

# **The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**Actuarial Valuation and Review as of  
July 1, 2016**



This report has been prepared at the request of the Board of Administration to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Administration and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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*September 16, 2016*

*Board of Administration  
The Water and Power Employees' Retirement Plan of the City of Los Angeles  
111 North Hope Street, Room 357  
Los Angeles, California 90012*

*Dear Board Members:*

*We are pleased to submit this Actuarial Valuation and Review as of July 1, 2016. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2016-2017 and analyzes the preceding year's experience.*

*This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement Plan. The census information and financial information on which our calculations were based was prepared 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; 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); and changes in plan provisions or applicable law.*

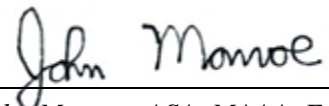
*The actuarial calculations were completed under the supervision of John Monroe, ASA, MAAA, Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, 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 the expectations for the Plan.*

*We look forward to reviewing this report at your next meeting and to answering any questions.*

*Sincerely,*

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

By:   
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Senior Vice President and Actuary*

  
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*JEM/gxk*

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## SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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### Purpose

This report has been prepared by Segal Consulting to present a valuation of The Water and Power Employees' Retirement Plan of the City of Los Angeles as of July 1, 2016. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of March 31, 2016, provided by the Retirement Office (for the July 1, 2016 valuation, the Retirement Office also provided information on 265 members who retired on April 1, 2016);
- The assets of the Plan as of June 30, 2016, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

### Significant Issues in Valuation Year

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

*Ref: Pg. 39*

- The results of this valuation reflect changes in the actuarial assumptions as recommended by Segal and adopted by the Board for the July 1, 2016 valuation. These changes were documented in our Actuarial Experience Study and are also outlined in Section 4, Exhibit II of this report. These assumption changes resulted in an increase in the aggregate required contribution rate (all tiers combined) of 9.53% of compensation before reflecting the two-year phase-in adopted by the Board and discussed below. The most significant of the assumption changes were the change to the 7.25% investment return assumption and the change to a generational mortality assumption.

*Ref: Pg. 29, 30*

- The actuarial accrued liability exceeds the actuarial value of assets, resulting in an Unfunded Actuarial Accrued Liability (UAAL) of \$1.94 billion, which is an increase from \$1.47 billion in the previous valuation. The Board's funding policy determines the Department's required contribution as the normal cost increased or offset by a UAAL amortization charge or credit. Under this funding policy, the Plan's UAAL is amortized over various 15-year periods, each beginning with the year that each portion or base of the UAAL was first identified and amortized.

*Ref: Pg. 12-14, 15*

- The aggregate required contribution rate (before phase-in) increased from 42.77% to 50.02% of pay for the 2016-2017 plan year, which is estimated to be \$464.6 million. This includes amortization of the components of the Plan's UAAL over

## SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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15-year fixed periods. Under the Plan's funding policy, the required contribution rate continues to be larger than the mandatory 110% matching of the employee contribution for Tier 1.

- The Board elected to phase-in the impact of new actuarial assumptions adopted for the July 1, 2016 valuation on the required contribution rate over a two-year period, beginning with the 2016-2017 fiscal year. The recommended pre-phase-in contribution rates for 2016-2017 are contained in this report. The aggregate required contribution rate after reflecting the phase-in is 45.25% of compensation and is shown in a separate letter that follows this report. All other results shown in this valuation report exclude the effect of the phase-in.
- The market value of assets earned a return of 0.8% for the July 1, 2015 to June 30, 2016 plan year. The actuarial value of assets earned a return of 6.9% for the July 1, 2015 to June 30, 2016 plan year due to the deferral of most of the current year investment loss and the recognition of prior investment gains and losses. This resulted in an actuarial loss of \$62.3 million when measured against the assumed rate of return of 7.50% for 2015-2016. This actuarial investment loss increased the aggregate required contribution by 0.73% of compensation.
- The salaries for continuing actives increased on average by 2.2% from the amounts in effect on March 31, 2015 to the amounts in effect on March 31, 2016. Since this increase is less than the average assumed rate of approximately 4.9%, the plan experienced an actuarial gain from individual salary experience. This gain amounted to \$129.0 million for the current year, which decreased the aggregate required contribution by 1.52% of compensation. There was also a gain from cost-of-living adjustments (COLAs) less than assumed which amounted to \$100.0 million, decreasing the aggregate required contribution rate by 1.18% of compensation.
- The total unrecognized return (i.e., the difference between the market value of assets and the "smoothed" actuarial value of assets) changed by \$584 million during the plan year from a \$236 million unrecognized gain in 2015 to a \$348 million unrecognized loss in 2016. This investment loss will be recognized in the determination of the actuarial value of assets over the next few years. This means that, if the Plan earns the assumed rate of investment return of 7.25% per year (net of expenses) on a **market value** basis, then the deferred losses will be recognized over the next few years as shown in the footnote in Chart 7.
- The unrecognized investment losses of \$348 million represent about 3.4% of the market value of assets. Unless offset by future investment gains or other favorable experience, the future recognition of the \$348 million in past market losses is expected to have an impact on the Plan's future funded ratio and aggregate required contributions. This potential impact may be illustrated as follows:
  - If the deferred losses were recognized immediately in the actuarial value assets, the funded percentage would decrease from 84.2% to 81.3%.

*Ref: Pg. 8, 15*

*Ref: Pg. 15, 29*

*Ref: Pg. 5*

## SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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For comparison purposes, if all deferred gains in the July 1, 2015 valuation had been recognized immediately in the July 1, 2015 valuation, the funded percentage would have increased from 86.9% to 89.0%.

- If the deferred losses were recognized immediately in the actuarial value of assets, the aggregate required contribution would increase from 50.02% of covered payroll to 54.06% of covered payroll.

For comparison purposes, if all the deferred gains in the July 1, 2015 valuation had been recognized immediately in the July 1, 2015 valuation, the aggregate employer contribution rate would have decreased from 42.77% of covered payroll to 39.97% of covered payroll.

*Ref: Pg. 35*

- This year, the balance in the General Reserve and the Reserve for Investment Gains and Losses increased from \$1,974 million as of June 30, 2015 to \$2,122 million as of June 30, 2016. These two reserves track changes in the book value of assets. Consistent with prior valuations, this year we have been instructed to include all but \$101.0 million of the end of year General Reserve and Reserve for Investment Gains and Losses as valuation assets. The \$101.0 million amount is 1% of the end of year market value of assets.
- The actuarial valuation report as of July 1, 2016 is based on financial information as of that date. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

**SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**Summary of Key Valuation Results**

	2016		2015	
<b>Required Contributions for plan year beginning July 1 (Before Phase-in) <sup>(1)</sup>:</b>	<b>Rate</b>	<b>Estimated Annual Amount</b>	<b>Rate</b>	<b>Estimated Annual Amount</b>
Tier 1 & Tier 2 Combined (aggregate)	50.02%	\$464,625,683	42.77%	\$393,783,103
Tier 1	51.40%	\$415,712,625	43.45%	\$375,755,518
Tier 2	40.74%	\$48,913,058	32.24%	\$18,027,585
<b>Funding elements for plan year beginning July 1:</b>		<b>2016</b>		<b>2015</b>
Total Normal cost (beginning of year)		\$217,276,778		\$209,832,859
Market value of assets (MVA)		10,097,394,723		10,086,857,641
Actuarial value of assets (AVA)		10,344,355,801		9,750,343,300
Actuarial accrued liability (AAL)		12,289,229,001		11,218,445,567
Unfunded/(overfunded) actuarial accrued liability on AVA basis		1,944,873,200		1,468,102,267
Unfunded/(overfunded) actuarial accrued liability on MVA basis		2,191,834,278		1,131,587,926
Funded ratio on AVA basic (AVA/AAL)		84.17%		86.91%
Funded ratio on MVA basic (MVA/AAL)		82.16%		89.91%
<b>Demographic data for plan year beginning July 1:</b>				
Number of retired members and beneficiaries		9,265		8,843
Number of vested former members <sup>(2)</sup>		1,612		1,528
Number of active members		9,348		9,205
Projected total compensation		\$928,888,680		\$920,781,074
Projected average compensation		\$99,368		\$100,031

<sup>(1)</sup> Required contributions are assumed to be paid at the middle of every year. The July 1, 2016 contribution rates are before adjustments to phase-in over two years the required contribution rate impact of new assumptions adopted for the July 1, 2016 valuation.

<sup>(2)</sup> Includes terminated members due a refund of employee contributions and members receiving Permanent Total Disability (PTD) benefits.

## SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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### Important Information about Actuarial Valuations

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 valuation 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 WPERP. 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.



## SECTION 1: Valuation Summary for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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- If WPERP 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 WPERP 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.

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**A. MEMBER DATA**

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, vested terminated members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A, B, and C.

*A historical perspective of how the member population has changed over the past ten valuations can be seen in this chart.*

**CHART 1**  
**Member Population: 2007 – 2016**

<b>Year Ended June 30</b>	<b>Active Members</b>	<b>Vested Terminated Members*</b>	<b>Retired Members and Beneficiaries</b>	<b>Ratio of Non-Actives to Actives</b>
2007	7,993	1,535	8,746	1.29
2008	8,164	1,548	8,670	1.25
2009	8,868	1,742	8,505	1.16
2010	9,295	1,739	8,468	1.10
2011	9,203	1,694	8,496	1.11
2012	8,962	1,648	8,510	1.13
2013	8,913	1,555	8,642	1.14
2014	8,960	1,484	8,739	1.14
2015	9,205	1,528	8,843	1.13
2016	9,348	1,612	9,265	1.16

*\*Includes terminated members due a refund of employee contributions and members receiving PTD benefits.*

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**Active Members**

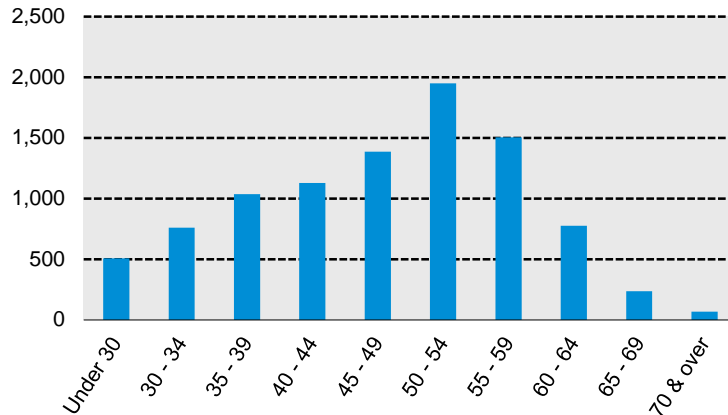
Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 9,348 active members with an average age of 48.0, average years of service of 16.3 years and average compensation of \$99,368. The 9,205 active members in the prior valuation had an average age of 48.9, average service of 17.6 years and average compensation of \$100,031.

