



**B**ARTEL  
ASSOCIATES, LLC

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**Stanislaus County Employees' Retirement  
Association**

**Actuarial Review of June 30, 2015 Actuarial  
Valuation**

**And**

**July 1, 2012 through June 30, 2015 Experience Study**

February 28, 2017



February 28, 2017

Mr. Rick Santos  
Executive Director  
**Stanislaus County Employees' Retirement Association**  
832 12<sup>th</sup> Street Suite 600  
Modesto, CA 95353

Dear Mr. Santos:

We are pleased to present the results of our review of the Stanislaus County Employees' Retirement Association's (StanCERA's) June 30, 2015 actuarial valuation and July 1, 2012 through June 30, 2015 experience study. The purpose of our review was to verify the reasonableness of the actuarial calculations and recommendations made in those reports. Our report also comments on those calculations, methodologies and recommendations.

We would like to acknowledge the assistance of both StanCERA and Cheiron staff. Cheiron's actuaries provided timely, helpful, and thorough responses to our questions and provided the supporting information we requested.

This review was conducted by the undersigned. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion in this report.

We would be pleased to discuss our review and this report with the Association.

Sincerely,



Mary Elizabeth Redding,  
F.S.A, MAAA, EA, FCA.  
Vice President



Tak Frazita,  
ASA, MAAA, EA  
Associate Actuary

c: John Bartel, Marilyn Oliver, Deanna Van Valer, Bartel Associates, LLC

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# SECTION 1

## EXECUTIVE SUMMARY

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This report has been prepared by Bartel Associates, LLC to present the results of our review of the June 30, 2015 actuarial valuation and the July 1, 2012 through June 30, 2015 experience study of the Stanislaus County Retirement Association (StanCERA) by Cheiron. Our review was based on actuarial reports, census data, and additional information provided by StanCERA and Cheiron, and on discussions with Cheiron staff.

Overall, we believe Cheiron's actuarial work produced for StanCERA is reasonable, appropriate, and accurate, as well as following generally accepted actuarial principles and practices. We believe the experience study and the actuarial methods and assumptions selected based upon it are reasonable and overall comply with Actuarial Standards of Practice. Likewise, we find the census data work and calculation of actuarial liabilities reasonable, appropriate, and in compliance with actuarial standards of practice. Finally, we find the overall determination of the member and employer contribution rates to be reasonable. Our most significant are summarized as:

- On a percentage basis, the largest differences we found were in calculating the liabilities for Tier 3. However, due to the small size of Tier 3, the total dollar AAL difference was less than \$500,000.
- Across all groups, Bartel Associates' calculation of the Actuarial Accrued Liability as of June 30, 2015 is 0.7% larger than Cheiron's. The 2016/17 employer contribution rate that would have resulted from our valuation is 1.7% above, or 0.5% of payroll higher than the rate Cheiron calculated.

We do have several comments and recommendations for Cheiron and StanCERA based upon our review. Those comments are detailed in the following sections.

We would like to again express our thanks to StanCERA and Cheiron staff for their assistance in this project.

\* \* \* \* \*



Mary Elizabeth Redding, FSA, MAAA, EA, FCA  
Vice President



Tak Frazita, ASA, MAAA, EA  
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Vice President



# **PART 1: REVIEW OF ACTUARIAL VALUATION**

## **PURPOSE, SCOPE AND METHODOLOGY**

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### **Purpose of the Actuarial Review**

Bartel Associates, LLC has performed an actuarial review of StanCERA's June 30, 2015 actuarial valuation to provide assurance to the Association that the actuarial calculations, methods, assumptions, and conclusions are reasonable and conform to Actuarial Standards of Practice.

### **Scope of the Actuarial Review**

The scope our review includes the following:

- 1) Conduct an independent review and analysis of the valuation results, including an evaluation of the data used for reasonableness and consistency as well as a review of mathematical calculations for completeness and accuracy.
- 2) Verification that all appropriate benefits have been valued and valued accurately.
- 3) Verification that the data provided by the system is consistent with data used by Cheiron.
- 4) Evaluation of the actuarial cost method and actuarial asset valuation method in use and whether other methods would be more appropriate for StanCERA.
- 5) Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability

### **Methodology**

Our actuarial review process consisted of the following steps:

- 1) Compare the demographics of the 2015 data provided by StanCERA with the valuation data used by Cheiron for the June 30, 2015 actuarial valuation. Review Cheiron's data editing procedures. Process the data in accordance with Bartel Associates' procedures, taking into account additional information provided by Cheiron, and compare the results to Cheiron's valuation data.
- 2) Independently summarize StanCERA's benefit provisions. Using that, develop an actuarial valuation model. Use the actuarial assumptions in Cheiron's report, comparing those to the assumptions recommended in the experience study. Compare the benefit provisions in Cheiron's report to our independent summary.
- 3) Select "sample lives" who are individuals from each benefit tier and member status with a range of pay, service, and gender. Use the valuation model to determine actuarial liabilities for each. Obtain a summary of Cheiron's results for these same individuals. Discuss any discrepancies. Adjust the valuation model as required and appropriate.



## **PART 1: REVIEW OF ACTUARIAL VALUATION PURPOSE, SCOPE AND METHODOLOGY**

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- 4) Run the valuation model with Cheiron's valuation data, compile results by categories and compare to Cheiron's results.
- 5) Review the assets included in the valuation including calculation, allocation, and exclusion of any reserves. Review Cheiron's calculation of the actuarial valuation of assets. Determine whether the methodology is appropriate.
- 6) Review and replicate the calculation of the unfunded actuarial accrued liability and its amortization. Determine whether the methodology is appropriate.
- 7) Review and replicate the calculation of employer contribution rates. Determine whether the methodology is appropriate.
- 8) Review the complete actuarial valuation report for compliance with actuarial standards, clarity, and completeness. Present recommendations for improvement.

The remainder of Part 1 of our report presents the results of each of these steps.

# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: CENSUS DATA

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The exhibit below provides a comparison by membership group and status of key data indicators in Cheiron's valuation data and the StanCERA raw data as processed by Bartel Associates. In general, the data files match very closely, with differences attributable mainly to:

- 1) Additional transfer members included in Cheiron's valuation data. We understand these records have been added by Cheiron in order to properly value benefits for members transferred between General and Safety, or other membership groups. We verified that the service between the two records matches the total reported in StanCERA's data file.
- 2) Annualization of earnings. Cheiron's annualization procedure requires prior year earnings and hours as inputs. Bartel Associates did not have that data and so could not match the annualized earnings for certain employees.

Overall, we believe the census data is reasonable and, as used in the valuation, complies with Actuarial Standards of Practice regarding data quality. In our opinion data is adequate to support the valuation's conclusions.

### **Observations and Recommendations**

- 1) Salaries of new members were annualized to a 2,080 hour basis and used as projected valuation salary for the coming year. For other active members whose fiscal year 2015 pensionable earnings decreased from 2014, 2015 earnings were multiplied by the number of hours worked in FY 2014 and divided by FY 2015 hours. This "annualized" pay was used as projected valuation salary for the coming year. We agree with this methodology, which is slightly conservative. However, for 6 active employees who worked more than 2080 hours in 2014 but not 2015, the process resulted in annualizing 2015 earnings to more than a 2,080 hour basis and using that amount as projected valuation salary. We recommend that the annualization be capped at 2,080 hours.
- 2) We reviewed the data checks performed by Cheiron and find them to be reasonable and to adequately screen for data errors. We did note that in certain areas a number of corrections were required to be applied to StanCERA's data. For example, several new retirees from Terminated Vested status were not added to the retiree file, and for new retirees, the benefit payment amount for July 2015 included retroactive payments. We recommend that StanCERA work with Cheiron to identify ways to improve data reporting and reduce the number of foreseeable data errors.



# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: CENSUS DATA

- 3) We also recommend that StanCERA maintain a record of at least the initial allocation of each retiree’s pension and annuity benefit among classifications and employers. This information is necessary for an accurate valuation.

	StanCERA Data Processed by Bartel Associates			Cheiron Valuation Data			Ratio Bartel/Cheiron		
	General	Safety	Total	General	Safety	Total	General	Safety	Total
<b>Active Participants</b>									
Number	3,421	723	4,144	3,421	723	4,144	100%	100%	100%
Avg. Age	45.47	38.11	44.19	45.45	38.08	44.17	100%	100%	100%
Avg. Service	10.94	10.25	10.82	10.94	10.25	10.82	100%	100%	100%
Avg. Pay (no furloughs)	\$55,396	\$67,962	\$57,587	\$55,116	\$68,004	\$57,364	101%	100%	100%
<b>Service Retired</b>									
Number	2,470	348	2,818	2,472	349	2,821	100%	100%	100%
Avg. Age	69.49	64.57	68.88	69.46	64.57	68.85	100%	100%	100%
Avg. Annual Total Benefit	\$28,344	\$51,730	\$31,232	\$28,315	\$51,627	\$31,199	100%	100%	100%
<b>Beneficiaries</b>									
Number	323	87	410	323	87	410	100%	100%	100%
Avg. Age	72.74	66.70	71.46	72.70	66.66	71.42	100%	100%	100%
Avg. Annual Total Benefit	\$16,700	\$27,721	\$19,039	\$16,700	\$27,721	\$19,039	100%	100%	100%
<b>Duty Disabled</b>									
Number	108	118	226	108	118	226	100%	100%	100%
Avg. Age	67.11	57.86	62.28	67.01	57.88	62.24	100%	100%	100%
Avg. Annual Total Benefit	\$23,941	\$36,607	\$30,554	\$23,941	\$36,607	\$30,554	100%	100%	100%
<b>Ordinary Disabled</b>									
Number	75	7	82	75	7	82	100%	100%	100%
Avg. Age	64.44	57.03	63.81	64.36	57.00	63.73	100%	100%	100%
Avg. Annual Total Benefit	\$15,637	\$22,342	\$16,210	\$15,637	\$22,342	\$16,210	100%	100%	100%
<b>Total in Pay</b>									
Number	2,976	560	3,536	2,978	561	3,539	100%	100%	100%
Avg. Age	69.63	63.39	68.64	69.59	63.39	68.61	100%	100%	100%
Avg. Annual Total Benefit	\$26,600	\$44,446	\$29,426	\$26,577	\$44,395	\$29,402	100%	100%	100%
<b>Term Vested</b>									
Number	391	76	467	393	80	473	99%	95%	99%
Avg. Age	50.12	43.32	49.01	50.07	43.33	48.93	100%	100%	100%
Avg. Service	9.97	10.10	9.99	10.00	10.01	10.00	100%	101%	100%
<b>Transfers</b>									
Number	318	121	439	367	139	506	87%	87%	87%
Avg. Age	47.39	41.63	45.80	46.41	40.61	44.82	102%	103%	102%
Avg. Service	5.70	6.61	5.95	6.30	6.81	6.44	90%	97%	92%
<b>Total Inactives</b>									
Number	709	197	906	760	219	979	93%	90%	93%
Avg. Age	48.90	42.28	47.46	48.31	41.60	46.81	101%	102%	101%
Avg. Service	8.05	7.96	8.03	8.21	7.98	8.16	98%	100%	98%

More detailed comparisons of the census data is provided in Appendix A.

