

**CITY OF SAN JOSE FEDERATED CITY
EMPLOYEES' RETIREMENT SYSTEM**

Audit of June 30, 2016 Pension Actuarial Valuation



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February 8, 2017

Board of Administration
City of San Jose Federated City Employees' Retirement System
1737 North 1st Street, Suite 580
San Jose, CA 95112

Re: Audit of June 30, 2016 Pension Actuarial Valuation

Dear Members of the Board:

We are pleased to present the results of our audit of the June 30, 2016 Pension Actuarial Valuation for the City of San Jose Federated City Employees' Retirement System ("System"). The purpose of this audit was to verify the calculations completed by Cheiron and to offer comments on the methodology and the results of their actuarial valuation.

This review was conducted by Paul Angelo, a Fellow of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA, and Andy Yeung, an Associate of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA. This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

The assistance of Cheiron and the System is gratefully acknowledged. We appreciate the opportunity to be of service to the Board of Administration, and we are available to answer any questions you may have on this report.

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.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Angelo".

Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President & Actuary

A handwritten signature in black ink, appearing to read "Andy Yeung".

Andy Yeung, ASA, MAAA, FCA, EA
Vice President & Actuary

AB/bbf

cc: Tim Doyle
Bill Hallmark
Gene Kalwarski

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This report has been prepared by Segal Consulting (Segal) to present an audit of the June 30, 2016 Pension Actuarial Valuation performed by Cheiron for the System. As described in the System's contract for actuarial audit services, the scope of our audit is to review the liabilities and the contribution rates for the Tier 1 and Tier 2 plans that were included in the System's June 30, 2016 Pension Actuarial Valuation Report.

Summary of Results and Recommendations

This audit report includes an independent reproduction of the detailed valuation results that appear in the June 30, 2016 valuation report prepared by Cheiron. This audit was based on actuarial reports, employee data and supplemental information provided by both the System and Cheiron.

We have performed this actuarial audit of the System 's June 30, 2016 Pension Actuarial Valuation to provide assurance to the System 's Board of Administration that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices. ***Our audit confirms that the results of the actuarial calculations as of June 30, 2016 are reasonable, and that those calculations are based on generally accepted actuarial principles and practices.***

The following is a high-level summary of the results from our audit of the June 30, 2016 Pension Actuarial Valuation:

- The valuation results were prepared using the non-economic (demographic) actuarial assumptions approved by the Board covering the June 30, 2010 through June 30, 2015 experience study period. Those non-economic assumptions were used in the June 30, 2015 valuation and have been carried over unchanged for the June 30, 2016 valuation. A review of those non-economic assumptions is not included in our contract for actuarial services and is therefore beyond the scope of this assignment.
- The economic (investment return, price inflation and wage inflation) actuarial assumptions previously used in the June 30, 2015 valuation were subsequently reviewed by the System and the investment return assumption was modified as part of the June 30, 2016 valuation. We have performed a high level review of those assumptions for reasonableness. We

concluded that Cheiron has recommended a set of economic assumptions that are generally consistent with each other, and are reasonable for use in the June 30, 2016 valuation for the System. This is the case even though those three assumptions appear to have been developed independently. Our review is included in Section III of this report.

- We understand that the Board has followed a practice of reviewing the economic assumptions (in particular, the investment return assumption) before each annual valuation. While the annual review of economic assumptions should allow the System to incorporate the most up-to-date capital market information in calculating the liabilities, that practice of performing an annual review is becoming less common practice among similar systems particularly when selecting long term economic assumptions (such as the investment return assumption).

When continuing with the current practice, we would recommend to the Board that they consider their deliberation of those economic assumptions for the upcoming valuation before (or just immediately after) the date of the valuation. Based on our prior experience working with other investment consulting firms, we understand that the long-term capital market assumptions provided by those firms are updated only periodically during the year, and that by starting the review of those economic assumptions earlier (e.g., earlier than the discussion that started in November 2016 as was the case during the review of the assumptions for the June 30, 2016 valuation), it should allow the Board more time to review, deliberate and adopt or modify the investment return assumption(s) recommended by Cheiron.

- The demographic data used in the 2016 valuation by Cheiron was primarily that supplied by the System. With the exception to modify the form of payment for about 10% of the retirees, it included only minimal changes made by Cheiron.

Specifically, 292 service and disabled retirees in the original 2016 data from the System were listed as having elected either 50% or 100% continuance benefit; however, these retirees were included in Cheiron's final data as having elected single life annuity. We understand from Cheiron that the payment form was adjusted for these individual retirees each year based on the responses to the data questions for the current year and all prior years. These retirees were either not married at the time of retirement or their beneficiaries had died.

Segal would recommend that the System request Cheiron provide a list of these retirees to reconfirm their life annuity form of payment and then change the data in the System's records accordingly.

- In performing the actuarial valuation, there was a need to take the salary earned during 2015/2016 to project it forward to estimate the amount that would be earned during 2016/2017 and thereafter in their valuations for the System and the Police and Fire Plan (Plan). While we are satisfied with the explanation provided by Cheiron for the two methods based on two different starting salaries used in their valuations for the System and the Plan, we note that it is not common for the same actuary to use two methods to project salaries for different employee groups who worked for the same employer.
- All active employees were assumed by Cheiron to earn one year of service between valuations. This means all part-time employees were assumed Cheiron to work full-time in the future; however, that assumption made by Cheiron was not disclosed in their report. Furthermore, there was a need to convert salaries for part-time employees as well as salaries for full-time employees who did not earn a full year of service during 2015/2016 into full-time equivalent salaries; however, the method used by Cheiron did not properly adjust for those amounts. When we raised this issue with Cheiron, they estimated an understatement of the salaries used in their valuation by about 0.7% for Tier 1 and 2% for Tier 2. (We have estimated the impact to be about 1.2% for the two Tiers combined.) Cheiron should be asked to document the contribution rate impact in their next valuation even though we do not believe that impact to be material.
- Market value of assets has been maintained by the System for each of the two tiers. We have reviewed and agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.
- Segal's total (Tier 1 and Tier 2) present value of future benefits is 101% of Cheiron's total present value of future benefits. This key result is the basis for all other liabilities and cost calculations in the valuation.
- Segal's total City contribution rate is 59.50% of payroll and Cheiron's total City contribution rate is 58.33% of payroll. The total City contribution rate calculated by Segal is about 102% of that calculated by Cheiron. This level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present value of future benefit between the past actuarial accrued liability and the future normal costs.
- Segal's total employee contribution rate is about 6.47% of payroll and Cheiron's total employee contribution rate is 6.46% of payroll. The total member rate calculated by Segal is

about 100% of that calculated by Cheiron. Again, this level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron. This small difference of 0.01% of payroll may also be explained by rounding.

- A list of all action items we would recommend as part of the June 30, 2017 valuation is provided in Exhibit D. (Note that in preparing the list, we have included several items that are only addressed in Sections II and III of this report.)

Detailed Findings

Our detailed findings and recommendations are summarized as follows:

- As indicated in Section III of this report, we found the economic assumptions reviewed as part of the June 30, 2016 valuation and used by Cheiron to be reasonable and in accordance with generally accepted actuarial standards and principles.
- Segal's *total present value of future benefits* as of June 30, 2016 is 101% of Cheiron's present value.
- A comparison of Segal's present value of future benefits (PVB) to Cheiron's present values by Tier and in total indicates that the total liabilities of each plan are reasonable as shown in the following table.

