power Employees' Retirement Plan of the City of Los Angeles (WPERP). The census and financial information on which our calculations were based was provided by the Retirement Office. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of John Monroe, ASA, MAAA, Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and expectations for the WPERP.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Paul Angelo, FSA, MAAA, FCA, EA *Senior Vice President and Actuary*	*John Monroe, ASA, MAAA, EA* *Vice President and Actuary*

TJH/hy

SECTION 1

VALUATION SUMMARY

SECTION 2

GAS 68 INFORMATION

SECTION 2 (CONTINUED)

SECTION 3

ACTUARIAL ASSUMPTIONS AND METHODS AND APPENDICES

Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standard (GAS) 68 for employer reporting as of June 30, 2019. The results used in preparing this GAS 68 report are comparable to those used in preparing the Governmental Accounting Standard (GAS) 67 report for the WPERP based on a reporting date and a measurement date as of June 30, 2018. This valuation is based on:

- The benefit provisions of the WPERP, as administered by the Retirement Office;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of March 31, 2018, provided by the Retirement Office;
- The assets of the WPERP as of June 30, 2018, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the July 1, 2018 valuation; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc. adopted by the Board for the July 1, 2018 valuation

General Observations on GAS 68 Actuarial Valuation

The following points should be considered when reviewing this GAS 68 report:

- The Government Accounting Standard Board (GASB) rules only define pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans develop and adopt funding policies under current practices.
- When measuring pension liability GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as WPERP uses for funding. This means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on the same basis as WPERP’s Actuarial Accrued Liability (AAL) measure for funding. We note that the same is true for the Normal Cost component of the annual plan cost for funding and financial reporting.
- The Net Pension Liability (NPL) is equal to the difference between the TPL and the Plan’s Fiduciary Net Position. The Plan’s Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) calculated on a market value basis. The NPL reflects all investment gains and losses as of the measurement date.

- For this report, the reporting dates for the employer are June 30, 2019 and June 30, 2018. The NPL was measured as of June 30, 2018 and June 30, 2017, respectively, and determined based upon the results of the actuarial valuations as of July 1, 2018 and July 1, 2017, respectively. The Plan's Fiduciary Net Position (plan assets) and the TPL were valued as of the measurement dates. Consistent with the provisions of GAS 68, the assets and liabilities measured as of June 30, 2018 and June 30, 2017 are not adjusted or rolled forward to the June 30, 2019 and June 30, 2018 reporting dates, respectively.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The results of this valuation reflect changes in Plan provisions that were adopted by the Board. The interest crediting rate on employee, Additional Annuity and Department matching contributions was decreased from 7.50% to 7.25% per annum, consistent with the rate used in the actuarial valuation. The interest rate and mortality table used to calculate the Money Purchase Annuity and certain other optional benefit amounts were changed to 7.25% per annum and a unisex version of mortality tables consistent with those used in the valuation. The vesting requirement for Tier 2 members was amended to include a reduction in the minimum vesting requirement for Tier 2 members to 5 years. These Plan provision changes decreased the Total Pension Liability by $59 million.
- The NPL decreased from $1,343.2 million as of June 30, 2017 to $910.5 million as of June 30, 2018 primarily due to the 8.84% return on the market value of assets during 2017/18 (that was more than the assumed return of 7.25%) and the Plan provision changes. Changes in these values during the last two fiscal years ending June 30, 2018 and June 30, 2017 can be found in Exhibit 5.
- The discount rate used to measure the TPL and NPL as of June 30, 2018 and 2017 was 7.25%, following the same assumptions used by the WPERP in the funding valuations as of July 1, 2018 and July 1, 2017. The detailed calculations used in the derivation of the discount rate can be found in Appendices A and B of Section 3. Various other information that is required to be disclosed can be found throughout Exhibits 1 through 13 in Section 2.
- The NPL has been allocated based on the projected compensation for each entity for the year following the measurement date. LADWP provided us with information that indicates each member's percentage under Water versus Power and we used these percentages to determine each member's allocation between these two entities. The NPL allocation can be found in Exhibit 7 in Section 2.
- Results shown in this report exclude any employer contributions made after the measurement date of June 30, 2018. The LADWP should consult with their auditors to determine the deferred outflow that should be created for these contributions.

Summary of Key Valuation Results

Reporting Date for Employer under GAS 68	6/30/2019[1]	6/30/2018[1]
Measurement Date for Employer under GAS 68	**6/30/2018**	**6/30/2017**
Disclosure elements for fiscal year ending June 30:		
1. Service cost[2]	$228,621,066	$217,276,778
2. Total Pension Liability	13,187,542,730	12,657,101,266
3. Plan's Fiduciary Net Position	12,277,085,263	11,313,899,335
4. Net Pension Liability (2) – (3)	910,457,467	1,343,201,931
5. Pension expense	172,995,196	244,285,100
Schedule of contributions for fiscal year ending June 30:		
6. Actuarially determined contributions[3]	$425,512,236	$403,780,319
7. Actual contributions	433,412,569	391,717,359
8. Contribution deficiency (excess) (6) – (7)	-7,900,333	12,062,960
Demographic data for plan year ending June 30:		
9. Number of retired members and beneficiaries	9,165	9,272
10. Number of vested terminated members[4]	1,728	1,648
11. Number of active members	10,114	9,806
Key assumptions as of June 30:		
12. Investment rate of return	7.25%	7.25%
13. Inflation rate	3.00%	3.00%
14. Projected salary increases[5]	4.50% to 10.00%, varying by service, including inflation	4.50% to 10.00%, varying by service, including inflation

[1] *The reporting dates and measurement dates for the plan are June 30, 2018 and 2017, respectively.*

[2] *The service cost is always based on the previous year's valuation, meaning both the June 30, 2018 and June 30, 2017 values are based on the valuations as of July 1, 2017 and July 1, 2016, respectively.*

[3] *Based on actual covered payroll reported by the Retirement Office. For the year ended June 30, 2017, reflects the effect of the phase-in over two years of the contribution rate impact of the new actuarial assumptions adopted by the Board effective with the July 1, 2016 valuation.*

[4] *Includes terminated members due a refund of member contributions and members receiving PTD benefits.*

[5] *Includes inflation at 3.00% plus real across-the-board salary increases of 0.50% plus merit and promotional increases that vary by service as of June 30, 2018 and 2017, respectively.*

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare an actuarial valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report (as well as the plan summary included in our funding valuation report) to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the Retirement Office. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** This valuation is based on the market value of assets as of the measurement date, as provided by the Retirement Office.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The valuation is prepared at the request of the LADWP to assist in preparing items related to the retirement plan in their financial report. Segal is not responsible for the use or misuse of its report, particularly by any other party.

- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If LADWP is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The LADWP should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of WPERP, it is not a fiduciary in its capacity as actuaries and consultants with respect to WPERP or LADWP.

EXHIBIT 1

General Information – “Financial Statements”, Note Disclosures and Required Supplementary Information for a Single-Employer Pension Plan

Plan Description

Plan administration. The Water and Power Employees’ Retirement Plan of the City of Los Angeles (WPERP) was established by the Los Angeles Department of Water and Power in 1938. WPERP is a single employer public employee retirement system whose main function is to provide retirement benefits to employees of the Los Angeles Department of Water and Power.

Under the provisions of the City Charter, the Board of Administration (the "Board") has the responsibility and authority to administer the Plan and to invest its assets. The Board members serve as trustees and must act in the exclusive interest of the Plan's members and beneficiaries. The Board has seven members: one member of the Board of Water and Power Commissioners, the General Manager, the Chief Accounting Employee, three employee members who are elected for three-year terms by active members of the Plan, and one retiree who is appointed by the Board of Water and Power Commissioners for a three-year term.