## PART 1: REVIEW OF ACTUARIAL VALUATION

### RESULTS: ACTUARIAL LIABILITIES

Shown below is a comparison of key valuation actuarial liabilities calculated by Bartel Associates compared to those in Cheiron's valuation report. Appendix D provides a more detailed listing of results by Tier and Status. Appendix B provides a comparison of Bartel Associates' and Cheiron's test life results.

(Amounts in \$000's)

	Bartel Associates			Cheiron Valuation Report			Ratio Bartel/Cheiron		
	General	Safety	Total	General	Safety	Total	General	Safety	Total
<b>Present Value of Future Benefits (PVFB)</b>									
Actives	994,208	358,935	1,353,143	979,480	354,297	1,333,777	101.5%	101.3%	101.5%
Terminated									
Vested	78,585	35,664	114,249	78,769	35,664	114,433	99.8%	100.0%	99.8%
Retirees	879,290	250,651	1,129,941	878,481	250,453	1,128,934	100.1%	100.1%	100.1%
Disabled	50,602	73,427	124,029	50,599	73,427	124,026	100.0%	100.0%	100.0%
Beneficiaries	55,495	29,344	84,839	55,499	29,322	84,821	100.0%	100.1%	100.0%
Total	2,058,180	748,021	2,806,201	2,042,828	743,163	2,785,991	100.8%	100.7%	100.7%
<b>Actuarial Accrued Liability (AAL)</b>									
Actives	715,114	238,665	953,779	704,216	235,092	939,308	101.5%	101.5%	101.5%
Terminated									
Vested	78,585	35,664	114,249	78,769	35,664	114,433	99.8%	100.0%	99.8%
Retirees	879,290	250,651	1,129,941	878,481	250,453	1,128,934	100.1%	100.1%	100.1%
Disabled	50,602	73,427	124,029	50,599	73,427	124,026	100.0%	100.0%	100.0%
Beneficiaries	55,495	29,344	84,839	55,499	29,322	84,821	100.0%	100.1%	100.0%
Total	1,779,086	627,751	2,406,837	1,767,564	623,958	2,391,522	100.7%	100.6%	100.6%
<b>Total Normal Cost (TNC)</b>									
Actives	36,095	15,299	51,395	35,629	15,241	50,870	101.3%	100.4%	101.0%

Present Value of Future Benefits (PVFB) is the value today of all projected benefits for each member, taking into account the time value of money (discounting for interest until the time the benefits are projected to be paid) as well as the projected level of benefits, probability of remaining employed, and the expected lifetime of the member and beneficiary. The average ratio is 100.7%. This indicates that overall, there is a good match with Cheiron for both the benefits being projected for active employees and the actuarial assumptions.

Actuarial Accrued Liability (AAL) is the portion of the present value of future benefits deemed earned to date under the selected actuarial cost method, and the total Normal Cost is the portion of the PVFB allocated to the coming year. Under the Entry Age method used in StanCERA's valuation, this allocation is in proportion to the present value of future pay beginning from each member's entry age. For inactive members, PVFB is the same as the AAL. The average AAL ratio is 101.5 % for active members and the average total normal



# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: ACTUARIAL LIABILITIES

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cost ratio is 101.0%. This indicates that overall, there is a good match with Cheiron for present value of future pay, entry age, and valuation methodology.

### **Observations and Recommendations**

While our overall match was good, there are specific areas where we believe benefits are not being correctly valued.

- 1) Tier 3 inactive benefits appear to have been valued including COLA. Tier 3 members are not eligible for COLA. In addition, Tier 3 vested terminated members were valued assuming an unmodified benefit of 60% joint and survivor. The Tier 3 unmodified benefit is a 50% joint and survivor. We recommend this be corrected in the next valuation.
- 2) The Tier 3 benefit is calculated as the benefit percentage multiplied by final average salary and service, less a fraction of the projected Social Security benefit. For benefits beginning before age 65, an early retirement factor (ERF) is applied to the net benefit. (See Stanislaus County Employees Retirement Association Retirement Allowance Procedures, page 20.) Cheiron is applying the ERF only to the formula portion of the benefit and not to the Social Security offset portion. This reduces the projected benefit. We recommend that this be corrected in the next valuation.
- 3) Bartel Associates' liabilities calculated for Tier 4 are higher than Cheiron's, with the difference larger than for the other Tiers. In reviewing the sample life, Cheiron told us that they apply the 100% of pay limitation using pay without including vacation pay cash-out. In our coding, we expect that if vacation cash-out is included for purposes of the benefit calculation it should also be included in the pay used to apply the 100% of pay limitation.

Since the average General Tier 4 member is age 61 with 35 years of service, the 100% of pay limitation is projected by the valuation to apply to most members. This explains the roughly 3% difference in Tier 4 General liabilities.

We note that benefits for Tier 5 members are the same as for Tier 4. As Tier 5 members are in general younger and with less service than Tier 4, the issue described above will have less impact on the total actuarial liabilities. However, we expect that it contributes to our liabilities being about 1.5% higher than Cheiron's for Tier 5.

# **PART 1: REVIEW OF ACTUARIAL VALUATION**

## **RESULTS: ACTUARIAL LIABILITIES**

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### **Conclusion**

We believe our total results are within an acceptable range of Cheiron's indicating that the significant liabilities are reasonably valued.



# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: VALUE OF ASSETS

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### **Actuarial Value of Assets**

Bartel Associates verified the market value (MVA) of assets, change in market value for the year, and Special (Non-valuation) Reserves against the fiduciary net position, changes in fiduciary net position, and reserves reported in StanCERA's 2015 CAFR. We have replicated Cheiron's calculation of the actuarial value of assets.

The actuarial value of assets (AVA) methodology used in the valuation recognizes investment returns above and below the assumed rate of return over five year periods. The resulting actuarial value is limited to be within 20% of the market value. This method is intended to smooth asset volatility in order to lower the volatility in employer contribution rates.

### **Observations and Recommendations**

#### **Asset smoothing method**

We find the actuarial asset value methodology to be reasonable. The 5-year asset smoothing period is the most common method used by public plans.

The methodology, in our opinion, meets Actuarial Standard of Practice No. 44 since:

- 1) The AVA falls into a reasonable range around the MVA
- 2) Differences between the AVA and MVA are recognized over a reasonable period of time
- 3) The method is not biased – it is not expected to produce AVA values over or under the MVA
- 4) Realized and unrealized gains and losses are treated identically.

The methodology used also meets the "Model Practice" definition in the California Actuarial Advisory Panel's publication "Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model" ("CAAP.") The "model practice" lists, for example, a 5-year smoothing with a 50%/150% corridor around market value, or 10 year smoothing and a 70%/130% corridor.

As discussed in the CAAP publication, market value corridors can remove the asset smoothing effect in severe market downturns as during 2008/2009, resulting in accelerated

## **PART 1: REVIEW OF ACTUARIAL VALUATION**

### **RESULTS: VALUE OF ASSETS**

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contribution increases. We recommend that the Board consider in advance the actions it might take with regard to asset smoothing if another severe market downturn occurs.

#### **Asset allocation**

As part of the actuarial valuation, the actuary allocates assets between the County and the City of Ceres (includes the other special districts). The allocation is made by first removing assets equal to the value of benefits for all inactive members. The remaining actuarial value of assets is allocated in proportion to the actuarial accrued liability (AAL) for active members in each group. This results in the active member liabilities for each group being the same percentage funded.

This method is much simpler and more transparent than attempting to create bookkeeping accounts for each group and tracking the assets, contributions, benefit payments and expenses attributable to each. However, if in the future a change should be made that impacts the liability of only one group, this method would result in the cost of that change being spread among all groups. We recommend that the Board consider any change to the asset allocation method that might be made in advance of such a change occurring.

We note the report does not appear to contain a description of the allocation of assets or unfunded actuarial accrued liability between the general and safety classifications of either group. We recommend that this be included in future reports.

# **PART 1: REVIEW OF ACTUARIAL VALUATION**

## **RESULTS: EMPLOYER CONTRIBUTION RATES**

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### **Amortization Method for Unfunded Actuarial Accrued Liability (UAAL)**

StanCERA's policy regarding amortization of the unfunded actuarial accrued liability (UAAL) is limited only by the 1937 Act's requirement that it be funded over not more than 30 years. StanCERA's adopted policy is to amortize the UAAL as a level percentage of payroll over a fixed period of 21 years from June 30, 2015.

The CAAP's publication "Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model" provides a detailed discussion of amortization policies and expresses a preference for:

- 1) Level percentage of pay amortization
  - a. Meets the general policy goal of being a reasonable allocation of the cost of benefits to years of service
  - b. Mirrors the percentage of pay cost allocation inherent in the Entry Age cost method.
- 2) Multiple fixed amortization layers
  - a. Track UAAL components by source, increasing transparency
  - b. Avoids the "reset" needed by a single fixed period amortization policy (such as StanCERA's) when the single amortization period becomes too short to provide contribution stability.
- 3) Amortization periods of 15-20 years for actuarial gains and losses, to avoid negative amortization.

### **Observations and Recommendations**

Under StanCERA's current actuarial assumptions (7.25% discount rate and 3.25% payroll growth) an amortization period of 21 years produces "negative amortization" meaning that the amortization payment is less than interest in the UAAL. Thus the UAAL will actually increase during the year, even if all actuarial assumptions are met and the required contributions are paid. Negative amortization will continue for two years, until the amortization period declines to 19 years. At that point the amortization payment will be slightly larger than interest on the UAAL. In subsequent years more and more of the UAAL principal will be paid each year and the balance is expected to decline, if all assumptions are met.

## **PART 1: REVIEW OF ACTUARIAL VALUATION**

### **RESULTS: EMPLOYER CONTRIBUTION RATES**

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As the amortization period declines, any unexpected decreases or increases on the UAAL will have increasingly larger impacts on the contribution rate. Two options to alleviate this are:

- 1) Freeze the amortization period at a point where sufficient smoothing provided
- 2) Create new UAAL layers for changes to the UAAL and amortize them each over a fixed period.

We recommend that the Board discuss these options over the next few years so that a policy can be established in advance.

#### **Determination of Contribution Rates**

Overall, we have verified that Cheiron's calculations of the total UAAL and the total employer and member Normal Cost contribution rates as a percentage of payroll are reasonable and calculated accurately, reflecting the results of the actuarial valuation. We also verified that the 3-year phase-in of the effect of change in actuarial assumptions was correctly computed.

We note Cheiron's report does not contain a description of the allocation of assets or unfunded actuarial accrued liability between the General and Safety classifications of either group. A description of the allocation of administrative expense between groups is also not provided. Cheiron provided the following description of the allocation methods. Note that the UAAL and administrative expenses are allocated using different methods, which also differ from the method used to allocate UAAL between County and non-County employers.