Plan	Ratio of Segal's PVB to Cheiron's PVB
Tier 1	101%
Tier 2	103%
Total Tiers 1 and 2 combined	101%

- Segal's *total actuarial accrued liability* as of June 30, 2016 is 101% of Cheiron's liability.

For this audit, our first focus was on matching the core numbers on which the Tiers' ultimate costs depend: the present values of future benefits. The results of this analysis were shown in the previous table. We also focused on more detailed analyses of (i) the proper implementation of the demographic assumptions as determined by the 2015 experience study as well as the economic assumptions reviewed and approved as part of the 2016 valuation, (ii) the breakdown of the total normal cost contribution rate into the portions paid by the City and by the members, and (iii) the determination of the UAAL contribution rate paid by the City and by the members. Those detailed analyses produced the following findings and recommendations:

- Segal's *total City contribution rate* is 59.50% of payroll and Cheiron's total City contribution rate is 58.33% of payroll. The total City contribution rate calculated by Segal is about 102% of that calculated by Cheiron. This level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present

value of future benefit between the past actuarial accrued liability and the future normal costs.

- Segal’s *total employee contribution rate* is about 6.47% of payroll and Cheiron’s total employee contribution rate is 6.46% of payroll. The total member rate calculated by Segal is about 100% of that calculated by Cheiron. Again, this level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron. This small difference of 0.01% of payroll may also be explained by rounding.

- While we were able to locate and opine on Cheiron’s calculations for the total City contribution rate of 58.33% as provided on page 1 of their report, we were not able to locate Cheiron’s breakdown of the total City contribution rate between the normal cost rate and the Unfunded Actuarial Accrued Liability (UAAL) contribution rate.

As Cheiron did not include the breakdown of the total normal cost rate and UAAL rate for the City and for the members in their report, in the table below we only show the ratios of the normal cost rate and the UAAL contribution rate for the City and the members for Tier 1 and Tier 2 separately, and not in the total.

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Net City Normal Cost Rate	98%	104%	
City UAAL Rate	103%	100%	
Total City Rate	102%	104%	102%

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Member Normal Cost Rate	98%	104%	
Member UAAL Rate	N/A ⁽¹⁾	100%	
Total Member Rate	98%	104%	100%

⁽¹⁾ Not applicable as Tier 1 members do not share in the cost to fund the UAAL.

- For funding purposes, market value of assets has been maintained by the System on a Tier by Tier basis and we agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.

- In determining the UAAL contribution rate, Cheiron uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each of the

UAAL layers. The total of those amortization payments is then converted to a percent by using the expected payroll for the fiscal year that begins one year after the date of the current valuation. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.

- Overall, we have verified that Cheiron's calculations of the normal cost, UAAL and the total City contribution rate as a percentage of payroll are reasonable. Similarly, we have verified that Cheiron's calculations of the normal cost, UAAL and the total member contribution rate as a percentage of payroll are reasonable.

PURPOSE AND SCOPE OF THE ACTUARIAL AUDIT

Purpose of the Audit

Segal Consulting has performed an actuarial audit of Cheiron's June 30, 2016 Pension Actuarial Valuation to provide assurance to the System's Board of Administration that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices.

Scope of the Audit

The scope of the audit, as described in the System's Actuarial Audit Services Agreement with Segal, includes the following:

- Evaluation of the available data for the performance of such valuation, the degree to which such data is sufficient to support the conclusions of the valuation, and the use and appropriateness of any assumptions made regarding such data.
- Comparison of the major benefits summarized in Appendix C of Cheiron's 2016 valuation report against those that are included in the online Summary of Plan Description. For some benefits, we have also consulted with the relevant provisions in the City Ordinance to confirm our understanding. We concluded that all the major benefits have been included by Cheiron in their valuation.
- Completion of a parallel valuation as of June 30, 2016 using the assumptions, methodologies and funding methods used by the System's consulting actuary in their performance of the June 30, 2016 valuation.
- Evaluation of the parallel valuation results for the two Tiers that were included in the June 30, 2016 Actuarial Valuation Report and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and/or adjustments with the System's consulting actuary.

RESULTS OF THE VALUATION AUDIT

Several steps are involved in conducting an actuarial audit of a retirement benefits program. Outlined below are the primary steps we took to comply with the scope of the audit services. Following each step is a description of our observations.

Even though our analysis was performed concurrently with Cheiron's actuarial valuation, they were not able to answer our questions, address our observations and provide the backup we requested while they were preparing the June 30, 2016 valuation. This might in part be explained by the tight timeline Cheiron had to follow to prepare multiple valuation results under different alternative economic actuarial assumptions and to present those results to the Board. However, our audit results generally confirm and support the results of their final 2016 valuation.

Step 1: Compare the demographics of the 2016 data provided by the System with the valuation data used by Cheiron for the June 30, 2016 actuarial valuation.

Results

EXHIBIT-A provides a comparison, by membership type (i.e., Tiers 1 and 2), of the number of participants, their average ages, average salaries (active members), average service (active members) and average benefits (pensioners). This exhibit indicates that Cheiron had only made a few adjustments, estimations or corrections to the data received from the System. In general, the data received was "valuation ready" with the exception of the adjustment they have to make to about 10% of the retiree records to reflect more up-to-date information on surviving beneficiaries eligible for a continuance benefit.

Observations

- (1) We asked for and received what was supposed to be the "final" membership data file used by Cheiron in their valuation. However, Segal noticed that the continuance benefit percent to the spouse for one of the retirees was different from that reported by the System in their original data file. (For that one retiree, in the final valuation file, Cheiron indicated a continuance benefit of

100% while the System data indicated a continuance benefit of 50%). When Segal asked Cheiron to provide an explanation as to why the continuance percent in the Cheiron's final data did not match the System's data, that was when Cheiron informed us that the final valuation data file they used for the valuation showed a 50% continuance benefit, consistent with the System data. This was different from the 100% continuance benefit shown on the "final" membership data file previously sent to us. We did not ask Cheiron whether they made other changes in the membership data file since that final file was provided to Segal. We would strongly recommend to Cheiron that for documentation purposes especially for use in a future actuarial audit, they always provide the final valuation data file to the actuarial auditor and inform the actuarial auditor of any subsequent changes they might have to make to that data as soon as possible.

- (2) The payments awarded to ex-spouses under the combined account option (records indicated in the beneficiary data file with a code of "Q" for Qualified Domestic Relations Order or "QDRO") have been combined by Cheiron with the payments awarded to the corresponding members into a single record. No combining was necessary with respect to the annuity and pension portions of the benefit reported on the member record as the System has already included the ex-spouse's portions of those benefits in the member's record. Only the COLA portion of the benefit that has been paid to the ex-spouse would need to be added and combined with the COLA portion of the benefit for the retiree. We are only noting this detail for documentation purposes as the method used by Cheiron is consistent with how the data should be handled based on our discussion with the System.
- (3) For 26 records (including 25 retirees and 1 beneficiary that is not a "QDRO"), Cheiron's Tier 1 benefit amount was higher than Cheiron's total benefit amount by \$0.6 million as provided in the final data file. The total benefit amount was correct and Cheiron reassured us that the total benefit was what they used in their calculations of the liabilities.
- (4) There were 292 service and disabled retirees in the original 2016 data from the System listed as having elected either 50% or 100% continuance benefit. However, these 292 retirees were included in Cheiron's final data as having elected single life annuity. We understand when we asked Cheiron that the payment form was adjusted for these individual retirees each year based on the responses to the data questions for the current year and all prior years. These retirees were either not married at the time of retirement or their beneficiaries had died.

