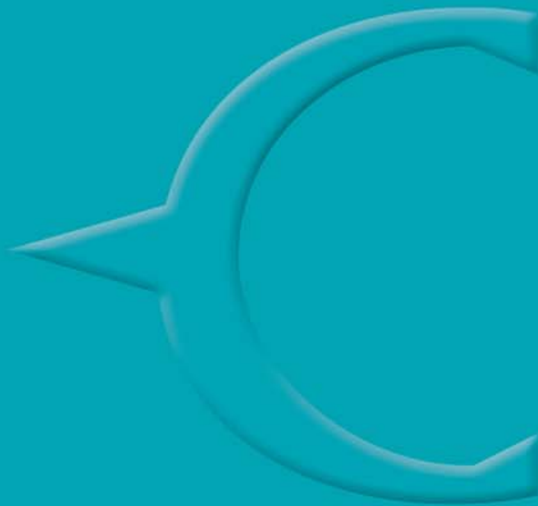

Contra Costa County Employees' Retirement Association

Audit of the December 31, 2018 Actuarial Valuation

Produced by Cheiron

October 2019

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Via Electronic Mail

October 29, 2019

Board of Retirement
Contra Costa County Employees' Retirement Association
1200 Concord Avenue, Suite 300
Concord, CA 94520

Members of the Board:

Cheiron is pleased to present the results of our actuarial audit of the December 31, 2018 Actuarial Valuation for Contra Costa County Employees' Retirement Association (CCCERA) performed by Segal Consulting (Segal). We would like to thank Segal for providing us with information and explanations that facilitated the actuarial audit process and ensured that our findings are accurate and benefit CCCERA.

We direct your attention to the executive summary section of our report that highlights the key findings of our review. The balance of the report provides details in support of these findings along with supplemental data, background information, and discussion of the process used in the evaluation of the work performed by Segal.

In preparing our report, we relied on information (some oral and some written) supplied by CCCERA and Segal. This information includes, but is not limited to, actuarial assumptions and methods adopted by CCCERA, the plan provisions, employee data, and financial information.

We performed an informal examination of the obvious characteristics of the data for reasonableness in accordance with Actuarial Standard of Practice No. 23. A detailed description of all information provided for this review is provided in the body of our report.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Contra Costa County Employees' Retirement Association for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other users.

Sincerely,
Cheiron

Anne D. Harper, FSA, MAAA, EA
Principal Consulting Actuary

William R. Hallmark, ASA, FCA, MAAA, EA
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SECTION I – EXECUTIVE SUMMARY

Scope of Assignment

Cheiron performed a complete independent replication of the CCCERA December 31, 2018 Actuarial Valuation. We reviewed the census data provided by CCCERA staff, and compared it to the information used by Segal in their valuation. We then performed a full parallel valuation, including the calculation of the projected benefits, Actuarial Liability, and normal cost for all CCCERA members, and compared the results to those shown in Segal's actuarial valuation report.

This audit provides CCCERA confirmation that:

- The results reported by Segal can be relied upon,
- The actuarial methods comply with Actuarial Standards of Practice (ASOP), and
- The communication of the actuarial valuation results is complete and reasonable.

Key Findings and Recommendations

The main findings of our review are as follows:

1. The liabilities and costs computed in the valuation as of December 31, 2018 are materially accurate and were computed in accordance with generally accepted actuarial principles. For the scope of this audit, materiality means the results in the aggregate are within industry standards of plus or minus 5%. Our replication of the measures of plan liabilities and costs is summarized in Table I-1 on the following page. We note that all results are within 5% of Segal's calculation except for the Unfunded Actuarial Liability (UAL) amount and the UAL payment as a percentage of payroll. We are not concerned with these differences as the UAL is leveraged by the assets, and discussed in more detail later in the report.

2. There were differences in the actuarial methodology employed by Segal and Cheiron, but in our professional opinion both are reasonable. Section II of this report discusses these differences in more detail and makes some suggestions for consideration in future valuations.

