

**STANISLAUS COUNTY EMPLOYEES'
RETIREMENT ASSOCIATION**

**Actuarial Review of June 30, 2012 Actuarial Valuation and
July 1, 2009 through June 30, 2012 Experience Study**

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September 4, 2013

Mr. Rick Santos
Executive Director
Stanislaus County Employees' Retirement Association
832 12th Street, Suite 600
Modesto, CA 95354

Re: Actuarial Review of June 30, 2012 Actuarial Valuation and
July 1, 2009 through June 30, 2012 Experience Study

Dear Rick:

We are pleased to present the results of this review of the June 30, 2012 actuarial valuation and July 1, 2009 through June 30, 2012 experience study for the Stanislaus County Employees' Retirement Association (StanCERA). The purpose of this review is to verify the calculations and recommendations made by EFI and to offer comments on the methodologies and the results.

This review was conducted by Andy Yeung, an Associate of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA and Paul Angelo, a Fellow 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 EFI and StanCERA is gratefully acknowledged. The staff at EFI was knowledgeable, cooperative and helpful in our review.

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.

We appreciate the opportunity to be of service to Stanislaus County Employees' Retirement Association and we are available to answer any questions you may have on this report.

Sincerely,

A handwritten signature in black ink that reads "Andy Yeung".

Andy Yeung, ASA, MAAA, EA, FCA
Vice President and Associate Actuary

A handwritten signature in black ink that reads "Paul Angelo".

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

AB/hy

cc: Graham Schmidt, EFI

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A: Actuarial Review of June 30, 2012 Actuarial Valuation

Executive Summary

This report has been prepared by The Segal Company to present a review of the June 30, 2012 actuarial valuation for the current benefit formulas (i.e., excluding those new benefit formulas mandated by the California Public Employees' Pension Reform Act of 2013) and the July 1, 2009 through June 30, 2012 experience study performed by EFI for StanCERA. This review was based on actuarial reports, employee data, and supplemental information provided by both StanCERA and EFI.

Note that this first part of the report focuses on our review of the June 30, 2012 actuarial valuation; the second part of this report focuses on our review of the July 1, 2009 through June 30, 2012 experience study.

Our overall assessment of EFI's actuarial work for StanCERA is that all major actuarial functions are being appropriately addressed. The actuarial calculations of the underlying present value of benefits are reasonable and the actuarial valuation process was conducted according to generally accepted actuarial principles and practices. Even though our assignment is limited to reviewing the reasonableness of the actuarial assumptions and does not entail the collection and analysis of the actual underlying membership data so as to develop an independent recommendation for the assumptions included in the actuarial experience study, we believe that EFI has employed generally accepted actuarial practices and principles in studying plan experience and selecting those assumptions.

While EFI has used a variation of the actuarial funding method that is not commonly used by other California public retirement plans and is therefore not supported by Segal's valuation software, we are nonetheless comfortable with their calculation of the employer and member contribution rates based on the close match to those contribution rates when the StanCERA results were recast by EFI using the more common method. We believe that the actuarial methods as recommended by EFI are reasonable for use in StanCERA's actuarial valuation. However, in order to contribute to the improvement of the valuation process, we do have some important comments on some of the methods and assumptions used by EFI that, in our opinion, warrant additional review by EFI and discussion with the Board of Retirement.

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In addition to reviewing of the results in total for all the members in each tier, we have also reviewed the results for 22 individual members among different tiers. This should provide an additional level of reassurance that the generally close match in the results for each tier was not due to offsetting results for different members within that tier.

Our observations and recommendations on the review of the June 30, 2012 actuarial valuation are summarized below:

- Segal's total present value of future benefits (PVB) as of June 30, 2012 is 101% of EFI's total present value.
- Segal's total actuarial accrued liability (AAL) as of June 30, 2012 is 97% of EFI's AAL.
- Segal's total present value of future normal costs (PVFNC) as of June 30, 2012 is 132% of EFI's present value of future normal costs.
- Our first focus was on matching the core numbers on which the plan's ultimate costs depend: the present value of future benefits. This resulted in a close match as shown above. However, the allocation of the PVB between the AAL and the PVFNC differs significantly as shown above (i.e., 97% for AAL and 132% for PVFNC). This is mainly due to the difference in the versions of the Entry Age actuarial cost method¹ that are used by EFI and Segal.

EFI employs a version of the Entry Age actuarial cost method that is much less commonly used and is not supported by our valuation software. We would describe this version as "funding to decrement," where costs are spread as a level percentage of pay for each individual benefit type (retirement, disability, etc.) and each individual eligibility age but only through the period of time during which the member is eligible for that particular benefit, and with the benefit at each age funded only through that age. Segal recommends to its clients the much more common "funding to maximum retirement

¹ This method has also been referred to as the Entry Age Normal actuarial cost method but following recent guidance from both the Governmental Accounting Standards Board (GASB) and the California Actuarial Advisory Panel, it is referred to as the Entry Age actuarial cost method in this report.

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age”² version of this method where costs for all benefits at all ages are spread over the member’s entire expected career length.

The “funding to maximum retirement age” method should result in a more stable (or level) normal cost rate over each member’s career, and this is the reason why this method is also favored by other public retirement plan actuaries. We understand that EFI recommended a change to this method during their 2009-2012 experience study for the purpose of setting the employer normal cost rate, but the Board did not adopt that recommendation. We strongly support EFI’s recommended change and provide more details on this issue later in this report.

As part of the June 30, 2010 valuation, EFI recommended a change in the method used in setting the Cost-of-Living-Adjustment (COLA) component of the member’s normal cost rate. That method was ultimately implemented and has been used since the June 30, 2010 valuation. Under that recommended approach, member COLA normal cost rates are calculated at each possible entry age using the “funding to maximum retirement age” method. While that is also our recommended approach to calculate member COLA normal cost rates, StanCERA should be reminded that with that change, the Association now uses a version of the Entry Age actuarial cost method to set contribution rates for the employer that is different from the version used for the member.

- As part of their experience study, EFI also made a recommendation to change from the “aggregate” to the “individual” version of the Entry Age actuarial cost method, but the Board did not adopt that recommendation. Again, we strongly support EFI’s recommended change and provide more details on this issue later in this report.
- In addition to comparing the PVB, AAL and PVFNC, we also focused on matching the employer contribution rates determined in EFI’s valuation. For employer contribution rates, the comparison is as follows:

² EFI has referred to this method as “funding to final decrement”.

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Funding to Decrement (EFI only)			
Class	EFI Employer Contribution Rate	Segal Employer Contribution Rate	Ratio of Segal to EFI
General	18.43%	20.25%	110%
Safety	30.54%	35.34%	116%
Total	20.73%	23.11%	111%

- There are significant differences between the employer contribution rates determined by Segal and those determined by EFI. In order to reconcile these results, we obtained from EFI their cost results as of June 30, 2012 calculated using the “funding to maximum retirement age” method. The table below summarizes those employer contribution rates and confirms that the variation in the cost method explains almost all of the difference in the employer contribution rates.

Funding to Maximum Retirement Age			
Class	EFI Employer Contribution Rate	Segal Employer Contribution Rate	Ratio of Segal to EFI
General	20.90%	20.25%	97%
Safety	35.41%	35.34%	100%
Total	23.65%	23.11%	98%

- Overall, we have verified that EFI’s calculations of the UAAL and the total employer and employee Normal Cost contribution rates as a percentage of payroll are reasonable based on the specific version of the cost method that they used and consistent with the relevant provisions of the CERL and past practices. However, in developing the contribution rate to amortize the UAAL, EFI adjusts the projected payroll to exclude members who are expected to “decrement” (i.e. terminate, die, disable or retire) from the Association during the plan year following the valuation. As it is our understanding that the same UAAL rate (calculated using a level percent of payroll amortization approach) would be charged not just on payroll for current members but also on new members expected to join the plan after the date of the valuation , we would recommend that EFI use the

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unreduced projected payroll (i.e., without adjusting for current year decrement) in the UAAL rate calculation.

- Under the 1937 Act County Employees Retirement Law (CERL), the individual entry age based basic member contribution rates are calculated by taking the discounted present value of a specified percent of final average salary for each year of service assuming retirement at a specified age and dividing that by the discounted present value of future salaries. It is our understanding that, before the June 30, 2010 valuation, all future salaries, including those expected to be earned after 30 years of employment, were included in the above calculation. However, effective with the June 30, 2010 valuation, only future salaries expected to be earned before 30 years of employment are included in the calculation of the basic member contribution rates.

As General and Safety employees enrolled at StanCERA are not required to make member contributions after they have attained 30 years of service, the procedure used prior to the June 30, 2010 valuation implicitly assumed that while those members expected to work over 30 years of service would continue to accrue additional benefits after 30 years of service, such additional benefits would be funded entirely by the employer and not by those members. On the other hand, the procedure used by EFI effective with the June 30, 2010 valuation explicitly assumed that the additional benefits earned after 30 years of service are now (partially) funded with higher member contributions during their first 30 years of service and not entirely by the employer.

We believe that this is a material change in the Board's actuarial funding policy and as such, would warrant specific discussion and documentation as part of the June 30, 2010 and future valuations.

- The assumptions used in the June 30, 2012 valuation are those that were recommended in the 2009-2012 experience study performed by EFI and approved the Board. In particular, the 7.75% investment rate of return assumption recommended for the June 30, 2012 valuation was developed net of investment expense but gross of administrative expense. It is our understanding that this is different from past practice in that, prior to the June 30, 2012 valuation, the investment return assumption had been developed net of both investment and administrative expenses.

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- There is a difference between setting the investment return assumption net of administrative expense versus gross of administrative expense because when an investment return assumption that was net of administrative expense was used historically to establish both the employer's and the member's contribution requirements, such administrative expense had been paid for implicitly by both the employer and the member.