Segal would recommend that the System request Cheiron provide a list of the 292 retirees to confirm their life annuity form of payment and then change the data in the System's records accordingly.

- (5) In the System's original non-retiree data file, the total benefit service reported by the System exceeded the sum of the benefit service broken down between Tier 1 and Tier 2 for most active members by 0.09 years. Cheiron used the breakdown of the Tier 1 and Tier 2 service to calculate the benefit amounts for actives in their valuation. When Segal raised a question with respect to the discrepancies in service with Cheiron, Cheiron confirmed that that issue was discussed with the System's staff. The total benefit service reported by the System did include service earned in pay period fifteen ("PP15") that was accrued after the end of the June 30, 2016 valuation date but was excluded from the calculation when the System provided the breakdown of the service between Tier 1 and Tier 2 to Cheiron. Cheiron correctly used the breakdown of the Tier 1 and Tier 2 service to determine the benefit amount in the valuation. However, Cheiron did not update the credited service (used for eligibility purposes in determining when a member would first be vested in a particular type of benefit) provided by the client to exclude the 0.09 years accrued in PP15. This could result in a small overstatement in Cheiron's calculations because a few members might have been assumed to be eligible for retirement before they accrued the minimum service to retire. We believe the impact of the overestimated credited service on the liability to be minimal.

Step 2: Develop a valuation program based on the relevant provisions of the System as summarized in the Summary Plan Descriptions, using the actuarial methods and assumptions outlined in the most recent valuation report, and further defined by Cheiron.

Observations

- (1) Cheiron's valuation report does not state precisely how the reciprocity and the percent of refund of contribution assumptions are applied in combination in their valuation program. Segal would recommend to Cheiron that they document how these assumptions are applied when they prepare their future valuation reports.

Based on our discussion with Cheiron, all actives who have less than 5 years of service when they terminate employment are assumed to get a refund of contributions (100% refund of contributions). The reciprocity and percent of refund assumptions are only applied in

combination to actives that have more than 5 years of service. For actives with more than 5 years of service, the reciprocity assumption is applied after the percent of refund assumption is applied.

For example, for an active member age 30 with more than 5 years of service, the total termination rate is 7.00%, the percent of refund assumption is 27.50%, and 25% of terminating employees is assumed to subsequently work for a reciprocal employer. Cheiron applies the assumptions in the following order:

- 1.925% ($7.00\% * 27.5\%$) will get a refund of contributions,
- 1.269% ($7.00\% * (100\% - 27.5\%) * 25\%$) will work for a reciprocal employer, and
- 3.806% ($7.00\% * (100\% - 27.5\%) * 75\%$) will get a deferred vested benefit without working for a reciprocal employer.

- (2) In performing the actuarial valuation, there was a need to take the salary earned during 2015/2016 to project it forward to estimate the amount that would be earned during 2016/2017 and thereafter in their valuations for the System and the Police and Fire Plan (Plan). While we are satisfied with the explanation provided by Cheiron for the two methods based on two different starting salaries used in their valuations for the System and the Plan, we note that it is not common for the same actuary to use two methods to project salaries for different employee groups who worked for the same employer.
- (3) Cheiron confirmed for us that in their valuation, they assumed service would increase by one year for all actives in between valuations (This means all part-time employees are assumed to work full time in the future.) Segal would recommend this assumption be disclosed in the assumption section in their future valuation reports.

Furthermore, there was a need to convert to salaries for part-time employees as well as salaries for full-time employees who did not earn a full year of service during 2015/2016 into full-time equivalent salaries; however, the method used by Cheiron did not properly adjust for those amounts. When we raised this issue with Cheiron, they estimated an understatement of the salaries used in their valuation by about 0.7% for Tier 1 and 2% for Tier 2. (We have estimated the impact to be about 1.2% for the two Tiers combined.) Cheiron should be asked to document the contribution rate impact in their next valuation even though we do not believe that impact to be material.

Step 3: Run the valuation program with specific individuals (test lives) who illustrate particular benefit provisions and compare results to Cheiron's results.

Results

EXHIBIT-B provides a comparison of Segal's and Cheiron's test life results for (i) the present value of future benefits, (ii) the present value of future normal costs, and (iii) the actuarial accrued liability.

- *Present Value of Future Benefits:* This measure represents the current value of the member's projected benefits, recognizing the time value of money (*i.e.*, the investment return assumption), the salary increase assumption and the probabilities of retirement, death, disability and turnover. This value is the cornerstone for the entire valuation as it represents the amount expected to be needed to provide all future expected benefit payouts for current members, based on the valuation assumptions.

The ratio of Segal's results to Cheiron's results, on a *total present value of future benefits basis*, range from 100% to 101% for the active test lives. With the exception of one terminated vested member and one deferred reciprocal member, where we included a minimum liability equal to the members' account balance, the ratio of Segal's results to Cheiron's results is about 101% for the terminated vested and retired test lives.

We believe our results are within an acceptable range of Cheiron's results to provide assurance that the significant plan liabilities are properly valued.

- *Present Value of Future Normal Costs and Actuarial Accrued Liability:* The funding method adopted by the System, the Entry Age Actuarial Cost Method, separates the present value of future benefits for active members into two components, the actuarial accrued liability and the present value of future normal costs. Simply stated, the Entry Age Actuarial Cost Method determines a level cost as a percentage of pay for each year of service, called the normal cost. For active members, the actuarial accrued liability is the accumulated value of *past* normal costs (less any expected benefits, and assuming all actuarial assumptions were exactly realized), while the present value of future normal costs represents the current value of *future* normal costs required to fully fund the member's projected benefits before the member is expected to retire.

The method used to separate the present value of projected benefits into its two components can differ somewhat from valuation system to valuation system, even though the underlying funding method used in the systems is the same.

For the active test lives, the ratios of Segal's results to Cheiron's is about 101% (range from 98% to 111%) for the present value of future normal costs and about 101% (range from 93% to 132%) for the actuarial accrued liability [See pages 28A-28C].

Observations

- (1) Segal's valuation system generally assumed active members decrement (i.e., retirement, termination, etc.) at the beginning of each plan year (July 1). The Cheiron system, in contrast, assumes decrements occur in the middle of the year (January 1). As part of this audit for the System, we have changed our timing of the decrement to allow for the middle of the year timing for the decrements assumed by Cheiron.

Either methodology is acceptable, with each actuarial firm establishing its own approach for the assumed timing of decrements.