Plan membership. At June 30, 2018, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	9,165
Vested terminated members entitled to, but not yet receiving benefits[(1)]	1,728
Active members	10,114
Total	21,007

[(1)] Includes terminated members due a refund of member contributions and members receiving PTD benefits.

Benefits provided. WPERP provides service retirement, disability, death and survivor benefits to eligible employees. Most employees of the LADWP become members of WPERP effective on the first day of biweekly payroll following employment. Members employed prior to January 1, 2014 are designated as Tier 1 and those hired on or after January 1, 2014 are designated as Tier 2 (unless a specific exemption applies to employee providing a right to Tier 1 status).

Tier 1 members are eligible to retire once they attain the age of 60 with 5 or more years of Department service or at age 55 with 10 or more years of Department service acquired in the last 12 years prior to retirement. A Tier 1 member with 30 years of Department service is eligible to retire regardless of age. Tier 2 members are eligible to retire once they attain the age of 60 with 5 years of continuous Department service with the Plan immediately prior to reaching eligibility or age 60 with 10 or more years of Qualifying service or at any age with 30 years of Qualifying service. For both tiers, combined years of service between WPERP and LACERS is used to determine retirement eligibility and at least 5 years must be actual employment at DWP or City. The one exception is the age 60 with 5 years of continuous Department Service for Tier 2 where only service with DWP can be counted. For both tiers, members receiving Permanent Total Disability benefits may retire regardless of age. For Tier 1, to be eligible for a Formula Pension, the employee must have worked or been paid disability four of the last five years immediately preceding eligibility to retire, or while eligible to retire.

The Formula Pension benefit the member will receive is based upon age at retirement, monthly average salary base and years of retirement service credit.

The Tier 1 Formula Pension is equal to 2.1% times years of service credit times monthly average salary base. In addition, members retiring after attaining age 55 with 30 years of service credit, receive an increase in the benefit factor from 2.1% to 2.3%. A reduced early retirement benefit is paid for those members attaining age 55 with 10 years of service or any age (under 55) with 30 years of service. The reduction is 1.5% for each year of retirement age between 60 and 55 and 3.0% for each year of retirement before age 55.

Under Tier 2, there are various benefit factors that apply as shown below:

- 1.5% at age 60 with 5 years of continuous Department Service (or 10 years of Qualifying Service)
- 2.0% at age 60 with 30 years of Qualifying Service
- 2.0% at age 55 with 30 years of Service Credit
- 2.0% at age 63 with 5 years of continuous Department Service (or 10 years of Qualifying Service)
- 2.1% at age 63 with 30 years of Qualifying Service

The reduced early retirement benefits for Tier 2 are the same as Tier 1. These are applied to the age 60 benefit for members (with 2.0% formula) who retire before age 60 with less than 30 years of service credit. Service Credit with the Department and with LACERS is combined for satisfying this requirement.

For Tier 1 members, the maximum monthly retirement allowance is 100% of monthly average salary base. For Tier 2 members, the maximum monthly retirement allowance is 80% of monthly average salary base.

Under Tier 1, pension benefits are calculated based on the highest average salary earned during a 12-month period. Under Tier 2, pension benefits are calculated based on the average salary earned during a 36-month period.

For both tiers, the member may elect the Full Allowance, or choose an optional retirement allowance. The Full Allowance provides the highest monthly benefit and up to a 50% continuance to an eligible surviving spouse or domestic partner. There are five optional retirement allowances the member may choose. Each of the optional retirement allowances requires a reduction in the Full Allowance in order to allow the member the ability to provide various benefits to a surviving spouse, domestic partner, or named beneficiary.

WPERP provides annual cost-of-living adjustments (COLAs) to retirees that are not considered vested retirement. The cost-of-living adjustments are made each July 1 based on the percentage change in the average of the Consumer Price Index for the Los Angeles-Long Beach-Anaheim Area--All Items For All Urban Consumers. It is capped at 3.0% for Tier 1 and 2.0% for Tier 2. Tier 2 members may purchase additional 1% COLA protection at full actuarial cost.

The LADWP contributes to the retirement plan based upon actuarially determined contribution rates adopted by the Board of Administration. Employer contribution rates are adopted annually based upon recommendations received from WPERP’s actuary after the completion of the annual actuarial valuation. The average employer contribution rate as of June 30, 2018 (based on the July 1, 2017 valuation) was 44.62% of compensation.

All members are required to make contributions to WPERP regardless of the retirement plan or tier in which they are included. The average member contribution rate as of June 30, 2018 (based on the July 1, 2017 valuation) was 7.10% of compensation. Most Tier 1 members contribute at 6% of compensation and all Tier 2 members contribute at 10% of compensation.

EXHIBIT 2

Net Pension Liability

Reporting Date for Employer under GAS 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
The components of the Net Pension Liability are as follows:		
Total Pension Liability	$13,187,542,730	$12,657,101,266
Plan's Fiduciary Net Position	(12,277,085,263)	(11,313,899,335)
Net Pension Liability	$910,457,467	$1,343,201,931
Plan's Fiduciary Net Position as a Percentage of the Total Pension Liability	93.10%	89.39%

The Net Pension Liability (NPL) for the Plan was measured as of June 30, 2018 and 2017. The Plan's Fiduciary Net Position (plan assets) and Total Pension Liability (TPL) were valued as of the measurement date and are from actuarial valuations as of July 1, 2018 and 2017, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL are the same as those used in the WPERP actuarial valuations as of July 1, 2018 and 2017, respectively.

Actuarial assumptions. The TPL as of June 30, 2018 and 2017 was determined by an actuarial valuation as of July 1, 2018 and 2017, respectively. The actuarial assumptions used in the June 30, 2018 and 2017 measurements were based on the results of an experience study for the period from July 1, 2012 through June 30, 2015. For the actuarial valuation as of July 1, 2018, the employee contribution, Additional Annuity and matching account crediting rate was changed from 7.50% to 7.25% based on a Plan amendment. The service used to determine the proportion of Tier 2 terminating members assumed to be ordinary withdrawals changed to 5 years (from 15 years) based on vesting eligibility changes to Tier 2 plan. These assumptions are the same as the assumptions used in the July 1, 2018 funding actuarial valuation for the WPERP. The assumptions used in the funding valuation are outlined on page 9 of this report. In particular, the following assumptions were applied to all periods included in the June 30, 2018 and 2017 measurements:

Inflation	3.00%
Salary increases	4.50% to 10.00%, varying by service, including inflation
Investment rate of return	7.25%, net of pension plan investment expense, including inflation
Other Assumptions	Same as those used in the July 1, 2018 funding valuation

EXHIBIT 3
Target Asset Allocation

The long-term expected rate of return on pension plan investments was determined in 2016 using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, used in the derivation of the long-term expected investment rate of return assumption as of June 30, 2018 and 2017 are summarized in the following table. This information will change every three years based on the actuarial experience study.

Asset Class	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return
Domestic Equity	29%	5.76%
International Equity	19%	7.25%
Custom Fixed Income	25%	1.74%
Real Estate	8%	4.37%
Real Return	5%	2.39%
Private Equity	8%	7.75%
Hedge Funds	5%	3.50%
Cash and Cash Equivalents	1%	-0.46%
Total	100%	

Discount rate. The discount rates used to measure the Total Pension Liability (TPL) was 7.25% as of June 30, 2018 and June 30, 2017. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the required contribution rates. For this purpose, only employee and employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both June 30, 2018 and June 30, 2017.