This allocation of administrative expense changed with the setting of the investment return assumption gross of administrative expense because as part of that procedure, (1) member rates no longer include an implicit cost for administrative expense and (2) there is now an explicit charge for the administrative expense that is paid for entirely by the employer.

We believe that this is a material change in the Board's actuarial funding policy and as such, would warrant specific discussion and documentation as part of the June 30, 2012 and future valuations.

- Regarding a more technical issue related to the development of the member rates, as part of the June 30, 2010 valuation, EFI also switched to a method to calculate the member's COLA rate for each possible entry age even though there may not be an actual member with that specific entry age in that General or Safety membership group or tier. When we used the more common method to calculate COLA member rates based only on the actual demographic profile of members actually reported for the valuation, we observed that in the aggregate our result (8.78% of payroll) is very close to that computed by EFI (8.75% of payroll).
- Our review of EFI's experience study and the reasonableness of those assumptions is contained in the second part of this report.
- More detailed information about the comparison of results can be found in the following sections including some other minor comments.

Section I: Purpose and Scope of the Actuarial Review

Purpose of the Actuarial Review

The Segal Company has performed an actuarial review of StanCERA's June 30, 2012 actuarial valuation to provide assurance to the Association that the actuarial calculations are reasonable and that the actuarial valuation process was conducted according to generally accepted actuarial principles and practices.

Scope of the Actuarial Review

The scope of the review, as described in StanCERA's Actuarial Consulting Services Agreement with Segal, includes the following:

- Conduct an independent analysis of the detailed valuation results of StanCERA's June 30, 2012 annual valuation and July 1, 2009 through June 30, 2012 experience study for StanCERA to express an opinion and assure that the results presented are sound and reasonable.
- Determine whether the actuarial methods, considerations and analyses used by the consulting actuary EFI in preparing the June 30, 2012 actuarial valuation are technically sound and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board and appropriate practice for a 1937 Act County Retirement Fund. This determination includes:
 - a. 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.
 - b. Verification that all appropriate benefits have been valued and valued accurately. Verification that the data provided by the system is consistent with data used by EFI.
 - c. Evaluation of the actuarial cost method and actuarial asset valuation method in use and whether other methods would be more appropriate for StanCERA.
 - d. Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability and the amortization period.

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- e. Review of the demographic and economic actuarial assumptions for consistency, reasonableness, and compatibility.

- Express an opinion as to whether the consulting actuary's reports conform to appropriate Standards of Practice as promulgated by the Actuarial Standards Board and is comprehensive. Recommendations for improvement in the report presentation and analysis should be included.

Section II: Results of the Actuarial Review

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

Since our analysis was performed after EFI's actuarial valuation was completed, we were not able to discuss our observations with EFI while they were preparing the June 30, 2012 valuation. Nonetheless, our results generally confirm and support the results of that valuation, based on the specific version of the cost method used (as discussed below).

Step 1: Compare the demographics of the 2012 data provided by StanCERA with the valuation data used by EFI for the June 30, 2012 actuarial valuation.

Results

Exhibit A provides a comparison by membership group (i.e., General, Safety and in Total) of the number of participants, their average ages, average salaries (active members), average service (active members) and average benefits (pensioners). This exhibit indicates that EFI had only made a few adjustments, estimations or corrections to the data received from StanCERA. In general, the data received was "valuation ready."

Observations

- (1) For members who entered the Association during 2011/2012, their salaries were annualized assuming 2,080 hours worked for a full year of employment. For continuing active members whose salaries for 2011/2012 had decreased compared to 2010/2011 and for whom the reduction was caused by a reduction in the hours worked for 2011/2012, their salaries reported for 2011/2012 were adjusted to compensate for the reduction in hours.
- (2) The number of records reported by StanCERA as members who transferred (or left employment with an employer at StanCERA to work at another employer with reciprocal agreement with the Association) was lower than that used by EFI in their valuation. That difference (54 records) can all be explained by records added by EFI to track members who have a change (transfer) in membership group within StanCERA.

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Step 2: Develop a valuation program based on the relevant provisions of the County Employees Retirement Law (CERL) as summarized in EFI's June 30, 2012 valuation report, using the actuarial methods and assumptions outlined in that report.

Observations

- (1) We were informed by EFI that they use a version of the Entry Age actuarial cost method that is referred to as “funding to decrement.” We believe that this is an acceptable funding method to use under the Actuarial Standards of Practice; however, it is not a commonly used funding method for retirement systems and it is not one that is supported by our valuation software. (Also, this method is not sanctioned by Governmental Accounting Standards Board, or GASB, for financial reporting purposes under the new Statements No. 67 and 68). Segal’s valuation program has been set up on the more common version of the Entry Age actuarial cost method that is often referred to as “funding to maximum retirement age.” These two funding methods produce different results as shown later in this section.

Under the “funding to decrement” methodology, costs are spread as a level percentage of pay for each individual benefit type (retirement, disability, etc.) and each individual eligibility age but only through the period of time during which the member is eligible for that particular benefit, and with the benefit at each age funded only through that age. The “funding to maximum retirement age” spreads costs for all benefits at all ages over the member’s entire expected career length.

In their 2012 experience study, EFI recommended a change to the more commonly used approach; however, the Board did not adopt their recommended approach.

These two versions of the Entry Age actuarial cost method represent different funding methodologies; in particular, they represent different interpretations of what is meant by “level contributions.” In our opinion, for a given group of current active members, the “funding to maximum retirement age” method will produce normal costs that are a level percentage of the salaries paid to that group of active members throughout their careers. This level cost percentage is not affected by the fact that members might or might not be

Section II: Results of the Actuarial Review

eligible for or be expected to receive different types of benefits at different ages. The entire plan is viewed as a single financial commitment, which is funded as a level percentage of pay over the entire expected working lifetime of the active group. This is by far the most common application of the level funding concept among both private and public retirement systems.

One way to understand the policy differences between the “funding to maximum retirement age” and the “funding to decrement” methods is to ask whether the plan is considered: (1) a single commitment to be funded uniformly over the careers of all members, or (2) a collection of separate commitments, each of which is funded over its own range of applicable ages. The “funding to maximum retirement age” method results in a level normal cost for each member, but it allocates the funding of some types of benefit to periods that extend beyond the time that those types of benefit are expected to be incurred by and commenced by the member. In contrast, the “funding to decrement” method ensures that the funding of each type of benefit occurs by the time payment of such benefits is expected to commence to the member.

A somewhat creative example may help illustrate the differences. Suppose that you know that your travel needs will progress according to the following schedule:

Sportscar: years 1-5
SUV: years 4-15
Sailboat: years 12-20

If you finance each purchase only over its years of use, then you will have higher costs in the overlapping years. In this scenario, you would go to the bank and set up three level payments plans, each of which starts now and runs through the last year of the vehicle. This is analogous to the “funding to decrement approach.” However, if you have a creative banker who is not worried about collateral, you could combine all three vehicles into a single financing plan with level payments over 20 years. This is “funding to maximum retirement age.”

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Under this last approach, it is true that in year 18 you would still be making payments on a car you have not seen for 13 years or an SUV you have not seen for 3 years. It is also true that you will have enjoyed level travel expenses over the entire 20-year period. If level costs are the primary policy desire, then this last approach is the best available solution.

Around a decade ago, the actuary for a large 1937 Act County system recommended a change from the “funding to maximum retirement age” approach to the “funding to decrement” approach. There was some controversy and concern over the change so the retirement system hired around five actuarial firms to provide information on this issue. All responding firms commented that the “funding to decrement” approach was very uncommon and that their firm was not providing valuation services under that approach. In the end, the system retained the “funding to maximum retirement age” approach.

Ultimately, this is a matter of funding policy, but we concur with EFI’s experience study recommendation to change to the “funding to maximum retirement age” approach. This is due to the following reasons:

- This method produces a more level cost as a percentage of pay over the careers of a group of active members.
- This is by far the most common approach, representing an endorsement by many actuarial firms and consultants.
- As EFI noted, for financial reporting purposes, this method is required under GASB Statements No. 67 and 68.

(2) As part of the June 30, 2010 valuation, EFI recommended a change in the method used in setting the COLA component of the member’s normal cost rate, and that method was ultimately implemented and has been used since the June 30, 2010 valuation. Under that recommended approach, member COLA normal cost rates are calculated at each possible entry age using the “funding to maximum retirement age”. While that is also our recommended approach to calculate member COLA normal cost rates, StanCERA should be reminded that with that change, the Association now uses a version of the Entry Age

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actuarial cost method to set contribution rates for the employer that is different from the version used for the member.

- (3) As part of the experience study, EFI also made a recommendation to change from the “aggregate” to the “individual” version of the Entry Age actuarial cost method, but the Board did not adopt that recommendation. Again, we strongly support EFI’s recommended change.

For StanCERA, the AAL for each of the General and Safety membership groups is calculated by summing up the “individual” AAL for each member covered in that group. However, the normal cost for the General and Safety membership groups is calculated on an “aggregate” basis by taking the Present Value of Future Normal Costs divided by the Present Value of Future Salaries to obtain a normal cost for all employees covered in that membership group.

While we believe that the current practice of calculating normal cost using an aggregate approach will continue to be permitted under the Actuarial Standards of Practice for funding purposes, that approach will no longer be allowed for financial reporting purposes under the recently adopted GASB accounting disclosure requirements. Under those requirements, the normal cost for each membership group has to be calculated by summing up the next year’s “individual” Normal Costs for each member covered in that membership group.

Even though the adopted accounting disclosure requirements will require other major changes such as more rapid recognition for investment gains/losses and much shorter amortization for actuarial gains/losses, we believe there is an advantage to changing the current practice so that the same normal cost can continue to be used for both financial disclosure purposes and for funding purposes. Furthermore and perhaps more importantly, we believe that the more individually based version of the Entry Age actuarial cost method is more consistent with the fact that, even under the “aggregate” version of the Entry Age actuarial cost method, the normal costs are first determined on an “individual” basis and that the payment of normal cost determined under the

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“aggregate” method may result in future actuarial losses. For these reasons, the “individual” method is more commonly used by public plans in the U.S.