- (2) The actuarial assumptions recommended by the 2015 experience study together with a preliminary 7.00% investment return assumption approved by the Board for the June 30, 2016 valuation were used to value the test lives. (As the final investment return assumption approved by the Board for the 2016 valuation is 6.875%, this means that there would be some differences between the test case results we reviewed prepared using the 7.00% and those that would have been produced using the 6.875% assumption.)
- (3) COLA in the first year for Tier 2 retirees should be pro-rated based on the fraction of the year that the Tier 2 retirees would have been retired (e.g., one-quarter of a year assuming the retirement on January 1). Segal confirmed that Cheiron has not pro-rated the 1.5% COLA for Tier 2 members in their first partial year after retirement. As such, Cheiron overestimated both the actuarial accrued liability and normal cost for Tier 2 by 1.125%. This overstatement should not have a significant impact on the contribution rates for the System as a whole because there was relatively low liability in Tier 2.
- (4) As stated above, Segal set a minimum liability in our valuation for each member to be at least equal to the member's account balance. Cheiron assumed that all current inactive vested and

reciprocal members receive a monthly deferred retirement benefit without comparing the value of that benefit to the account balance. We believe this should not affect the overall results materially.

- (5) In the 2016 test case file, Cheiron provided the calculation for one active member with prior Tier 1 service that had since transferred to Tier 2. The initial cost calculations provided for that member in the 2016 test case was inconsistent with the calculation they provided for the 2015 test case.

In the 2015 test case file, the normal cost for Tier 1 for this member was \$0, and the actuarial accrued liability for Tier 1 of \$112,443 was equal to the present value of future benefits (PVB) for Tier 1 based on the service that was previously earned under Tier 1. In the 2016 test case, the normal cost for Tier 1 for this member was \$3,351, and the actuarial accrued liability for Tier 1 was \$91,854, which is less than the PVB of \$125,226.

Segal asked Cheiron for the reasons behind the change in the results for Tier 1. In their response, Cheiron agreed with our observation and requested that Segal overwrite the 2016 Cheiron results for this member in the test case file by zeroing out the normal cost for Tier 1, and by setting the AAL equal to the PVB of \$125,226. We understand from our discussions with Cheiron that after those changes, the results should match those in their final valuation.

Step 4: Run the valuation program with all participant data, compile results, and compare to Cheiron's results.

Results

EXHIBIT-C provides a comparison, by Tier, of Segal's results and Cheiron's results for (i) the present value of future benefits, (ii) the present value of future normal costs, (iii) the UAAL, (iv) the total normal cost and UAAL contribution rates, (v) the City normal cost and UAAL contribution rates and (vi) the member normal cost and UAAL contribution rates.

- The ratios of Segal's results to Cheiron's results, on a *total present value of future benefits basis*, range from 102% to 103% for active members. For the terminated vested and the retirees combined, the results are even closer as the ratio is 101%. In total, our present value

of future benefits is 101% of Cheiron's present value as shown in the column labeled "TOTAL" on page 29-C.

- The present value of future normal costs is allocated between member contributions and the City contributions. For Tier 1, members contribute 3/11 of the normal cost rate (including administrative expenses, but excluding the cost for reciprocal benefits) and the City pays the remainder of the total contribution rate, including the UAAL payments. For Tier 2, the members and the City each pays half of the total contribution rate including both normal cost and UAAL payments.
- The actuarial accrued liability depends in part on the valuation system's methodology for separating the present value of projected benefits into its two components – the actuarial accrued liability and the present value of future normal costs. The UAAL is then simply the difference between the actuarial accrued liability and the actuarial value of assets. Therefore, differences in the actuarial accrued liabilities due to the variations in the valuation systems impact the UAAL, and the related City and member normal cost contribution rates.
- Segal's *total City contribution rate* is 59.50% of payroll and Cheiron's total City contribution rate is 58.33% of payroll. The total City contribution rate calculated by Segal is about 102% of that calculated by Cheiron. This level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron in allocating the present value of future benefits between the past actuarial accrued liability and the future normal costs.
- Segal's *total employee contribution rate* is about 6.47% of payroll and Cheiron's total employee contribution rate is 6.46% of payroll. The total member rate calculated by Segal is about 100% of that calculated by Cheiron. Again, this level of difference can generally be explained by differences in procedures and methods used by Segal and Cheiron. This small difference of 0.01% of payroll may also be explained by rounding.
- While we were able to locate and opine on Cheiron's calculations for the total City contribution rate of 58.33% as provided on page 1 of their report, we were not able to locate Cheiron's breakdown of the total City contribution rate between the normal cost rate and the UAAL contribution rate.

As Cheiron did not include the breakdown of the total normal cost rate and UAAL rate for the City and for the members in their report, in the table below we only show the ratios of the normal cost rate and the UAAL contribution rate for the City and the members for Tier 1 and Tier 2 separately, and not in the total.

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Net City Normal Cost Rate	98%	104%	
City UAAL Rate	103%	100%	
Total City Rate	102%	104%	102%

RATIO OF SEGAL/CHEIRON	Tier 1	Tier 2	Total
Member Normal Cost Rate	98%	104%	
Member UAAL Rate	N/A ⁽¹⁾	100%	
Total Member Rate	98%	104%	100%

⁽¹⁾ Not applicable as Tier 1 members do not share in the cost to fund the UAAL.

- For funding purposes, market value of assets has been maintained by the System on a Tier by Tier basis and we agreed with the calculation of the (smoothed) actuarial value of assets used in the valuation.
- In determining the UAAL contribution rate, Cheiron uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each of the UAAL layers. The total of those amortization payments is then converted to a percent by using the expected payroll for the fiscal year that begins one year after the date of the current valuation. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.
- The present value of future benefits as shown on page 17 of Cheiron’s report is missing a liability of about \$10,000 for one Tier 2 retiree. The actuarial accrued liability as show on page 19 of Cheiron’s report (\$3,786,719,000) does not match the actuarial accrued liability as shown on page 4 of their report (\$3,786,730,000). We believe that difference of \$11,000 is

also attributable to the missing liability for that Tier 2 retiree. In preparing our Exhibit C, we have reflected the “corrected” PVB and AAL in presenting Cheiron’s results based on the additional backup information we received from Cheiron.

- Overall, we have verified that Cheiron’s calculations of the normal cost, UAAL and the total City contribution rate as a percentage of payroll are reasonable. Similarly, we have verified that Cheiron’s calculations of the normal cost, UAAL and the total member contribution rate as a percentage of payroll are reasonable.

Step 5: Evaluate the valuation results and methodology as presented in the Cheiron actuarial valuation report.

Observations

- (1) As we have not been provided with a draft of Cheiron’s actuarial valuation report (as originally anticipated in our contract for audit services), we reviewed Cheiron’s final actuarial report in detail after it had already been presented to the Board. Most of our comments (already discussed in the previous steps) based on that final report are relatively minor and deal primarily with providing additional disclosures for documentation purposes.

REVIEW OF ECONOMIC ASSUMPTIONS

The economic assumptions reviewed by Cheiron during the 2016 actuarial valuation are the investment rate of return, price inflation and wage growth (price inflation and real wage increases). Actuarial Standard of Practice No. 27 (ASOP 27) provides the actuary guidance in developing these assumptions. Among these guidelines is the need for consistency among the economic assumptions selected by the actuary.

Results

Cheiron has recommended a set of economic assumptions that are generally consistent with each other, and are reasonable for use in the June 30, 2016 valuation for the System. This is the case even though those three assumptions appear to have been developed independently.

We understand that the Board has followed a practice of reviewing the economic assumptions (in particular, the investment return assumption) before each annual valuation. While the annual review of economic assumptions should allow the System to incorporate the most up-to-date capital market information in calculating the liabilities, that practice of performing an annual review is becoming a less common practice particularly when selecting long term economic assumptions (such as the investment return assumption).