- 1) After splitting the unfunded actuarial accrued liability between County/Former County and City of Ceres and Other Districts, the UAAL is allocated between General and Safety on the basis of the total actuarial accrued liability (AAL).
- 2) Administrative expenses are allocated among the groups on the basis of the total non-expense projected contribution for the year: the normal cost and UAAL contribution rates multiplied by projected payroll.

We recommend a description of the allocation method and a break-down of the actuarial liabilities and payroll into the categories needed to replicate the allocation be included in future reports.

We assume that the employer contribution rates determined in the actuarial valuation are intended to apply only to pensionable earnings, in particular, to the earnings of Tier 6





# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: EMPLOYER CONTRIBUTION RATES

employees only up to the PEPRA limits. We recommend this be specifically stated in the report.

The following chart compares the employer contribution rates we calculated for each group, including reallocation of UAAL, as compared to Cheiron's results. Please see Appendix C for additional detail of the contribution calculation.

### Conclusion

In our opinion, the resulting employer contribution rates are sufficiently close for us to conclude that the employer contribution rates developed in the actuarial valuation report are reasonable.

<b>Bartel Associates</b>					
	<b>General</b>		<b>Safety</b>		<b>Total</b>
	<b>County</b>	<b>Ceres</b>	<b>County</b>	<b>Ceres</b>	
Total Normal Cost	19.81%	20.98%	31.81%	33.45%	22.39%
Member Contribution Rate	9.17%	8.91%	13.46%	13.10%	10.04%
Employer Normal Cost Rate	10.64%	12.07%	18.35%	20.35%	12.35%
UAL Amortization	16.75%	17.34%	23.39%	21.46%	18.09%
Administrative Expense Rate	0.86%	0.93%	1.32%	1.32%	0.96%
Net Employer Contribution Rate	28.25%	30.34%	43.06%	43.13%	31.40%

<b>Cheiron Valuation Report</b>					
	<b>General</b>		<b>Safety</b>		<b>Total</b>
	<b>County</b>	<b>Ceres</b>	<b>County</b>	<b>Ceres</b>	
Total Normal Cost	19.56%	20.78%	31.71%	33.16%	22.17%
Member Contribution Rate	9.06%	8.93%	13.29%	12.88%	9.92%
Employer Normal Cost Rate	10.50%	11.85%	18.42%	20.28%	12.24%
UAL Amortization	16.34%	17.02%	22.82%	21.16%	17.66%
Administrative Expense Rate	0.86%	0.93%	1.33%	1.33%	0.96%
Net Employer Contribution Rate	27.70%	29.80%	42.57%	42.77%	30.86%

<b>Ratio Bartel/Cheiron</b>					
	<b>General</b>		<b>Safety</b>		<b>Total</b>
	<b>County</b>	<b>Ceres</b>	<b>County</b>	<b>Ceres</b>	
Total Normal Cost	101.3%	100.9%	100.3%	100.9%	101.0%
Member Contribution Rate	101.2%	99.8%	101.2%	101.7%	101.2%
Employer Normal Cost Rate	101.3%	101.9%	99.6%	100.3%	100.9%
UAL Amortization	102.5%	101.8%	102.5%	101.4%	102.4%
Administrative Expense Rate	100.3%	100.1%	99.4%	99.1%	100.0%
Net Employer Contribution Rate	102.0%	101.8%	101.2%	100.8%	101.7%



## **PART 1: REVIEW OF ACTUARIAL VALUATION RESULTS: GASBS 67 AND 68 METHODOLOGY**

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We have performed a high-level review of the GASBS 67/68 Report as of June 30, 2015 as prepared by Cheiron. We reviewed the following:

- 1) Total pension liability as of the June 30, 2015 measurement date to match the June 30, 2014 amount from 2014 actuarial valuation and to review the roll-forward to June 30, 2015
- 2) Market value of assets for agreement with those reported in the June 30, 2015 actuarial valuation reports
- 3) Calculation of the collective pension expense, deferred inflows and outflows of revenue
- 4) Reasonability of the method used to allocate amounts among the cost-sharing employers.
- 5) Calculation of the employer-specific deferred inflows and outflows of resources to the cost-sharing employers.

### **Comments**

In general we believe the amounts in Cheiron's report are calculated accurately and in accordance with our understanding of the requirements of GASB Statements 67 and 68. We have two comments.

- 1) Cheiron stated that they did not perform the cash flow projection described in paragraph 41 of Statement 67, and instead relied on professional judgment as a sufficiently reliable alternate method. We agree with Cheiron's conclusion that this plan is very unlikely to "fail" the GASBS 67 cash flow test. However, we do not believe "professional judgment" meets the GASB's requirements of an acceptable alternative method.
- 2) The proportionate share used to allocate amounts including net pension liability among the cost-sharing employers is based on the amortization payment required from each employer. GASBS 67 requires that the determination of proportionate shares reflect the future contribution effort of each employer. The method used by Cheiron reflects only a portion of the future contribution effort that will be required by each employer – funding of the UAAL – but it does not consider the ongoing normal cost payments.

Since GASB Statements 67 and 68 are accounting and not actuarial standards, your auditors are ultimately responsible for determining whether or not this report complies with those accounting standards.



# PART 1: REVIEW OF ACTUARIAL VALUATION

## RESULTS: REVIEW OF ACTUARIAL VALUATION REPORT

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We reviewed the actuarial valuation report for compliance with the Actuarial Standards of Practice, as well for other information that might be missing or unclear to the reader. The following are our comments.

- 1) As previously discussed, the report should state the allocation method for UAAL and administrative expenses and provide the detail needed to replicate the calculation.
- 2) The service retirement rate for Safety employees aged 44-47 with over 20 years of service is listed as 10% in both the actuarial valuation report and Appendix A, proposed assumptions, in the experience study. However, the rate on the ProVal file provided to us was 5% for that age range. In addition, inspection of the expected number of retirements presented on page 20 of the experience study indicates that the actual rate was intended to be 5%. Cheiron should correct this in their next report.
- 3) The valuation report does not discuss what form of benefit participants are assumed to elect or whether this has any effect on the valuation. We recommend adding this in the next valuation.
- 4) The following comments relate to the Summary of Plan Provisions
  - a. In general, since the benefit summary is necessarily a summary, it would be helpful to cite the applicable Code sections.
  - b. PEPRA compensation is described as limited to the Social Security Wage Base. The limits are similar but not the same (\$117,200 for PEPRA in 2015 vs. \$118,500 for the SSWB).
  - c. The Summary describes categories of service that may be purchased, but the actuarial valuation and the assumptions used do not indicate to what extent service purchases impact the results.
  - d. Membership date is not shown in the tables describing each Tier of benefits. It would be helpful to know the criteria for eligibility in each Tier. In addition, Tier 2 is described as being open. We recommend adding that it is only open to reciprocal, non-PEPRA hires.
  - e. The age factors shown in Table 2 are incorrect for Safety 2% @ 50. The correct rate for age 50 is missing and the subsequent factors are off one year.
  - f. The report should contain more detail on Tier 3 benefits, particularly the early retirement factor and its application.
  - g. The report should contain more detail on the PEPRA benefit formulas. Particularly, the Safety PEPRA benefit formula should be noted as three PEPRA formulas are available.

**PART 1: REVIEW OF ACTUARIAL VALUATION**  
**RESULTS: REVIEW OF ACTUARIAL VALUATION REPORT**

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- 5) We also recommend expanding the description of the basis for member contribution rates, particularly Social Security integration and the basis for COLA rates.
- 6) For clarity, we recommend the report specify that PEPRA member contribution rates are based on half of the Normal Cost including both the basic benefit and the Cost of Living benefit.
- 7) The report does not list the actuarial assumptions that were changed from the previous valuation. We believe this would be helpful to the user.

## **PART 2: REVIEW OF MEMBER CONTRIBUTION RATES PURPOSE, SCOPE & METHODOLOGY**

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### **Purpose of the Actuarial Review**

Bartel Associates has performed an actuarial review of the member contribution rates calculated in connection with StanCERA's June 30, 2015 actuarial valuation to provide assurance to the Association that the actuarial calculations are accurate and the methods and assumptions are reasonable.

### **Scope of the Actuarial Review**

The scope our review includes the following:

- 1) Independently replicate the basic member contributions for each Tier.
- 2) Independently replicate the COLA rates for each Tier.
- 3) Determine whether the rates are calculated in accordance with the requirements of the appropriate section of the CERL and whether they use the appropriate actuarial assumptions and methodology.

### **Methodology**

Our actuarial review process consisted of the following steps:

- 1) Basic member contribution rates for each Tier were calculated in Excel spreadsheets following the appropriate sections of the CERL and using the assumptions described in Cheiron's actuarial valuation report.
- 2) COLA contribution rates were determined following Cheiron's methodology through use of the actuarial valuation model. The present value of the COLA was determined and divided by the present value of future pays for individuals at each possible entry age in each applicable tier.

The following section presents the results of each of these steps.

## PART 2: REVIEW OF MEMBER CONTRIBUTION RATES

### RESULTS

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#### **Basic Member Rates**

We were able to match the basic member contribution rates calculated by Cheiron exactly.

#### **Comments and Conclusion**

We have several comments on the calculations, as follows.

- 1) The actuarial valuation report states that member contribution rates are calculated assuming, among other things, an average salary increase of 3.25% per year. The actual calculation used the actuarial valuation's assumed salary increases of 3.25% plus service-based longevity and promotion increases. We recommend this be described in the next valuation report.
- 2) The actuarial valuation includes a "load" for accumulated vacation time. This means that member benefits except for Tier 6 are increased 3% (Safety) or 3.5% (General) for vacation time cashed out at retirement. The following comments relate to the application of this load.
  - a. The vacation load is generally applied to the projected retirement benefit. However, the load is not applied to members hired at the oldest two years in each schedule.
  - b. For Tier 2, which uses 3-year average pay, 1/3 of the load is applied to the projected benefit. However, this is not consistent with the valuation assumptions which state the load is applied to the projected benefit with no difference by Tier mentioned. It is also not consistent with the derivation of that assumption in the Experience Study: the load was derived by dividing vacation pay by final average earnings. If this methodology is meant to reflect vacation cash-outs equal to the load amount increasing the final year's salary, we note that there is a slight difference between increasing the final year's pay by the load percentage and increasing the final average salary by 1/3 of the load percentage.
  - c. Most significantly, the methodology used creates an inconsistency between the salary used in calculating the benefit and that assumed to be the basis for member contributions. We assume that the vacation time converted becomes pensionable pay and as such member contributions must be paid with respect to that amount. In determining member contribution rates, the present value of projected benefits is divided by the present value of pay that is subject to the

## **PART 2: REVIEW OF MEMBER CONTRIBUTION RATES**

### **RESULTS**

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member contributions (for example, pay after 30 years of service is excluded.) Cheiron's calculation of the present value of pay is not adjusted to include any vacation time. Therefore the member contribution rates calculated are spreading the cost of benefits including vacation time over pay that excludes vacation time. If all assumptions are met, the benefit will be fully paid before member contributions are applied to the vacation pay, and member contributions on vacation pay will result in more than the value of the benefit being funded.