EXHIBIT 4

Discount Rate Sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the Net Pension Liability (NPL) of the WPERP as of June 30, 2018, calculated using the discount rate of 7.25%, as well as what the WPERP's NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.25%) or 1-percentage-point higher (8.25%) than the current rate:

Net Pension Liability	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
Water	$864,130,466	$292,447,213	$(180,279,571)
Power	1,826,112,424	618,010,254	(380,973,450)
Total for all Entities	$2,690,242,890	$910,457,467	$(561,253,021)

EXHIBIT 5

Schedule of Changes in Net Pension Liability – Last Two Fiscal Years

Reporting Date for Employer under GAS 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Total Pension Liability		
1. Service Cost	$228,621,066	$217,276,778
2. Interest	913,798,415	887,133,571
3. Change of benefit terms	(59,019,242)	0
4. Differences between expected and actual experience	10,253,750	(196,176,749)
5. Changes of assumptions	0	0
6. Benefit payments, including refunds of member contributions	(563,212,525)	(540,361,335)
7. Net change in Total Pension Liability	$530,441,464	$367,872,265
8. Total Pension Liability – beginning	$12,657,101,266	$12,289,229,001
9. Total Pension Liability – ending (7) + (8)	$13,187,542,730	$12,657,101,266
Plan's fiduciary net position		
10. Contributions – employer (including those for administrative expenses)	$439,298,444	$397,747,778
11. Contributions – employee	93,659,240	83,239,105
12. Net investment income	998,777,227	1,280,806,288
13. Benefit payments, including refunds of member contributions	(563,212,525)	(540,361,335)
14. Administrative expense	(5,336,458)	(5,375,229)
15. Other	0	0
16. Net change in Plan's Fiduciary Net Position	$963,185,928	$1,216,056,607
17. Plan's Fiduciary Net Position – beginning	$11,313,899,335	$10,097,842,728
18. Plan's Fiduciary Net Position – ending (16) + (17)	$12,277,085,263	$11,313,899,335
19. Net Pension Liability – ending (9) – (18)	$910,457,467	$1,343,201,931
20. Plan's fiduciary net position as a percentage of the Total Pension Liability (18) / (9)	93.10%	89.39%
21. Covered payroll	$953,635,670	$892,332,196
22. Plan Net Pension Liability as percentage of covered payroll (19) / (21)	95.47%	150.53%

Notes to Schedule:

Benefit changes: Certain technical amendments related to the administration of Tier 2 provisions were adopted. The vesting requirement for Tier 2 members was amended to include a reduction in the minimum vesting requirement for Tier 2 members to 5 years. The employee contribution, additional annuity and matching account crediting rate was changed from 7.50% to 7.25%.

EXHIBIT 6

Schedule of Employer Contributions – Last Ten Fiscal Years

Year Ended June 30,	Actuarially Determined Contributions[(1)(2)(3)]	Contributions in Relation to the Actuarially Determined Contributions[(2)(3)]	Contribution Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
2009	$141,291,588	$145,941,275	-$4,649,687	$696,704,083	20.95%
2010	200,578,728	201,034,807	-456,079	767,912,436	26.18%
2011	304,431,910	286,699,384	17,732,526	791,760,493	36.21%
2012	336,874,865	321,688,919	15,185,946	805,607,436	39.93%
2013	376,667,610	368,426,348	8,241,262	817,421,028	45.07%
2014	387,823,989	384,265,892	3,558,097	819,923,866	46.87%
2015	387,464,759	376,902,022	10,562,737	839,213,254	44.91%
2016	368,599,924	362,359,894	6,240,030	861,818,854	42.05%
2017	403,780,319	391,717,359	12,062,960	892,332,196	43.90%
2018	425,512,236	433,412,569	-7,900,333	953,635,670	45.45%

(1) *All "Actuarially Determined Contributions" through June 30, 2014 were determined as the "Annual Required Contribution" under GAS 25 and 27.*

(2) *Based on actual covered payroll reported by the Retirement Office. For the year ended June 30, 2015, reflects the effect of the phase-in over two years of the contribution rate impact of new actuarial assumptions adopted by the Board effective with the July 1, 2014 valuation. For the year ended June 30, 2017, reflects the effect of the phase-in over two years of the contribution rates impact of new actuarial assumption adopted by the Board effective with the July 1, 2016 valuation.*

(3) *Actuarially Determined Contributions exclude employer contributions towards administrative expenses.*

See accompanying notes to this schedule on next page.

Notes to Exhibit 6

Methods and assumptions used to establish "actuarially determined contribution" rates:		
Valuation date	Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported	
Actuarial cost method	Entry Age Actuarial Cost Method	
Amortization method	Level dollar amortization	
Remaining amortization period	The July 1, 2004 Unfunded Actuarial Accrued Liability is amortized over a 15-year period commencing July 1, 2004. Any subsequent changes in Unfunded Actuarial Accrued Liability are amortized over separate 15-year periods effective with that valuation.	
Asset valuation method	The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market returns and the expected returns on a market value basis, and is recognized over a five-year period. As directed by the Retirement Office, the actuarial valuation of assets may be reduced by an amount classified as a non-valuation reserve.	
	July 1, 2018 Valuation Date	July 1, 2017 Valuation Date
Actuarial assumptions:		
Investment rate of return	7.25%, net of investment expenses	7.25%, net of investment expenses
Inflation rate	3.00%	3.00%
Real across-the-board salary increase	0.50%	0.50%
Projected salary increases*	4.50% to 10.00%	4.50% to 10.00%
Cost of living adjustments	3.00% (actual increases are contingent upon CPI increases with a 3.00% maximum for Tier 1, 2.00% maximum for Tier 2)	3.00% (actual increases are contingent upon CPI increases with a 3.00% maximum for Tier 1, 2.00% maximum for Tier 2)
Mortality	Healthy Post-Retirement: Head count-weighted RP-2014 Healthy Annuitant Mortality Table with no age adjustment for males and set back one year for females, projected generationally with the two-dimensional MP-2015 projection scale	Healthy Post-Retirement: Head count-weighted RP-2014 Healthy Annuitant Mortality Table with no age adjustment for males and set back one year for females, projected generationally with the two-dimensional MP-2015 projection scale
Other assumptions	Same as those used in the July 1, 2018 funding actuarial valuation	Same as those used in the July 1, 2017 funding actuarial valuation

* *Includes inflation at 3.00% plus real across-the-board salary increases of 0.50% plus merit and promotional increases as of July 1, 2018 and 2017.*

EXHIBIT 7

Determination of Proportionate Share

Projected Compensation by Funding Entity

July 1, 2018 to June 30, 2019

Entity	Projected Compensation	Proportionate Share as of June 30, 2018 Measurement Date
Water	$344,835,498	32.121%
Power	728,719,110	67.879%
Total	$1,073,554,608	100.000%

Notes:
Projected July 1, 2018 through June 30, 2019 compensation information is based on the July 1, 2018 actuarial valuation.

The following items are allocated based on the corresponding proportionate share shown above.

1) Net Pension Liability
2) Service Cost
3) Interest on the Total Pension Liability
4) Current-period benefit changes
5) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
6) Expensed portion of current-period changes of assumptions or other inputs
7) Member contributions
8) Projected earnings on plan investments
9) Expensed portion of current-period differences between actual and projected earnings on plan investments
10) Administrative expense
11) Recognition of beginning of year deferred outflows of resources as pension expense
12) Recognition of beginning of year deferred inflows of resources as pension expense

For purposes of the above results, the reporting date for the employer under GAS 68 is June 30, 2019. The reporting date and measurement date for the plan under GAS 67 are June 30, 2018. Consistent with the provisions of GAS 68, the assets and liabilities as of June 30, 2018 are not adjusted or "rolled forward" to June 30, 2019. Other results, such as the total deferred inflows and outflows would also be allocated based on the same proportionate shares determined above.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Projected Compensation by Funding Entity

July 1, 2017 to June 30, 2018

Entity	Projected Compensation	Proportionate Share as of June 30, 2017 Measurement Date
Water	$314,884,513	31.748%
Power	676,930,481	68.252%
Total	$991,814,994	100.000%

Notes:
Projected July 1, 2017 through June 30, 2018 compensation information is based on the July 1, 2017 actuarial valuation.