When continuing with the current practice, we would recommend to the Board that they consider their deliberation of those economic assumptions for the upcoming valuation before (or just immediately after) the date of the valuation. Based on our prior experience working with other investment consulting firms, we understand that the long-term capital market assumptions provided by those firms are updated only periodically during the year, and that by starting the review of those economic assumptions earlier (e.g., earlier than the discussion that started in November 2016 as was the case during the review of the assumptions for the June 30, 2016 valuation), it should allow the Board more time to review, deliberate and adopt or modify the investment return assumption(s) recommended by Cheiron.

Details of Review

In order to demonstrate the interconnection and the consistency among the investment return, price inflation and wage inflation assumptions, Segal utilized a “building block” approach in developing and documenting our review of these three assumptions. Under this approach, the investment rate of return assumption is the combination of the inflation component and the real rate of return component (used by the investment consultants), less an expense component. Similarly, the wage growth assumption is the combination of the inflation component and the real wage increase component. (It should be noted that the salary increase assumption is developed using the wage growth assumption and the merit increase assumption.) In our experience, this is generally the preferred approach for documenting and developing these assumptions.

Inflation Assumption for Use in Projecting Benefit Obligations

The first “building block” to consider is the price inflation component assumption. This assumption underlies all other economic assumptions, including both the investment return and the projection of benefit liabilities (i.e., salary increase for actives and COLAs for retirees in Tier 2). In their analysis, as part of the 2015 experience study, Cheiron cited the inflation expectations from the Federal Reserve Survey of Professional Economic Forecasters and those inflation assumptions used by different California public retirement plans in their valuations. They also included the inflation expectation of Meketa, the investment consultant for the System.

There was a wide disparity between the 50th percentile assumptions of 2.15% from the economic forecasters and 3.25% from the retirement plan valuations. While we would find the 2.5% assumption used by Cheiron to be within the reasonable range for this assumption, it is important to acknowledge the different time horizons used by the economic forecasters (10 years as provided in the Cheiron experience study) and the much longer time period used by the California public retirement plans in their valuations. For example, the benefits for some members currently in their 30’s and 40’s will not commence until they retire at 60’s and 70’s and then be paid for 20 to 30 years after their retirement. Due to the difference in the time horizon,

the inflation assumption adopted by Segal's California public retirement system clients (that have recently reviewed these assumptions) have been in the range of 2.75% to 3.00%.

It should also be noted that the inflation assumption used by Meketa had dropped from 2.8% to 2.5% between the 2015 experience study and the 2016 valuation.

Administrative and Investment Expenses Paid from the System and the Deduction of some of those Expenses in Development of Investment Return Assumption

Administrative Expenses

In their 2015 experience study, Cheiron analyzed the administrative expenses as a percentage of payroll for each plan year since 2006. The administrative expense ratio had ranged from a low of 0.65% to a high of 1.62%. The average over the ten-year period from fiscal year 2006 to 2015 was 1.06%, while the average over the most recent three-year period from fiscal year 2013 to 2015 was 1.49%.

Rather than to offset the administrative expenses with actual investment income, which would lower the investment return assumption, Cheiron included an additional contribution rate in their valuation to defray those expenses. That assumption was increased from 0.7% of payroll to 1.0% of payroll to partially recognize: (1) the increase in actual amount of the administrative expenses (about \$3.9 million for fiscal year 2014-2015) and (2) a payroll base (about \$240.7 million for fiscal year 2014-2015) that had yet to recover to its level before the recession that started in 2009 (about \$320.0 million for fiscal year 2008-2009).

We agree with Cheiron that the collection of 1.0% of payroll to defray administrative expenses may be subject to increase in future valuations and that the investment return assumption does not have to be adjusted to anticipate the payment of such expenses.

Investment Expenses

The actual amount of investment expenses paid out of the pension plan during fiscal year 2015 was \$9.6 million. (Of that amount, about 90% was paid out as investment managers fees and the remaining 10% was paid out for investment consulting, custodian banking, and other expenses.)

Because Cheiron made no provision to collect those investment expenses as an additional contribution rate, these investment expenses came out of investment return. Because Cheiron did not make an explicit reduction for these, there was an implicit 0.00% investment expense assumption used by Cheiron in their development of the investment return assumption. While we have not audited the capital market assumptions, it has been our experience working with the investment consultants retained by our California public retirement system clients that their capital market assumptions are generally gross of (i.e. not reduced for) investment expenses.

It should be noted that individual actuarial firms use different models with different criteria and parameters to develop the investment return assumption, and the model used by Segal is different from that used by Cheiron. Segal would generally subtract some portion of the investment expenses (total investment expenses were about 51 basis points or bps) from the indexed (or passively managed) returns in developing the investment return assumption, which would lower the expected investment return assumption¹. Furthermore, in the case of the System, it appears based on information provided in the comparison of asset performance section of the Fiscal Year 2015 CAFR that the average market return net of manager fees was lower than the policy benchmark by about 40 bps during a 10-year period. While this may be a coincidence (40 bps versus 51 bps), this observation could be used to support some reduction in the investment return assumption for payment of those expenses.

We also note that about 10% of the total investment expense paid in Fiscal Year 2015 was for investment consulting, custodian banking, and other expenses that either were not directly in pursuit of “alpha” returns or were expenses that had not been netted out of the capital market assumptions. For all these reasons, we recommend that Cheiron review their methodology in conjunction with the ASOP 27 to consider making some provisions for payment of future investment expenses when they review the investment return assumption before the June 30, 2017 valuation.

¹ Our practice may be considered by some to be more conservative than that required under the Actuarial Standard of Practice (ASOP) No. 27, which states in part in Section 3.8.3.d, “Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). The actuary should not assume that superior or inferior returns will be achieved, **net of investment expenses**, from an active investment management strategy compared to a passive investment management strategy unless the actuary believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period.” (emphasis added). We believe this means that assuming only enough superior return to cover related investment expenses would not require the relevant supporting data referenced in ASOP No. 27.

Development of Investment Rate of Return Assumption

For the investment rate of return assumption, based on alternatives presented by Cheiron, the Board chose to reduce the current assumption of 7.00% used in the June 30, 2015 valuation to 6.875% used in the June 30, 2016 valuation. Cheiron derived the 7.00% investment return assumption by applying the System's target asset allocation in a stochastic model developed using the capital market assumptions provided by Meketa, the System's investment consultants, in preparing their investment return assumption recommended for the June 30, 2015 valuation. While the reduction to the 6.875% investment return assumption for the June 30, 2016 valuation is consistent with the trend in the industry to adopt more conservative investment return assumptions, we would nonetheless recommend to Cheiron that they include a more detailed analysis behind their recommendation in a more formal report. This should supplement the high level analysis provided in their Power Point presentation made to the Board at the December 2016 meeting.

We have the following observations with respect to the development of the 7.00% investment return assumption that Cheiron provided in their June 30, 2015 experience study report.