- d. While the impacts of these items are relatively small, we recommend Cheiron discuss this methodology with StanCERA before new member rates are determined.

#### **Member COLA Rates**

Unlike basic member contribution rates, the COLA rates are meant to finance one half of the actual cost of the COLA. Cheiron's methodology is to calculate the contribution rate based upon the present value of benefits and the present value of future salaries (modified to limit payments to 30 years) as determined by the actuarial valuation model for a hypothetical employee at each entry age in each Tier, except Tiers 3 and 6.

Under this methodology, if all actuarial assumptions are exactly met, during the period from Entry Age until retirement, each active employee will fund one half the value of the lifetime retiree COLA they will receive.

#### **Comments**

Bartel Associates was able to exactly replicate Cheiron's calculations upon consulting with Cheiron. Cheiron applied no service eligibility requirement for deferred terminated benefits for the purpose of calculating member COLA contribution rates. We recommend this be reviewed since 5 years of Credited Service are required for participants to retire with deferred vested benefits.

COLA Member contribution rates calculated using the 5 year service requirement are about 0.1% of pay higher for General Tier 2 and General Tier 5, less than .05% higher for Safety Tier 2 and generally less than .03% higher for Safety Tier 5.

## PART 2: REVIEW OF MEMBER CONTRIBUTION RATES RESULTS

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The following chart compares Bartel Associates' calculation of Member contribution rates for General Tier 5 members at three entry ages. The COLA rates shown reflect the application of the 5-year eligibility requirement for deferred vested benefits.

Entry Age	Bartel Associates				Cheiron Valuation Report				Ratio Bartel/Cheiron			
	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350	Basic First \$350	Basic Over \$350	COL First \$350	COL Over \$350
20	4.09%	6.14%	1.27%	1.91%	4.09%	6.14%	1.21%	1.81%	100.0%	100.0%	105.0%	105.5%
40	5.55%	8.32%	1.97%	2.97%	5.55%	8.32%	1.93%	2.89%	100.0%	100.0%	102.1%	102.8%
54	6.55%	9.83%	2.06%	3.08%	6.55%	9.83%	2.03%	3.05%	100.0%	100.0%	101.5%	101.0%

### Overall Conclusion

We believe the member contribution rates determined by Cheiron are reasonable.





## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY PURPOSE, SCOPE & METHODOLOGY**

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### **Purpose of the Actuarial Review**

Bartel Associates has performed an actuarial review of StanCERA's July 1, 2012 through June 30, 2015 triennial experience study to provide assurance to the Association that the actuarial calculations, methods, considerations and analysis are reasonable and conform to Actuarial Standards of Practice.

### **Scope of the Actuarial Review**

The scope our review includes the following:

- 1) Evaluation of the available data for the performance of such experience study, the degree to which such data is sufficient to support the conclusions of the study, and the use and appropriateness of any assumptions made regarding such data.
- 2) Evaluation of recommended economic and non-economic assumptions as presented in the experience study report.
- 3) Independent reproduction of the experience study without relying on Cheiron's work.
- 4) Evaluation of the study results and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and adjustments.

### **Methodology**

Bartel Associates performed the following steps in connection with our review of the actuarial experience study.

- 1) We performed stochastic modeling to evaluate Cheiron's determination of the expected rate of return on assets and also to evaluate the discount rate we would recommend based on Bartel Associates' usual capital market assumptions.
- 2) Based on the historical data files provided by Cheiron, we replicated the demographic experience study and compared our replication to Cheiron's results.
- 3) For other assumptions, we reviewed Cheiron's report and used professional judgment to evaluate the methodologies, evaluation of data, and conclusions drawn.

## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**

### **RESULTS: ECONOMIC ASSUMPTIONS**

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The economic assumptions included in Cheiron's 7/1/2012 to 6/30/2015 actuarial experience study were:

- 1) Price inflation
- 2) COLA Growth
- 3) Across-the Board Pay Increases
- 4) Discount rate

#### **Price Inflation:**

In addition to providing a basis for valuing the System's Tier 1, 2, 4, 5 and 6 COLA increases, this assumption is a building block used in the construction of the Across-the Board Pay Increase and Discount Rate assumptions.

StanCERA's newly adopted assumption at the time of the experience study was 3.00%. We agree that this is a reasonable long-term assumption in view of factors such as historic experience (30-year average of 2.7%, 50-year average of 4.1%) and Social Security's long-term intermediate assumption of 2.6%. However there is clearly a trend towards lower inflation rates as evidenced by the trend of average rates of inflation in the last two current business cycles as shown below (per the 2016 social Security Trustee's Report).

Period	Average Rate of Inflation
1989-2000	2.96%
2000-2007	2.65%
2007-2015	1.68%

Taking into account the Federal Reserve's policy of inflation containment, it appears likely that at the next experience study a further reduction in the price inflation assumption should be considered.

#### **COLA Growth**

Cheiron used statistical simulations to estimate future COLA increases for participants of all Tiers other than Tier 3. Based on these simulations, they recommended a 2.7% increase assumption to project future COLA increases. We consider this a reasonable assumption taking into account considering that projected COLA bank balances will not always be sufficient to raise COLA increases to 3% in years when the increase in the CPI is below the 3% cap.

## PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY

### RESULTS: ECONOMIC ASSUMPTIONS

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#### **Across-the Board Pay Increases (Wage Inflation)**

This assumption is generally based on the assumed inflation rate plus a component for pay increases in excess of inflation (i.e. increases in real wages). The assumption is used to project future payrolls for amortization of the Unfunded Actuarial Accrued Liability and is also used as a building block in determining future active member pay increases. The assumption recommended in the Cheiron report was the price inflation rate increased by 0.25%. Though somewhat on the low side in comparison to historic nationwide experience, this assumption falls within the reasonability range.

#### **Discount Rate**

This assumption is dependent on the assumed rate of inflation and the “real” rate of return on the various asset investment classes in the StanCERA fund. The assumption most recently adopted by the Board and recommended by Cheiron is 7.25% (which may be separated into a 3.00% inflation rate and a real rate of return for the portfolio of 4.25%).

Cheiron simulated returns for the StanCERA portfolio based on VERUS 10-year capital market assumptions and also based on a survey of investment consultant’s 20-year capital market assumptions conducted by Horizon. We independently ran those simulations and agreed within a small margin of the results. Cheiron median return results are shown below:

	VERUS	Horizon	StanCERA
Inflation Assumption	2.10%	2.29%	3.00%
Real Rate of Return	<u>4.03%</u>	<u>5.03%</u>	<u>4.25%</u>
Median Discount Rate	6.13%	7.32%	7.25%

In addition we used our current capital market real rate of return assumptions, which are based on those of an average of four outside investment advisors, and StanCERA’s 3.00% inflation assumption to generate median results (50% confidence that assumption will be met) and also 45% and 55% confidence results as illustrated below:

**PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**  
**RESULTS: ECONOMIC ASSUMPTIONS**

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	45% Confidence	50% Confidence	55% Confidence
Real Rate of Return	4.92%	4.63%	4.29%
Investment Expenses	<u>-0.30%</u>	<u>-0.30%</u>	<u>-0.30%</u>
Net Real Rate of Return	4.62%	4.33%	3.99%
Inflation Assumption	<u>3.00%</u>	<u>3.00%</u>	<u>3.00%</u>
Discount Rate	7.62%	7.33%	6.99%
<b>Discount Rate rounded</b>	<b>7.50%</b>	<b>7.25%</b>	<b>7.00%</b>

The results confirm that the 7.25% is a reasonable assumption, but also that it contains only a small margin for conservatism. Taking into account the small margin and that there is a trend towards reductions in capital market assumptions among a number of investment consultants, we agree with Cheiron that it is likely that the discount rate will need to be reduced further in the future.

**Excess Earnings Policy**

We reviewed StanCERA's excess earnings policy and based on the system's funded level and the provisions of the policy it does not appear to be significant at this time. However we did not estimate potential costs of the policy and would recommend that its significance be reviewed by the system's actuary in the next valuation.

## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**

### **RESULTS: DEMOGRAPHIC ASSUMPTIONS**

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Actuarial Standard of Practice #35, “Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations” defines a reasonable assumption as one that:

- 1) Is appropriate for the purpose of the measurement;
- 2) Reflects the actuary’s professional judgment;
- 3) Takes into account historical and current demographic data that is relevant as of the measurement date;
- 4) Reflects the actuary’s estimate of future experience; and
- 5) Has no significant bias (i.e., it is not significantly optimistic or pessimistic).

The Standard also notes that, due to the inherent uncertainties in trying to predict the future, there is a range of possible reasonable assumptions and different actuaries may select different reasonable assumptions.

Our analysis focused on whether we believe the selected assumptions are reasonable and adequately supported by the data. However, we have several recommendations for improvements in subsequent studies.

Cheiron analyzed certain assumptions using aggregate data; Bartel Associates does not have data available to replicate these calculations. These assumptions include: active member mortality, reciprocity, retirement age for vested terminated members, and cashing out of unused vacation. Bartel Associates has reviewed the methodology and conclusions for these assumptions.

The demographic assumptions reviewed by Cheiron with recommended assumptions supported by detailed analysis of the past 3 years data are retiree mortality, termination, and disability and service retirement and merit salary increases. For these, Bartel Associates replicated the experience study performed by Cheiron. In general, our results are very close to Cheiron’s although there are a few discrepancies we expect are due to records for transferred individuals.

# PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY

## RESULTS: DEMOGRAPHIC ASSUMPTIONS

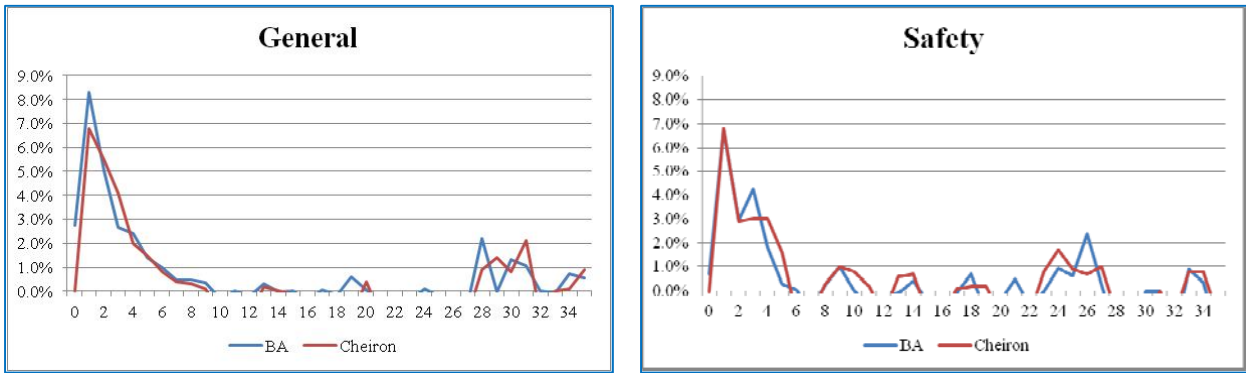
### Conclusion

Overall, we believe Cheiron's calculations are accurate and produced conclusions and recommended actuarial assumptions that are appropriate, supported by the data, and reasonable.