**Inactive Members**

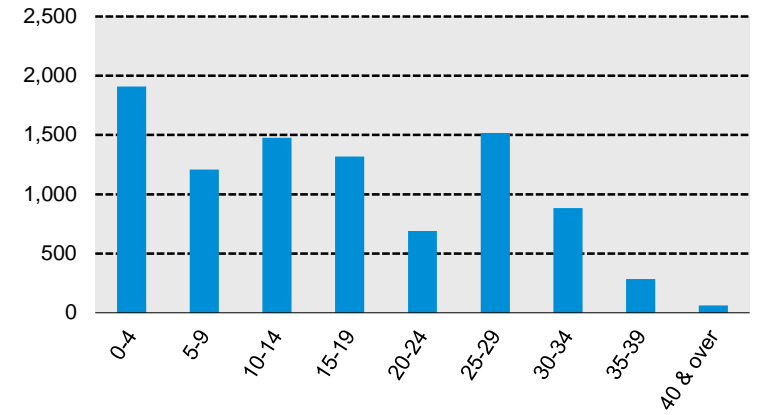
In this year's valuation, there were 1,612 members with a vested right to a deferred or immediate vested benefit, or entitled to a return of their employee contributions, versus 1,528 in the prior valuation.

*These graphs show a distribution of active members by age and by years of service.*

**CHART 2**  
**Distribution of Active Members by Age as of July 1, 2016**



**CHART 3**  
**Distribution of Active Members by Years of Service as of July 1, 2016**



**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

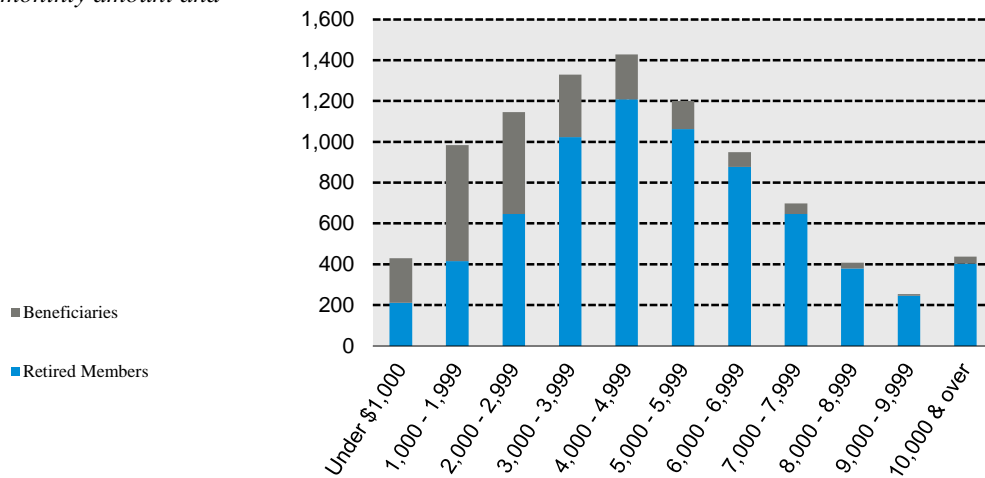
**Retired Members and Beneficiaries**

As of July 1, 2016, 7,119 retired members and 2,146 beneficiaries were receiving total monthly benefits of \$45,033,463. For comparison, in the previous valuation, there were 6,709 retired members and 2,134 beneficiaries receiving monthly benefits of \$41,382,393.

*These graphs show a distribution of the current retired members and beneficiaries based on their monthly amount and age.*

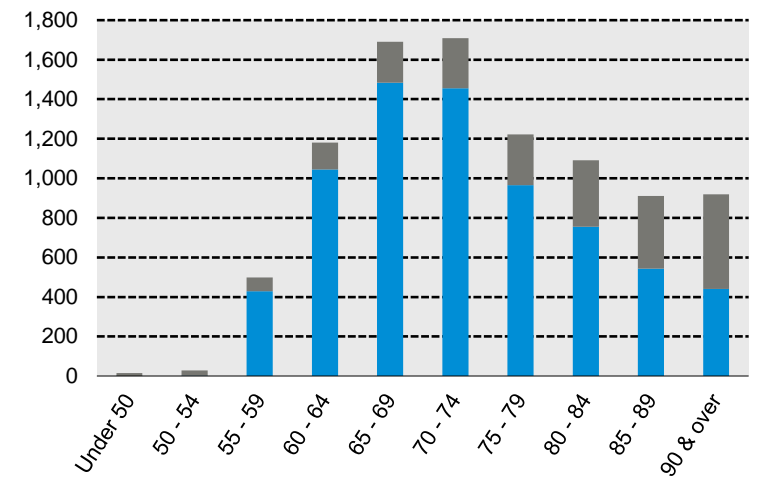
**CHART 4**

**Distribution of Retired Members and Beneficiaries by Type and by Monthly Amount as of July 1, 2016**



**CHART 5**

**Distribution of Retired Members and Beneficiaries by Type and by Age as of July 1, 2016**



**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**B. FINANCIAL INFORMATION**

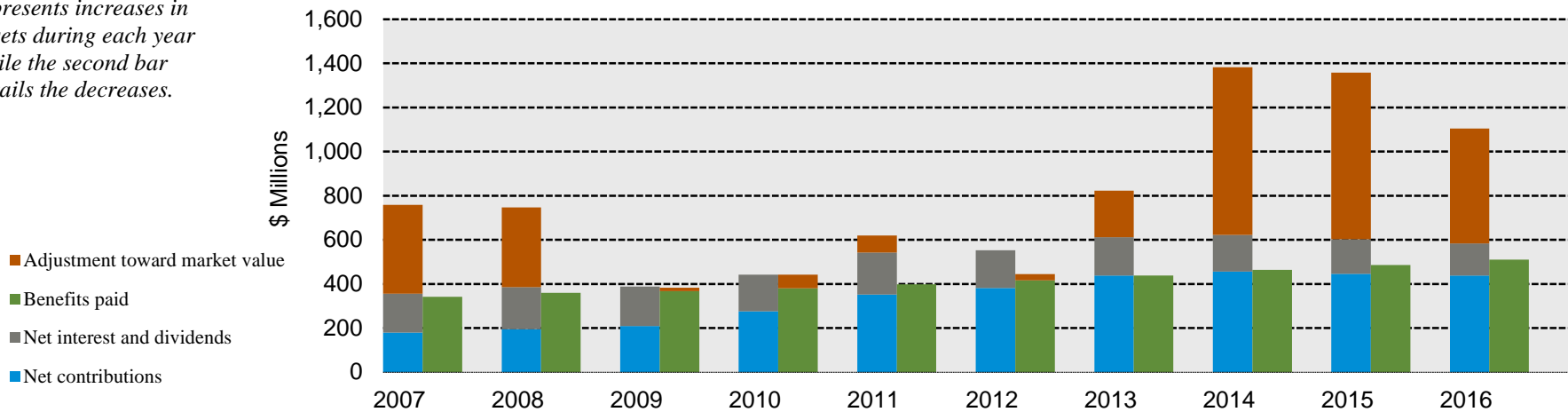
Retirement plan funding anticipates that, over the long term, both contributions (net of administrative expenses starting in 2015) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits D, E and F.

*The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.*

**CHART 6**

**Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended June 30, 2007 – 2016**



## SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative.

Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Please note that as instructed by Plan staff, we have included all but \$101.0 million (1% of the end of year market value of assets) in the General Reserve and Reserve for Investments Gains and Losses as valuation assets.