The following items are allocated based on the corresponding proportionate share shown above.

1) Net Pension Liability
2) Service Cost
3) Interest on the Total Pension Liability
4) Current-period benefit changes
5) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
6) Expensed portion of current-period changes of assumptions or other inputs
7) Member contributions
8) Projected earnings on plan investments
9) Expensed portion of current-period differences between actual and projected earnings on plan investments
10) Administrative expense
11) Recognition of beginning of year deferred outflows of resources as pension expense
12) Recognition of beginning of year deferred inflows of resources as pension expense

For purposes of the above results, the reporting date for the employer under GAS 68 is June 30, 2018. The reporting date and measurement date for the plan under GAS 67 are June 30, 2017. Consistent with the provisions of GAS 68, the assets and liabilities as of June 30, 2017 are not adjusted or "rolled forward" to June 30, 2018. Other results, such as the total deferred inflows and outflows would also be allocated based on the same proportionate shares determined above.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Projected Compensation by Funding Entity

July 1, 2016 to June 30, 2017

Entity	Projected Compensation	Proportionate Share as of June 30, 2016 Measurement Date
Water	$296,241,656	31.892%
Power	632,647,024	68.108%
Total	$928,888,680	100.000%

Notes:
Projected July 1, 2016 through June 30, 2017 compensation information is based on the July 1, 2016 actuarial valuation.

The following items are allocated based on the corresponding proportionate share shown above.

1) Net Pension Liability
2) Service Cost
3) Interest on the Total Pension Liability
4) Current-period benefit changes
5) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
6) Expensed portion of current-period changes of assumptions or other inputs
7) Member contributions
8) Projected earnings on plan investments
9) Expensed portion of current-period differences between actual and projected earnings on plan investments
10) Administrative expense
11) Recognition of beginning of year deferred outflows of resources as pension expense
12) Recognition of beginning of year deferred inflows of resources as pension expense

For purposes of the above results, the reporting date for the employer under GAS 68 is June 30, 2017. The reporting date and measurement date for the plan under GAS 67 are June 30, 2016. Consistent with the provisions of GAS 68, the assets and liabilities as of June 30, 2016 are not adjusted or "rolled forward" to June 30, 2017. Other results, such as the total deferred inflows and outflows would also be allocated based on the same proportionate shares determined above.

EXHIBIT 8
Pension Expense – Total

Reporting Date for Employer under GAS 68 Measurement Date for Employer under GAS 68	June 30, 2019 June 30, 2018	June 30, 2018 June 30, 2017
Components of Pension Expense		
1. Service cost	$228,621,066	$217,276,778
2. Interest on the Total Pension Liability	913,798,415	887,133,571
3. Expensed portion of current-period changes in proportion and differences between entity's contributions and proportionate share of contributions	0	0
4. Current-period benefit changes	(59,019,242)	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	1,659,183	(33,137,964)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions	(93,659,240)	(83,239,105)
8. Projected earnings on plan investments	(818,967,517)	(729,746,422)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(35,961,942)	(110,211,973)
10. Administrative expense	5,336,458	5,375,229
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	424,884,104	424,884,104
13. Recognition of beginning of year deferred inflows of resources as pension expense	(393,696,089)	(334,049,118)
14. Net amortization of deferred amounts from changes in proportion and differences between entity's contributions and proportionate share of contributions	0	0
Pension Expense	$172,995,196	$244,285,100

EXHIBIT 8 (continued)
Pension Expense – Water

Reporting Date for Employer under GAS 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Components of Pension Expense		
1. Service cost	$73,435,165	$68,981,709
2. Interest on the Total Pension Liability	293,520,356	281,649,929
3. Expensed portion of current-period changes in proportion and differences between entity's contributions and proportionate share of contributions	805,102	52,021
4. Current-period benefit changes	(18,957,517)	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	532,945	(10,520,744)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions	(30,084,199)	(26,427,010)
8. Projected earnings on plan investments	(263,059,810)	(231,682,167)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(11,551,303)	(34,990,440)
10. Administrative expense	1,714,119	1,706,544
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	136,476,636	134,893,528
13. Recognition of beginning of year deferred inflows of resources as pension expense	(126,458,762)	(106,054,954)
14. Net amortization of deferred amounts from changes in proportion and differences between entity's contributions and proportionate share of contributions	(266,246)	692,894
Pension Expense	$56,106,486	$78,301,310

EXHIBIT 8 (continued)
Pension Expense – Power

Reporting Date for Employer under GAS 68 Measurement Date for Employer under GAS 68	June 30, 2019 June 30, 2018	June 30, 2018 June 30, 2017
Components of Pension Expense		
1. Service cost	$155,185,901	$148,295,069
2. Interest on the Total Pension Liability	620,278,059	605,483,642
3. Expensed portion of current-period changes in proportion and differences between entity's contributions and proportionate share of contributions	(805,102)	(52,021)
4. Current-period benefit changes	(40,061,725)	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	1,126,238	(22,617,220)
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions	(63,575,041)	(56,812,095)
8. Projected earnings on plan investments	(555,907,707)	(498,064,255)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	(24,410,639)	(75,221,533)
10. Administrative expense	3,622,339	3,668,685
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	288,407,468	289,990,576
13. Recognition of beginning of year deferred inflows of resources as pension expense	(267,237,327)	(227,994,164)
14. Net amortization of deferred amounts from changes in proportion and differences between entity's contributions and proportionate share of contributions	266,246	(692,894)
Pension Expense	$116,888,710	$165,983,790

EXHIBIT 9
Deferred Outflows of Resources and Deferred Inflows of Resources – Total

Reporting Date for Employer under GAS 68 Measurement Date for Employer under GAS 68	June 30, 2019 June 30, 2018	June 30, 2018 June 30, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$9,826,014	$8,905,445
2. Changes of assumptions or other inputs	352,387,608	582,765,122
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between actual and expected experience in the Total Pension Liability	8,594,567	0
5. Total Deferred Outflows of Resources	$370,808,189	$591,670,567
Deferred Inflows of Resources		
6. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$9,826,014	$8,905,445
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	148,566,179	72,898,304
9. Difference between expected and actual experience in the Total Pension Liability	266,456,330	397,465,936
10. Total Deferred Inflows of Resources	$424,848,523	$479,269,685
Deferred outflows of resources and deferred inflows of resources related to pension expense will be recognized as follows:		
Reporting Date for Employer under GAS 68 Year Ended June 30:		
2019	N/A	$31,188,015
2020	$90,895,414	125,198,173
2021	34,177,541	68,480,300
2022	(116,281,436)	(81,978,677)
2023	(64,789,688)	(30,486,929)
2024	1,659,183	0
2025	298,652	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)
Deferred Outflows of Resources and Deferred Inflows of Resources – Water