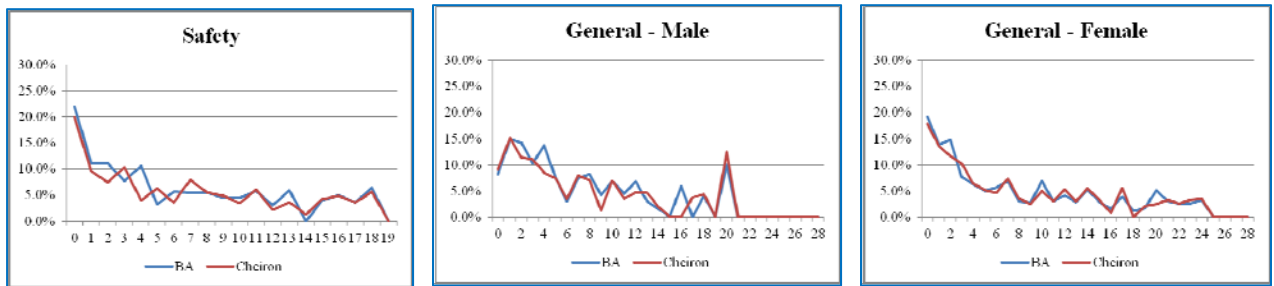
### Comments

Following are selected charts showing a comparison of the raw rates produced by our studies.

Salary – Merit and longevity, comparison of raw annual increases for each year of service.



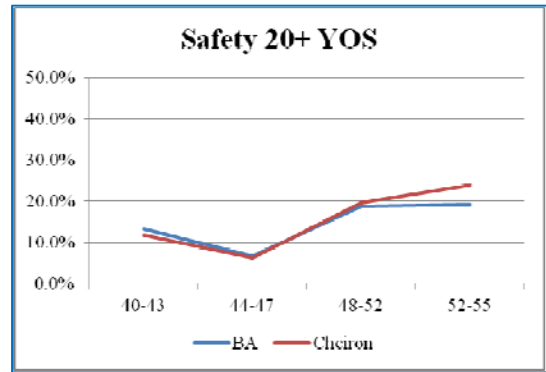
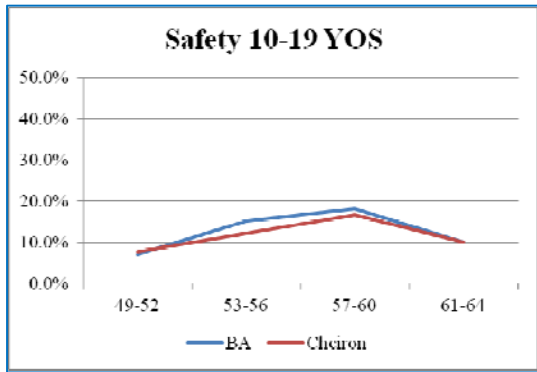
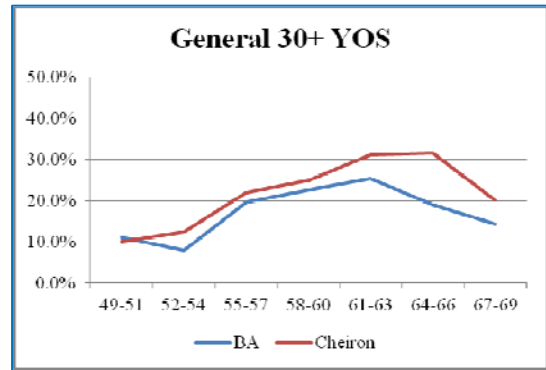
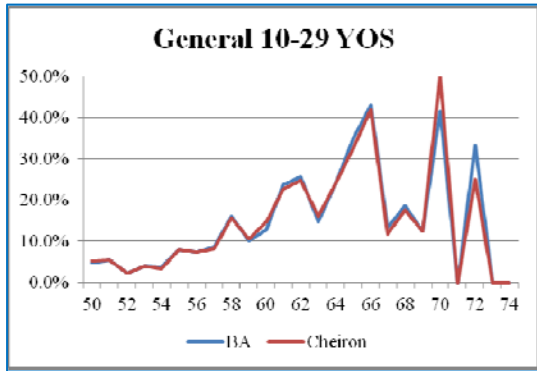
Termination of employment – comparison of raw annual increases for each year of service.



# PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY

## RESULTS: DEMOGRAPHIC ASSUMPTIONS

Service Retirement. We note the discrepancies apparent at later ages in the tables for members with longer years of service are due to the limited number of exposures at those ages, so that a difference in categorization of one member can have a visible impact on the rates.



### Data Analysis

Cheiron has followed standard industry methodology by finding “A/E” ratios for each contingency. The number of occurrences actually (“A”) found in the data is divided by the number expected (“E”) or predicted by the assumptions. Ratios near 100% indicate the assumptions may be working well. However, this calculation considers only the total number of occurrences and not how they are distributed by age or service. That timing is very important to the liabilities produced by the valuation. Cheiron has added a second measure to their analysis: r-squared. This factor measures how similar two curves are. An r-squared of 1.0 means the curves are identical. We believe this adds an important element to the assumption selection. By selecting assumptions with r-squared closer to 1.0 and a better

## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**

### **RESULTS: DEMOGRAPHIC ASSUMPTIONS**

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A/E ratio, the Association can be comfortable that the new assumptions are a better fit to the data than the previous assumptions.

Following are our comments on some of the specific calculations and assumptions selected.

#### **Merit pay increases**

The merit salary increase rates calculated by Bartel Associates are somewhat higher than those calculated by Cheiron. This may be because we are not using the same aggregate average pay offset.

Cheiron's report states that rates of merit salary increase were calculated by subtracting the increase in the aggregate average wages for members with over 20 years of service from the actual increase. It would be helpful if the average aggregate pay increases were documented in the report, as well as the actual pay increases observed.

The resulting recommended merit increase rates average about 0% for employees with about 10 years of service and later. We expect that result based on the methodology used. Cheiron has recommended using a merit increase rate of ½% after 10 years of service. If one gives full weight to the observed data, this creates a bias toward the valuation projecting higher salaries and hence higher liabilities than are truly expected. Alternatively, it could be viewed as adding an element of conservatism to the recommended rates. We recommend Cheiron comment on their reason for selecting the minimum ½%.

Our results closely matched Cheiron's. We note an observable "bump" in merit pay at about 25 years of service for Safety employees and about 30 years for General. We expect this relates to a longevity increase. If that is the case, and that pay practice is expected to continue, we recommend considering an adjustment to the merit increase rates at 25 and 30 years to reflect this.

#### **Disability**

We note that the actual number of disablements experienced during the 6-year period encompassed by the last two experience studies is quite small: 15 service-related disablements for Safety members and 5 for General members, and 3 total non-service-related disabilities. Due to lack of experience, Cheiron has recommended using the tables CalPERS



## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**

### **RESULTS: DEMOGRAPHIC ASSUMPTIONS**

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has developed for non-service-related disability based on a much larger pool of data. We concur with this recommendation.

The source of the current disablement rates for service-related disablements is not discussed in the report. We recommend that be disclosed. In the next experience study, we would recommend including 9 years of disablement experience, both to provide more data points and to monitor experience for any trends.

#### **Post-retirement Mortality**

We concur with Cheiron's methodology, weighting the calculations by benefit amount and also adjusting the calculated rates for credibility. However, we note that the resulting A/E ratios are below Cheiron's 90% target for male retirees. The report says they are comfortable with this ratio since "the use of generational mortality assumptions will automatically result in mortality rates that decrease over time." We strongly believe generational mortality rates are meant to reflect future improvements in mortality, improvements that will be seen in future experience studies. Their purpose is not to gradually improve valuation mortality rates until they match the currently observed data.

#### **Service Retirement**

Cheiron's experience study recommends service retirement rates that differ for General and Safety classifications, and are also different for Safety and General employees over 20 and 30 years of service, respectively. We note that experience studies for other public agencies have documented retirement behavior that differs depending on benefit levels. Cheiron has not provided any evidence to show whether StanCERA's experience differs by benefit formula, or is similar enough to be grouped by classification.

Additionally, while no data exists yet for retirement experience among employees with the PEPRA benefit formula, most California retirement systems expect PEPRA members to delay their retirements due to the lower benefit levels provided. In addition to affecting the valuation results, Tier 6 retirement rates would impact the member contribution rates calculated for that Tier. We recommend Cheiron document their rationale or supporting data for use of retirement rates that do not differ by tier.

## **PART 3: REVIEW OF ACTUARIAL EXPERIENCE STUDY**

### **RESULTS: DEMOGRAPHIC ASSUMPTIONS**

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#### **Vacation Cash-out**

The data provided by Cheiron compares the average pay cashed out at retirement and the average final average pay for each retiring member. We would like to see this calculation documented separately for the tiers with 12-month and 36-month average pay benefit formulas. For example, we understand that the amount of vacation time that can be cashed out in any year is limited. It is possible that members with 36-month final average pay formulas choose to cash out vacation in each of their final 3 years rather than only in the final year.

We would expect to see a difference in the amount of vacation time cashed out depending on a member's service. Cheiron should be requested to provide this analysis.

Also, it appears that there is a disconnect between the way this factor was calculated in the experience study and its application in the valuation. Based on the description in the experience study, we expect that, on average, the vacation time cashed out at retirement is sufficient to increase the 36-month final average earnings by 3.5% for General members and 3.0% for Safety, resulting in a 3.5% or 3.0% increase in the member's benefit. However, in the actuarial valuation, that load is applied only to the final year's pay, meaning that the 36-month final average pay, and so the member's benefit, is increased by only 1/3 of the load amount.

#### **Unused Sick Leave**

We also note the plan provides that unused sick leave may be converted to service credit at retirement. We believe this option should be analyzed to determine whether its impact is significant enough to require a separate assumption.