- (4) Under the 1937 CERL, the individual entry age based basic member contribution rates are calculated by taking the discounted present value of a specified percent of final average salary for each year of service assuming retirement at a specified age and dividing that by the discounted present value of future salaries. It is our understanding that, before the June 30, 2010 valuation, all future salaries, including those expected to be earned after 30 years of employment, were included in the above calculation. However, effective with the June 30, 2010 valuation, only future salaries expected to be earned before 30 years of employment are included in the calculation of the basic member contribution rates.

As General and Safety employees enrolled at StanCERA are not required to make member contributions after they have attained 30 years of service, the procedure used prior to June 30, 2010 valuation implicitly assumed that while those members with 30 years of service would continue to accrue additional benefits after 30 years of service, such additional benefits would be funded entirely by the employer and not by the members. On the other hand, the procedure used by EFI effective with the June 30, 2010 valuation explicitly assumed that the additional benefits earned after 30 years of service are now (partially) funded with higher members contributions during their first 30 years of service and not entirely by the employer.

We believe that this is a very important change in the Board’s actuarial funding policy and as such, would warrant specific discussion and documentation as part of the June 30, 2010 and future valuations.

- (5) Regarding the member rates, as part of the June 30, 2010 valuation, EFI also switched to a method to calculate the member’s COLA rate for each possible entry age even though there may not be an actual member with that specific entry age in that General or Safety membership group or tier. When we used the more common method to calculate COLA member rates based only on the actual demographic profile of members actually reported

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for the valuation, we observed that in the aggregate our result (8.78% of payroll) is very close to that computed by EFI (8.75% of payroll).

- (6) In determining the PVB, the AAL and the employer's normal cost rates, EFI had made the additional assumption that there would not be any across-the-board increases to individual salaries (i.e., salaries would only increase because of merit and promotion) for fiscal years 2012/2013 and 2013/2014. Note that this assumption was not made in the development of the member's basic and COLA rates.

While this adjustment is reasonable, we would generally recommend that such deviations be reflected in the valuation only after they have transpired, and appear in the actual data reported for the 2013 and 2014 valuations. This is done to maintain a more level normal cost rate.

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

Results

Exhibit B provides a comparison of Segal's and EFI's test life results for (i) the present value of future benefits (PVB), (ii) the present value of future normal costs (PVFNC), and (iii) the actuarial accrued liability (AAL).

- *Present Value of Future Benefits:* This liability 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 of the entire valuation as it represents the amount needed to provide all future expected benefit payouts for current members, based on the valuation assumptions.

The average ratios of Segal's results to EFI's results, on a total PVB basis, is 100.2% for inactive members and 101.1% for active members.

For active members with reciprocal service, EFI maintains two records - one is an active record that contains the combined StanCERA and reciprocal service, and another is an offsetting transfer record that contains the benefit service from the prior employer, for

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which the liabilities are subtracted from that of the active record in the valuation. The General Tier 2 active testcase has reciprocal service and there is a corresponding offsetting transfer record reported in the EFI final valuation data file. The total liability for this testcase provided by EFI has not been reduced by the liability for the corresponding offset record. We believe this explains why the ratio of Segal's to EFI's total present value of future benefit is 68.5%. As the total liability calculated by EFI is reduced by the offset records, we are not concerned with the variation for this test life.

For the active member in General Tier 3 where the ratio of Segal's result to EFI's result is 85%, we believe that variation may be explained by possible difference in procedures used by Segal and EFI to project the estimated Primary Insurance Amount (PIA) that is used as an offset to the benefit payable under that plan by StanCERA. The ratio of Segal's to EFI's total PVB for all 19 active members in General Tier 3 is 83%. As EFI's calculated PVB for General Tier 3 active members is less than 0.1% of EFI's total PVB for all active members, we are not concerned with the variation for this test life.

For the Safety Tier 5 member with relatively short service, we have calculated a PVB which is 121.3% of that calculated by EFI. Upon reviewing that difference with EFI, they confirmed for us that there was an issue related to the calculation of the present value of future salary for more recent hires. We would recommend that EFI conduct additional research to make sure that the liability and the contribution rates are not adversely impacted.

For the first two deferred vested members in General Tier 1 and Safety Tier 2, EFI confirmed that they did not set the member's liability to be at least equal to the refundable account balance. We recommend that comparison be made as part of the next valuation.

Also, for deferred vested members in Safety Tier 2, EFI had calculated their PVB using the benefit under 3% at 50 (Section 31664.1) instead of under 2% at 50 (Section 31664). This should be corrected as part of the next valuation.

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

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➤ Present Value of Future Normal Costs and Accrued Liability

As mentioned earlier, Segal and EFI use two different versions of the Entry Age funding method in their calculations. The difference in the present value of future normal cost and the actuarial accrued liability are primarily due to the two different versions of the Entry Age actuarial cost method.

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

Actuarial Value of Assets

We have reviewed EFI's calculation of the actuarial value of assets, and found that to be reasonable.

The 5-year asset smoothing period currently used by StanCERA is industry standard and is by far the most common period used by public plans. That 5-year period, in our opinion, also meets the Actuarial Standards of Practice of being "sufficiently short," which allows StanCERA substantial flexibility in setting the market value (MVA) corridor, including no MVA corridor.

It is our understanding for the valuation, assets are tracked on a book-keeping basis only between the County and the City of Ceres (includes the other special districts). As there is a separate contribution rate to amortize the Unfunded Actuarial Accrued Liability (UAAL) for each of the County and the City's General and Safety membership groups, there is a further sub-division of the assets maintained by EFI based on the proportion of the General and the Safety members' AAL determined in the actuarial valuation for each of the County and the City. While we believe the current practice to be a reasonable approach in determining UAAL contribution rates for the General and Safety membership groups, it suffers from the drawback of potentially shifting the obligations to pay off the UAAL when there is an increase in AAL for only one of the two membership groups. For instance, everything else being equal, an increase in the liability for the Safety group as a result of higher than expected number of disability retirements would result in a higher allocation of the Association's asset to the County's Safety group and a lower allocation to the County's General group. This means that there would be an increase in the UAAL contribution rate for the County's General group even though that deviation in experience is not caused by the County's General group.

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Amortization of Unfunded Actuarial Accrued Liability (UAAL)

With the exception that UAAL has to be amortized over a period not to exceed 30 years under Section 31453.5 of the 1937 CERL , governmental or public defined benefit plans like StanCERA are not subject to specific external funding or funding policy requirements such as those established for single employer (corporate) and multiemployer (Taft-Hartley) defined benefit pension plans under the Employee Retirement Income Security Act (ERISA) and the Internal Revenue Code (IRC).

Historically many public pension systems amortized their UAAL using the same single layer approach used by StanCERA. Because new amounts of UAAL arise each year (due to gains and losses, assumption changes and plan amendments) this requires a policy choice as to how to determine the remaining amortization period each year.

A “closed” or fixed period works like a home mortgage and so gets shorter each year. However, unlike a home mortgage, for a pension plan this eventually leads to an unstable situation where each year’s gain or loss (or other UAAL changes) is amortized over a shorter and shorter period. Eventually the policy needs to be amended to restart the amortization period at something like its original period.

To avoid this need to periodically revisit the policy, some systems use an “open” or rolling amortization period. This is analogous to refinancing your home mortgage each year, but including any new UAALs arising each year. While this is a stable policy, it also means that there is no date by which the UAAL is fully amortized, which raises questions of accountability and intergenerational equity.

To address both the stability and the accountability issues, many public systems have adopted the “layered” approach used by all corporate and multiemployer pension plans. Here each new amount of UAAL is amortized over a separate, fixed period. This approach also has the advantage of identifying the source of each dollar of current UAAL, as well as when each portion of UAAL will be fully amortized. We would recommend to StanCERA that consideration of the layered amortization approach be included in any future discussion with EFI on the Association’s actuarial funding policy.

Section II: Results of the Actuarial Review

Valuation Results

Exhibit C provides a comparison by class of members of Segal's results and EFI's results for (i) the present value of future benefits (PVB), (ii) the actuarial accrued liability (AAL) as well as the unfunded AAL (UAAL), and (iii) the member and employer contribution rates based on the June 30, 2012 valuation.

- The ratio of Segal's results to EFI's results on a total present value of future benefits basis is 101.0% for active members. For inactive members, the ratio of Segal's results to EFI's is 101.5%. Overall, our present value of future benefits is 101.2% of EFI's present value for all members.
- 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 unfunded actuarial accrued liability 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 unfunded actuarial accrued liabilities.

As mentioned earlier, Segal and EFI have used two different versions of the Entry Age actuarial cost method in their calculations. Mainly resulting from this difference, the ratio of Segal's results to EFI's results on a total actuarial accrued liability basis is 97.0%.

- The present value of future normal costs is calculated as the difference between the present value of future benefits and the actuarial accrued liability. The net effect of the results provided above is that the ratio of Segal's results to EFI's results on a present value of future normal costs basis is 132.2%. Again, this is mainly the result of the difference in the cost method mentioned above.
- We next focused on the determination of the employer contribution rates and that comparison is as follows:

Section II: Results of the Actuarial Review

Funding to Decrement (EFI only)			
Class	EFI Employer Contribution Rate	Segal Employer Contribution Rate	Ratio of Segal to EFI
General	18.43%	20.25%	110%
Safety	30.54%	35.34%	116%
Total	20.73%	23.11%	111%

- The significant differences in the employer contribution rates are a result of the difference in cost method. In order to confirm this, we obtained results from EFI as of June 30, 2012 that were based on a version of the cost method that is consistent with the method that we use. The table below summarizes those employer contribution rates and confirms that the variation in the cost method explains almost all of the difference in the employer contribution rates.