Reporting Date for Employer under GAS 68 **Measurement Date for Employer under GAS 68**	**June 30, 2019** **June 30, 2018**	**June 30, 2018** **June 30, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$6,021,444	$3,342,822
2. Changes of assumptions or other inputs	113,190,102	185,018,086
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between actual and expected experience in the Total Pension Liability	2,760,653	0
5. Total Deferred Outflows of Resources	$121,972,199	$188,360,908
Deferred Inflows of Resources		
6. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$3,804,570	$5,562,623
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	47,720,807	23,143,981
9. Difference between expected and actual experience in the Total Pension Liability	85,588,195	126,188,723
10. Total Deferred Inflows of Resources	$137,113,572	$154,895,327
Deferred outflows of resources and deferred inflows of resources related to pension expense will be recognized as follows:		
Reporting Date for Employer under GAS 68 Year Ended June 30:		
2019	N/A	$9,635,422
2020	$29,710,900	39,457,671
2021	10,942,823	20,900,923
2022	(37,415,917)	(26,897,211)
2023	(19,958,074)	(9,631,224)
2024	1,338,047	0
2025	240,848	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)
Deferred Outflows of Resources and Deferred Inflows of Resources – Power

Reporting Date for Employer under GAS 68 Measurement Date for Employer under GAS 68	June 30, 2019 June 30, 2018	June 30, 2018 June 30, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$3,804,570	$5,562,623
2. Changes of assumptions or other inputs	239,197,506	397,747,036
3. Net excess of projected over actual earnings on pension plan investments (if any)	0	0
4. Difference between actual and expected experience in the Total Pension Liability	5,833,914	0
5. Total Deferred Outflows of Resources	$248,835,990	$403,309,659
Deferred Inflows of Resources		
6. Changes in proportion and differences between entity's contributions and proportionate share of contributions[1]	$6,021,444	$3,342,822
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	100,845,372	49,754,323
9. Difference between expected and actual experience in the Total Pension Liability	180,868,135	271,277,213
10. Total Deferred Inflows of Resources	$287,734,951	$324,374,358
Deferred outflows of resources and deferred inflows of resources related to pension expense will be recognized as follows:		
Reporting Date for Employer under GAS 68 Year Ended June 30:		
2019	N/A	$21,552,593
2020	$61,184,514	85,740,502
2021	23,234,718	47,579,377
2022	(78,865,519)	(55,081,466)
2023	(44,831,614)	(20,855,705)
2024	321,136	0
2025	57,804	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GAS 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources

There are changes in each entity's proportionate share of the total Net Pension Liability (NPL) during the measurement period ended June 30, 2018. The net effect of the change on the entity's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all employees that are provided with pensions through the WPERP which is 6.18 years determined as of July 1, 2017 (the beginning of the measurement period ended June 30, 2018). This is described in Paragraph 33a. of GAS 68.

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended June 30, 2018 is recognized over the same period.

The net effects of the change on the entity's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources and the difference between the actual employer contributions and the proportionate share of the employer contributions for prior periods continue to be recognized based on the expected remaining service lives of all employees calculated as of those prior measurement dates.

The average of the expected service lives of all employees is determined by:

- Calculating each active employees' expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

EXHIBIT 10

Schedule of Proportionate Share of the Net Pension Liability – Total

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2013	100.0%	$2,308,458,976	$805,607,436	286.55%	76.18%
2014	100.0%	1,790,856,442	817,421,028	219.09%	82.26%
2015	100.0%	1,272,233,314	819,923,866	155.16%	88.41%
2016	100.0%	1,144,145,298	839,213,254	136.34%	89.80%
2017	100.0%	2,191,386,273	861,818,854	254.27%	82.17%
2018	100.0%	1,343,201,931	892,332,196	150.53%	89.39%
2019	100.0%	910,457,467	953,635,670	95.47%	93.10%

[1] *These are the actual payroll amounts for the years ending on the dates shown.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Water

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2013	32.292%	$745,446,783	$260,146,478	286.55%	76.18%
2014	32.573%	583,343,786	266,262,257	219.09%	82.26%
2015	32.344%	411,484,901	265,192,153	155.16%	88.41%
2016	32.603%	373,023,565	273,607,137	136.34%	89.80%
2017	31.892%	698,878,038	274,851,713	254.27%	82.17%
2018	31.748%	426,443,932	283,300,404	150.53%	89.39%
2019	32.121%	292,447,213	306,316,444	95.47%	93.10%

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Power

Reporting Date for Employer under GAS 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2013	67.708%	$1,563,012,193	$545,460,958	286.55%	76.18%
2014	67.427%	1,207,512,656	551,158,771	219.09%	82.26%
2015	67.656%	860,748,413	554,731,713	155.16%	88.41%
2016	67.397%	771,121,733	565,606,117	136.34%	89.80%
2017	68.108%	1,492,508,235	586,967,141	254.27%	82.17%
2018	68.252%	916,757,999	609,031,792	150.53%	89.39%
2019	67.879%	618,010,254	647,319,226	95.47%	93.10%

EXHIBIT 11

Schedule of Reconciliation of Net Pension Liability – Total

Reporting Date for Employer under GAS 68 **Measurement Date for Employer under GAS 68**	**June 30, 2019** **June 30, 2018**	**June 30, 2018** **June 30, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$1,343,201,931	$2,191,386,273
2. Pension Expense	172,995,196	244,285,100
3. Employer Contributions	(439,298,444)	(397,747,778)
4. New Net Deferred Inflows/Outflows	(135,253,201)	(603,886,678)
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	0
6. New Net Deferred Flows Due to Change in Proportion[1]	0	0
7. Recognition of Prior Deferred Inflows/Outflows	(31,188,015)	(90,834,986)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[1]	0	0
9. Ending Net Pension Liability	$910,457,467	$1,343,201,931

[1] *Includes differences between actual employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Water

Reporting Date for Employer under GAS 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GAS 68	**June 30, 2018**	**June 30, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$426,443,932	$698,878,038
2. Pension Expense	56,106,486	78,301,310
3. Employer Contributions	(141,496,251)	(128,575,911)
4. New Net Deferred Inflows/Outflows	(43,444,558)	(191,723,824)
5. Change in Allocation of Prior Deferred Inflows/Outflows	418,803	(1,160,158)
6. New Net Deferred Flows Due to Change in Proportion[1]	4,170,429	255,945
7. Recognition of Prior Deferred Inflows/Outflows	(10,017,874)	(28,838,574)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[1]	266,246	(692,894)
9. Ending Net Pension Liability	$292,447,213	$426,443,932

[1] *Includes differences between actual employer contributions and proportionate share of contributions.*

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Power

Reporting Date for Employer under GAS 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GAS 68	June 30, 2018	June 30, 2017
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$916,757,999	$1,492,508,235
2. Pension Expense	116,888,710	165,983,790
3. Employer Contributions	(297,802,193)	(269,171,867)
4. New Net Deferred Inflows/Outflows	(91,808,643)	(412,162,854)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(418,803)	1,160,158
6. New Net Deferred Flows Due to Change in Proportion[1]	(4,170,429)	(255,945)
7. Recognition of Prior Deferred Inflows/Outflows	(21,170,141)	(61,996,412)
8. Recognition of Prior Deferred Flows Due to Change in Proportion[1]	(266,246)	692,894
9. Ending Net Pension Liability	$618,010,254	$916,757,999

[1] *Includes differences between actual employer contributions and proportionate share of contributions.*

EXHIBIT 12

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Actual and Expected Experience on Total Pension Liability

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences Between Actual and Expected Experience	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30							
			2018	2019	2020	2021	2022	2023	2024	2025
2014	$(98,062,638)	5.24	$(18,714,244)	$(4,491,418)	$0	$0	$0	$0	$0	$0
2015	(154,221,968)	5.13	(30,062,762)	(30,062,762)	(3,908,158)	0	0	0	0	0
2016	(162,912,927)	5.47	(29,782,985)	(29,782,985)	(29,782,985)	(13,998,002)	0	0	0	0
2017	(189,469,795)	5.65	(33,534,477)	(33,534,477)	(33,534,477)	(33,534,477)	(21,797,410)	0	0	0
2018	(196,176,749)	5.92	(33,137,964)	(33,137,964)	(33,137,964)	(33,137,964)	(33,137,964)	(30,486,929)	0	0
2019	10,253,750	6.18	0	1,659,183	1,659,183	1,659,183	1,659,183	1,659,183	1,659,183	298,652
Net increase (decrease) in pension expense			$(145,232,432)	$(129,350,423)	$(98,704,401)	$(79,011,260)	$(53,276,191)	$(28,827,746)	$1,659,183	$298,652