# APPENDIX A

## MEMBERSHIP DETAIL

	StanCERA Data Processed by Bartel Associates									
	COUNTY									
	General						Safety			
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA	
<b>Active Participants</b>										
Number	1	247	17	36	2,227	769	2	480	161	
Avg. Age	56.28	38.77	53.30	61.05	48.97	36.52	59.41	41.31	28.32	
Avg. Service	16.76	4.09	17.75	34.73	14.61	1.12	26.57	13.16	1.08	
Avg. Pay (no furloughs)	\$37,398	\$50,953	\$49,585	\$74,420	\$60,229	\$40,958	\$83,543	\$71,361	\$58,082	
<b>Term Vested</b>										
Number	17	66	22	1	272	-	-	64	-	
Avg. Age	62.25	55.99	54.93	65.69	47.39	n/a	n/a	43.26	n/a	
Avg. Service	10.71	8.85	12.15	5.55	10.03	n/a	n/a	10.07	n/a	
<b>Transfers</b>										
Number	4	117	5	2	162	9	1	99	4	
Avg. Age	61.45	48.58	51.68	58.14	46.60	38.13	66.80	41.24	38.28	
Avg. Service	10.81	2.50	7.20	14.32	7.66	0.86	6.08	6.73	0.85	
<b>Total Inactives</b>										
Number	21	183	27	3	434	9	1	163	4	
Avg. Age	62.10	51.26	54.33	60.66	47.09	38.13	66.80	42.03	38.28	
Avg. Service	10.73	4.79	11.24	11.41	9.15	0.86	6.08	8.04	0.85	
	CERES									
	General						Safety			
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA	
<b>Active Participants</b>										
Number	-	4	-	2	90	28	-	72	8	
Avg. Age	n/a	44.00	n/a	61.31	48.40	37.30	n/a	38.95	30.13	
Avg. Service	n/a	9.56	n/a	41.13	14.66	1.14	n/a	11.96	0.68	
Avg. Pay (no furloughs)	n/a	\$48,811	n/a	\$62,454	\$68,685	\$42,926	n/a	\$84,530	\$58,082	
<b>Term Vested</b>										
Number	1	4	-	-	8	-	-	12	-	
Avg. Age	61.17	55.15	n/a	n/a	49.78	n/a	n/a	43.62	n/a	
Avg. Service	5.32	7.59	n/a	n/a	11.75	n/a	n/a	10.28	n/a	
<b>Transfers</b>										
Number	-	5	-	-	14	-	-	17	-	
Avg. Age	n/a	50.22	n/a	n/a	44.49	n/a	n/a	43.20	n/a	
Avg. Service	n/a	2.19	n/a	n/a	10.78	n/a	n/a	7.33	n/a	
<b>Total Inactives</b>										
Number	1	9	-	-	22	-	-	29	-	
Avg. Age	61.17	52.41	n/a	n/a	46.41	n/a	n/a	43.37	n/a	
Avg. Service	5.32	4.59	n/a	n/a	11.13	n/a	n/a	8.55	n/a	



## APPENDIX A

### MEMBERSHIP DETAIL

	Cherion Valuation Data								
	COUNTY								
	General						Safety		
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA
<b>Active Participants</b>									
Number	1	247	17	36	2,227	769	2	480	161
Avg. Age	56.00	38.73	53.24	61.00	48.95	36.49	59.50	41.27	28.32
Avg. Service	16.76	4.09	17.75	34.73	14.61	1.12	26.57	13.16	1.08
Avg. Pay (no furloughs)	\$37,398	\$50,552	\$49,340	\$74,329	\$59,919	\$40,768	\$83,543	\$71,433	\$50,826
<b>Term Vested</b>									
Number	17	66	22	1	274	-	-	68	-
Avg. Age	62.24	55.95	54.77	66.00	47.35	n/a	n/a	43.25	n/a
Avg. Service	10.47	8.85	12.15	5.55	10.09	n/a	n/a	9.96	n/a
<b>Transfers</b>									
Number	4	118	13	2	193	12	1	114	6
Avg. Age	61.75	48.61	50.54	58.00	45.49	35.08	67.00	40.27	34.67
Avg. Service	10.81	2.49	15.86	14.33	7.89	1.04	6.08	6.97	1.17
<b>Total Inactives</b>									
Number	21	184	35	3	467	12	1	182	6
Avg. Age	62.14	51.24	53.20	60.67	46.58	35.08	67.00	41.38	34.67
Avg. Service	10.53	4.77	13.53	11.41	9.18	1.04	6.08	8.09	1.17
	CERES								
	General						Safety		
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA
<b>Active Participants</b>									
Number	-	4	-	2	90	28	-	72	8
Avg. Age	n/a	44.00	n/a	61.00	48.40	37.32	n/a	38.89	30.25
Avg. Service	n/a	9.56	n/a	41.13	14.66	1.14	n/a	11.96	0.68
Avg. Pay (no furloughs)	n/a	\$48,436	n/a	\$62,454	\$68,978	\$42,695	n/a	\$84,047	\$59,711
<b>Term Vested</b>									
Number	1	4	-	-	8	-	-	12	-
Avg. Age	61.00	55.25	n/a	n/a	49.88	n/a	n/a	43.75	n/a
Avg. Service	5.32	7.59	n/a	n/a	11.75	n/a	n/a	10.28	n/a
<b>Transfers</b>									
Number	-	5	-	-	19	1	-	18	-
Avg. Age	n/a	50.00	n/a	n/a	41.79	33.00	n/a	43.28	n/a
Avg. Service	n/a	2.19	n/a	n/a	10.16	0.55	n/a	7.70	n/a
<b>Total Inactives</b>									
Number	1	9	-	-	27	1	-	30	-
Avg. Age	61.00	52.33	n/a	n/a	44.19	33.00	n/a	43.47	n/a
Avg. Service	5.32	4.59	n/a	n/a	10.63	0.55	n/a	8.73	n/a

# APPENDIX A

## MEMBERSHIP DETAIL

	Ratio Bartel/Cheiron								
	COUNTY								
	General						Safety		
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA
<b>Active Participants</b>									
Number	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Age	101%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Service	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Pay (no furloughs)	100%	101%	100%	100%	101%	100%	100%	100%	114%
<b>Term Vested</b>									
Number	100%	100%	100%	100%	99%	100%	100%	94%	100%
Avg. Age	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Service	102%	100%	100%	100%	99%	100%	100%	101%	100%
<b>Transfers</b>									
Number	100%	99%	38%	100%	84%	75%	100%	87%	67%
Avg. Age	100%	100%	102%	100%	102%	109%	100%	102%	110%
Avg. Service	100%	101%	45%	100%	97%	83%	100%	97%	73%
<b>Total Inactives</b>									
Number	100%	99%	77%	100%	93%	75%	100%	90%	67%
Avg. Age	100%	100%	102%	100%	101%	109%	100%	102%	110%
Avg. Service	102%	100%	83%	100%	100%	83%	100%	99%	73%
	CERES								
	General						Safety		
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	Tiers 1 & 4	Tiers 2 & 5	PEPRA
<b>Active Participants</b>									
Number	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Age	100%	100%	100%	101%	100%	100%	100%	100%	100%
Avg. Service	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Pay (no furloughs)	100%	101%	100%	100%	100%	101%	100%	101%	97%
<b>Term Vested</b>									
Number	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Age	100%	100%	100%	100%	100%	100%	100%	100%	100%
Avg. Service	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Transfers</b>									
Number	100%	100%	100%	100%	74%	0%	100%	94%	100%
Avg. Age	100%	100%	100%	100%	106%	100%	100%	100%	100%
Avg. Service	100%	100%	100%	100%	106%	100%	100%	95%	100%
<b>Total Inactives</b>									
Number	100%	100%	100%	100%	81%	0%	100%	97%	100%
Avg. Age	100%	100%	100%	100%	105%	100%	100%	100%	100%
Avg. Service	100%	100%	100%	100%	105%	100%	100%	98%	100%



# APPENDIX A

## MEMBERSHIP DETAIL

### Age & Service Distribution of Active Members by Count as of June 30, 2015 General Members (County)

StanCERA Data Processed by Bartel Associates													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	26	9	-	-	-	-	-	-	-	-	-	-	35
25-29	94	66	26	23	2	14	1	-	-	-	-	-	226
30-34	80	76	49	43	4	95	20	-	-	-	-	-	367
35-39	72	47	31	31	-	135	115	29	-	-	-	-	460
40-44	42	42	19	21	9	109	125	79	11	-	-	-	457
45-49	29	20	14	17	6	94	105	121	49	11	-	-	466
50-54	32	22	14	6	3	71	97	121	68	54	7	-	495
55-59	10	9	10	10	2	60	103	94	57	45	16	8	424
60-64	3	6	1	7	3	50	60	56	38	28	7	16	275
65-69	1	-	2	-	-	13	26	15	13	8	3	3	84
70+	-	-	-	-	-	1	3	3	1	-	-	-	8
<b>Total Count</b>	<b>389</b>	<b>297</b>	<b>166</b>	<b>158</b>	<b>29</b>	<b>642</b>	<b>655</b>	<b>518</b>	<b>237</b>	<b>146</b>	<b>33</b>	<b>27</b>	<b>3,297</b>
Cheiron Valuation Data													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	26	9	-	-	-	-	-	-	-	-	-	-	35
25-29	96	64	26	23	3	13	1	-	-	-	-	-	226
30-34	80	77	48	43	6	93	20	-	-	-	-	-	367
35-39	75	48	31	32	-	136	115	28	-	-	-	-	465
40-44	42	40	19	21	10	111	122	78	11	-	-	-	454
45-49	28	21	14	17	6	95	106	119	49	11	-	-	466
50-54	32	22	14	6	3	72	97	122	68	54	7	-	497
55-59	10	9	10	10	2	63	103	94	55	44	16	8	424
60-64	3	6	1	7	3	48	59	57	38	28	7	16	273
65-69	1	-	2	-	-	13	26	14	13	8	2	3	82
70+	-	-	-	-	-	1	3	3	1	-	-	-	8
<b>Total Count</b>	<b>393</b>	<b>296</b>	<b>165</b>	<b>159</b>	<b>33</b>	<b>645</b>	<b>652</b>	<b>515</b>	<b>235</b>	<b>145</b>	<b>32</b>	<b>27</b>	<b>3,297</b>
Ratio Bartel/Cheiron													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	98%	103%	100%	100%	67%	108%	100%	100%	100%	100%	100%	100%	100%
30-34	100%	99%	102%	100%	67%	102%	100%	100%	100%	100%	100%	100%	100%
35-39	96%	98%	100%	97%	100%	99%	100%	104%	100%	100%	100%	100%	99%
40-44	100%	105%	100%	100%	90%	98%	102%	101%	100%	100%	100%	100%	101%
45-49	104%	95%	100%	100%	100%	99%	99%	102%	100%	100%	100%	100%	100%
50-54	100%	100%	100%	100%	100%	99%	100%	99%	100%	100%	100%	100%	100%
55-59	100%	100%	100%	100%	100%	95%	100%	100%	104%	102%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	104%	102%	98%	100%	100%	100%	100%	101%
65-69	100%	100%	100%	100%	100%	100%	100%	107%	100%	100%	150%	100%	102%
70+	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Total Count</b>	<b>99%</b>	<b>100%</b>	<b>101%</b>	<b>99%</b>	<b>88%</b>	<b>100%</b>	<b>100%</b>	<b>101%</b>	<b>101%</b>	<b>101%</b>	<b>103%</b>	<b>100%</b>	<b>100%</b>