*The chart shows the determination of the actuarial value of assets as of the valuation date.*

### CHART 7

#### Determination of Actuarial Value of Assets for Year Ended June 30, 2016

From	To	Total Actual Market Return (net)	Expected Market Return (net)	Investment* Gain (Loss)	Deferred Factor	Deferred** Return
7/2011	6/2012	\$5,273,279	\$573,561,538	-\$568,288,259	0.0	\$0
7/2012	6/2013	922,455,661	572,610,516	349,845,145	0.2	69,969,029
7/2013	6/2014	1,406,480,292	643,809,077	762,671,215	0.4	305,068,486
7/2014	6/2015	416,474,352	726,771,065	-310,296,713	0.6	-186,178,028
7/2015	6/2016	82,810,914	753,804,054	-670,993,140	0.8	<u>-536,794,512</u>
1 Total Unrecognized Return***						-347,935,025
2 Market value of assets, June 30, 2016						10,097,394,723
3 Gross actuarial value: (2) - (1)						10,445,329,748
4 Portion of General Reserve and Reserve for Investment Gains and Losses not included as valuation asset						100,973,947
5 Net actuarial value as of June 30, 2016: (3) - (4)						<u>10,344,355,801</u>
6 Net actuarial value as a percentage of market value: (5) / (2)						102.4%
* Total return minus expected return on a market value basis						
** Recognition at 20% per year over 5 years						
*** Deferred return as of June 30, 2016 recognized in each of the next 4 years:						
(a) Amount recognized during 2016/2017		\$26,245,301				
(b) Amount recognized during 2017/2018		-43,723,727				
(c) Amount recognized during 2018/2019		-196,257,971				
(d) Amount recognized during 2019/2020		<u>-134,198,628</u>				
Subtotal		-\$347,935,025				

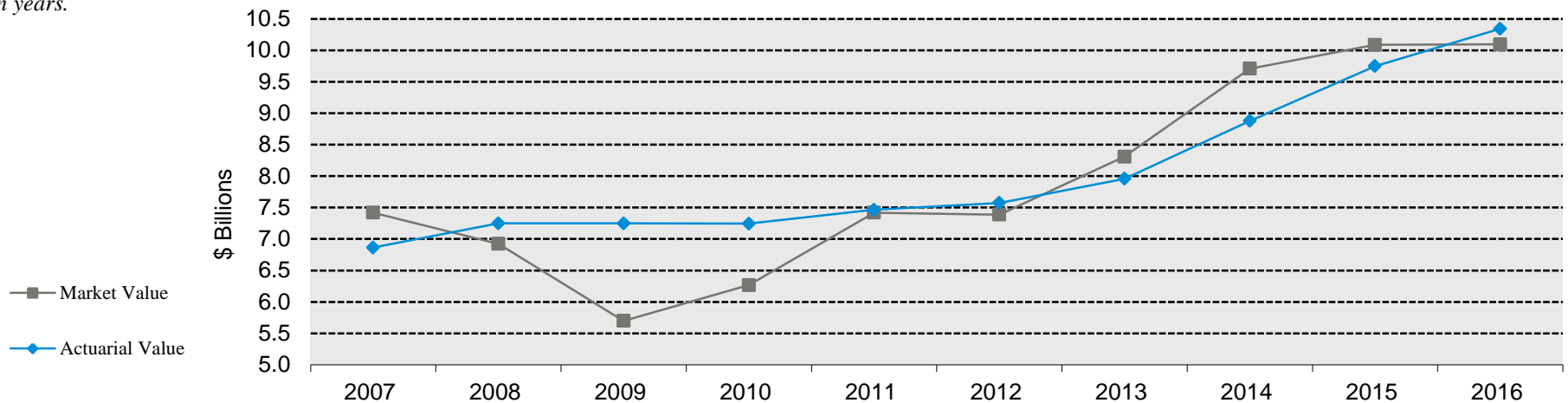
**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

Both the actuarial value and market value of assets are representations of the WPERP's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the WPERP's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

Note that in the chart below, actuarial value of assets are exclusive of a small portion of the General Reserve and Reserve for Investment Gains and Losses while that Reserve is included in the development of the Market Value of Assets.

*This chart shows the change in the actuarial value of assets versus the market value over the past ten years.*

**CHART 8**  
**Actuarial Value of Assets vs. Market Value of Assets as of June 30, 2007 – 2016**



**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**C. ACTUARIAL EXPERIENCE**

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total gain is \$109.0 million, \$62.3 million in losses from investments, \$18.2 million in losses from contribution experience and \$189.5 million in gains from all other sources. The net experience variation from individual sources other than investments and contribution experience was 1.6% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

*This chart provides a summary of the actuarial experience during the past year.*

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**CHART 9**  
**Actuarial Experience for Year Ended June 30, 2016**

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1. Net loss from investments*	-\$62,279,146
2. Net loss from contribution experience	-18,163,236
3. Net gain from other experience**	<u>189,461,173</u>
4. Net experience gain: (1) + (2) + (3)	\$109,018,791

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\* Details in Chart 10

\*\* See Section 3, Exhibit G. Does not include the effect of Plan or assumption changes.



**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Investment Rate of Return**

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the WPERP's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets was 7.50% for the 2015-2016 plan year (based on the July 1, 2015 valuation). The actual rate of return on an actuarial basis for the 2015-2016 plan year was 6.86%

Since the actual return on the actuarial value of assets for the year was less than the assumed return, the WPERP experienced an actuarial loss during the year ended June 30, 2016 with regard to its investments.

*This chart shows the gain/(loss) due to investment experience.*

**CHART 10**  
**Market and Actuarial Value Investment Experience for Year Ended June 30, 2016**

	<b>Market Value</b>	<b>Actuarial Value</b>
1. Actual return	\$82,810,914	\$666,286,333
2. Average value of assets	10,050,720,725	9,714,206,384
3. Actual rate of return: (1) ÷ (2)	0.82%	6.86%
4. Assumed rate of return	7.50%	7.50%
5. Expected return: (2) x (4)	\$753,804,054	\$728,565,479
6. Actuarial gain/(loss): (1) – (5)	<u>-\$670,993,140</u>	<u>-\$62,279,146</u>

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

**CHART 11**

**Investment Return – Actuarial Value vs. Market Value: 2007 – 2016**

Year Ended June 30	Net Interest and Dividend Income		Recognition of Capital Appreciation		Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
2007	\$175,884,502	2.76%	\$402,557,938	6.33%	\$578,442,440	9.09%	\$1,066,710,135	16.58%
2008	191,456,313	2.82	361,168,481	5.33	552,624,794	8.15	-324,830,786	-4.43
2009	178,210,091	2.49	-15,044,818	-0.21	163,165,273	2.28	-1,062,966,407	-15.53
2010	165,427,697	2.30	-61,931,590	-0.86	103,496,107	1.44	675,223,168	11.96
2011	189,663,213	2.63	76,943,548	1.06	266,606,761	3.69	1,197,629,301	19.18
2012	171,625,847	2.30	-28,332,250	-0.38	143,293,597	1.92	5,273,279	0.07
2013	173,531,364	2.29	211,568,037	2.79	385,099,401	5.08	922,455,661	12.48
2014	165,507,432	2.08	760,631,032	9.56	926,138,464	11.64	1,406,480,292	16.93
2015	156,994,160	1.77	755,549,754	8.53	912,543,914	10.30	416,474,352	4.30
2016	<u>146,128,493</u>	1.50	<u>520,157,840</u>	5.36	<u>666,286,333</u>	6.86	<u>82,810,914</u>	0.82
Total	\$1,714,429,112		\$2,983,267,972		\$4,697,697,084		\$4,385,259,909	
					Five-year average return	7.30%		6.59%
					Ten-year average return	6.16%		5.81%

*Note: Each year's yield is weighted by the average asset value in that year.*

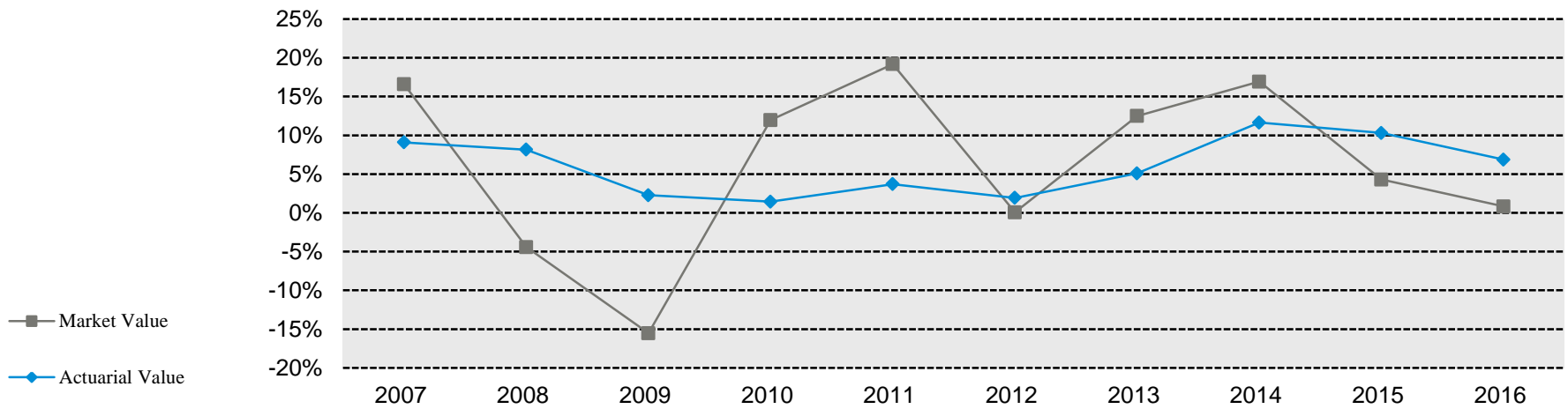
**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

*This chart illustrates how this leveling effect has actually worked over the years 2007 - 2016.*

**CHART 12**  
**Market and Actuarial Rates of Return for Years Ended June 30, 2007 - 2016**



## SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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### **Other Experience**

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- salary increases different than assumed, and
- COLA increases for retirees and beneficiaries different than assumed.

The net gain from this other experience for the year ended June 30, 2016 amounted to \$189,461,173, which is 1.6% of the actuarial accrued liability.

This gain is mainly the result of lower individual salary increases and lower COLA increases than expected. See Section 3, Exhibit G for a detailed development of the Unfunded Actuarial Accrued Liability.

## SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles

### D. REQUIRED CONTRIBUTION

The required Department contribution is made up of (a) the normal cost and (b) the amortization of the unfunded or overfunded actuarial accrued liability. For this year, amortization bases are created for the actuarial gain during the plan year ending June 30, 2016 and for the assumption changes. This produces a net total amortization charge of \$292,345,113.

Under the current funding policy, the Department's required contribution rate increased as a percentage of pay. This was the result of the assumption changes, the "smoothed" investment return being lower than assumed, offset somewhat by other favorable actuarial experience.

Chart 13 first shows the development of the required Department contribution for the total Plan. Similar information is then shown in Tier 1 and Tier 2 separately.