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GAS 68 Year Ended June 30	Effect of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30							
			2018	2019	2020	2021	2022	2023	2024	2025
2014	$0	5.24	$0	$0	$0	$0	$0	$0	$0	$0
2015	525,443,921	5.13	102,425,716	102,425,716	13,315,341	0	0	0	0	0
2016	0	5.47	0	0	0	0	0	0	0	0
2017	722,927,661	5.65	127,951,798	127,951,798	127,951,798	127,951,798	83,168,671	0	0	0
2018	0	5.92	0	0	0	0	0	0	0	0
2019	0	6.18	0	0	0	0	0	0	0	0
Net increase (decrease) in pension expense			$230,377,514	$230,377,514	$141,267,139	$127,951,798	$83,168,671	$0	$0	$0

As described in Exhibit 9, the average of the expected remaining service lives of all employees that are provided with pensions through the WPERP (active and inactive employees) determined as of July 1, 2017 (the beginning of the measurement period ending June 30, 2018) is 6.18 years.

EXHIBIT 12 (continued)

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Pension Plan Investments

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30							
			2018	2019	2020	2021	2022	2023	2024	2025
2014	$(347,400,696)	5.00	$(69,480,140)	$0	$0	$0	$0	$0	$0	$0
2015	(762,372,550)	5.00	(152,474,510)	(152,474,510)	0	0	0	0	0	0
2016	315,478,371	5.00	63,095,674	63,095,674	63,095,675	0	0	0	0	0
2017	657,054,582	5.00	131,410,916	131,410,916	131,410,916	131,410,918	0	0	0	0
2018	(551,059,866)	5.00	(110,211,973)	(110,211,973)	(110,211,973)	(110,211,973)	(110,211,974)	0	0	0
2019	(179,809,710)	5.00	0	(35,961,942)	(35,961,942)	(35,961,942)	(35,961,942)	(35,961,942)	0	0
Net increase (decrease) in pension expense			$(137,660,033)	$(104,141,835)	$48,332,676	$(14,762,997)	$(146,173,916)	$(35,961,942)	$0	$0

The differences between projected and actual earnings on pension plan investments are recognized over a five-year period per Paragraph 33b. of GAS 68.

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GAS 68 Year Ended June 30	Total Differences	Reporting Date for Employer under GAS 68 Year Ended June 30							
		2018	2019	2020	2021	2022	2023	2024	2025
2014	$(445,463,334)	$(88,194,384)	$(4,491,418)	$0	$0	$0	$0	$0	$0
2015	(391,150,597)	(80,111,556)	(80,111,556)	9,407,183	0	0	0	0	0
2016	152,565,444	33,312,689	33,312,689	33,312,690	(13,998,002)	0	0	0	0
2017	1,190,512,448	225,828,237	225,828,237	225,828,237	225,828,239	61,371,261	0	0	0
2018	(747,236,615)	(143,349,937)	(143,349,937)	(143,349,937)	(143,349,937)	(143,349,938)	(30,486,929)	0	0
2019	(169,555,960)	0	(34,302,759)	(34,302,759)	(34,302,759)	(34,302,759)	(34,302,759)	1,659,183	298,652
Net increase (decrease) in pension expense		$(52,514,951)	$(3,114,744)	$90,895,414	$34,177,541	$(116,281,436)	$(64,789,688)	$1,659,183	$298,652

EXHIBIT 13

Allocation of Changes in Total Net Pension Liability

In addition to the amounts shown in Exhibit 12, there are changes in each entity's proportionate share of the total Net Pension Liability (NPL) during the measurement period ending on June 30, 2018. The net effect of the change on the entity's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average of the expected remaining service lives of all employees shown previously. The differences between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ending on June 30, 2018 are recognized over the same period. These amounts are shown below, with the corresponding amounts for the measurement periods ending each June 30 beginning in 2013 as follows. While these amounts are different for each entity, they sum to zero for the entire Plan.

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2018

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30						
			2019	2020	2021	2022	2023	2024	2025
Water	$4,975,531	6.18	$805,102	$805,102	$805,102	$805,102	$805,102	$805,102	$144,919
Power	(4,975,531)	6.18	(805,102)	(805,102)	(805,102)	(805,102)	(805,102)	(805,102)	(144,919)
Total	$0		$0	$0	$0	$0	$0	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2017

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2018	2019	2020	2021	2022	2023
Water	$307,966	5.92	$52,021	$52,021	$52,021	$52,021	$52,021	$47,861
Power	(307,966)	5.92	(52,021)	(52,021)	(52,021)	(52,021)	(52,021)	(47,861)
Total	$0		$0	$0	$0	$0	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2016

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2017	2018	2019	2020	2021	2022
Water	$(8,017,676)	5.65	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(922,386)
Power	8,017,676	5.65	1,419,058	1,419,058	1,419,058	1,419,058	1,419,058	922,386
Total	$0		$0	$0	$0	$0	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2015

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2016	2017	2018	2019	2020	2021
Water	$6,128,971	5.47	$1,120,470	$1,120,470	$1,120,470	$1,120,470	$1,120,470	$526,621
Power	(6,128,971)	5.47	(1,120,470)	(1,120,470)	(1,120,470)	(1,120,470)	(1,120,470)	(526,621)
Total	$0		$0	$0	$0	$0	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2014

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2015	2016	2017	2018	2019	2020
Water	$(1,739,043)	5.13	$(338,995)	$(338,995)	$(338,995)	$(338,995)	$(338,995)	$(44,068)
Power	1,739,043	5.13	338,995	338,995	338,995	338,995	338,995	44,068
Total	$0		$0	$0	$0	$0	$0	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2013

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2014	2015	2016	2017	2018	2019
Water	$6,971,701	5.24	$1,330,477	$1,330,477	$1,330,477	$1,330,477	$1,330,477	$319,316
Power	(6,971,701)	5.24	(1,330,477)	(1,330,477)	(1,330,477)	(1,330,477)	(1,330,477)	(319,316)
Total	$0		$0	$0	$0	$0	$0	$0

Actuarial Assumptions and Methods

For June 30, 2018 Measurement Date and Employer Reporting as of June 30, 2019

Actuarial Assumptions:

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2012 through June 30, 2015 Actuarial Experience Study dated May 23, 2016. Unless otherwise noted, all actuarial assumptions and methods shown below apply to both Tier 1 and Tier 2 members.

Economic Assumptions:

Net Investment Return:	7.25%, net of investment expenses.
Consumer Price Index:	Increase of 3.00% per year; benefit increases due to CPI subject to 3.00% maximum for Tier 1 and 2.00% for Tier 2. The maximum COLA's are assumed to be paid for both Tier 1 and 2.
Employee Contribution, Additional Annuity and Matching Account Crediting Rate:	7.25%, based on Plan provisions
Administration Expenses:	Offset by additional employer contributions.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 3.00% per year from the valuation date.

Salary Increases:

Annual Rate of Compensation Increase

Inflation: 3.00% per year, plus "across the board" salary increases of 0.50% per year, plus the following merit and promotional increases.

Years of Service	Increase
Less than 1	6.50%
1	6.00%
2	5.50%
3	4.50%
4	3.00%
5	2.00%
6	1.50%
7	1.40%
8	1.30%
9	1.20%
10 & over	1.00%

The merit and promotional increases are added to the sum of the inflationary and "across the board" salary increases.