- To estimate the expected return from each category class, Cheiron used the specific capital market assumptions from only one investment consultant (i.e. Meketa). On the one hand, that would allow more consistency between the investment return expectation that might have been utilized by the investment consultant when they assist the Board in selecting the System's particular asset allocation and that was used in the actuarial valuation by Cheiron. On the other hand, it suffers from the undesired outcome (and possibly significant variability) of having the expected investment returns dependent on which investment consultant is employed by a retirement plan.
- In the 2015 experience study, Cheiron discussed that the 20-year median return from their stochastic modeling (without adjusting for the investment expense assumption) was 7.40%. In the 2015 review, Cheiron used the specific capital market assumptions prepared by Meketa which included an implicit inflation assumption of 2.8%. However, in 2015 Cheiron's recommended inflation assumption component for projecting the benefit obligations (i.e., salary increase for all actives and COLA for retirees in Tier 2) was 2.5%. While the difference of 0.3% was eliminated in 2016 when Meketa lowered their inflation

expectation from the 2.8% used by Cheiron in their 2015 experience study to 2.5% used by Cheiron in their 2016 analysis, we believe that the System's valuation report and experience study report should document which inflation assumption(s) is used to develop the investment return assumption and the price inflation and wage inflation for calculating the liabilities. To the extent they are different, an explanation should be provided accordingly, because otherwise, the economic assumptions would be arguably inconsistent.

- As an independent check, Segal has applied the model that we use for other California public retirement systems to review the adopted 6.875% investment return assumption. While, especially when first applied, our model does not necessarily produce an absolute investment return recommendation, it is very useful for comparing the level of risk inherent in the investment return assumptions adopted by a given retirement system at different points in time or with other retirement systems that have previously been analyzed using that model.

Based on the application of our model, we believe that the level of risk implicit in the 6.875% investment return assumption, along with a 2.50% price inflation assumption, is somewhat higher than the comparable risk measure used by other California public retirement systems that have been analyzed using that model. The main reason is that for those other California public retirement systems, we have used a higher inflation assumption (either 2.75% or 3.00%) in developing their investment return assumption.

- Another test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide. We note that an investment return assumption of 6.875% is the lowest value for this assumption among the California public sector retirement systems. The most common range, with a few exceptions, is from 7.00% to 7.50%.

Taking into account the above discussion and based on our own independent analysis, we believe that the 6.875% investment return assumption that has been recommended by Cheiron to the Board is reasonable. However, we believe that they should consider making adjustment in their model to address the issues related to investment expenses and inflation as discussed above.

Wage Increase Assumption

Cheiron used a somewhat different approach in developing their wage inflation assumption. Under that approach, they observed that “over [a] 20-year period, average wage growth (2.73 percent) was comparable to San Jose inflation (2.71 percent).” This information, together with the “3.0% across the board wage increases [that] have been negotiated for the next three years” as well as “the median wage inflation in [their] survey of California systems [of] 3.75 percent” were all considered in coming up with their 2.85% wage increase assumption. Again, our preference is to utilize a “building block” approach in developing the recommended wage inflation assumption, so as to maintain and demonstrate consistency with the price inflation assumption. Under that approach, the wage income assumption is the combination of the price inflation component and the productivity or real wage increase component. Even though we would find the 2.85% assumption recommended by Cheiron to be within the reasonable range for this assumption, our process would likely have led to a somewhat higher wage increase assumption, such as 3.0%. We have included below a narrative showing how we would develop such a 3.0% wage increase assumption.

Inflation Component

The price inflation component was discussed earlier where we concluded that Cheiron’s recommendation of 2.50% was reasonable.

Productivity or Real Wage Increase Component

Real “Across the Board” Pay Increases – These increases are sometimes termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees “across the board.” The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real “across the board” pay increases have averaged about 0.6% - 0.9% annually during the last ten to twenty years.

We also referred to the annual report on the financial status of the Social Security program published in July 2015. In that report, real “across the board” pay increases are forecast to be 1.2% per year under the intermediate assumptions. (Note that this should be comparable to the increase in national average wages reported by Social Security Administration in the June 30, 2015 experience study report.)

The real pay increase assumption is generally considered a more “macroeconomic” assumption, that is not necessarily based on individual plan experience. However, recent salary experience with public systems in California as well as anecdotal discussions with plans and plan sponsors indicate lower future real wage growth expectations for public sector employees. For these reasons, we would generally recommend an across the board pay increase assumption of 0.50%. When combined with Cheiron’s price inflation component of 2.50%, this results in a wage inflation assumption of 3.0%.

EXHIBIT – A
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
ANALYSIS OF PARTICIPANT DATA

Active Member Data						
	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number	2,163	2,162	1,135	1,135	3,298	3,297
Average Age	49.0	49.0	37.2	37.2	44.9	44.9
Average Eligibility Service	15.6	15.6	2.0	2.0	10.9	10.9
Average Benefit Service ⁽¹⁾	15.3	15.3	1.8	1.8	10.6	10.6
Average Tier 2 Benefit Service			1.6	1.6		
TOTAL						
Compensation rate as of 6/30/2016 ⁽²⁾	\$7,011,425	\$7,014,192	\$2,966,873	\$3,036,996	\$9,978,298	\$10,051,188
Earnable compensation for 7/1/2015-6/30/2016 ⁽²⁾	\$179,995,570	\$179,995,570	\$64,160,557	\$64,188,688	\$244,156,127	\$244,184,258
Expected salary for 7/1/2016-6/30/2017	\$186,072,235 ⁽³⁾	\$186,249,410	\$79,201,126 ⁽³⁾	\$80,573,965	\$265,273,361 ⁽³⁾	\$266,823,375
AVERAGE						
Compensation rate as of 6/30/2016 ⁽²⁾	\$3,242	\$3,244	\$2,614	\$2,676	\$3,026	\$3,049
Earnable compensation for 7/1/2015-6/30/2016 ⁽²⁾	\$83,216	\$83,254	\$56,529	\$56,554	\$74,032	\$74,063
Expected salary for 7/1/2016-6/30/2017	\$86,025 ⁽³⁾	\$86,147	\$69,781 ⁽³⁾	\$70,990	\$80,435 ⁽³⁾	\$80,929
% DIFFERENCE						
Number		0.0%		0.0%		0.0%
Average Age		0.0%		0.0%		0.0%
Average Eligibility Service		0.0%		0.0%		0.0%
Average Benefit Service ⁽¹⁾		0.0%		0.0%		0.0%
Average Tier 2 Benefit Service				0.0%		
TOTAL						
Compensation rate as of 6/30/2016 ⁽²⁾		0.0%		2.4%		0.7%
Earnable compensation for 7/1/2015-6/30/2016 ⁽²⁾		0.0%		0.0%		0.0%
Expected salary for 7/1/2016-6/30/2017		0.1%		1.7%		0.6%
AVERAGE						
Compensation rate as of 6/30/2016 ⁽²⁾		0.1%		2.4%		0.8%
Earnable compensation for 7/1/2015-6/30/2016 ⁽²⁾		0.0%		0.0%		0.0%
Expected salary for 7/1/2016-6/30/2017		0.1%		1.7%		0.6%

EXHIBIT – A (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
ANALYSIS OF PARTICIPANT DATA

(1) Service for Tier 2 members included service earned for some members while they were in Tier 1.

(2) 24 actives (including one Tier 1 and 23 Tier 2) did not have a compensation rate in the data provided by the System. Of those 24 actives, 13 members from Tier 2 were also missing earnable compensation. In the final Cheiron data file provided to Segal, both of the compensation rate and earnable compensation fields were assigned a value. However, those assigned amounts were not subsequently included by Cheiron in their 2016 valuation report.