*The chart compares this valuation's required contribution with the prior valuation.*

### CHART 13 Required Contribution

	Year Beginning July 1			
	2016*		2015	
<b><u>All Tiers Combined (Aggregate)</u></b>	<b>Amount</b>	<b>% of Payroll</b>	<b>Amount</b>	<b>% of Payroll</b>
1. Total normal cost	\$217,276,778	23.39%	\$209,832,859	22.79%
2. Expected employee contributions	<u>-61,249,700</u>	<u>-6.59%</u>	<u>-60,278,794</u>	<u>-6.55%</u>
3. Employer normal cost: (1) + (2)	\$156,027,078	16.80%	\$149,554,065	16.24%
4. Actuarial accrued liability	12,289,229,001		11,218,445,567	
5. Actuarial value of assets	<u>10,344,355,801</u>		<u>9,750,343,300</u>	
6. Unfunded actuarial accrued liability: (4) - (5)	\$1,944,873,200		\$1,468,102,267	
7. Amortization of unfunded actuarial accrued liability	292,345,113	31.47%	229,995,914	24.98%
8. Total required contribution: (3) + (7), adjusted for timing**	<u>464,625,683</u>	<u>50.02%</u>	<u>393,783,103</u>	<u>42.77%</u>
9. Projected compensation	\$928,888,680		\$920,781,074	

\* The July 1, 2016 contribution rates are *before* adjustment to phase-in over two years the contribution rate impact of new actuarial assumptions adopted as recommended in the June 30, 2015 Actuarial Experience Study.

\*\* Required contributions are assumed to be paid at the middle of every year.

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**CHART 13 (continued)  
Required Contribution**

	Year Beginning July 1			
	2016*		2015	
	Amount	% of Payroll	Amount	% of Payroll
<b>Tier 1</b>				
1. Total normal cost	\$195,925,107	24.22%	\$200,872,912	23.23%
2. Expected employee contributions	<u>-49,317,065</u>	<u>-6.10%</u>	<u>-54,727,402</u>	<u>-6.33%</u>
3. Employer normal cost: (1) + (2)	\$146,608,042	18.12%	\$146,145,510	16.90%
4. Actuarial accrued liability	12,254,441,750		11,208,760,084	
5. Amortization of unfunded actuarial accrued liability**	\$254,562,163	31.47%	\$216,028,483	24.98%
6. Total required contribution: (3) + (5), adjusted for timing***	<u>415,712,625</u>	<u>51.40%</u>	<u>375,755,518</u>	<u>43.45%</u>
7. Employer match (110% of (2)), adjusted for timing***	56,215,289	6.95%	62,457,648	7.22%
8. Greater of employer match (7) or total required contribution (6)	<u>\$415,712,625</u>	<u>51.40%</u>	<u>\$375,755,518</u>	<u>43.45%</u>
9. Projected compensation	\$808,838,256		\$864,862,923	

\* The July 1, 2016 contribution rates are before adjustment to phase-in over two years the contribution rate impact of new actuarial assumptions adopted as recommended in the June 30, 2015 Actuarial Experience Study.

\*\* The same UAAL contribution rate is charged to both Tier 1 and Tier 2.

\*\*\* Required contributions are assumed to be paid at the middle of every year.

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**CHART 13 (continued)**

**Required Contribution**

	Year Beginning July 1			
	2016*		2015	
	Amount	% of Payroll	Amount	% of Payroll
<b><u>Tier 2</u></b>				
1. Total normal cost	\$21,351,671	17.79%	\$8,959,947	16.02%
2. Expected employee contributions	<u>-11,932,635</u>	<u>-9.94%</u>	<u>-5,551,392</u>	<u>-9.93%</u>
3. Employer normal cost: (1) + (2)	\$9,419,036	7.85%	\$3,408,555	6.09%
4. Actuarial accrued liability	34,787,251		9,685,483	
5. Amortization of unfunded actuarial accrued liability**	37,782,950	31.47%	13,967,431	24.98%
6. Total required contribution: (3) + (5), adjusted for timing***	<u>48,913,058</u>	<u>40.74%</u>	<u>18,027,585</u>	<u>32.24%</u>
7. Projected compensation	\$120,050,424		\$55,918,151	

\* The July 1, 2016 contribution rates are before adjustment to phase-in over two years the contribution rate impact of new actuarial assumptions adopted as recommended in the June 30, 2015 Actuarial Experience Study.

\*\* The same UAAL contribution rate is charged to both Tier 1 and Tier 2.

\*\*\* Required contributions are assumed to be paid at the middle of every year.

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

The contribution requirements as of July 1, 2016 are based on all of the data described in the previous sections, the actuarial assumptions described in Section 4, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

**Reconciliation of Required Contribution**

The chart below details the changes in the aggregate required contribution from the prior valuation to the current year's valuation.

*The chart reconciles the contribution from the prior valuation to the amount determined in this valuation.*

**CHART 14**

**Reconciliation of Aggregate Required Contribution Rate from July 1, 2015 to July 1, 2016**

<b>Aggregate Required Contribution Rate as of July 1, 2015</b>	42.77%
Effect of actual contributions less than expected contributions	0.21%
Effect of investment loss	0.73%
Effect of gains on individual salary experience	-1.52%
Effect of gains on 2015 COLA experience	-1.18%
Effect of other experience*	-0.25%
Effect of increase in total payroll on UAAL amortization rate	-0.27%
Effect of changes in actuarial assumptions	<u>9.53%</u>
<b>Total change</b>	<u>7.25%</u>
<b>Aggregate Required Contribution Rate as of July 1, 2016**</b>	50.02%

\* Includes effect of differences in actual versus expected experience including mortality, disability, withdrawal and retirement experience. This also reflects the change in aggregate normal cost rate due to new members entering Tier 2.

\*\* The July 1, 2016 contribution rates are before adjustment to phase-in over two years the contribution rate impact of new actuarial assumptions adopted as recommended in the June 30, 2015 Actuarial Experience Study.



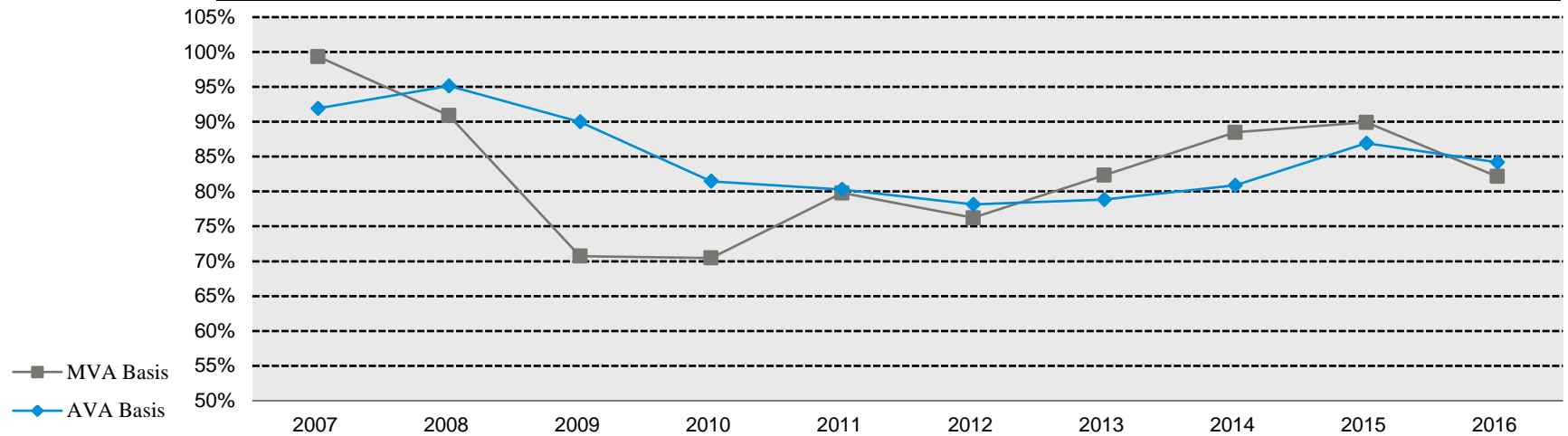
**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**E. FUNDED RATIO**

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the actuarial value of assets and market value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors. The chart below depicts a history of the funded ratio for this plan. Chart 16 on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the valuation or market value of assets is used.

**CHART 15**  
**Funded Ratio for Plan Years Ending June 30, 2007 - 2016**



**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**CHART 16**  
**Schedule of Funding Progress**

<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)</b>	<b>Funded Ratio (AVA basis) (a) / (b)</b>	<b>Covered Payroll (c)</b>	<b>UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)</b>
07/01/2007	\$6,864,084,006	\$7,467,285,349	\$603,201,343	\$91.92%	\$670,372,663	89.98%
07/01/2008	7,247,853,233	7,619,102,935	371,249,702	95.13%	708,731,840	52.38%
07/01/2009	7,248,721,252	8,057,060,950	808,339,698	89.97%	805,137,795	100.40%
07/01/2010	7,244,429,689	8,893,618,433	1,649,188,744	81.46%	856,089,559	192.64%
07/01/2011	7,465,183,643	9,297,204,318	1,832,020,675	80.29%	870,203,423	210.53%
07/01/2012	7,573,885,754	9,692,602,852	2,118,717,098	78.14%	886,539,366	238.99%
07/01/2013	7,958,487,587	10,094,867,871	2,136,380,284	78.84%	900,254,454	237.31%
07/01/2014	8,877,594,529	10,975,550,617	2,097,956,088	80.89%	900,126,274	233.07%
07/01/2015	9,750,343,300	11,218,445,567	1,468,102,267	86.91%	920,781,074	159.44%
07/01/2016	10,344,355,801	12,289,229,001	1,944,873,200	84.17%	928,888,680	209.38%

**SECTION 2: Valuation Results for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**F. VOLATILITY RATIOS**

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the market value of assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measure since it is based on the current level of assets.