Demographic Assumptions:

Mortality Rates:

Pre-retirement:	Head count-weighted RP-2014 Employee Mortality Table times 80%, projected generationally with the two-dimensional MP-2015 projection scale.
After Service Retirement:	Head count-weighted RP-2014 Healthy Annuitant Mortality Table with no age adjustment for males and set back one year for females, projected generationally with the two-dimensional MP-2015 projection scale.
After Disability Retirement:	Head count-weighted RP-2014 Healthy Annuitant Mortality Table with no age adjustment for males and set back one year for females, projected generationally with the two-dimensional MP-2015 projection scale.

The RP-2014 mortality tables and adjustments as shown above reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

Termination Rates Before Retirement:

	Rate (%)	
	Male	
Age	**Mortality***	**Disability**
25	0.049	0.006
30	0.048	0.012
35	0.053	0.012
40	0.064	0.018
45	0.098	0.030
50	0.167	0.054
55	0.273	0.126
60	0.452	0.240
65	0.779	0.000
	Female	
Age	**Mortality***	**Disability**
25	0.017	0.000
30	0.022	0.006
35	0.029	0.036
40	0.039	0.072
45	0.058	0.102
50	0.100	0.138
55	0.168	0.168
60	0.241	0.000
65	0.356	0.000

* *5% of pre-retirement deaths are assumed to be duty related, with the remaining being non-duty related. Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates.*

Withdrawal Rates:

Years of Service	Total Withdrawal*
Less than 1	12.00%
1	6.00%
2	4.00%
3	2.50%
4	2.00%
5	2.00%
6	1.75%
7	1.50%
8	1.25%
9	1.00%
10 & over	0.75%

* *No withdrawal is assumed after a member is first eligible to retire. Ordinary withdrawal members are assumed to receive their account balance at termination. Vested termination members are assumed to receive a deferred retirement benefit. For Tier 1 members terminating with less than one year of service, and Tier 2 members terminating with less than 5 years of service, 100% are assumed to be ordinary withdrawals. For Tier 1 members terminating with at least one year of service but less than eleven years of service, 30% are assumed to be ordinary withdrawals with the remaining 70% being vested terminations. For Tier 1 members terminating with 11 or more years of service and Tier 2 members terminating with 5 or more years of service, 15% are assumed to be ordinary withdrawals, with the remaining 85% being vested terminations.*

Retirement Rates:

Age	Rate (%) Tier 1 Under 30 Years of Service	Rate (%) Tier 1 30 or More Years of Service	Rate (%) Tier 2 Under 30 Years of Service	Rate (%) Tier 2 30 or More Years of Service
55	4.50%	25.00%	0.0%	25.0%
56	2.00	20.00	0.0	14.0
57	2.50	17.00	0.0	12.0
58	3.00	17.00	0.0	12.0
59	3.00	17.00	0.0	12.0
60	5.00	20.00	5.0	17.5
61	6.00	20.00	2.5	5.0
62	6.00	20.00	0.0	5.0
63	6.00	25.00	20.0	25.0
64	7.00	25.00	15.0	25.0
65	11.00	28.00	14.0	28.0
66	11.00	28.00	14.0	28.0
67	11.00	28.00	14.0	28.0
68	11.00	28.00	14.0	28.0
69	13.00	28.00	13.0	28.0
70	25.00	25.00	100.0	100.0
71	25.00	25.00	100.0	100.0
72	25.00	25.00	100.0	100.0
73	25.00	25.00	100.0	100.0
74	25.00	25.00	100.0	100.0
75	100.00	100.00	100.0	100.0

Benefit for Inactive Vested Members:	For Tier 1, inactive vested members are assumed to retire at age 60 with a Money Purchase Annuity. Tier 1 and Tier 2 members receiving Permanent Total Disability benefits are assumed to retire at the earlier of age 65 or age 55 with 30 years of service. For Tier 2, inactive vested members are assumed to retire at age 63.
Definition of Active Members:	First day of biweekly payroll following employment.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Data Adjustments:	Data as of March 31 has been adjusted to June 30 by adding three months of age and, for active employees, three months of service. Contribution account balances were also increased by three months of interest. For members in pay status, we have increased their benefits by the assumed July 1 COLA.
Percent Married/Domestic Partner:	85% of male members and 60% of female members are assumed to have an eligible spouse or domestic partner at pre-retirement death or retirement. The assumption is also applied for current retirees retired before April 1, 2012 with Options Full, A, B, or C since they are missing this data. Spousal gender is assumed to be opposite that of the member.
Age of Spouse:	Females are 3 years younger than their spouses.
Future Benefit Accruals:	1.0 year of service per year.
Other Government Service:	Tier 1 members are assumed to purchase an additional 0.10 years of service per year. Tier 2 members are assumed to purchase an additional 0.03 years of service per year. These service purchases exclude those priced at full actuarial cost. The valuation reflects expected future member contributions that are associated with these assumed service purchases.

__Actuarial Methods:__

Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age equals attained age less years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percent of salary.
Projected Compensation:	Projected compensation for the year following the valuation date is calculated by annualizing the bi-weekly pay rate increased by the assumed rate of salary increase. For members with less than one year of service as of the valuation date, no salary increase assumption is applied to their annualized compensation.
Expected Remaining Service Lives:	The average of the expected service lives of all employees is determined by: ➤ Calculating each active employee's expected remaining service life as the present value of \$1 per year of future service at zero percent interest. ➤ Setting the remaining service life to zero for each nonactive or retired member. ➤ Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

Changes in Actuarial Assumptions and Methods:	Based on changes in Plan provisions that were adopted, the following assumptions have been changed. Previously, these assumptions were as follows:
Employee Contribution, Additional Annuity and Matching Account Crediting Rate:	7.50%, based on Plan provisions

Withdrawal Rates:

To determine the proportion of terminating members assumed to be ordinary withdrawals, the previous withdrawal assumptions used 15 years instead of 5 years for Tier 2:

For Tier 1 members terminating with less than one year of service, and Tier 2 members terminating with less than 15 years of service, 100% are assumed to be ordinary withdrawals. For Tier 1 members terminating with at least one year of service but less than eleven years of service, 30% are assumed to be ordinary withdrawals with the remaining 70% being vested terminations. For Tier 1 members terminating with 11 or more years of service and Tier 2 members terminating with 15 or more years of service, 15% are assumed to be ordinary withdrawals, with the remaining 85% being vested terminations.

APPENDIX A

Calculation of Discount Rate as of June 30, 2018
Projection of Plan’s Fiduciary Net Position ($ in millions)

Year Beginning July 1,	Projected Beginning Plan's Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Investment Earnings (d)	Projected Ending Plan's Fiduciary Net Position (e) = (a) + (b) - (c) + (d)
2018	$12,277	$495	$624	$885	$13,034
2019	13,034	479	659	938	13,792
2020	13,792	444	704	991	14,523
2021	14,523	403	750	1,040	15,217
2022	15,217	393	796	1,089	15,902
2023	15,902	411	841	1,137	16,610
2024	16,610	357	886	1,185	17,266
2025	17,266	258	930	1,227	17,822
2026	17,822	226	973	1,265	18,339
2027	18,339	181	1,015	1,299	18,805
2043	22,532	90	1,701	1,575	22,496
2044	22,496	82	1,729	1,571	22,422
2045	22,422	73	1,758	1,564	22,301
2046	22,301	64	1,786	1,554	22,133
2047	22,133	55	1,812	1,541	21,917
2092	21,368	0	133	1,544	22,779
2093	22,779	0	110	1,647	24,316
2094	24,316	0	90	1,760	25,985
2095	25,985	0	73	1,881	27,794
2096	27,794	0	58	2,013	29,748
2131	319,757	0	0 *	23,182	342,940
2132	342,940				
2132 Discounted Value:	117 **				

* Less than $1 million, when rounded.