Funding to Maximum Retirement Age			
Class	EFI Employer Contribution Rate	Segal Employer Contribution Rate	Ratio of Segal to EFI
General	20.90%	20.25%	97%
Safety	35.41%	35.34%	100%
Total	23.65%	23.11%	98%

- Overall, we have verified that EFI’s calculations of the UAAL and the total employer and employee Normal Cost contribution rates as a percentage of payroll are reasonable based on the specific version of the cost method that they used and consistent with the relevant provisions of the CERL and past practices. However, in developing the contribution rate to amortize the UAAL, EFI adjusts the projected payroll to exclude members who are expected to “decrement” (i.e. terminate, die, disable or retire) during the plan year following the valuation. As it is our understanding that the same UAAL rate (calculated using a level percent of payroll amortization approach) would be charged not just on payroll for current members but also on new members expected to join the plan after the date of the valuation , we would recommend that EFI use the unreduced projected payroll (i.e., without the reduction for decrements in the current year) in the UAAL rate calculation.

Section II: Results of the Actuarial Review

- Regarding a more technical issue related to the development of the member rates, as part of the June 30, 2010 valuation, EFI also switched to a method to calculate the member's COLA rate for each possible entry age even though there may not be an actual member with that specific entry age in that General or Safety membership group or tier. When we used the more common method to calculate COLA member rates based only on the actual demographic profile of members actually reported for the valuation, we observed that in the aggregate our total basic plus COLA member rate (8.78% of payroll) is very close to that computed by EFI (8.75% of payroll).

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

Observations

We reviewed the EFI actuarial report in detail and have a few comments that may improve the discussions provided in the report.

- (1) On pages 42 and 43 of their valuation report, EFI notes that a level percentage of pay amortization policy which means that a period of around 19 or more years will result in amortization payments for some years that is less than the interest on the UAAL. Since StanCERA uses a 24-year amortization period for the total UAAL as of June 30, 2012, there will be a period of several years where the principal balance on the UAAL increases (i.e. "negative amortization"). For various reasons (including to limit the number of years in which negative amortization might occur), we generally recommend an amortization period of 15 to 20 years for most of our clients that use the level percentage of payroll approach. This should be included in any future discussion with EFI on the Association's actuarial funding policy.
- (2) The report should document the assumption for salary increases used for terminated vested members that go on to work for a reciprocal entity.
- (3) The early retirement age factors provided on page 14 of the valuation report for Safety Tier 2 are incorrect. However, the correct factors were used in the valuation.
- (4) During our review, we made the observation that the member contribution rates for Safety Tier 2 as documented in the June 30, 2012 valuation report were not reflective of

Section II: Results of the Actuarial Review

the rates actually used in the valuation. We understand that the corrected member contribution rates were subsequently provided to StanCERA in an e-mail dated August 8, 2013.

- (5) There was a group of about 200 non-vested members that have been reported by StanCERA as terminated but not yet received a refund of their member account balance. EFI has included a liability equal to their member account balance in the valuation. We recommend that a disclosure on the count and the liability be made as part of the next valuation report.
- (6) The service based merit and promotional salary increase assumption as provided on page 43 of the June 30, 2012 valuation report were not the same as those recommended in the 2009-2012 experience study that were used in the valuation. We recommend that those assumptions documented on page 43 be corrected to reflect the actual assumptions in the next valuation report.

EXHIBIT A

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

ANALYSIS OF PARTICIPANT DATA

ACTIVE MEMBERS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	3,231	3,233	661	661	3,892	3,894
Average Age	46.35	46.36	39.14	39.14	45.12	45.14
Average Annual Salary (Not Annualized)*	\$53,158	\$53,163	\$60,297	\$60,297	\$54,371	\$54,374
Average Service	11.75	11.76	11.01	11.01	11.62	11.63
% DIFFERENCE						
Number		0.1%		0.0%		0.1%
Average Age		0.0%		0.0%		0.0%
Average Annual Salary (Not Annualized)*		0.0%		0.0%		0.0%
Average Service		0.1%		0.0%		0.1%

**The annualized salaries shown in the 2012 valuation report are \$55,447, \$63,022 and \$56,733 for the General, Safety and total groups, respectively.*

EXHIBIT A (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

ANALYSIS OF PARTICIPANT DATA

TERMINATED VESTED PARTICIPANTS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	545	554	102	99	647	653
Average Age	49.83	49.82	43.25	43.66	48.80	48.89
Average Service	7.34	7.59	6.08	6.34	7.14	7.40
% DIFFERENCE						
Number		1.7%		-2.9%		0.9%
Average Age		0.0%		0.9%		0.2%
Average Service		3.4%		4.3%		3.6%

TRANSFER (RECIPROCAL) PARTICIPANTS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number*	136	180	55	69	191	249
Average Age	48.27	45.68	38.93	37.46	45.58	43.40
Average Service	5.85	5.41	6.85	6.20	6.14	5.63
% DIFFERENCE						
Number		32.4%		25.5%		30.4%
Average Age		-5.4%		-3.8%		-4.8%
Average Service		-6.5%		-9.5%		-8.3%

**EFI transfer records include 54 records for those members who had a change in membership group (from General to Safety or vice versa) and/or tier. These records were created by EFI to capture the service in the group and/or tier prior to the transfer.*

EXHIBIT A (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

ANALYSIS OF PARTICIPANT DATA

SERVICE RETIRED PARTICIPANTS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	2,132	2,148	294	295	2,427*	2,443
Average Age	69.04	69.01	64.05	64.05	68.43	68.41
Average Annual Benefit	\$25,863	\$25,759	\$48,788	\$48,952	\$28,630	\$28,559
% DIFFERENCE						
Number		0.8%		0.3%		0.7%
Average Age		0.0%		0.0%		0.0%
Average Annual Benefit		-0.4%		0.3%		-0.2%

* Includes one retiree with unknown membership.

BENEFICIARIES						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	310	311	84	84	395**	395
Average Age	73.25	73.20	64.81	64.81	71.41	71.42
Average Annual Benefit	\$14,854	\$15,069	\$25,066	\$25,373	\$16,989	\$17,261
% DIFFERENCE						
Number		0.3%		0.0%		0.0%
Average Age		-0.1%		0.0%		0.0%
Average Annual Benefit		1.4%		1.2%		1.6%

** Includes one beneficiary with unknown membership.

EXHIBIT A (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

ANALYSIS OF PARTICIPANT DATA

DUTY DISABLED PARTICIPANTS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	108	108	112	112	220	220
Average Age	65.05	65.06	56.51	56.51	60.70	60.70
Average Annual Benefit	\$22,137	\$22,137	\$34,076	\$34,076	\$28,215	\$28,215
% DIFFERENCE						
Number		0.0%		0.0%		0.0%
Average Age		0.0%		0.0%		0.0%
Average Annual Benefit		0.0%		0.0%		0.0%

ORDINARY DISABLED PARTICIPANTS						
	General		Safety		Total	
	StanCERA	EFI	StanCERA	EFI	StanCERA	EFI
Number	78	78	6	6	84	84
Average Age	64.51	64.51	56.15	56.15	63.91	63.92
Average Annual Benefit	\$14,092	\$14,092	\$19,043	\$19,043	\$14,446	\$14,446
% DIFFERENCE						
Number		0.0%		0.0%		0.0%
Average Age		0.0%		0.0%		0.0%
Average Annual Benefit		0.0%		0.0%		0.0%

EXHIBIT B

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

TEST LIFE COMPARISON - ACTIVES

	General Tier 2*		General Tier 2		General Tier 3	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$122,699	\$84,036	\$103,834	\$108,047	\$32,225	\$27,455
PV – Future Normal Costs **	64,271	83,380	42,773	53,353	6,309	6,937
Actuarial Accrued Liability	58,428	656	61,061	54,694	25,915	20,519
RATIO OF SEGAL/EFI						
PVB		68.5%		104.1%		85.2%
PV – Future Normal Costs **		129.7%		124.7%		110.0%
Actuarial Accrued Liability		1.1%		89.6%		79.2%

	General Tier 4		General Tier 5		General Tier 5	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$635,350	\$629,938	\$119,335	\$123,727	\$233,439	\$240,812
PV – Future Normal Costs **	29,448	51,358	81,064	88,004	101,764	116,352
Actuarial Accrued Liability	605,902	578,579	38,271	35,724	131,675	124,460
RATIO OF SEGAL/EFI						
PVB		99.1%		103.7%		103.2%
PV – Future Normal Costs **		174.4%		108.6%		114.3%
Actuarial Accrued Liability		95.5%		93.3%		94.5%

**For active members with reciprocal service, EFI maintains two records - one is an active record that contains all the StanCERA and reciprocal service, and another is an offsetting transfer record that contains the benefit service from the prior employer for use in calculating the liability to be subtracted from that of the active record.*

The General Tier 2 active test case has reciprocal service and there is a corresponding offsetting transfer record reported in the EFI final valuation data file. The total liability for this test case provided by EFI has not been reduced by the liability for the corresponding offset record.

***The difference in the present value of future normal cost is primarily due to the difference in the versions of the Entry Age actuarial cost method used by EFI and Segal.*

EXHIBIT B (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

TEST LIFE COMPARISON – ACTIVES (CONTINUED)

	Safety Tier 2		Safety Tier 4		Safety Tier 5	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$209,781	\$207,325	\$1,865,233	\$1,883,464	\$237,959	\$288,725
PV – Future Normal Costs *	118,303	151,543	12,063	95,570	207,389	254,592
Actuarial Accrued Liability	91,478	55,782	1,853,170	1,787,895	30,570	34,133
RATIO OF SEGAL/EFI						
PVB		98.8%		101.0%		121.3%**
PV – Future Normal Costs *		128.1%		792.3%		122.8%
Actuarial Accrued Liability		61.0%		96.5%		111.7%

	Safety Tier 5	
	EFI	Segal
PVB	\$786,370	\$801,766
PV – Future Normal Costs *	184,017	266,819
Actuarial Accrued Liability	602,354	534,947
RATIO OF SEGAL/EFI		
PVB		102.0%
PV – Future Normal Costs *		145.0%
Actuarial Accrued Liability		88.8%

* The difference in the present value of future normal cost is primarily due to the difference in the versions of the Entry Age actuarial cost method used by EFI and Segal.