For WPERP, the current AVR is about 10.9. This means that a 1% asset gain/(loss) (relative to the assumed investment return) translates to about 10.9% of one-year's payroll. Since WPERP amortizes actuarial gains and losses over a period of 15 years, there would be a 1.2% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities. For example, if a plan is 50% funded on a market value basis, the liability volatility ratio would be double the asset volatility ratio and the plan sponsor should expect contribution volatility to increase over time as the plan becomes better funded.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions.

For WPERP, the current LVR is about 13.2. This is about 21% higher than AVR. Therefore we would expect that contribution volatility will increase over the long-term.

*This chart shows how the asset and liability volatility ratios have varied over time.*

**CHART 17**  
**Volatility Ratios for Years Ended June 30, 2008 – 2016**

Year Ended June 30	Asset Volatility Ratio	Liability Volatility Ratio
2008	9.8	10.8
2009	7.1	10.0
2010	7.3	10.4
2011	8.5	10.7
2012	8.3	10.9
2013	9.2	11.2
2014	10.8	12.2
2015	11.0	12.2
2016	10.9	13.2

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT A**

**Table of Plan Coverage**

**i. Total**

<b>Category</b>	<b>Year Ended July 1</b>		<b>Change From Prior Year</b>
	<b>2016</b>	<b>2015</b>	
<b>Active members in valuation:</b>			
Number	9,348	9,205	1.6%
Average age	48.0	48.9	N/A
Average years of service	16.3	17.6	N/A
Projected total compensation	\$928,888,680	\$920,781,074	0.9%
Projected average compensation	99,368	100,031	-0.7%
Account balances	1,286,644,247	1,316,796,795	-2.3%
<b>Vested terminated members:*</b>			
Number	1,612	1,528	5.5%
Average age	54.2	54.4	N/A
Average account balances	\$60,471	\$63,076	-4.1%
<b>Retired members:</b>			
Number in pay status	7,119	6,709	6.1%
Average age	72.8	73.2	N/A
Average monthly benefit	\$5,385	\$5,212	3.3%
<b>Beneficiaries:</b>			
Number in pay status	2,146	2,134	0.6%
Average age	79.6	79.6	N/A
Average monthly benefit	\$3,122	\$3,005	3.9%

\* Includes terminated members due a refund of contributions and members receiving PTD benefits.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT A**

**Table of Plan Coverage**

**ii. Tier 1**

<b>Category</b>	<b>Year Ended July 1</b>		<b>Change From Prior Year</b>
	<b>2016</b>	<b>2015</b>	
<b>Active members in valuation:</b>			
Number	7,798	8,457	-7.8%
Average age	50.0	49.9	N/A
Average years of service	19.3	19.1	N/A
Projected total compensation	\$808,838,256	\$864,862,923	-6.5%
Projected average compensation	103,724	102,266	1.4%
Account balances	1,275,065,331	1,313,739,243	-2.9%
<b>Vested terminated members:*</b>			
Number	1,477	1,495	-1.2%
Average age	55.1	54.7	N/A
Average account balances	\$65,663	\$64,364	2.0%
<b>Retired members:</b>			
Number in pay status	7,119	6,709	6.1%
Average age	72.8	73.2	N/A
Average monthly benefit	\$5,385	\$5,212	3.3%
<b>Beneficiaries:</b>			
Number in pay status	2,146	2,134	0.6%
Average age	79.6	79.6	N/A
Average monthly benefit	\$3,122	\$3,005	3.9%

\* Includes terminated members due a refund of contributions and members receiving PTD benefits.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT A**

**Table of Plan Coverage**

**iii. Tier 2**

<b>Category</b>	<b>Year Ended July 1</b>		<b>Change From Prior Year</b>
	<b>2016</b>	<b>2015</b>	
<b>Active members in valuation:</b>			
Number	1,550	748	107.2%
Average age	38.4	37.7	N/A
Average years of service	1.2	0.8	N/A
Projected total compensation	\$120,050,424	\$55,918,151	114.7%
Projected average compensation	77,452	74,757	3.6%
Account balances	11,578,916	3,057,552	278.7%
<b>Vested terminated members:*</b>			
Number	135	33	309.1%
Average age	43.9	39.4	N/A
Average account balances	\$3,667	\$4,715	-22.2%
<b>Retired members:</b>			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit	N/A	N/A	N/A
<b>Beneficiaries:</b>			
Number in pay status	0	0	N/A
Average age	N/A	N/A	N/A
Average monthly benefit	N/A	N/A	N/A

\* Includes terminated members due a refund of contributions and members receiving PTD benefits.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT B**

**Members in Active Service as of July 1, 2016  
By Age, Years of Service, and Average Compensation**

**i. Total**

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	83	83	--	--	--	--	--	--	--	--
	\$81,899	\$81,899	--	--	--	--	--	--	--	--
25 - 29	424	372	52	--	--	--	--	--	--	--
	83,239	80,399	\$103,553	--	--	--	--	--	--	--
30 - 34	759	407	251	101	--	--	--	--	--	--
	91,859	79,151	108,295	\$102,224	--	--	--	--	--	--
35 - 39	1,037	327	259	336	114	1	--	--	--	--
	94,968	78,803	100,608	104,279	\$100,733	\$134,387	--	--	--	--
40 - 44	1,129	248	204	326	303	44	4	--	--	--
	95,113	78,634	95,906	101,042	99,483	111,047	\$87,000	--	--	--
45 - 49	1,385	199	174	248	319	211	225	9	--	--
	98,630	80,930	90,830	95,318	95,231	116,747	111,081	\$116,556	--	--
50 - 54	1,949	149	113	198	254	217	634	358	26	--
	105,986	79,910	95,816	93,030	97,429	104,493	115,098	117,675	\$111,218	--
55 - 59	1,504	75	77	154	185	119	403	353	135	3
	106,140	93,384	91,843	92,818	95,640	99,710	106,692	120,869	116,117	\$122,368
60 - 64	775	36	58	80	98	71	183	131	91	27
	100,662	79,734	86,819	88,926	91,247	102,381	106,367	110,811	106,706	\$114,452
65 - 69	235	10	15	25	38	22	51	29	29	16
	102,445	116,746	87,459	93,495	89,960	97,375	109,744	102,025	114,009	114,706
70 & over	68	3	5	8	7	5	17	4	4	15
	92,925	37,151	67,031	77,320	111,428	64,377	93,101	128,731	139,667	99,703
Total	9,348	1,909	1,208	1,476	1,318	690	1,517	884	285	61
	\$99,368	\$80,333	\$98,158	\$98,052	\$96,803	\$107,141	\$110,715	\$117,458	\$112,781	\$111,281

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT B**

**Members in Active Service as of July 1, 2016  
By Age, Years of Service, and Average Compensation**

**ii. Tier 1**

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	12	12	--	--	--	--	--	--	--	--
	\$90,642	\$90,642	--	--	--	--	--	--	--	--
25 - 29	148	96	52	--	--	--	--	--	--	--
	97,970	94,946	\$103,553	--	--	--	--	--	--	--
30 - 34	436	84	251	101	--	--	--	--	--	--
	103,751	92,007	108,295	\$102,224	--	--	--	--	--	--
35 - 39	767	57	259	336	114	1	--	--	--	--
	101,590	91,341	100,608	104,279	\$100,733	\$134,387	--	--	--	--
40 - 44	913	32	204	326	303	44	4	--	--	--
	99,672	97,470	95,906	101,042	99,483	111,047	\$87,000	--	--	--
45 - 49	1,210	24	174	248	319	211	225	9	--	--
	101,344	88,703	90,830	95,318	95,231	116,747	111,081	\$116,556	--	--
50 - 54	1,821	22	113	198	253	217	634	358	26	--
	107,918	88,130	95,816	93,030	97,490	104,493	115,098	117,675	\$111,218	--
55 - 59	1,443	14	77	154	185	119	403	353	135	3
	106,673	92,692	91,843	92,818	95,640	99,710	106,692	120,869	116,117	\$122,368
60 - 64	749	10	58	80	98	71	183	131	91	27
	101,374	78,646	86,819	88,926	91,247	102,381	106,367	110,811	106,706	114,452
65 - 69	231	6	15	25	38	22	51	29	29	16
	102,917	144,452	87,459	93,495	89,960	97,375	109,744	102,025	114,009	114,706
70 & over	68	3	5	8	7	5	17	4	4	15
	92,925	37,151	67,031	77,320	111,428	64,377	93,101	128,731	139,667	99,703
Total	7,798	360	1,208	1,476	1,317	690	1,517	884	285	61
	\$103,724	\$92,741	\$98,158	\$98,052	\$96,814	\$107,141	\$110,715	\$117,458	\$112,781	\$111,281



**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT B**

**Members in Active Service as of July 1, 2016  
By Age, Years of Service, and Average Compensation**

**iii. Tier 2**

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	71	71	--	--	--	--	--	--	--	--
	\$80,421	\$80,421	--	--	--	--	--	--	--	--
25 - 29	276	276	--	--	--	--	--	--	--	--
	75,339	75,339	--	--	--	--	--	--	--	--
30 - 34	323	323	--	--	--	--	--	--	--	--
	75,808	75,808	--	--	--	--	--	--	--	--
35 - 39	270	270	--	--	--	--	--	--	--	--
	76,155	76,155	--	--	--	--	--	--	--	--
40 - 44	216	216	--	--	--	--	--	--	--	--
	75,844	75,844	--	--	--	--	--	--	--	--
45 - 49	175	175	--	--	--	--	--	--	--	--
	79,864	79,864	--	--	--	--	--	--	--	--
50 - 54	128	128	--	--	--	--	--	--	--	--
	78,513	78,513	--	--	--	--	--	--	--	--
55 - 59	61	61	--	--	--	--	--	--	--	--
	93,543	93,543	--	--	--	--	--	--	--	--
60 - 64	26	26	--	--	--	--	--	--	--	--
	80,153	80,153	--	--	--	--	--	--	--	--
65 - 69	4	4	--	--	--	--	--	--	--	--
	75,188	75,188	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
Total	1,550	1,550	--	--	--	--	--	--	--	--
	\$77,452	\$77,452	--	--	--	--	--	--	--	--

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT C**

**Reconciliation of Member Data**

	<b>Active Members</b>	<b>Vested Terminated Members*</b>	<b>Retired Members</b>	<b>Beneficiaries</b>	<b>Total</b>
Number as of July 1, 2015	9,205	1,528	6,709	2,134	19,576
New members	840	N/A	N/A	N/A	840
Terminations – with vested rights	-93	93	N/A	N/A	0
Retirements	-601	-56	657**	N/A	0
Died with beneficiary	-4	-1	-100	105	0
Died without beneficiary	-16	0	-149	-122	-287
Rehire	26	-26	0	0	0
Data adjustments	0	91***	2	29****	122
Contribution refunds	<u>-9</u>	<u>-17</u>	<u>N/A</u>	<u>N/A</u>	<u>-26</u>
Number as of July 1, 2016	9,348	1,612	7,119	2,146	20,225

\* Includes terminated members due a refund of member contributions and members receiving PTD benefits.