# APPENDIX A

## MEMBERSHIP DETAIL

### Age & Service Distribution of Active Members by Count as of June 30, 2015 General Members (Ceres)

StanCERA Data Processed by Bartel Associates													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	2	2	-	-	-	-	-	-	-	-	-	-	4
25-29	5	1	1	-	-	-	-	-	-	-	-	-	7
30-34	2	1	3	4	-	4	-	-	-	-	-	-	14
35-39	1	2	1	-	-	2	7	1	-	-	-	-	14
40-44	1	-	-	2	-	5	5	1	1	-	-	-	15
45-49	2	-	1	-	-	5	4	2	1	2	-	-	17
50-54	1	-	-	-	2	4	3	4	3	2	-	1	20
55-59	1	1	-	-	-	3	3	5	2	2	-	-	17
60-64	-	2	1	-	-	1	1	-	2	1	2	-	10
65-69	-	-	-	-	-	3	1	-	-	-	-	1	5
70+	-	-	-	-	-	1	-	-	-	-	-	-	1
<b>Total Count</b>	<b>15</b>	<b>9</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>28</b>	<b>24</b>	<b>13</b>	<b>9</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>124</b>
Cheiron Valuation Data													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	2	2	-	-	-	-	-	-	-	-	-	-	4
25-29	5	1	1	-	-	-	-	-	-	-	-	-	7
30-34	2	1	3	4	-	4	-	-	-	-	-	-	14
35-39	1	2	1	-	-	2	7	1	-	-	-	-	14
40-44	1	-	-	2	-	5	5	1	1	-	-	-	15
45-49	2	-	1	-	-	5	4	2	1	2	-	-	17
50-54	1	-	-	-	2	4	3	4	3	2	-	1	20
55-59	1	1	-	-	-	4	3	4	2	2	-	-	17
60-64	-	2	1	-	-	1	1	-	2	1	2	-	10
65-69	-	-	-	-	-	3	1	-	-	-	-	1	5
70+	-	-	-	-	-	1	-	-	-	-	-	-	1
<b>Total Count</b>	<b>15</b>	<b>9</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>29</b>	<b>24</b>	<b>12</b>	<b>9</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>124</b>
Ratio Bartel/Cheiron													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
30-34	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
35-39	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
40-44	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
45-49	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
50-54	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
55-59	100%	100%	100%	100%	100%	75%	100%	125%	100%	100%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
65-69	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
70+	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Total Count</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>97%</b>	<b>100%</b>	<b>108%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



# APPENDIX A

## MEMBERSHIP DETAIL

### Age & Service Distribution of Active Members by Count as of June 30, 2015 Safety Members (County)

StanCERA Data Processed by Bartel Associates													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	24	8	5	-	-	-	-	-	-	-	-	-	37
25-29	36	27	21	10	-	6	-	-	-	-	-	-	100
30-34	18	6	8	10	1	62	17	-	-	-	-	-	122
35-39	7	5	6	1	-	24	56	9	-	-	-	-	108
40-44	2	1	-	1	-	20	31	45	8	-	-	-	108
45-49	-	-	1	-	1	5	18	30	26	4	-	-	85
50-54	2	1	2	-	-	6	10	7	15	8	-	-	51
55-59	-	-	2	-	-	3	7	1	3	3	1	1	21
60-64	-	-	-	-	-	2	1	5	1	-	-	-	9
65-69	-	-	1	-	-	1	-	-	-	-	-	-	2
70+	-	-	-	-	-	-	-	-	-	-	-	-	0
<b>Total Count</b>	<b>89</b>	<b>48</b>	<b>46</b>	<b>22</b>	<b>2</b>	<b>129</b>	<b>140</b>	<b>97</b>	<b>53</b>	<b>15</b>	<b>1</b>	<b>1</b>	<b>643</b>
Cheiron Valuation Data													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	24	8	5	-	-	-	-	-	-	-	-	-	37
25-29	39	25	20	10	-	6	-	-	-	-	-	-	100
30-34	18	6	8	12	2	60	16	-	-	-	-	-	122
35-39	7	6	7	1	1	21	57	11	-	-	-	-	111
40-44	2	1	-	1	-	21	29	43	8	-	-	-	105
45-49	1	-	1	-	1	5	18	30	26	4	-	-	86
50-54	2	1	2	-	-	6	9	7	15	8	-	-	50
55-59	-	-	2	-	-	3	7	1	3	3	1	1	21
60-64	-	-	-	-	-	2	1	5	1	-	-	-	9
65-69	-	-	1	-	-	1	-	-	-	-	-	-	2
70+	-	-	-	-	-	-	-	-	-	-	-	-	0
<b>Total Count</b>	<b>93</b>	<b>47</b>	<b>46</b>	<b>24</b>	<b>4</b>	<b>125</b>	<b>137</b>	<b>97</b>	<b>53</b>	<b>15</b>	<b>1</b>	<b>1</b>	<b>643</b>
Ratio Bartel/Cheiron													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	92%	108%	105%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
30-34	100%	100%	100%	83%	50%	103%	106%	100%	100%	100%	100%	100%	100%
35-39	100%	83%	86%	100%	0%	114%	98%	82%	100%	100%	100%	100%	97%
40-44	100%	100%	100%	100%	100%	95%	107%	105%	100%	100%	100%	100%	103%
45-49	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
50-54	100%	100%	100%	100%	100%	100%	111%	100%	100%	100%	100%	100%	102%
55-59	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
65-69	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
70+	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Total Count</b>	<b>96%</b>	<b>102%</b>	<b>100%</b>	<b>92%</b>	<b>50%</b>	<b>103%</b>	<b>102%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>





# APPENDIX A

## MEMBERSHIP DETAIL

### Age & Service Distribution of Active Members by Count as of June 30, 2015 Safety Members (Ceres)

StanCERA Data Processed by Bartel Associates													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	2	-	1	-	-	-	-	-	-	-	-	-	3
25-29	2	2	3	1	-	2	-	-	-	-	-	-	10
30-34	1	1	2	-	1	9	4	-	-	-	-	-	18
35-39	-	-	-	-	-	5	3	4	-	-	-	-	12
40-44	1	-	-	1	-	4	6	5	1	-	-	-	18
45-49	1	-	-	-	-	2	2	3	3	1	-	-	12
50-54	1	-	-	-	-	-	-	2	1	-	-	-	4
55-59	-	-	-	-	-	-	-	-	-	1	1	-	2
60-64	-	-	-	-	-	1	-	-	-	-	-	-	1
65-69	-	-	-	-	-	-	-	-	-	-	-	-	0
70+	-	-	-	-	-	-	-	-	-	-	-	-	0
<b>Total Count</b>	<b>8</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>23</b>	<b>15</b>	<b>14</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>80</b>
Cheiron Valuation Data													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	0
20-24	2	-	1	-	-	-	-	-	-	-	-	-	3
25-29	2	2	3	1	-	2	-	-	-	-	-	-	10
30-34	1	1	2	-	2	9	3	-	-	-	-	-	18
35-39	-	-	-	-	1	5	2	4	-	-	-	-	12
40-44	1	-	-	1	-	4	6	5	1	-	-	-	18
45-49	1	-	-	-	-	2	2	3	3	1	-	-	12
50-54	1	-	-	-	-	-	-	2	1	-	-	-	4
55-59	-	-	-	-	-	-	-	-	-	1	1	-	2
60-64	-	-	-	-	-	1	-	-	-	-	-	-	1
65-69	-	-	-	-	-	-	-	-	-	-	-	-	0
70+	-	-	-	-	-	-	-	-	-	-	-	-	0
<b>Total Count</b>	<b>8</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>23</b>	<b>13</b>	<b>14</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>80</b>
Ratio Bartel/Cheiron													
Age	Years of Service												Total
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
30-34	100%	100%	100%	100%	50%	100%	133%	100%	100%	100%	100%	100%	100%
35-39	100%	100%	100%	100%	0%	100%	150%	100%	100%	100%	100%	100%	100%
40-44	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
45-49	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
50-54	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
55-59	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
65-69	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
70+	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Total Count</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>33%</b>	<b>100%</b>	<b>115%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



## APPENDIX B

### DETAIL OF SAMPLE LIVES

Sample	Status	General/ Safety	Tier	Bartel Associates			Cheiron Valuation Report			Ratio Bartel/Cheiron			Comments
				Present Value of Future Benefits	Actuarial Liability	Valuation Pay	Present Value of Future Benefits	Actuarial Liability	Valuation Pay	Present Value of Future Benefits	Actuarial Liability	Valuation Pay	
1	Active	General	3	23,379	15,133	34,230	9,635	6,026	34,230	242.6%	251.1%	100.0%	Cheiron did not apply ERF to Social Security offset Cheiron's benefits limited by FAP without vacation load
2			4	585,764	570,676	40,948	566,012	551,902	40,948	103.5%	103.4%	100.0%	
3			5	587,902	391,059	97,856	585,129	391,642	97,856	100.5%	99.9%	100.0%	
4			6	148,014	17,415	105,061	144,318	17,280	105,061	102.6%	100.8%	100.0%	
5		Safety	5	367,825	108,359	68,098	362,708	107,485	68,098	101.4%	100.8%	100.0%	
6	Disability	General	1	860,196	860,196	-	860,196	860,196	-	100.0%	100.0%	n/a	
7			2	173,636	173,636	-	173,636	173,636	-	100.0%	100.0%	n/a	
8	Service Retirement	General	5	650,602	650,602	-	650,602	650,602	-	100.0%	100.0%	n/a	
9			4	592,063	592,063	-	592,063	592,063	-	100.0%	100.0%	n/a	
10		Safety	5	430,381	430,381	-	430,381	430,381	-	100.0%	100.0%	n/a	
11	Terminated	General	3	13,459	13,459	-	17,901	17,901	-	75.2%	75.2%	n/a	Cheiron applied COLA and 60% survivor continuance
12			5	25,941	25,941	-	25,941	25,941	-	100.0%	100.0%	n/a	
13			5	443,049	443,049	-	443,049	443,049	-	100.0%	100.0%	n/a	
14			5	99,326	99,326	-	99,326	99,326	-	100.0%	100.0%	n/a	
15		Safety	2	441,488	441,488	-	441,488	441,488	-	100.0%	100.0%	n/a	
16			5	159,288	159,288	-	159,288	159,288	-	100.0%	100.0%	n/a	
17			5	287,394	287,394	-	287,394	287,394	-	100.0%	100.0%	n/a	

# APPENDIX C

## DETAIL OF UAAL ALLOCATION

(Amounts in \$000's)