** Upon reviewing that difference with EFI, they confirmed for us that there was an issue related to the calculation of the present value of future salary for more recent hires. We would recommend that EFI conduct additional research to make sure that the liability and the contribution rates are not adversely impacted.

EXHIBIT B (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

TEST LIFE COMPARISON – INACTIVES

	Inactive Vested General Tier 1 *		Inactive Vested Safety Tier 2 **		Transfer General Tier 2	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$22,303	\$22,344	\$9,436	\$9,527	\$14,625	\$14,686
RATIO OF SEGAL/EFI						
PVB		100.2%		101.0%		100.4%

	Transfer Safety Tier 5		Retiree General Tier 3		Retiree Safety Tier 2	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$68,518	\$68,599	\$63,964	\$63,964	\$99,689	\$99,867
RATIO OF SEGAL/EFI						
PVB		100.1%		100.0%		100.2%

	Ordinary Disabled General Tier 5		Ordinary Disabled Safety Tier 5		Duty Disabled General Tier 1	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$113,600	\$113,811	\$356,092	\$356,699	\$149,188	\$149,519
RATIO OF SEGAL/EFI						
PVB		100.2%		100.2%		100.2%

	Duty Disabled Safety Tier 4		Beneficiary General Tier 1		Beneficiary Safety Tier 1	
	EFI	Segal	EFI	Segal	EFI	Segal
PVB	\$1,275,154	\$1,277,414	\$63,659	\$63,789	\$230,720	\$231,143
RATIO OF SEGAL/EFI						
PVB		100.2%		100.2%		100.2%

* Refundable employee account balance is \$37,413. We recommend that the liability be set at least equal to the member's refundable account balance.

** Refundable employee account balance is \$31,627. We recommend that the liability be set at least equal to the member's refundable account balance.

EXHIBIT C

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

**COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)**

PRESENT VALUE OF FUTURE BENEFITS (PVB)						
	General		Safety		Total	
	EFI	Segal	EFI	Segal	EFI	Segal
Actives:						
Death	\$13,975	\$10,693	\$5,011	\$4,328	\$18,986	\$15,021
Disability	17,709	17,721	42,319	43,110	60,027	60,831
Termination	32,863	32,363	14,966	14,876	47,829	47,238
Transfer Offset	-18,997	0	-3,779	0	-22,775	0
Retirement	<u>765,228</u>	<u>756,778</u>	<u>215,580</u>	<u>216,203</u>	<u>980,808</u>	<u>972,981</u>
Active Total	\$810,778	\$817,555	\$274,097	\$278,517	\$1,084,875	\$1,096,071
Inactives:						
Retirees and Beneficiaries	\$723,105	\$734,776	\$264,441	\$267,550	\$987,546	\$1,002,326
Inactive Vesteds & Transfers	54,112	54,689	19,287	19,506	73,399	74,195
Inactive Total	\$777,217	\$789,465	\$283,728	\$287,056	\$1,060,945	\$1,076,521
Total PVB	\$1,587,995	\$1,607,020	\$557,825	\$565,573	\$2,145,820	\$2,172,592
RATIO OF SEGAL/EFI						
Actives:						
Death		76.51%		86.37%		79.11%
Disability		100.07%		101.87%		101.34%
Termination		98.48%		99.39%		98.77%
Transfer Offset		N/A		N/A		N/A
Retirement		98.90%		100.29%		99.20%
Active Total		100.84%		101.61%		101.03%
Inactives:						
Retirees and Beneficiaries		101.61%		101.18%		101.50%
Inactive Vesteds & Transfers		101.07%		101.13%		101.08%
Inactive Total		101.58%		101.17%		101.47%
Total PVB		101.20%		101.39%		101.25%

EXHIBIT C (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

**COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)**

UNFUNDED ACTUARIAL ACCRUED LIABILITY						
	General		Safety		Total	
	EFI	Segal	EFI	Segal	EFI	Segal
Present Value of Future Benefits	\$1,587,995	\$1,607,020	\$557,825	\$565,573	\$2,145,820	\$2,172,592
PV Future Total NC Contributions	<u>-183,781</u>	<u>-237,832</u>	<u>-73,326</u>	<u>-102,089</u>	<u>-257,107</u>	<u>-339,920</u>
Actuarial Accrued Liability	\$1,404,214	\$1,369,188	\$484,499	\$463,484	\$1,888,713	\$1,832,672
Current Assets at Actuarial Value*	<u>-1,087,517</u>	<u>-1,090,968</u>	<u>-364,247</u>	<u>-360,796</u>	<u>-1,451,764</u>	<u>-1,451,764</u>
Unfunded Actuarial Accrued Liability (UAAL)	\$316,697	\$278,220	\$120,252	\$102,688	\$436,949	\$380,908
RATIO OF SEGAL/EFI						
Present Value of Future Benefits		101.20%		101.39%		101.25%
PV Future Total NC Contributions		129.41%		139.23%		132.21%
Actuarial Accrued Liability		97.51%		95.66%		97.03%
Current Assets at Actuarial Value		100.32%		99.05%		100.00%
Unfunded Actuarial Accrued Liability		87.85%		85.39%		87.17%

* We have reallocated assets between General and Safety based on the proportion of the liabilities calculated for each of the two membership groups.

EXHIBIT C (CONTINUED)

**STANISLAUS COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
JUNE 30, 2012 VALUATION**

**COMPARISON OF RESULTS
(% of Payroll)**

CONTRIBUTION RATES						
	General		Safety		Total	
	EFI	Segal	EFI	Segal	EFI	Segal
1. Total Normal Cost Contribution Rate	13.08%	17.02%	21.21%	29.47%	14.62%	19.38%
2. Average Member Contribution Rate	7.93%	8.02%	12.24%	12.08%	8.75%	8.78%
3. Net Employer Normal Cost Contribution Rate (1. - 2.)*	5.15%	9.00%	8.97%	17.39%	5.87%	10.60%
4. UAAL Payment	\$21,621,127	\$19,007,541	\$8,209,752	\$7,015,482	\$29,830,879	\$26,023,022
5. Pay (County & Ceres)**	174,280,739	182,240,983	40,776,729	42,477,215	215,057,468	224,718,198
6. Combined UAAL Contribution Rate (4. / 5.)*	12.41%	10.43%	20.13%	16.52%	13.88%	11.58%
7. Administrative Expenses	0.87%	0.82%	1.44%	1.43%	0.98%	0.93%
8. Total StanCERA Employer Contribution Rate (3. + 6. + 7.)*	18.43%	20.25%	30.54%	35.34%	20.73%	23.11%
RATIO OF SEGAL/EFI						
1. Total Normal Cost Contribution Rate		130.1%		138.9%		132.6%
2. Average Member Contribution Rate		101.1%		98.7%		100.3%
3. Net Employer Normal Cost Contribution Rate (1. - 2.)*		174.8%		193.9%		180.6%
4. UAAL Payment		87.9%		85.5%		87.2%
5. Pay (County & Ceres)		104.6%		104.2%		104.5%
6. Combined UAAL Contribution Rate (4. / 5.)*		84.0%		82.1%		83.4%
7. Administrative Expenses		94.3%		99.3%		94.9%
8. Total StanCERA Employer Contribution Rate (3. + 6. + 7.)*		109.9%		115.7%		111.5%
<p>* Adjusted to reflect payroll weighting of separate groups and tiers. Results may not add properly due to the payroll weighting. Differences in results are mainly due to the use of different versions of the Entry Age method as described earlier in this report.</p> <p>** In developing the UAAL contribution rate, EFI has used the projected payroll after the amount has been reduced to exclude members expected to decrement from the Association during the plan year following the valuation. Segal has not included such reduction in developing the UAAL rate.</p>						

B: Review of July 1, 2009 through June 30, 2012 Experience Study

Executive Summary

The purposes of our review are provided on Page A-1 of this report.

Our observations and recommendations with regard to the July 1, 2009 through June 30, 2012 experience study are summarized as follows:

- In the July 1, 2009 through June 30, 2012 experience study, EFI has recommended a reduction in the annual inflation from 3.50% to 3.25%. Since EFI has also recommended a reduction in the nominal (i.e., gross of inflation) annual investment return assumption from 8.00% to 7.75%, there is no change in the real rate of return assumption (4.5%), with the exception that the return assumption is no longer expected to be net of administrative expenses because such administrative expenses are now funded explicitly in the valuation with additional contributions made by the employer.

While we agree with EFI that the development of an investment return assumption that is gross of administrative expense would satisfy the requirements for selecting discount rate under the new GASB Statements No. 67 and 68, it has the impact of changing the past practice of implicitly allocating such administrative expenses to both the employers and the employees.

In particular, in developing the investment rate of return assumption for the June 30, 2012 valuation, there is now an explicit charge recommended in the contributions to pay for the administrative expense, and the 7.75% investment rate of return assumption is now developed gross of such expense. This is different from past practice prior to the June 30, 2012 valuation where the expected administrative expenses were subtracted from the gross investment return to arrive at the net investment return. This difference is significant because when the net investment rate of return assumption was used historically to establish both the employer's and the member's contribution requirements, such administrative expense had in effect been paid for implicitly by both the employer and the members.