\*\* Includes 265 members who retired on April 1, 2016.

\*\*\* Terminated members due a refund of member contributions.

\*\*\*\* New beneficiaries from either death of retired members or divorce settlements.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT D**

**Summary Statement of Income and Expenses on an Actuarial Value Basis**

	Year Ended June 30, 2016	Year Ended June 30, 2015
<b>Net assets at actuarial value at the beginning of the year</b>	\$9,750,343,300	\$8,877,594,529
<b>Contribution income:</b>		
Employer contributions	\$362,359,894	\$376,902,022
Employee contributions	75,068,523	68,552,375
Net administrative expense contributions	<u>791,047</u>	<u>717,370</u>
Net contribution income	438,219,464	446,171,767
<b>Investment income:</b>		
Interest, dividends and other income	\$174,064,797	\$169,965,653
Adjustment toward market value	520,157,840	755,549,754
Less investment fees	<u>-27,936,304</u>	<u>-12,971,493</u>
Net investment income	<u>666,286,333</u>	<u>912,543,914</u>
<b>Total income available for benefits</b>	\$1,104,505,797	\$1,358,715,681
<b>Less benefit payments:</b>		
Retirement benefits paid	-\$505,600,036	-\$480,465,024
Refund of members' contributions	<u>-4,893,260</u>	<u>-5,501,886</u>
Net benefit payments	-\$510,493,296	-\$485,966,910
<b>Change in reserve for future benefits</b>	\$594,012,501	\$872,748,771
<b>Net assets at actuarial value at the end of the year</b>	\$10,344,355,801	\$9,750,343,300

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT E**

**Summary Statement of Plan Assets**

	Year Ended June 30, 2016	Year Ended June 30, 2015
<b>Cash equivalents</b>	\$15,850,378	\$9,688,828
<b>Accounts receivable:</b>		
Accrued investment income	\$24,092,174	\$21,576,304
Open investment trades and others	253,259,363	192,621,249
Securities lending - collateral	617,083,498	551,763,182
Department of Water and Power	<u>48,199,186</u>	<u>50,401,537</u>
Total accounts receivable	942,634,221	816,362,272
<b>Investments:</b>		
Fixed income	\$2,805,273,641	\$1,990,107,215
Equities	5,455,575,817	6,676,919,897
Other assets	<u>1,873,402,257</u>	<u>1,455,695,118</u>
Total investments at market value	<u>10,134,251,715</u>	<u>10,122,722,230</u>
<b>Total assets</b>	\$11,092,736,314	\$10,948,773,330
<b>Less accounts payable:</b>		
Accounts payable	-\$378,258,093	-\$310,152,507
Security lending - collateral	-617,083,498	<u>-551,763,182</u>
Total accounts payable	-\$995,341,591	-\$861,915,689
<b>Net assets at market value</b>	<u>\$10,097,394,723</u>	<u>\$10,086,857,641</u>
<b>Net assets at actuarial value</b>	<u>\$10,344,355,801</u>	<u>\$9,750,343,300</u>

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT F**

**Development of the Fund Through June 30, 2016**

<b>Year Ended June 30</b>	<b>Employer Contributions</b>	<b>Employee Contributions*</b>	<b>Other Contributions</b>	<b>Net Investment Return**</b>	<b>Benefit Payments</b>	<b>Actuarial Value of Assets at End of Year</b>
2007	\$129,154,539	\$47,060,446	\$3,549,724	\$578,442,440	\$341,886,580	\$6,864,084,005
2008	141,862,126	48,694,047	4,195,096	548,429,698	359,411,739	7,247,853,233
2009	145,941,275	59,405,012	4,088,598	159,076,675	367,643,541	7,248,721,252
2010	201,034,807	71,246,053	4,463,141	99,032,966	380,068,530	7,244,429,689
2011	286,699,384	65,965,607	5,672,227	260,934,534	398,517,798	7,465,183,643
2012	321,688,919	60,105,653	5,428,297	137,856,300	416,386,058	7,573,885,754
2013	368,426,348	69,633,449	4,392,846	380,706,555	438,557,365	7,958,487,587
2014	384,265,892	72,299,526	4,872,432	921,266,032	463,596,940	8,877,594,529
2015	376,902,022	68,552,375	717,370	912,543,914	485,966,910	9,750,343,300
2016	362,359,894	75,068,523	791,047	666,286,333	510,493,296	10,344,355,801

\* Includes member normal contributions, Additional Annuity program contributions, contributions due to open contracts for purchased service and member contributions transferred from LACERS.

\*\* Net of investment fees and administrative expenses prior to 2015. Starting in 2015, administrative expenses are included as an offset to "other contributions".

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT G**

**Development of Unfunded Actuarial Accrued Liability for Year Ended June 30, 2016**

1. Unfunded actuarial accrued liability at beginning of year		\$1,468,102,267
2. Normal cost at beginning of year		209,832,859
3. Total expected contributions (employer and employee)		-455,726,198
4. Interest		
(a) For whole year on (1) + (2)	\$125,845,134	
(b) For half year on (3)	<u>-17,089,732</u>	
(c) Total interest		<u>108,755,402</u>
5. Expected unfunded actuarial accrued liability		\$1,330,964,330
6. Changes due to:		
(a) Actual contributions less than expected contributions	\$18,163,236	
(b) Investment loss	62,279,146	
(c) Gains on individual salary experience	-128,958,793	
(d) Gains on 2015 COLA experience	-100,018,035	
(e) Other losses	39,515,655	
(f) Changes in actuarial assumptions	<u>722,927,661</u>	
(g) Total changes		<u>613,908,870</u>
7. Unfunded actuarial accrued liability at end of year		<u>\$1,944,873,200</u>

*Note: The "Net gain from other experience" of \$189,461,173 shown in Section 2, Chart 9 is equal to the sum of items 6(c), 6(d) and 6(e).*

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT H**

**Table of Amortization Bases**

Type*	Date Established	Initial Years	Initial Amount	Annual Payment**	Years Remaining	Outstanding Balance
Combined Base	07/01/2004	15	\$170,392,797	\$18,164,606	3	\$50,893,092
Actuarial Loss	07/01/2005	15	267,915,003	28,476,510	4	102,867,839
Actuarial Loss	07/01/2006	15	183,420,211	19,439,626	5	84,915,824
Actuarial Loss	07/01/2007	15	47,238,833	4,992,598	6	25,326,937
Assumption Changes	07/01/2007	15	-18,102,738	-1,913,250	6	-9,705,719
Actuarial Gain	07/01/2008	15	-204,179,457	-21,520,961	7	-123,314,544
Actuarial Loss	07/01/2009	15	457,336,004	48,077,540	8	304,938,190
Plan Amendments	07/01/2009	15	2,239,982	235,479	8	1,493,557
Actuarial Loss	07/01/2010	15	626,174,290	65,658,959	9	453,957,963
Assumption Changes	07/01/2010	15	255,885,598	26,831,479	9	185,509,542
Actuarial Loss	07/01/2011	15	268,017,929	28,054,569	10	208,908,500
Plan Amendments	07/01/2011	15	-6,948,892	-727,370	10	-5,416,365
Actuarial Loss	07/01/2012	15	380,800,633	39,792,503	11	316,076,966
Actuarial Loss	07/01/2013	15	133,360,391	13,912,875	12	116,954,133
Actuarial Gain	07/01/2014	15	-434,196,395	-45,225,658	13	-399,701,222
Assumption Changes	07/01/2014	15	525,443,921	54,729,950	13	483,699,494
Actuarial Gain	07/01/2015	15	-341,001,627	-35,490,050	14	-327,945,617
Plan Amendments	07/01/2015	15	-144,007,904	-14,987,752	14	-138,494,240
Actuarial Gain	07/01/2016	15	-109,018,791	-11,337,411	15	-109,018,791
Assumption Changes	07/01/2016	15	722,927,661	<u>75,180,871</u>	15	<u>722,927,661</u>
Total				\$292,345,113		\$1,944,873,200

\* The outstanding July 1, 2004 amortization bases were combined into a single amortization base and amortized over 15 years.

\*\* Level dollar amount. The July 1, 2016 outstanding balances were re-amortized by using the new 7.25% interest rate assumption.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT I**

**Section 415 Limitations**

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Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan.

A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets.

In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of \$160,000 indexed for inflation. That limit is \$210,000 for 2016. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions.

Benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m).

Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.

Contribution rates determined in this valuation have not been reduced for the Section 415 limitation. Actual limitations will result in gains when they occur.



**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT J**

**Definitions of Pension Terms**

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The following list defines certain technical terms for the convenience of the reader:

**Assumptions or Actuarial**

**Assumptions:**

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Withdrawal rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

**Normal Cost:**

The amount of contributions required to fund the benefit allocated to the current year of service.