<b>Bartel Associates</b>							
	<b>County</b>			<b>Ceres</b>			<b>Total</b>
	<b>General</b>	<b>Safety</b>	<b>Total</b>	<b>General</b>	<b>Safety</b>	<b>Total</b>	
Actuarial Value of Assets							1,763,629
Accumulated Employee Contributions			183,725			12,349	196,074
Inactive Actuarial Liability							1,453,058
Net Assets for Distribution							114,497
Active Actuarial Liability			893,220			60,559	953,779
Allocation of Remaining Assets			93.65%			6.35%	100.00%
Remaining Assets			107,227			7,270	114,497
Total Assets			290,952			19,619	310,571
Active Funded Ratio			32.57%			32.40%	32.56%
Unfunded Actuarial Liability			602,268			40,940	643,208
Total Actuarial Liability	1,724,576	570,621	2,295,197	54,510	57,130	111,640	2,406,837
Allocation of Unfunded Actuarial Liability	75.14%	24.86%	100.00%	48.83%	51.17%	100.00%	
Unfunded Actuarial Liability	452,535	149,733	602,268	19,989	20,950	40,940	643,208
UAL Amortization	31,788	10,518	42,306	1,404	1,472	2,876	45,182
UAL Amortization Rate	16.75%	23.39%	18.02%	17.34%	21.46%	19.22%	18.09%
<b>Cheiron Valuation Report</b>							
	<b>County</b>			<b>Ceres</b>			<b>Total</b>
	<b>General</b>	<b>Safety</b>	<b>Total</b>	<b>General</b>	<b>Safety</b>	<b>Total</b>	
Actuarial Value of Assets							
Accumulated Employee Contributions			183,725			12,349	196,074
Inactive Actuarial Liability							1,452,214
Net Assets for Distribution							115,341
Active Actuarial Liability			879,305			60,003	939,308
Allocation of Remaining Assets			93.61%			6.39%	100.00%
Remaining Assets			107,973			7,368	115,341
Total Assets			291,698			19,717	311,415
Active Funded Ratio			33.17%			32.86%	33.15%
Unfunded Actuarial Liability			587,607			40,286	627,893
Total Actuarial Liability	1,713,558	567,116	2,280,674	54,006	56,842	110,848	2,391,522
Allocation of Unfunded Actuarial Liability	75.13%	24.87%	100.00%	48.72%	51.28%	100.00%	
Unfunded Actuarial Liability	441,492	146,115	587,607	19,628	20,658	40,286	627,893
UAL Amortization	31,012	10,264	41,276	1,379	1,451	2,830	44,106
UAL Amortization Rate	16.34%	22.82%	17.58%	17.02%	21.16%	18.92%	17.66%
<b>Ratio Bartel/Cheiron</b>							
	<b>County</b>			<b>Ceres</b>			<b>Total</b>
	<b>General</b>	<b>Safety</b>	<b>Total</b>	<b>General</b>	<b>Safety</b>	<b>Total</b>	
Actuarial Value of Assets							100.0%
Accumulated Employee Contributions			100.0%			100.0%	100.0%
Inactive Actuarial Liability							100.1%
Net Assets for Distribution							99.3%
Active Actuarial Liability			101.6%			100.9%	101.5%
Allocation of Remaining Assets			100.0%			99.4%	100.0%
Remaining Assets			99.3%			98.7%	99.3%
Total Assets			99.7%			99.5%	99.7%
Active Funded Ratio			98.2%			98.6%	98.2%
Unfunded Actuarial Liability			102.5%			101.6%	102.4%
Total Actuarial Liability	100.6%	100.6%	100.6%	100.9%	100.5%	100.7%	100.6%
Allocation of Unfunded Actuarial Liability	100.0%	100.0%	100.0%	100.2%	99.8%	100.0%	
Unfunded Actuarial Liability	102.5%	102.5%	102.5%	101.8%	101.4%	101.6%	102.4%
UAL Amortization	102.5%	102.5%	102.5%	101.8%	101.4%	101.6%	102.4%
UAL Amortization Rate	102.5%	102.5%	102.5%	101.8%	101.4%	101.6%	102.4%



# APPENDIX D

## DETAIL OF ACTUARIAL LIABILITIES BY TIER

(Amounts in \$000's)

Bartel Associates												
	General						Safety					Total
	Tiers 1 & 2	Tier 3	Tier 4	Tier 5	Tier 6	Total	Tiers 1 & 2	Tier 4	Tier 5	Tier 6	Total	
Present Value of Future Benefits												
Actives	29,962	1,161	33,659	872,614	56,812	994,208	10,427	2,080	318,866	27,562	358,935	1,353,143
Terminated Vested	11,025	624	1,147	65,591	198	78,585	3,769	-	31,805	90	35,664	114,249
Retirees	187,358	1,130	295,110	395,692	-	879,290	53,392	77,457	119,802	-	250,651	1,129,941
Disabled	32,289	9	1,449	16,856	-	50,602	34,593	5,492	33,342	-	73,427	124,029
Beneficiaries	31,394	83	10,205	13,813	-	55,495	22,543	3,024	3,777	-	29,344	84,839
<b>Total</b>	<b>292,027</b>	<b>3,006</b>	<b>341,570</b>	<b>1,364,566</b>	<b>57,011</b>	<b>2,058,180</b>	<b>124,724</b>	<b>88,053</b>	<b>507,593</b>	<b>27,651</b>	<b>748,021</b>	<b>2,806,201</b>
Actuarial Liability												
Actives	8,129	990	32,344	667,488	6,163	715,114	2,242	1,979	232,177	2,267	238,665	953,779
Terminated Vested	11,025	624	1,147	65,591	198	78,585	3,769	-	31,805	90	35,664	114,249
Retirees	187,358	1,130	295,110	395,692	-	879,290	53,392	77,457	119,802	-	250,651	1,129,941
Disabled	32,289	9	1,449	16,856	-	50,602	34,593	5,492	33,342	-	73,427	124,029
Beneficiaries	31,394	83	10,205	13,813	-	55,495	22,543	3,024	3,777	-	29,344	84,839
<b>Total</b>	<b>270,193</b>	<b>2,835</b>	<b>340,256</b>	<b>1,159,441</b>	<b>6,361</b>	<b>1,779,086</b>	<b>116,539</b>	<b>87,952</b>	<b>420,904</b>	<b>2,356</b>	<b>627,751</b>	<b>2,406,837</b>
<b>Total Normal Cost</b>	<b>2,214</b>	<b>27</b>	<b>440</b>	<b>28,279</b>	<b>5,136</b>	<b>36,095</b>	<b>886</b>	<b>50</b>	<b>12,058</b>	<b>2,306</b>	<b>15,299</b>	<b>51,395</b>

Cheiron Valuation Report												
	General						Safety					Total
	Tiers 1 & 2	Tier 3	Tier 4	Tier 5	Tier 6	Total	Tiers 1 & 2	Tier 4	Tier 5	Tier 6	Total	
Present Value of Future Benefits												
Actives	29,594	1,110	32,786	859,435	56,555	979,480	10,341	2,024	314,774	27,158	354,297	1,333,777
Terminated Vested	11,017	816	1,147	65,591	198	78,769	3,769	-	31,805	90	35,664	114,433
Retirees	187,355	1,411	294,811	394,904	-	878,481	53,392	77,457	119,603	-	250,453	1,128,934
Disabled	32,286	11	1,449	16,853	-	50,599	34,593	5,492	33,342	-	73,427	124,026
Beneficiaries	31,391	109	10,205	13,793	-	55,499	22,543	3,024	3,756	-	29,322	84,821
<b>Total</b>	<b>291,643</b>	<b>3,456</b>	<b>340,398</b>	<b>1,350,578</b>	<b>56,753</b>	<b>2,042,828</b>	<b>124,639</b>	<b>87,997</b>	<b>503,280</b>	<b>27,247</b>	<b>743,163</b>	<b>2,785,991</b>
Actuarial Liability												
Actives	8,194	961	31,513	657,418	6,130	704,216	2,303	1,921	228,667	2,201	235,092	939,308
Terminated Vested	11,017	816	1,147	65,591	198	78,769	3,769	-	31,805	90	35,664	114,433
Retirees	187,355	1,411	294,811	394,904	-	878,481	53,392	77,457	119,603	-	250,453	1,128,934
Disabled	32,286	11	1,449	16,853	-	50,599	34,593	5,492	33,342	-	73,427	124,026
Beneficiaries	31,391	109	10,205	13,793	-	55,499	22,543	3,024	3,756	-	29,322	84,821
<b>Total</b>	<b>270,243</b>	<b>3,308</b>	<b>339,125</b>	<b>1,148,560</b>	<b>6,328</b>	<b>1,767,564</b>	<b>116,600</b>	<b>87,894</b>	<b>417,174</b>	<b>2,291</b>	<b>623,958</b>	<b>2,391,522</b>
<b>Total Normal Cost</b>	<b>2,170</b>	<b>26</b>	<b>425</b>	<b>27,888</b>	<b>5,120</b>	<b>35,629</b>	<b>875</b>	<b>52</b>	<b>12,051</b>	<b>2,263</b>	<b>15,241</b>	<b>50,870</b>

Ratio Bartel/Cheiron												
	General						Safety					Total
	Tiers 1 & 2	Tier 3	Tier 4	Tier 5	Tier 6	Total	Tiers 1 & 2	Tier 4	Tier 5	Tier 6	Total	
Present Value of Future Benefits												
Actives	101.2%	104.6%	102.7%	101.5%	100.5%	101.5%	100.8%	102.8%	101.3%	101.5%	101.3%	101.5%
Terminated Vested	100.1%	76.5%	100.0%	100.0%	100.0%	99.8%	100.0%	N/A	100.0%	100.0%	100.0%	99.8%
Retirees	100.0%	80.1%	100.1%	100.2%	N/A	100.1%	100.0%	100.0%	100.2%	N/A	100.1%	100.1%
Disabled	100.0%	81.8%	100.0%	100.0%	N/A	100.0%	100.0%	100.0%	100.0%	N/A	100.0%	100.0%
Beneficiaries	100.0%	76.1%	100.0%	100.1%	N/A	100.0%	100.0%	100.0%	100.6%	N/A	100.1%	100.0%
<b>Total</b>	<b>100.1%</b>	<b>87.0%</b>	<b>100.3%</b>	<b>101.0%</b>	<b>100.5%</b>	<b>100.8%</b>	<b>100.1%</b>	<b>100.1%</b>	<b>100.9%</b>	<b>101.5%</b>	<b>100.7%</b>	<b>100.7%</b>
Actuarial Liability												
Actives	99.2%	103.0%	102.6%	101.5%	100.5%	101.5%	97.4%	103.0%	101.5%	103.0%	101.5%	101.5%
Terminated Vested	100.1%	76.5%	100.0%	100.0%	100.0%	99.8%	100.0%	N/A	100.0%	100.0%	100.0%	99.8%
Retirees	100.0%	80.1%	100.1%	100.2%	N/A	100.1%	100.0%	100.0%	100.2%	N/A	100.1%	100.1%
Disabled	100.0%	81.8%	100.0%	100.0%	N/A	100.0%	100.0%	100.0%	100.0%	N/A	100.0%	100.0%
Beneficiaries	100.0%	76.1%	100.0%	100.1%	N/A	100.0%	100.0%	100.0%	100.6%	N/A	100.1%	100.0%
<b>Total</b>	<b>100.0%</b>	<b>85.7%</b>	<b>100.3%</b>	<b>100.9%</b>	<b>100.5%</b>	<b>100.7%</b>	<b>99.9%</b>	<b>100.1%</b>	<b>100.9%</b>	<b>102.9%</b>	<b>100.6%</b>	<b>100.6%</b>
<b>Total Normal Cost</b>	<b>102.0%</b>	<b>103.8%</b>	<b>103.5%</b>	<b>101.4%</b>	<b>100.3%</b>	<b>101.3%</b>	<b>101.3%</b>	<b>97.6%</b>	<b>100.1%</b>	<b>101.9%</b>	<b>100.4%</b>	<b>101.0%</b>