We believe that this is a material change in the Board's actuarial funding policy and as

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such, would warrant specific discussion and documentation as part of the June 30, 2012 and future valuations.

- EFI has used capital market assumptions provided by SIS, StanCERA's current investment consultant, in developing the investment rate of return assumption. Therefore, any recommendations for the investment rate of return assumption will depend heavily upon those capital market assumptions from the Association's investment consultant. We understand that it may not be possible to use an average of capital market assumptions from several investment advisory firms for the stochastic modeling that was performed by EFI. However, we caution that relying on only one investment consultant's capital market assumptions may lead to the undesired result of an investment rate of return assumption that can vary significantly depending on which investment consultant is employed by a system. In this case, we have found that capital market assumptions from the current investment consultant appear to be higher than the average from a sample of investment consultants that we maintain.

- In developing the investment return assumption, EFI has calculated a mean return of 7.81% by using a stochastic simulation of future returns over a ten-year period. It was concluded by EFI that there is a slightly better than 50/50 chance that a 7.75% return would be achieved over a ten-year period. However, this calculation does not reflect the effect of investment expense.

On page 43 of the June 30, 2012 valuation report, EFI describes the 7.75% investment return assumption as being net of investment related expenses. However, there is no mention of investment expenses in EFI's experience study report and it is our understanding that the returns in the stochastic simulation are in fact gross of investment related expenses.

Generally speaking, when Segal develops the investment return assumption for our clients with an actively managed portfolio, we would have subtracted the investment

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expenses³ (including active management fees) from the indexed (or passively managed) returns in developing the net investment return assumption which would lower the expected investment return assumption. Note that we generally would not recommend an explicit assumption in the development of the investment return assumption that there would be additional returns (“alpha”) from active management⁴.

- There was only limited underlying data presented by EFI to justify the 0.25% recommendation for the real wage increase component of the salary increase assumption. While we would agree that 0.25% is within the reasonable range for this assumption (generally between 0.25% and 0.75%), we recommend that EFI provide more data to support the development of this assumption and consider increasing this component to a minimum of 0.5% in future experience study.
- We are comfortable with EFI’s analysis and recommendation to use a 2.7% COLA increase assumption; however, this will lead to actuarial losses in years when inflation is above 2.7% per year, even though the stated CPI assumption is 3.25%.
- In reviewing the demographic assumptions for StanCERA, EFI has analyzed and provided documentation on the experience for each of the General and Safety membership groups, and different assumptions were recommended accordingly for each of the two groups.

However, for the (pre and post-retirement) mortality assumptions, the same assumption tables have been recommended by EFI for both General and Safety. We have requested from EFI the supporting data separated by the General and Safety membership groups. We would agree that there was no evidence to support a different mortality table for each of the two groups; however, we would recommend that such information be disclosed in their report for documentation purposes.

³ For StanCERA, the investment expense (including management, consulting and custodian fees) has been about 0.35%.

⁴ This is consistent with the Actuarial Standard of Practice No. 27, Section 3.6.3.e, which states: Investment Manager Performance – Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). Few investment managers consistently achieve significant above-market returns nets of expenses over long periods.”

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Furthermore, while we believe EFI's recommendation to maintain the mortality tables to be reasonable, our preference would have been to strive for an AE ratio (measured by taking the number of actual deaths to the expected deaths) of 110%, which is about a one-year improvement in future life expectancy. The average AE ratio for the last six years for the actives, non-disabled retirees and beneficiaries is only 104% and is below the 110% that we would generally recommend for this type of study.

- For the termination (withdrawal and deferred retirement) rates, EFI has recommended different percentage assumptions for those who are expected to receive refund of their contributions as opposed to receiving a deferred retirement benefit. For documentation purposes, those percentages should be substantiated with the actual experience of members who withdrew versus deferred their pension upon termination from StanCERA.

Similarly, the percent of members who are expected to become reciprocal members after their terminations should be substantiated with the actual experience of members who left StanCERA but continued membership at another reciprocal system.

- Documentation should also be included on the recommended reciprocal salary increase assumption⁵.
- In future experience studies, EFI should provide the recommended unisex assumptions used to calculate the new individual entry age based employee rates. As the effect on the employer rate associated with the change in the recommended assumptions is included in the EFI experience study report, we would recommend that the associated impact on the member rates also be included in that report.
- In order to anticipate the cashing out of unused vacation time during the final salary averaging period (terminal pay), EFI has applied a load on the salary of 3.5% for General and 2.5% for Safety members projected to have at least 20 years of service at service

⁵ We note that after an inquiry to EFI, they clarified that a 4.25% per year salary increase was assumed for the reciprocal employees, and that they would disclose that assumption in their next valuation as of June 30, 2013.

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retirement, disability retirement or in-service death. Upon reviewing the data used to derive those assumptions, EFI confirmed our observation that the assumptions were prepared using vacation cashouts from all members (i.e., including members with less than 20 years of service). Because shorter service members have lower cashout levels, this understates the level of cashouts for members with at least 20 years of service. This produces an understatement of the liabilities and contribution rates; this inconsistency should be corrected as part of the next valuation.

Section I: Purpose and Scope of the Actuarial Review

The purpose and the scope of our review are provided on pages A-7 and A-8 of this report.

Section II: Results of the Actuarial Review

Review of Economic Assumptions

The economic assumptions reviewed by EFI during the 2009-2012 experience study are inflation, investment rate of return, payroll growth, and COLA increases. The Actuarial Standard of Practice No. 27 (ASOP 27) provides the actuary guidance in developing these assumptions. Primary among these guidelines is the consistency of the economic assumptions selected by the actuary. EFI has recommended a set of economic assumptions that are generally consistent with each other.

EFI has utilized a “building block” approach in developing the recommended investment rate of return assumption. This is the preferred approach for developing this assumption. Under this approach, the investment rate of return assumption is the combination of the inflation component and the real rate of return component. Unless accounted for otherwise, our preferred approach in developing the investment return assumption is to include an expense component, which typically includes administrative and investment related expenses. In the 2009-2012 experience study, EFI has specifically accounted for the administrative expense component by assessing an additional contribution of \$2.1 million to the employer. We understand from page 43 of the June 30, 2012 valuation report that EFI’s real rate of return calculation is net of investment related expense. However, there is no specific mention of this in their experience study report, and we feel it a more explicit discussion of investment expense would be appropriate.

Inflation Assumption

The first “building block” to consider is the price inflation component assumption. This assumption underlies all other economic assumptions. EFI has recommended lowering the current 3.50% assumed rate of inflation to 3.25%.

In their analysis, EFI determined that an assumption of “below 3.00% may appear to match well with current market and professional expectations.” However, they concluded that changing from the current 3.50% inflation assumption to an assumption lower than 3.00% would be too drastic and would therefore be inadvisable. In their report, EFI recommended a 3.25% inflation assumption because the 3.25% assumption falls within the reasonable range for that assumption.

Section II: Results of the Actuarial Review

EFI also mentioned that if markets and professionals continue to indicate lower future inflation expectations at the time of the next experience study, then the 3.25% inflation assumption could be lowered again. We concur here as well.

Administrative and Investment Expense Assumptions

Administrative Expense

EFI mentioned that Article 31580.2 of the 1937 Act states that, excluding certain expenses, administrative expenses may not exceed 0.20% of the Association's assets, and that over the last three years the actual expenses have averaged 0.16%. Furthermore, in order to use the same investment return assumption for both funding and for financial disclosure purposes under the recently approved GASB Statements No. 67 and 68, EFI's recommended 7.75% investment return assumption has been developed gross of administrative expense.

While we generally agree with EFI's recommendation, we note that EFI has historically used the investment rate of return **net** of administrative expense to establish both the employer and member contribution requirements. Consequently, using an investment return assumption **gross** of administrative expense has the indirect impact of changing the past practice of implicitly allocating such administrative expense between the employer and the member. This represents a change to the actuarial funding policy used to determine employer and member contribution rates. We believe that this is a material change in the Board's actuarial funding policy and as such, would warrant specific discussion and documentation as part of the June 30, 2012 and future valuations.

Investment Expense

As previously mentioned, we understand from page 43 of the June 30, 2012 valuation report that EFI's 7.75% investment return assumption is net of investment related expense. However, there is no mention of this in EFI's experience study report and we believe that this information should have been included.

Section II: Results of the Actuarial Review

Generally speaking, individual actuarial firms use different models with different criteria to determine the investment return assumption, and the model used by Segal is different from that used by EFI. Besides the difference between EFI's current investment consultant only method and Segal's use of an averaged return from various investment consultants, Segal would subtract the investment expenses⁶ from the indexed (or passively managed) returns in developing the investment return assumption which would lower the expected investment return assumption. Note that we generally would not recommend an explicit assumption in the development of the investment return assumption that there would be additional returns ("alpha") from active management. This is consistent with the Actuarial Standard of Practice No. 27, Section 3.6.3.e, which states: Investment Manager Performance – Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). Few investment managers consistently achieve significant above-market returns nets of expenses over long periods.”

Investment Rate of Return Assumption

Based on their stochastic modeling, and using stochastic assumptions developed by the current investment consultant, EFI determined the mean rate of investment return to be 7.81%. EFI has recommended a 7.75% assumption and noted that there is a slightly better than 50/50 chance that that assumption would be achieved over a ten-year period.

While we support the reduction in EFI's recommended investment return assumption of 7.75%, we believe that consideration should have been given to lowering the assumption to either 7.50% or 7.25%. In reviewing the investment rate of return assumption, we observe the following:

1. The real rate of return assumption for a portfolio can be adjusted to reflect the potential risk of shortfalls in the return assumptions. An Association's asset allocation also determines this portfolio risk, since volatility risk levels also are expected to vary by asset class. This portfolio risk can be incorporated into the real rate of return assumption through a risk adjustment, which produces margin for adverse deviation. In Segal's economic assumptions

⁶ For StanCERA, the investment expense (including management, consulting and custodian fees) has been about 0.35%.