**Actuarial Accrued Liability**

**For Actives:**

The value of all projected benefit payments for current members less the portion that will be paid by future normal costs.

**Actuarial Accrued Liability**

**For Pensioners:**

The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

**Unfunded Actuarial Accrued**

**Liability:**

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Amortization of the Unfunded Actuarial Accrued Liability:**

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

**Investment Return:**

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT K**

**Actuarial Balance Sheet**

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, we first determine the amount and timing of all future payments that will be made by the Plan for current participants. We then discount these payments at the valuation interest rate to the date of the valuation, thereby determining their present value. We refer to this present value as the "liability" of the Plan.

Second, we determine how this liability will be met. These actuarial "assets" include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future Department normal cost contributions, and the present value of future Department amortization payments or credits.

**Actuarial Balance Sheet**

<u>Assets</u>	<u>July 1, 2016</u>	<u>July 1, 2015</u>
1. Total actuarial value of assets	\$10,344,355,801	\$9,750,343,300
2. Present value of future contribution by members	662,202,464	606,397,067
3. Present value of future Department contributions for		
(a) entry age normal cost	1,506,219,599	1,386,650,708
(b) unfunded actuarial accrued liability	1,944,873,200	1,468,102,267
4. Total current and future assets	\$14,457,651,064	\$13,211,493,342
 <u>Liabilities</u>	 <u>July 1, 2016</u>	 <u>July 1, 2015</u>
5. Present value of benefits for retirees and beneficiaries	\$6,841,312,150	\$5,895,471,562
6. Present value of benefits for terminated vested members	209,589,957	200,526,239
7. Present value of benefits for active members	7,406,748,957	7,115,495,541
8. Total liabilities	\$14,457,651,064	\$13,211,493,342

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**EXHIBIT L**

**Reserves and Designated Balances**

	<u>June 30, 2016</u>	<u>June 30, 2015</u>
1. Reserve for retirement allowance for retired members	\$6,609,715,991	\$6,052,694,436
2. Contribution accounts:		
(a) Members	1,495,226,521	1,497,404,562
(b) Department of Water and Power	(1,343,612,617)	(1,189,150,983)
3. General Reserve and Reserve for Investment Gains and Losses*	<u>2,122,012,489</u>	<u>1,974,161,412</u>
4. Total	\$8,883,342,384	\$8,335,109,427

\* *Out of the total General Reserve and Reserve for Investment Gains and Losses, \$100,973,947 and \$100,868,576 are not included as valuation assets as of June 30, 2016 and June 30, 2015, respectively.*

**SECTION 3: Supplemental Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT M  
Adjusted Reserves**

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Each year the Retirement Board adjusts its retired reserves to agree with the value calculated during the valuation. The following table presents the required transfers.

<u>Adjusted Reserves</u>	<u>June 30, 2016</u>	<u>June 30, 2015</u>
1. Retired reserve balance	\$6,609,715,991	\$6,052,694,436
2. Actuarially computed present value	6,841,312,150	5,895,471,562
3. Actuarial gain (loss): (1) – (2)	(231,596,159)	157,222,874
4. Transfer from (to) DWP contribution accounts to (from) retired reserves:	231,596,159	(157,222,874)

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT I**

**Summary of Actuarial Valuation Results**

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The valuation was made with respect to the following data supplied to us:

1. Retired members as of the valuation date (including 2,146 beneficiaries in pay status)	9,265
2. Members inactive during year ended June 30, 2016 with vested rights*	1,612
3. Members active during the year ended June 30, 2016	9,348

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The actuarial factors as of the valuation date are as follows:

1. Normal cost		\$217,276,778
2. Present value of future benefits		14,457,651,064
3. Present value of future normal costs		2,168,422,063
4. Actuarial accrued liability		12,289,229,001
Retired members and beneficiaries	\$6,841,312,150	
Inactive members with vested rights*	209,589,957	
Active members	5,238,326,894	
5. Actuarial value of assets (\$10,097,394,723 at market value as reported by Retirement Office)		10,344,355,801
6. Unfunded actuarial accrued liability		\$1,944,873,200

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\* Includes terminated members due a refund of member contributions and members receiving PTD benefits.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT I (continued)**

**Summary of Actuarial Valuation Results**

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The determination of the aggregate required contribution for all tiers combined is as follows:

	<b>Dollar Amount</b>	<b>% of Payroll</b>
1. Total normal cost	\$217,276,778	23.39%
2. Expected employee contributions	<u>-61,249,700</u>	<u>-6.59%</u>
3. Employer normal cost: (1) + (2)	\$156,027,078	16.80%
4. Amortization of unfunded actuarial accrued liability	<u>292,345,113</u>	<u>31.47%</u>
5. Total required contribution: (3) + (4), adjusted for timing*	<u>\$464,625,683</u>	<u>50.02%</u>
6. Projected compensation	\$928,888,680	

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\* Required contribution is assumed to be paid at the middle of every year. These amounts are before adjustment to phase-in over two years the contribution impact of new actuarial assumptions adopted as recommended in the June 30, 2015 Actuarial Experience Study.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT II**

**Actuarial Assumptions and Methods**

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**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:**

7.50%, 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.



**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Demographic Assumptions:**

**Mortality Rates:**

<i>Pre-retirement:</i>	Head count-weighted RP-2014 Employee Mortality Table times 80%, projected generationally with the two-dimensional MP-2015 projection scale.
<i>After Service Retirement:</i>	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.
<i>After Disability Retirement:</i>	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.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Termination Rates  
Before Retirement:**

Rate (%)		
Male		
Age	Mortality*	Disability
25	.049	0.006
30	.048	0.012
35	.053	0.012
40	.064	0.018
45	.098	0.030
50	.167	0.054
55	.273	0.126
60	.452	0.240
65	.779	0.000
Female		
Age	Mortality*	Disability
25	.017	0.000
30	.022	0.006
35	.029	0.036
40	.039	0.072
45	.058	0.102
50	.100	0.138
55	.168	0.168
60	.241	0.000
65	.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.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Withdrawal Rates:**

<u>Years of Service</u>	<u>Total Withdrawal*</u>
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 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.*

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Retirement Rates:**

Age	Rate (%)			
	Tier 1		Tier 2	
	Under 30 Years of Service	30 or More Years of Service	Under 30 Years of Service	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

#### SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles

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<b>Benefit for Inactive Vested Members:</b>	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.
<b>Definition of Active Members:</b>	First day of biweekly payroll following employment.
<b>Unknown Data for Members:</b>	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
<b>Data Adjustments:</b>	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.
<b>Percent Married/Domestic Partner:</b>	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.
<b>Age of Spouse:</b>	Females are 3 years younger than their spouses.
<b>Future Benefit Accruals:</b>	1.0 year of service per year.
<b>Other Government Service:</b>	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.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**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.

<b><u>Years of Service</u></b>	<b><u>Increase</u></b>
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.

**Actuarial Methods:**

**Actuarial Value of Assets:**

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 and expected returns on a market value basis and is recognized over a five-year period. As directed by the Retirement Office, the actuarial value of assets may be reduced by an amount classified as a non-valuation reserve.

**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, with Normal Cost determined as if the current benefit accrual rate had always been in effect (“replacement life”).

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Amortization Policy:** The July 1, 2004 Unfunded Actuarial Liability is amortized over a fifteen-year period commencing July 1, 2004. Any subsequent change in Surplus or Unfunded Actuarial Accrued Liability are amortized over separate fifteen-year periods. All amortization amounts are determined in equal dollar amounts over the amortization period. The Board may, by resolution, adopt a separate period of not more than thirty years to amortize the change in Surplus or Unfunded Actuarial Accrued Liability resulting from an unusual event, plan amendment or change in assumptions or methods.

**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.

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**Changes in Actuarial Assumptions and Methods:**

Based on the actuarial experience study and review of economic assumptions, the following assumptions were changed. Previously, these assumptions were as follows:

**Economic Assumptions:**

**Net Investment Return:** 7.50%, net of investment expenses.

**Consumer Price Index:** Increase of 3.25% per year; benefit increases due to CPI subject to 3.00% maximum for Tier 1 and 2.00% for Tier 2.

**Demographic Assumptions:**

**Mortality Rates:**

*After Service Retirement and Pre-retirement:*

RP-2000 Combined Healthy Mortality Table with ages set back one year, projected to 2030 with Scale AA.

*After Disability Retirement*

RP-2000 Combined Healthy Mortality Table with ages set back one year, projected to 2030 with Scale AA.

The RP-2000 mortality tables projected with Scale AA to 2020 and adjusted by the applicable set back shown above reasonably reflects the projected mortality experience as of the measurement date. The additional projection to 2030 is a provision for future mortality improvement.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Changes in Actuarial Assumptions and Methods (previous assumptions continued):**

**Termination Rates Before Retirement:**

Age	Rate (%)	
	Mortality*	
	Male	Female
25	0.028	0.013
30	0.036	0.018
35	0.060	0.031
40	0.080	0.041
45	0.094	0.063
50	0.116	0.093
55	0.180	0.191
60	0.367	0.382
65	0.739	0.742

\* 5% of pre-retirement deaths are assumed to be duty related, with the remaining being non-duty related.

**Withdrawal Rates:**

Years of Service	Total Withdrawal*
Less than 1	9.00%
1	4.00%
2	3.50%
3	3.00%
4	2.75%
5	2.50%
6	2.25%
7	2.00%
8	1.75%
9	1.50%
10	1.25%
11 & over	1.00%

\* 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 15 years of service, 100% are assumed to be ordinary withdrawals. For members terminating with more than one year of service (15 years of service for Tier 2), 15% are assumed to be ordinary withdrawals, with the remaining 85% being vested terminations.