** $342,940 million when discounted with interest at the rate of 7.25% per annum has a value of $117 million as of June 30, 2018.

APPENDIX A (continued)

Calculation of Discount Rate as of June 30, 2018
Projection of Pension Plan's Fiduciary Net Position ($ in millions)

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Years 2028-2042, 2048-2091, and 2097-2130 have been omitted from this table.

(3) Column (a): Except for the "discounted value" shown for 2132, none of the projected beginning Plan's Fiduciary Net Position amounts shown have been adjusted for the time value of money.

(4) Column (b): Projected total contributions include employee and employer normal cost rates applied to closed group projected payroll (based on covered active members as of June 30, 2018), plus employer contributions to the unfunded actuarial accrued liability. Contributions are assumed to occur halfway through the year, on average.

(5) Column (c): Projected benefit payments have been determined in accordance with Paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of June 30, 2018. The projected benefit payments reflect the cost of living increase assumptions used in the July 1, 2018 valuation report. The projected benefit payments are assumed to occur halfway through the year, on average.

(6) Column (d): Projected investment earnings are based on the assumed investment rate of return of 7.25% per annum.

(7) Throughout the projection, administrative expenses are not shown as they are expected to be offset by additional employer contributions above those shown in this projection.

(8) As illustrated in this Appendix, the Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of June 30, 2018 shown earlier in this report, pursuant to Paragraph 44 of GASB Statement No. 67.

APPENDIX B

Calculation of Discount Rate as of June 30, 2017
Projection of Plan's Fiduciary Net Position ($ in millions)

Year Beginning July 1,	Projected Beginning Plan's Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Investment Earnings (d)	Projected Ending Plan's Fiduciary Net Position (e) = (a) + (b) - (c) + (d)
2017	$11,314	$500	$590	$817	$12,041
2018	12,041	491	624	868	12,776
2019	12,776	479	664	920	13,511
2020	13,511	448	707	970	14,222
2021	14,222	412	752	1,019	14,900
2022	14,900	405	797	1,066	15,574
2023	15,574	423	842	1,114	16,269
2024	16,269	369	885	1,161	16,915
2025	16,915	270	928	1,202	17,459
2026	17,459	237	971	1,239	17,965
2042	21,721	78	1,638	1,518	21,678
2043	21,678	71	1,664	1,514	21,599
2044	21,599	63	1,688	1,507	21,481
2045	21,481	54	1,712	1,497	21,321
2046	21,321	46	1,734	1,485	21,117
2091	30,740	0	114	2,224	32,850
2092	32,850	0	94	2,378	35,134
2093	35,134	0	76	2,544	37,602
2094	37,602	0	61	2,724	40,265
2095	40,265	0	49	2,917	43,134
2121	247,495	0	0*	17,943	265,438
2122	265,438				

2122 Discounted Value: 171**

** Less than $1 million, when rounded.*

*** $265,438 million when discounted with interest at the rate of 7.25% per annum has a value of $171 million as of June 30, 2017.*

APPENDIX B (continued)

Calculation of Discount Rate as of June 30, 2017
Projection of Pension Plan's Fiduciary Net Position ($ in millions)

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Years 2027-2041, 2047-2090, and 2096-2120 have been omitted from this table.

(3) Column (a): Except for the "discounted value" shown for 2122, none of the projected beginning Plan's Fiduciary Net Position amounts shown have been adjusted for the time value of money.

(4) Column (b): Projected total contributions include employee and employer normal cost rates applied to closed group projected payroll (based on covered active members as of June 30, 2017), plus employer contributions to the unfunded actuarial accrued liability. Contributions are assumed to occur halfway through the year, on average.

(5) Column (c): Projected benefit payments have been determined in accordance with Paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of June 30, 2017. The projected benefit payments reflect the cost of living increase assumptions used in the July 1, 2017 valuation report. The projected benefit payments are assumed to occur halfway through the year, on average.

(6) Column (d): Projected investment earnings are based on the assumed investment rate of return of 7.25% per annum.

(7) Throughout the projection, administrative expenses are not shown as they are expected to be offset by additional employer contributions above those shown in this projection.

(8) As illustrated in this Appendix, the Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of June 30, 2017 shown earlier in this report, pursuant to Paragraph 44 of GASB Statement No. 67.

APPENDIX C
Glossary of Terms

Definitions of certain terms *as they are used in Statement 68;* the terms may have different meanings in other contexts.

Active employees
Individuals employed at the end of the reporting or measurement period, as applicable.

Actual contributions
Cash contributions recognized as additions to a pension Plan's Fiduciary Net Position.

Actuarial present value of projected benefit payments
Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

Actuarial valuation
The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

Actuarial valuation date
The date as of which an actuarial valuation is performed.

Actuarially determined contribution
A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

Ad hoc cost-of-living adjustments (ad hoc COLAs)
Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.

APPENDIX C (continued)
Glossary of Terms

Agent employer
An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.

Agent multiple-employer defined benefit pension plan (agent pension plan)
A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.

Automatic cost-of-living adjustments (automatic COLAs)
Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Automatic postemployment benefit changes
Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Closed period
A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.

APPENDIX C (continued)
Glossary of Terms

Collective deferred outflows of resources and deferred inflows of resources related to pensions
Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.

Collective Net Pension Liability
The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.

Collective pension expense
Pension expense arising from certain changes in the collective Net Pension Liability.

Contributions
Additions to a pension Plan's Fiduciary Net Position for amounts from employers, nonemployer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.

Cost-of-living adjustments
Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-sharing employer
An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.

Cost-sharing multiple-employer defined benefit pension plan (cost-sharing pension plan)
A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

APPENDIX C (continued)
Glossary of Terms

Covered payroll
The payroll on which contributions to a pension plan are based.

Defined benefit pension plans
Pension plans that are used to provide defined benefit pensions.

Defined benefit pensions
Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)

Defined contribution pension plans
Pension plans that are used to provide defined contribution pensions.

Defined contribution pensions
Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.

APPENDIX C (continued)

Glossary of Terms

Discount rate
The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension Plan's Fiduciary Net Position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.

2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Entry age actuarial cost method
A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the *normal cost.* The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the *actuarial accrued liability.*

Inactive employees
Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.

Measurement period
The period between the prior and the current measurement dates.

Multiple-employer defined benefit pension plan
A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

APPENDIX C (continued)

Glossary of Terms

Net Pension Liability
The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan.

Nonemployer contributing entities
Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 68, employees are not considered nonemployer contributing entities.

Other postemployment benefits
All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.

Pension plans
Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed, and benefits are paid as they come due.

Pensions
Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.

Plan members
Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).

Postemployment
The period after employment.

APPENDIX C (continued)
Glossary of Terms

Postemployment benefit changes
Adjustments to the pension of an inactive employee.

Postemployment healthcare benefits
Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.

Projected benefit payments
All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.

Public employee retirement system
A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.

Real rate of return
The rate of return on an investment after adjustment to eliminate inflation.

Service costs
The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.

Single employer
An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.

Single-employer defined benefit pension plan (single-employer pension plan)
A defined benefit pension plan that is used to provide pensions to employees of only one employer.

APPENDIX C (continued)
Glossary of Terms

Special funding situations
Circumstances in which a nonemployer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists:

1. The amount of contributions for which the nonemployer entity legally is responsible is *not* dependent upon one or more events or circumstances unrelated to the pensions.

2. The nonemployer entity is the only entity with a legal obligation to make contributions directly to a pension plan.

Termination benefits
Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.

Total Pension Liability
The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement 68.

5571888v4/04994.018