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development model, we typically include such risk adjustment in developing the investment rate of return assumption.

The original development of the risk adjustment component of our investment earnings assumption model arose from our experience with many retirement boards over many years. Quite simply, combining the boards' inflation assumption with the real return and expense components produced – and produces – a substantially higher assumed return than what the boards actually adopt, regardless of the consulting actuary or the methods involved in the process.

Even without including any adjustment for the approximately 0.4% in investment expense (including management, consulting and custodian fees), there is only a small risk adjustment incorporated into the 7.75% investment return recommendation from EFI as their mean return is calculated at 7.81%. While this risk adjustment is not directly comparable to the corresponding component of our model, we believe EFI should consider incorporating a slightly larger risk adjustment into their recommendation.

2. 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 7.75% is on the high end but still within the most common range for this assumption among most California public sector retirement systems. That range, with few exceptions, is from 7.50% to 7.75%. In particular, two of the largest California systems, CalPERS and LACERA, had both adopted a 7.50% investment return assumption when they reviewed that assumption for their June 30, 2012 valuation. (Note that OCERS and FCERA have since adopted a 7.25% investment return assumption for their December 31, 2012 and June 30, 2013 valuations, respectively.)

EFI used the capital market assumptions provided by SIS in deriving their recommendation for the expected rate of investment return. Therefore, any recommendations for the expected rate of investment return are heavily dependent on those capital market assumptions from the Association's investment consultant. We understand that it may not be possible to use an average

Section II: Results of the Actuarial Review

of capital market assumptions from several investment advisory firms for the stochastic modeling that was performed by EFI. However, we caution that relying on only one investment consultant's capital market assumptions may lead to the undesired result of expected investment returns that vary significantly depending on which investment consultant is employed by a system. In this case, we have found that capital market assumptions from the current investment consultant appear to be higher than the average from a sample of investment consultants that we maintain.

Salary Increase Assumption

EFI also utilized a "building block" approach in developing the recommended salary increase assumption. Under this approach, the salary increase assumption is the combination of the inflation component, the productivity or real wage increase component, and the merit and promotion increase component. This is the preferred approach for developing this assumption.

Inflation Component

The price inflation component was discussed earlier where we agreed with EFI's recommendation of lowering the assumed rate of inflation from the current 3.50% to 3.25%.

Productivity or Real Wage Increase Component

Real "across the board" pay increases are typically 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, some portion of the value of these improvements can provide a source for pay increases greater than price inflation. These increases are typically assumed to extend to all employees "across the board."

EFI introduced a real "across the board" pay increase component of 0.25% in conjunction with the 2006-2009 experience study. For the 2009-2012 experience study, they have recommended maintaining the 0.25% assumption. However, there is only limited data provided in their report to support the magnitude of this assumption, and we believe that more data should have been included.

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The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real “across the board” pay increases above inflation have averaged about 0.5% - 0.75% annually during the last 10 - 20 years. For this assumption, we believe a reasonable range for the productivity component to be 0.25% - 0.75%. While we concur that EFI’s recommended 0.25% assumption to be within the reasonable range, a higher assumption such as 0.50% may be justified at some retirement systems.

Merit and Promotion Increase Component

The last step or building block needed to complete the salary increase assumption is the merit and promotion increase component, which was reviewed by EFI as part of the demographic assumptions. Merit and promotion increases are the salary increases above the general wage increases due to the combination of promotions, longevity increases, bonuses and merit pay increases as applicable. Our review of EFI’s results on the merit and promotion increase component is included in the following Review of Demographic Assumptions section of this report.

Payroll Growth Assumptions

The payroll growth assumption used by EFI for the purposes of amortizing the Unfunded Actuarial Accrued Liabilities (UAAL) as a level percent of payroll is comprised of the inflation and productivity components discussed above. EFI recommended decreasing this assumption from 3.75% to 3.50%, to reflect the decrease in the inflation assumption from 3.50% to 3.25% and the maintenance of the real, across the board wage increase assumption at 0.25%. We concur with the method used by EFI, but again believe that a 3.75% payroll growth assumption (incorporating a productivity component of 0.50%) might have been a better recommendation instead of the 3.50% assumption.

COLA Increase Assumption

All retired members and beneficiaries, except for General Tier 3, are entitled to receive annual cost of living adjustments (COLA) of up to 3%, based on the annual increase in the Consumer Price Index (CPI) and the availability of individually accumulated COLA banks. The current

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assumption is that all eligible members will receive, on the average, a 2.70% COLA increases annually.

EFI performed stochastic simulations on inflation and based on their modeling, which includes a lowering of the inflation assumption from 3.50% to 3.25%, they developed an expectation that there will be years when inflation falls below the 3% COLA level. Based on this result, they have concluded that for some members this shortfall will not be made up in future years with the accumulated COLA banks. As such, EFI has recommended maintaining the COLA increase assumption of 2.70% which again is lower than the statutory increase of up to 3% per year.

We understand that the results of the stochastic modeling of the inflation assumption are significantly dependent on assuming that the lower levels of inflation will persist in the early years of the projections. If this is not assumed, then the stochastic modeling will produce results closer to the 3% statutory COLA.

We feel there are some advantages to using the statutory increase of 3.0% as the ongoing COLA increase assumption. In years when the CPI increase falls below the 3.0% COLA level and certain members do not have sufficient COLA banks to be granted the full 3.0% COLA, any difference between the 3.0% COLA assumption and the actual amount granted would be treated as an actuarial gain to the Association. However, EFI's approach would generate actuarial losses in years when the CPI increase is above the 2.7% COLA assumption, which, under a 3.25% inflation assumption environment, would be expected to occur the majority of the time.

Review of Demographic Assumptions

The Actuarial Standards Board has adopted an Actuarial Standard of Practice (No. 35) which provides actuaries guidance in selecting demographic and other noneconomic assumptions. Reasonableness of each assumption and consistency among the assumptions are primary among the considerations for selecting assumptions in accordance with the ASOP. The Standard of Practice bases the evaluation of an assumption's reasonableness on two criteria. First, the "assumption is expected to appropriately model the contingency being measured." Second, the

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“assumption is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.”

The primary demographic assumptions reviewed by EFI during the 2009-2012 experience study are retiree mortality, termination, and service retirement. Secondary assumptions reviewed include active member mortality, disability retirement (ordinary and duty), reciprocity, retirement age for vested terminated members, merit and promotion pay increases, and cashing out of unused vacation (terminal pay).

For many demographic assumptions, the actuary must consider the factors affecting the variation in the rates of decrement. Often, the rate of terminations by active members will be highly correlated to their years of service. Alternatively, the variation in the rate of retirements may be better correlated to the participant’s age. The type of assumption utilized determines how the data is to be grouped for analysis. Many large systems have analyzed the correlation of the variation in certain decrements to age and service simultaneously. This approach can lead to a “select and ultimate” type of assumption or one that depends on both age and service. In some cases, the additional complexity does not affect results materially.

The prevalent method used to determine the appropriateness of a demographic assumption is to analyze the actual to expected ratios (AE ratios). An AE ratio is found by dividing, for any single contingency, the actual number to occur in the data by the number expected to occur based upon current assumptions. These ratios display how well the current assumptions anticipated actual experience. An AE ratio of 100% results when actual experience equals that expected under the assumption.

For each contingency, the actuary determines a reasonable range for the AE ratio. This reasonable range is based upon the materiality of the assumption, the effect of future trends, and the degree of conservatism or margin the actuary considers necessary. An AE ratio falling into this range would indicate the current assumption may still be appropriate. AE ratios not in the reasonable range may indicate the need to modify the assumption. In our opinion, EFI has performed accurate analyses of the reasonableness of the current assumptions by using AE ratios.

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Overall, we believe EFI's recommendations for changes to the demographic assumptions are reasonable but note the following:

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Pre- and Post-Retirement Mortality Rates

Expected experience under the current mortality assumptions was reasonably close to actual experience during the 2009-2012 experience study period. However, there is generally a trend towards expectation of increases in life expectancy in the future, and it is common to include a margin in the recommended assumptions to reflect these expected increases.

For all active member and retired member and beneficiaries deaths, except for deaths for disabled members, EFI recommended the continuation of the RP-2000 Combined Healthy Mortality Table, projected from 2000 to 2020 using Projection Scale AA. For disabled retirees, EFI recommended the continuation of the same mortality table used for healthy retirees but set forward 7 years.

In reviewing the demographic assumptions for StanCERA, EFI has analyzed and provided documentation on the experience for each of the General and Safety membership groups and different assumptions were recommended accordingly for each of the two groups. For the (pre and post-retirement) mortality assumptions, the same assumption tables have been recommended by EFI for both General and Safety. We have requested from EFI the supporting data separated by the General and Safety membership groups. We would agree that there was no evidence to support a different mortality table for each of the two groups; however, we would recommend that such information be disclosed in their report for documentation purposes.

Furthermore, while we believe the recommendation from EFI to maintain the mortality tables to be reasonable, our preference would have been to strive for an AE ratio (measured by taking the number of actual deaths to the expected deaths) of 110%, which is about a one-year improvement in future life expectancy. The average AE ratio for the actives, non-disabled retirees and beneficiaries is only 104% and is below the 110% that we would generally recommend for this type of studies.

Service Retirement Rates

In developing their recommended service retirement assumptions, EFI included actual vested terminations and transfers that were eligible for a service retirement benefit in their count of

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actual retirements. While these members have not yet chosen to retire, we still consider this method reasonable since the termination assumptions (which are discussed below) are set to zero once a member reaches service retirement eligibility. In other words, all active members who are eligible for a service retirement benefit are being exposed to the service retirement rates rather than the termination rates, and the development of the service retirement rates reflects this practice.