SECTION I – EXECUTIVE SUMMARY

Table I-1
Summary of Valuation Results as of December 31, 2018
($ in thousands)

	Segal	Cheiron	Ratio
Present Value of Future Benefits	$ 11,428,659	$ 11,374,530	100%
Actuarial Liability (AL)	$ 9,682,144	$ 9,613,769	99%
Valuation Value of Assets (VVA)	8,650,178	8,650,178	100%
Unfunded Actuarial Liability (UAL)	$ 1,031,966	$ 963,591	93%
Funded Percentage on VVA basis	89.3%	90.0%	101%
Contribution Rate by Component (AL difference amortized over 18 years)			
Net Employer Normal Cost Rate	15.81%	16.20%	102%
UAL Payment Rate	19.92%	19.01%	95%
Total Employer Contribution	35.73%	35.22%	99%

Our primary recommendations are summarized as follows:

- For the next valuation, we recommend Segal consider whether to modify the timing methodology used in their valuation system, which assumes that benefit payments are paid at the beginning of the month.

- For the next valuation, we recommend Segal modify their methodology for determining the entry age used to calculate the normal cost for active members with reciprocal service with another system.

- We commend Segal for including projections of the outstanding balance of the Unfunded Actuarial Liability (UAL) and UAL payment projections on pages 100-101 of the valuation report. However, we suggest that Segal also include projections of the employer contribution rate and funded status in their report to help the CCCERA Board and stakeholders understand the dynamics of their actuarial funding policies and the impact of the new PEPRA benefit tiers on the future costs of the system.

Valuation Procedures

Overall, we find that the December 31, 2018 actuarial valuation procedures applied in the reporting of the funded status and the determination of the funding requirements based on the current funding policies and adopted assumptions are reasonable and conform to the ASOPs. This conclusion is based on our review of: the valuation report, the census data used in the valuation, and our parallel valuation using the information described above.

Valuation Results

Our independent replication of the December 31, 2018 actuarial valuation found no material difference in calculations of plan liabilities, normal costs, Valuation Value of Assets, and overall contribution rates from the amounts calculated by Segal based on the adopted assumptions and methods. Consequently, we conclude that the valuation prepared by Segal for CCCERA as of December 31, 2018 is reasonable and can be relied on by the Board for its intended purpose.

Present Value of Future Benefits

The comparison of the present value of future benefits calculated by Segal and Cheiron indicates how closely we match the application of the assumptions to the census data in the valuation. To confirm that the match is close across all Cost Groups, a comparison of the Present Value of Benefits for each Cost Group is shown below in Table II-1. We note that all results are within 1% - a very close match and well below the 5% threshold.

Table II-1
Present Value of Benefits Comparison by Cost Group
($ in thousands)

	Segal	Cheiron	Ratio
General			
Cost Group 1 - County and Small Districts (Tier 1 and 4)	$ 1,543,502	$ 1,536,250	100%
Cost Group 2 - County and Small Districts (Tier 3 and 5)	4,973,687	4,943,123	99%
Cost Group 3 - Central Contra Costa Sanitary District	475,717	472,237	99%
Cost Group 4 - Contra Costa Housing Authority	72,192	71,750	99%
Cost Group 5 - Contra Costa County Fire Protection District	70,104	69,742	99%
Cost Group 6 - Small Districts (Non-Enhanced Tier 1 and 4)	8,308	8,221	99%
Safety			
Cost Group 7 - County (Tier A and D)	$ 2,079,941	$ 2,066,027	99%
Cost Group 8 - Contra Costa and East Fire Protection Districts	1,158,333	1,155,683	100%
Cost Group 9 - County (Tier C and E)	219,883	220,714	100%
Cost Group 10 - Moraga-Orinda Fire District	220,587	219,736	100%
Cost Group 11 - San Ramon Valley Fire District	490,599	490,594	100%
Cost Group 12 - Rodeo-Hercules Fire Protection District	51,354	51,380	100%

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

Actuarial Liability

The entry age actuarial cost method attributes the Present Value of Future Benefits between time periods. The portion attributed to periods before the valuation date is the Actuarial Liability and is used as a funding target in developing contribution rates. Cheiron and Segal use slightly different methods for employing the entry age actuarial cost method. For the calculation of the Actuarial Liability in Table II-2 below, we replicated the method used by Segal. See below for a discussion of the differences in methods between Segal and Cheiron. We note that the Actuarial Liability for each cost group is within 1% - a very close match and well below the 5% threshold.