**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

**Changes in Actuarial Assumptions and Methods (previous assumptions continued):**

**Retirement Rates:**

Age	Rate (%)			
	Tier 1		Tier 2	
	Under 30 Years of Service	30 or More Years of Service	Under 30 Years of Service	30 or More Years of Service
55	5.0%	25.0%	0.0%	25.0%
56	3.0	18.0	0.0	12.5
57	3.0	15.0	0.0	10.0
58	3.0	15.0	0.0	10.0
59	3.0	15.0	0.0	10.0
60	5.0	20.0	5.0	17.5
61	6.0	15.0	2.5	5.0
62	6.0	15.0	0.0	5.0
63	6.0	25.0	20.0	25.0
64	7.0	20.0	15.0	20.0
65	12.0	25.0	15.0	25.0
66	12.0	25.0	15.0	25.0
67	12.0	25.0	15.0	25.0
68	12.0	25.0	15.0	25.0
69	15.0	25.0	15.0	25.0
70	30.0	30.0	100.0	100.0
71	30.0	30.0	100.0	100.0
72	30.0	30.0	100.0	100.0
73	30.0	30.0	100.0	100.0
74	30.0	30.0	100.0	100.0
75	100.0	100.0	100.0	100.0

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Changes in Actuarial Assumptions and Methods (previous assumptions continued):**

**Benefit for Inactive Vested Members:**

For Tier 1, inactive vested members are assumed to retire at age 60 with a Money Purchase Annuity. Members receiving Permanent Total Disability benefits are assumed to retire at the earlier of age 60 or age 55 with 30 years of service. For Tier 2, inactive vested members are assumed to retire at age 63.

**Other Government Service:**

Tier 1 members are assumed to purchase an additional 0.15 years of service per year. Tier 2 members are assumed to purchase an additional 0.03 years of service per year.

**Salary Increases:**

**Annual Rate of Compensation Increase**

Inflation: 3.25% per year, plus “across the board” salary increases of 0.75% per year, plus the following merit and promotional increases.

<u>Years of Service</u>	<u>Increase</u>
Less than 1	6.00%
1	5.50%
2	5.00%
3	4.00%
4	2.50%
5	1.50%
6	1.10%
7	1.00%
8	0.90%
9	0.80%
10 & over	0.75%

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

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**EXHIBIT III**

**Summary of Plan Provisions**

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This exhibit summarizes the major provisions of the Retirement Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

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**Plan Year:** July 1 through June 30

**Census Date:** March 31

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**Membership Eligibility:**

*Tier 1* All members hired before January 1, 2014.

*Tier 2* All members hired on or after January 1, 2014.

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**Formula Retirement Benefit:**

*Tier 1*

*Age & Service Requirement*

Age 60 with 5 years of Department service; or  
Age 55 with 10 years of Department service in the last 12 years; or  
Any age with 30 years of Department service; or  
Receiving permanent total disability benefits from the Plan.

Note: To be eligible, 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.

*Monthly Amount*

The greater of 2.1% of the Monthly Salary Base or \$9.50 per year of service. For those age 55 or older with 30 or more years of service the factor is 2.3% of the Monthly Salary Base. Benefits are limited to 100% of Monthly Salary Base.

*Monthly Salary Base*

Equivalent of monthly average salary of highest successive 26 biweekly payroll periods (one year).

*Cost of Living Benefit*

Based on CPI subject to a maximum of 3% per year.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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Tier 2

*Age & Service Requirement*

Age 60 with 10 years of Qualifying Service; or  
Age 55 with 30 years of Qualifying Service; or  
Any age with 30 years of Qualifying Service.

*Monthly Amount*

2.0% x Monthly Salary Base x service credit at age 55 with 30 years of Qualifying Service; or  
2.1% x Monthly Salary Base x service credit at age 63 with 30 years of Qualifying Service; or  
2.0% x Monthly Salary Base x service credit at age 63 with 10 years of Qualifying Service; or  
1.5% x Monthly Salary Base x service credit at age 60 with 10 years of Qualifying Service.

*Monthly Salary Base*

Benefits are limited to 80% of Monthly Salary Base.  
Equivalent of monthly average salary of highest successive 78 biweekly payroll periods (three years).

*Cost of Living Benefit*

Based on CPI subject to a maximum of 2% per year.

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**Money Purchase Annuity:**

Tier 1

A monthly lifetime benefit equal in value to the employee normal contribution account plus Department matching contribution (current service contribution) account at retirement date.

Tier 2

Same as Tier 1 (except no Department matching contribution).

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**Minimum Benefit:**

If the money purchase annuity amount exceeds the monthly amount of the formula retirement benefit and the retiree meets the eligibility requirements for the formula retirement benefit, the amount of the money purchase annuity is paid and the cost-of-living and death after retirement continuance features of the formula retirement benefit are also paid.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Early Retirement Reduction Factors:**

Tier 1

The early retirement factor is determined by the attained age on the effective date of retirement. Every three months of attained age will affect the factor.

<b>Attained Age at Actual Retirement</b>	<b>Exact Age</b>	<b>+3 Months</b>	<b>+6 Months</b>	<b>+9 Months</b>
48	.7150	.7225	.7300	.7375
49	.7450	.7525	.7600	.7675
50	.7750	.7825	.7900	.7975
51	.8050	.8125	.8200	.8275
52	.8350	.8425	.8500	.8575
53	.8650	.8725	.8800	.8875
54	.8950	.9025	.9100	.9175
55	.9250	.92875	.9325	.93625
56	.9400	.94375	.9475	.95125
57	.9550	.95875	.9625	.96625
58	.9700	.97375	.9775	.98125
59	.9850	.98875	.9925	.99625
60 & Over	1.0000			

The factor is 1.0000 for those retiring at age 55 or later with at least 30 years of service.

Tier 2

Same as Tier 1 with the exception that only the factors below age 55 are used. These are applied to the age 55 benefit for members who retire before age 55 with 30 or more years of service credit. Service Credit with the Department and with LACERS may be combined for satisfying this requirement.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Member Normal Contributions:**

Tier 1

If an employee became a plan member after May 31, 1984, the member normal contribution rate is 6% of pay.

If an employee became a plan member before June 1, 1984 or transferred from CERS with an entry age contribution rate, sample rates by entry age are as follows:

<u>Entry Age</u>	<u>Rate</u>
20	2.601%
25	3.102%
30	3.611%
35	4.161%
40	4.742%
45	5.381%
50	6.042%
55	6.762%
59	7.332%

Tier 2

Normal contribution rate of 10% of pay.

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**Department Current Service Contributions:**

Tier 1

The Department of Water and Power makes actuarially based contributions that are a minimum of 110% of employee contributions.

Tier 2

Same as Tier 1, except that the minimum contribution equal to 110% of employee contributions is not required.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Disability:**

Tier 1

Disability benefits are paid from the Disability Fund. However, if a member is receiving permanent and total disability benefits, the member may elect to retire. Other than a nominal amount, no service credit during disability is earned for the Formula benefit; however, credit is earned during disability toward the \$9.50 minimum formula.

Tier 2

Same as Tier 1 (except no \$9.50 minimum formula).

**Deferred Retirement Benefit (Vested):**

Tier 1

*Age & Service Requirement*

Age 60 with one year of continuous membership; or  
Age 55 with 10 years of contributing membership in the 12 years prior to separation from service.

*Amount*

Value of employee normal contribution account plus Department matching contribution (called current service contribution) account at retirement date. Does not include cost-of-living and death after retirement continuance features of the formula retirement benefit.

Tier 2

*Age & Service Requirement*

Any age with 15 years of service credit. Service Credit with the Department and with LACERS may be combined for satisfying this requirement.

*Amount*

Formula Retirement Benefit at age 60 or later. Does not include cost-of-living and death after retirement continuance features of the formula retirement benefit.

**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Death Before Retirement:**

Tier 1 and Tier 2

*Age and Service Requirement*

None

*Amount*

Refund of member contributions with interest.

*Age, Service and Type of  
Death Requirement*

Any death of a member who is eligible for service retirement, but who has not yet retired or attained 25 years of service

In lieu of the refund of member contributions with interest, the member's spouse or domestic partner may elect an immediate lifetime monthly allowance. The monthly allowance payable to the surviving spouse or domestic partner is the amount the spouse or domestic partner would have received had the member elected a full joint and survivor allowance.

*Age, Service and Type of  
Death Requirement*

Duty death with 10 years of service, but prior to service retirement eligibility or attainment of 25 years of service.

*Amount*

In lieu of the refund of member contributions with interest, the member's spouse or domestic partner may elect either:

- (a) A deferred lifetime monthly allowance commencing when the member would have been eligible for a service retirement or attained 25 years of service; or
- (b) An immediate lifetime monthly allowance calculated with up to five years added to the member's age or service. This option is only available if the member has attained age 50 or attained 20 years of service.

The monthly allowance payable is the amount the spouse or domestic partner would have received had the member elected a full joint and survivor allowance.

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**Death After Retirement:**

Tier 1 and Tier 2

50% of retiree's unmodified allowance continued to eligible spouse or domestic partner (reduced if difference in ages is greater than five years).



**SECTION 4: Reporting Information for The Water and Power Employees' Retirement Plan of the City of Los Angeles**

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**Withdrawal of Contributions Benefit  
(Ordinary Withdrawal):**

Tier 1 and Tier 2 Refund of employee contributions with interest.

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**Post-retirement  
Cost-of-Living Benefits:**

Tier 1 Future changes based on the Consumer Price Index to a maximum of 3% per year, excess "banked."

Tier 2 Future changes based on the Consumer Price Index to a maximum of 2% per year. Member may purchase additional 1% COLA protection at full actuarial cost.

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**Changes in Plan Provisions:** There have been no changes in plan provisions since the previous actuarial valuation.

**NOTE:** *The summary of major Plan provisions is designed to outline principle Plan benefits as interpreted for purposes of the actuarial valuation. If the Retirement Office should find the Plan summary not in accordance with the actual provisions, the Retirement Office should alert the actuary so they can both be sure the proper provisions are valued.*

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