We note that EFI has used the actual service retirements during 2009-2012 to assist them in estimating the retirement rates anticipated for all current active members. As there is only one set of retirement assumptions for each of the General and Safety membership groups, EFI should be requested to document how they might have “normalized” retirement experience of members from different tiers (with different benefits) to generate a set of retirement assumptions that would be suitable for use in the valuation for all tiers within the General and Safety membership groups.

Ordinary Disability Retirement Rates

EFI mentioned that the ordinary disability rates are applied to members with at least five years of service. This seems reasonable in light of the five-year service requirement for ordinary disability eligibility.

EFI has recommended that no changes be made to the ordinary disability rates, which seems reasonable based on the AE ratio for General members and the overall lack of data for Safety members.

Duty Disability Retirement Rates

EFI recommended changes to the General male and General female duty disability rates. After the recommended changes, actual experience remains below expected experience for the General members because when combined with the experience from the prior experience study period, the AE ratios are around 93%.

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The AE ratios for Safety members under the current assumptions are around 63%. However, EFI has not recommended a change in those assumptions because they claimed that the deviation in actual versus expected experience was the greatest at the lower ages where there were relatively few exposures in those age groups, even with six years of experience. We believe that while the reason provided by EFI may be reasonable, it would be very desirable for them to provide data in the experience study report to substantiate their claim.

Termination (Withdrawal and Deferred Retirement) Rates

EFI developed termination rates based on service instead of age, which is among the most common practice used in valuations for public retirement systems in California. Actual terminations were less than expected terminations during the experience study period for General but not for Safety members. Upon further investigation, EFI concluded that the largest difference between the higher number of actual and the lower number of expected terminations was from members within their first two years of service. Based on our inquiry, EFI confirmed that when generating the current termination rates they looked at both experience from 2009-2012 and 2006-2009 in order to make sure that the rates were not overly influenced by the staff reductions in 2009/2010. Accordingly, EFI recommended increasing the termination rates for General males and for Safety while decreasing the rates for General females. The recommended rates resulted in AE ratios of 92.7% for General members and 119.8% for Safety members. Depending on the experience for the next study, we believe that a further adjustment in the termination rates for General members may be warranted.

We note that EFI assumes no terminations will occur once a member is eligible for service retirement, as we discussed earlier. We think that this is a reasonable assumption.

In addition to the termination rates, EFI has recommended an assumption of 50% and 20% be assumed for those General members expected to take a refund with less than 10 years of service and with ten or more years of service, respectively. For Safety, those percentages are 35% and 10% for members with less than 10 years of service and with ten or more years of service, respectively. The rest of the members are expected to receive deferred retirement benefits. While those percentages appear to be reasonable; for documentation purposes, they should be

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substantiated with the actual experience of members who received refunds versus deferred their pension upon termination from StanCERA. Of those members expected to receive a deferred pension, 25% of those General and 50% of Safety members would be expected to go on to be employed at a reciprocal employer. While those percentages appear to be reasonable; for documentation purposes, they should be substantiated with the actual experience of members from the last three years. Also, documentation should also be included on the recommended reciprocal salary increase assumption⁷.

Retirement Age for Vested Terminated Members

The current retirement age assumption for vested terminated members is 58 for General members (65 for Tier 3) and 53 for Safety member. EFI stated that the actual commencement ages for the deferred vested members were close to the current assumptions and no changes were recommended. Again, we would suggest that information on the actual commencement ages be included to substantiate their findings.

Merit and Promotion Pay Increases

Merit and promotion increases are the salary increases above the general wage increases due to the combination of promotions, longevity increases, bonuses and merit pay increases as applicable. The current assumptions are based on service.

EFI's development of the merit and promotion increases was based on what they referred to as a "transverse" study. It appears that the mechanics of the study simply involve the plotting of average pay against service for active members, then generating a best-fit line related to the plotted data. While Segal has not seen this type of study used elsewhere, according to the description provided in the EFI report, it appears to suggest that the method is premised on a homogeneous group of active members between experience studies. If our understanding is correct, then it may be worthwhile to point out there was a rather significant change in membership demographics between 2009 and 2012 as provided in the table below:

⁷ We note that after an inquiry to EFI, they clarified that a 4.25% per year salary increase was assumed for the reciprocal employees and that they would agree to disclose that assumption in their report.

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	General		Safety	
	2009	2012	2009	2012
Number of members	3,619	3,233	736	661
Average age	45.37	46.36	37.35	39.14
Average years of service	10.28	11.76	8.94	11.01

We also note that it is somewhat surprising that the recommended assumption is a flat 4.00% per year for General members during the first four years of employment, as our experience with other clients has shown the merit and promotion increases to be steeper (i.e., higher than lower) during the early employment years. This assumption should be closely monitored going forward.

Unused Vacation (Terminal Pay) Assumption

Final compensation for benefit calculation purposes may be increased in the final year(s) before retirement, since members are able to cash out vacation time that gets included in final compensation. EFI reviewed this assumption for the 2009-2012 experience study and recommended that a 3.5% compensation load in the final year of the final compensation averaging period be added for General members and a 2.5% load be added for Safety members. Furthermore, these assumptions are only applicable for members with full career benefits (i.e., where the career length is at least 20 years). However, EFI confirmed our observation that those assumptions were developed using vacation cashouts from all members (i.e., including members with less than 20 years of service). Based on the 2009-2012 data, the actual compensation load was 3.7% and 2.7% for General and Safety retirees, respectively, regardless of how many years of service they had at the retirement date. For the retirees with more than 20 years of service, the actual compensation load was 5.5% and 3.6% for General and Safety, respectively.

We would suggest that the data supporting the development of the recommended assumption be included in the experience study report. Also, we recommend that the liabilities and the contribution rates be corrected as part of the next valuation.

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Family Composition

The current marriage assumption for active members is that 50% of female members and 90% of male members will be married at retirement. In addition, male spouses are currently assumed to be three years older than their wives. It does not appear that these assumptions were reviewed for the experience study and we feel that they should have been reviewed.

Other Assumptions

We understand that conversion of sick leave to retirement service credit was reviewed by EFI and upon their discussions with StanCERA, it was deemed to have an insignificant impact on the liabilities and no such assumption was included in the valuation.

Based on prior conversations we had with the plan sponsor when we performed an earlier review of StanCERA and upon observing the change in the number of actives between June 30, 2009 and June 30, 2012, we understand that the County had experienced significant staff reductions in both filled and allocated positions during 2009/2010. While EFI may exercise discretion in determining whether the experience for the prior three years should be modified to reflect such layoffs (for instance, if they are considered one-time in nature and not an ongoing situation), such decisions should be discussed in their report for documentation purposes.

Member Contribution Rates

The effect on the employer rate of the new assumptions should reflect the recommended changes to the member rates.

Review of Actuarial Methods

A review of the actuarial cost method was included in EFI's experience study report and was discussed in detail in the first section of this report. EFI did not review the asset smoothing method used in their experience study report. This method smoothes market returns above and below the assumed return over five year periods. The resulting actuarial value is limited to be no less than 80% and no more than 120% of the market value. This method is intended to smooth out the volatility inherent in market returns in order to lower the volatility in the employer's

Section II: Results of the Actuarial Review

contribution rates. The five-year period is the prevalent period used for public sector defined benefit plans and we concur with its use. The use of a corridor was a significant issue that we discussed with numerous clients after the market downturn in 2008, and while we are comfortable with its use, parties should be aware that this narrow corridor can add significant contribution volatility in times of extraordinary market gains or losses.

Review of Methods Used to Determine Member Rates

We have identified several policy issues related to the determination of the member contribution rates and they are provided in Section A of this report.

Overall Conclusion

Our overall assessment of EFI's actuarial work for StanCERA is that all major actuarial functions are being appropriately addressed. EFI has employed generally accepted actuarial practices and principles in studying plan experience, selecting assumptions, computing employer contribution rates, and presenting the results of their work. We believe that the actuarial assumptions as recommended by EFI are reasonable for use in StanCERA's actuarial valuation.

Summary of Suggestions for Future Experience Studies

It is our opinion that in future experience studies, EFI should consider the following:

- For the investment return assumption: (a) consider indicating the magnitude of the investment expense, expressed as a percentage of total assets, (b) subject to future economic conditions, consider a further decrease in the investment return assumption to 7.50% or 7.25% and (c) consider using capital market assumptions from a number of investment consultants instead of just the Association's current investment consultant.
- For the real wage increase component of the salary increase assumption: (a) consider providing more data to support the development of this assumption, and (b) consider increasing this component to a minimum of 0.5%.

Section II: Results of the Actuarial Review

- For the mortality assumption: (a) consider providing the expected number of deaths and the AE ratios under the recommended assumptions for General and Safety separately, and (b) consider increasing the margin for future mortality improvements to be at least 10% on a number of deaths basis.
- For the service retirement rates, consider some modifications to the rates to produce a better fit to the actual retirement rates for different tiers.
- For the termination rates: (a) consider a further adjustment in the termination rates for General members, if warranted, and (b) consider including information on the supporting data used to develop the recommended assumption for members who expected to receive a refund of contributions.
- For the reciprocal assumptions: (a) consider including information on the supporting data used to develop the recommended assumption for members transferring to a reciprocal employer, and (b) consider documenting the recommended reciprocal pay assumption.
- For the merit and promotion pay increases, consider monitoring the assumption for General members, especially for the first few years of employment.
- For the unused vacation (terminal pay) assumption, consider including the data supporting the development of the recommended assumption.
- For the family composition assumptions (i.e., percent married at retirement and spouse age difference), consider including a review of these assumptions.
- For the member contribution rates: (a) consider showing the effect on the member contribution rates of the recommended changes in assumptions, and (b) consider developing the effect on the employer rate associated with the change in the recommended assumptions by reflecting the recommended changes to the member rates.