(3) The expected salary for 2016/2017 has been calculated using a method consistent with that used by Cheiron and it is as follows:

Step One - *For new hires and rehires, an annualized salary was calculated by multiplying Compensation Rate (comp2) times 365/14. For all other actives, an annualized salary was set to equal to earnable compensation if it was provided or by multiplying Compensation Rate (comp2) times 365/14 if earnable compensation was not provided*

Step Two – *Expected Salary for 2016/2017 was calculated by increasing the annualized salary with one year of wage inflation and one-half year of merit.*

The differences in the expected salary between the System and Cheiron can be explained by item (2) above.

EXHIBIT – A (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
ANALYSIS OF PARTICIPANT DATA

Retired & Disabled Member Data						
	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number					3,493	3,492
Average Age	A breakdown between Tier 1 and Tier 2 was not provided in the Cheiron valuation report.				68.8	68.8
Total Annual Benefit					\$165,344,419	\$165,313,149
Average Annual Benefit					\$47,336	\$47,341
% DIFFERENCE						
Number						0.0%
Average Age						0.0%
Total Annual Benefit						0.0%
Average Annual Benefit						0.0%

EXHIBIT – A (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
ANALYSIS OF PARTICIPANT DATA

BENEFICIARIES						
	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number					511 ⁽¹⁾	511
Average Age					74.4	74.4
Total Annual Benefit	A breakdown between Tier 1 and Tier 2 was not provided in the Cheiron valuation report.				\$12,430,982	\$12,437,426
Average Annual Benefit					\$24,327	\$24,339
% DIFFERENCE						
Number						0.0%
Average Age						0.0%
Total Annual Benefit						0.1%
Average Annual Benefit						0.0%

⁽¹⁾ Did not include 103 records indicated in the beneficiary file with the indicator of “Q” for *Qualified Domestic Relations Order* or “*QDRO*”.

EXHIBIT – A (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
ANALYSIS OF PARTICIPANT DATA

Inactive Member Data						
	Tier 1		Tier 2		Total	
	System	Cheiron	System	Cheiron	System	Cheiron
Number	1,037	1,038	174	168	1,211	1,206
Average Age	46.7	46.7	37.6	37.7	45.4	45.4
Total Contribution Balance with Interest ⁽¹⁾	\$58,434,582	\$58,552,569	\$1,198,206	\$1,112,563	\$59,632,789	\$59,665,132
Average Contribution Balance with Interest ⁽¹⁾	\$56,350	\$56,409	\$6,886	\$6,622	\$49,243	\$49,474
% DIFFERENCE						
Number		0.1%		-3.4%		-0.4%
Average Age		0.0%		0.3%		0.0%
Total Contribution Balance with Interest ⁽¹⁾		0.2%		-7.1%		0.1%
Average Contribution Balance with Interest ⁽¹⁾		0.1%		-3.8%		0.5%

⁽¹⁾ Contribution balance for Tier 2 members included contributions made by some members while they were in Tier 1.

EXHIBIT – B
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
TEST LIFE COMPARISON

ACTIVES	Testlife #1		Testlives#2&3		Testlife #4		Testlife #5		Testlives #1-5	
	Tier 1		Tier 1 & 2		Tier 1		Tier 1		Total Actives	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	\$223,684	\$226,391	\$212,455	\$215,591	\$301,092	\$304,217	\$130,547	\$130,335	\$867,778	\$876,534
PV - Future Normal Costs	\$200,696	\$196,056	\$59,583 ⁽²⁾	\$62,331	\$77,296	\$75,511	\$50,310	\$56,093	\$387,885	\$389,991
Actuarial Accrued Liability	\$22,988	\$30,335	\$152,872 ⁽²⁾	\$153,260	\$223,796	\$228,706	\$80,237	\$74,242	\$479,893	\$486,543
RATIO OF SEGAL/CHEIRON										
Total PVB	101%		101%		101%		100%		101%	
PV - Future Normal Costs	98%		105%		98%		111%		101%	
Actuarial Accrued Liability	132% ⁽¹⁾		100%		102%		93%		101%	

⁽¹⁾ The ratio of Segal/Cheiron for this member was relatively high because this member had very low service and therefore a low actuarial accrued liability. We believe this difference should not have a material impact on the overall results.

⁽²⁾ In the 2016 test case file, Cheiron provided the calculation for one active member with prior Tier 1 service that had since transferred to Tier 2. The initial cost calculations provided for that member in the 2016 test case was inconsistent with the calculation they provided for the 2015 test case.

In the 2015 test case file, the normal cost for Tier 1 for this member was \$0, and the actuarial accrued liability for Tier 1 of \$112,443 was equal to the present value of future benefits for Tier 1 based on the service that was previously earned under Tier 1. In the 2016 test case, the normal cost for Tier 1 for this member was \$3,351, and the actuarial accrued liability for Tier 1 was \$91,854, which was less than the PVB of \$125,226.

Segal asked Cheiron for the reasons behind the change in the results for Tier 1. In their response, Cheiron agreed with our observation and requested that Segal overwrite the 2016 Cheiron results for this member in the test case file by zeroing out the normal cost for Tier 1, and by setting the AAL equal to the PVB of \$125,226. We understand from our discussions with Cheiron that after those changes, the results should match those in their final valuation.

The Cheiron numbers above reflect the changes Cheiron requested Segal to make.

EXHIBIT – B (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
TEST LIFE COMPARISON

INACTIVES	Testlife #6		Testlife #7		Testlife #8		Testlife #9		Testlife #10	
	Beneficiary Tier 1		Beneficiary Tier 1		Beneficiary Tier 1		Non-Service Disability Tier 1		Non-Service Disability Tier 1	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	\$907,324	\$914,130	\$626,052	\$630,747	\$14,298	\$14,402	\$329,905	\$332,379	\$495,296	\$499,010
RATIO OF SEGAL/CHEIRON										
	101%		101%		101%		101%		101%	

INACTIVES	Testlife #11		Testlives #12-13		Testlife #14		Testlife #15		Testlife #16	
	Reciprocal Tier 2		Reciprocal Tier 1 & 2		Reciprocal Tier 1		Reciprocal Tier 1		Retired Tier 1	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	\$2,948	\$5,381	\$51,694	\$50,976	\$7,344	\$7,430	\$16,188	\$16,587	\$301,670	\$303,932
RATIO OF SEGAL/CHEIRON										
	183% ⁽¹⁾		100%		101%		102%		101%	

⁽¹⁾ Segal set a minimum liability in our valuation for each member to be at least equal to the member’s account balance. Cheiron assumed that all current inactive vested and reciprocal members receive a monthly deferred retirement benefit without comparing the value of that benefit to the account balance. We believe this difference should not have a material impact on the overall results.

EXHIBIT – B (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
TEST LIFE COMPARISON

INACTIVES	Testlife #17		Testlife #18		Testlife #19		Testlives #20-21		Testlife #22	
	Retired Tier 1		Retired Tier 1		Retired Tier 1		Retired Tier 1 & 2 ⁽¹⁾		Service Disability Tier 1	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	\$1,254,149	\$1,263,555	\$2,033,319	\$2,048,568	\$794,789	\$800,749	\$152,119	\$152,630	\$352,571	\$355,214
RATIO OF SEGAL/CHEIRON										
	101%		101%		101%		100%		101%	

⁽¹⁾ We asked and received the final membership data filed used by Cheiron in their valuation. However, Segal noticed that the continuance benefit percent to the spouse for this retiree was different from that reported by the System in their original data file. (For this retiree, in the final valuation file Cheiron indicated a continuance benefit of 100% while the System indicated a continuance benefit of 50%). When Segal asked Cheiron to provide an explanation as to why the spouse continuance percent in Cheiron’s final data did not match the System’s data, that was when Cheiron told us that the final valuation data file they used for the valuation showed a 50% continuance benefit and was different from the earlier “final” membership data file that was sent to us.

INACTIVES	Testlife #23		Testlife #24		Testlife #25		Testlife #26		Testlives #6-26	
	Service Disability Tier 1		Terminated Vested Tier 1		Terminated Vested Tier 1		Terminated Vested Tier 2 ⁽²⁾		Total Inactives	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Total PVB	\$197,477	\$198,957	\$108,666	\$110,021	\$84,266	\$85,088	\$7,720	\$10,026	\$7,737,795	\$7,799,781
RATIO OF SEGAL/CHEIRON										
	101%		101%		101%		130%		101%	

⁽²⁾ Segal set a minimum liability in our valuation for each member to be at least equal to the member’s account balance. Cheiron assumed that all current inactive vested and reciprocal members receive a monthly deferred retirement benefit without comparing the value of that benefit to the account balance. We believe this difference should not a material impact on the overall results.

EXHIBIT – C
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Tier 1		Tier 2		Total	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Actives	\$1,296,783	\$1,318,114	\$94,887	\$97,775	\$1,391,670	\$1,415,889
Retirees ⁽¹⁾	\$2,515,114	\$2,534,011	\$10	\$10	\$2,515,124	\$2,534,021
Inactive Vesteds	\$207,110	\$209,245	\$970	\$1,000	\$208,080	\$210,245
Total PVB	\$4,019,007	\$4,061,370	\$95,867	\$98,785	\$4,114,874	\$4,160,155
RATIO OF SEGAL/CHEIRON						
Actives		102%		103%		102%
Retirees		101%		100%		101%
Inactive Vesteds		101%		103%		101%
Total PVB		101%		103%		101%

⁽¹⁾ The present value of future benefits as reported on page 17 of Cheiron’s valuation report is missing a liability of about \$10,000 for one Tier 2 retiree. We reflected the “corrected” Cheiron PVB based on additional information provided by Cheiron.

EXHIBIT – C (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES' RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
COMPARISON OF RESULTS

CONTRIBUTION RATES	Tier 1		Tier 2		Total	
	Cheiron	Segal	Cheiron	Segal	Cheiron ⁽¹⁾	Segal
1. Normal Cost Rate (incl. admin. exp.)	24.60%	24.06%	12.46%	12.90%		
2. Member Normal Cost Rate	<u>6.60%</u>	<u>6.46%</u>	<u>6.23%</u>	<u>6.45%</u>		
3. Net City Normal Cost Rate (1. - 2.)	18.00%	17.60%	6.23%	6.45%		
4. Total UAAL Rate	76.04%	78.10%	0.04%	0.04%		
5. Member UAAL Rate	<u>0.00%</u>	<u>0.00%</u>	<u>0.02%</u>	<u>0.02%</u>		
6. City UAAL Rate (4. - 5.)	76.04%	78.10%	0.02%	0.02%		
7. Total Member Rate (2. + 5.)	6.60%	6.46%	6.25%	6.47%	6.46%	6.47%
8. Total City Rate (3. + 6.)	94.04%	95.70%	6.25%	6.47%	58.33%	59.50%
RATIO OF SEGAL/CHEIRON						
1. Normal Cost Rate (incl. admin. exp.)		98%		104%		
2. Member Normal Cost Rate		98%		104%		
3. Net City Normal Cost Rate (1. - 2.)		98%		104%		
4. Total UAAL Rate		103%		100%		
5. Member UAAL Rate		N/A		100%		
6. City UAAL Rate (4. - 5.)		103%		100%		
7. Total Member Rate (2. + 5.)		98%		104%		100%
8. Total City Rate (3. + 6.)		102%		104%		102%

⁽¹⁾ While we were able to locate and opine on Cheiron's calculations for the total City contribution rate of 58.33% as provided on page 1 of their report, we were not able to locate Cheiron's breakdown of the total City contribution rate between the normal cost rate and the UAAL contribution rate.

As Cheiron did not include the breakdown of the total normal cost rate and UAAL rate for each of the City and the member in their report, in the table above we only show the ratios of the normal cost rate and the UAAL contribution rate for the City and the members for Tier 1 and Tier 2 separately, and not in the total.

EXHIBIT – C (CONTINUED)
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
JUNE 30, 2016 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

UNFUNDED ACTUARIAL ACCRUED LIABILITY	Tier 1		Tier 2		Total	
	Cheiron	Segal	Cheiron	Segal	Cheiron	Segal
Present Value of Future Benefits	\$4,019,007	\$4,061,370	\$95,867	\$98,785	\$4,114,874	\$4,160,155
PV Future NC Contributions	249,846	246,242	78,298	81,409	328,144	327,651
Actuarial Accrued Liability	3,769,161	3,815,128	17,569	17,376	3,786,730	3,832,504
Current Assets at Actuarial Value	2,017,961	2,017,961	16,780	16,780	2,034,741	2,034,741
UAAL	1,751,200	1,797,167	789	596	1,751,989	1,797,763
Total UAAL Rate	76.04%	78.10%	0.04%	0.04%	45.13%	46.43%
RATIO OF SEGAL/CHEIRON						
Present Value of Future Benefits		101%		103%		101%
PV Future NC Contributions		99%		104%		100%
Actuarial Accrued Liability		101%		99%		101%
Current Assets at Actuarial Value		100%		100%		100%
UAAL		103%		76%		103%
Total UAAL Rate		103%		100%		103%

EXHIBIT – D
CITY OF SAN JOSE FEDERATED CITY EMPLOYEES’ RETIREMENT SYSTEM
RECOMMENDED ACTION ITEMS BEFORE JUNE 30, 2017 VALUATION

- In developing the economic assumptions for the 2017 valuation, Cheiron should consider documenting the interrelationship between the price inflation, wage inflation and investment return assumption. Cheiron should consider some provisions for payment of future investment expenses when they review the investment return assumption.
- The Board might want to consider their deliberation of the economic assumptions before (or just immediately) after the date of the valuation.
- The System should request a list of retirees for whom Cheiron has changed their form of payment to a single life annuity in their 2016 valuation.
- Cheiron should maintain a final data file used in the 2017 valuation. This is important for use in an actuarial audit.
- Cheiron should document the assumption that all employees are assumed to earn 1 year of service between valuations.
- Cheiron should correct the method they use to convert salaries for part-time employees as well as salaries for full-time employees who did not earn a full year of service during 2015/2016 into full-time equivalent salaries.
- Cheiron should clarify the application of the reciprocity and percent of refund of contribution assumptions in the 2017 valuation.
- Cheiron should prorate the COLA for Tier 2 members in the 2017 valuation.