Table II-2

Actuarial Liability Comparison by Cost Group
($ in thousands)

	Segal	Cheiron	Ratio
General			
Cost Group 1 - County and Small Districts (Tier 1 and 4)	$ 1,510,948	$ 1,503,832	100%
Cost Group 2 - County and Small Districts (Tier 3 and 5)	3,823,773	3,773,381	99%
Cost Group 3 - Central Contra Costa Sanitary District	412,241	410,007	99%
Cost Group 4 - Contra Costa Housing Authority	63,995	63,578	99%
Cost Group 5 - Contra Costa County Fire Protection District	60,758	60,433	99%
Cost Group 6 - Small Districts (Non-Enhanced Tier 1 and 4)	6,694	6,645	99%
Safety			
Cost Group 7 - County (Tier A and D)	$ 1,940,811	$ 1,929,374	99%
Cost Group 8 - Contra Costa and East Fire Protection Districts	1,042,856	1,041,210	100%
Cost Group 9 - County (Tier C and E)	75,707	76,741	101%
Cost Group 10 - Moraga-Orinda Fire District	195,310	194,665	100%
Cost Group 11 - San Ramon Valley Fire District	439,542	439,920	100%
Cost Group 12 - Rodeo-Hercules Fire Protection District	45,056	44,977	100%

Normal Costs

The Normal Cost represents the portion of the Present Value of Future Benefits that is attributed to the current year of service. Under the entry age method, it is designed to be a level percent of pay throughout an individual's career. As noted in the Actuarial Liability section, Cheiron and Segal use slightly different methods for employing the entry age actuarial cost method. For the calculation of the Employer Normal Cost in Table II-3 on the next page we replicated the method used by Segal. We note that the Employer Normal Cost for each group is within the 5% threshold except for Tier A for the County, CCCFPD, and East CCCFPD and Tier D for CCCFPD and East CCCFPD.

It is not unusual for there to be differences in the allocation of the total present value of benefits into past and future amounts (the actuarial liability and normal costs, respectively) due to the different valuation systems and minor differences in programming. We are not concerned with

these differences if they offset each other (where Cheiron's normal cost rates shown in Table II-3 below are higher than Segal's, but our Actuarial Liabilities in Table II-2 are lower) and when the projected value of benefits match is so close, as it is in our analysis.

Table II-3
Employer Normal Cost Comparison by Benefit Tier

	Segal	Cheiron	Ratio
General			
County and District Tier 1	15.0%	15.0%	100%
County and District Tier 4 with 3% COLA	11.8%	12.0%	102%
County Tier 4 with 2% COLA	10.7%	10.9%	102%
County and District Tier 3	15.2%	15.5%	102%
County and District Tier 5 with 3%/4% COLA	11.2%	11.6%	104%
County Tier 5 with 2% COLA	10.0%	10.4%	104%
CCCSD Tier 1	16.0%	16.3%	101%
CCCSD Tier 4	11.1%	11.1%	101%
CC Housing Authority Tier 1	16.4%	16.2%	99%
CC Housing Authority Tier 4	12.0%	12.2%	102%
CCCFPD Tier 1	15.2%	15.6%	103%
CCCFPD Tier 4 (3% COLA)	15.2%	15.4%	101%
CCCFPD Tier 4 (2% COLA)	12.3%	12.4%	101%
Non-Enhanced District Tier 1	16.4%	16.3%	99%
Non-Enhanced District Tier 4	12.6%	12.8%	101%
Safety			
County Tier A	29.4%	31.5%	107%
County Tier D	20.0%	20.4%	102%
CCCFPD and East CCCFPD Tier A	28.9%	30.6%	106%
CCCFPD and East CCCFPD Tier D	18.4%	19.6%	107%
CCCFPD Tier E	15.4%	15.9%	103%
County Tier C	24.9%	25.5%	102%
County Tier E	16.7%	17.4%	104%
Moraga-Orinda FD Tier A	27.1%	27.9%	103%
Moraga-Orinda FD Tier D	17.9%	18.2%	102%
San Ramon Tier A	28.6%	29.1%	102%
San Ramon Tier D	16.2%	16.5%	102%
NE Rodeo-Hercules FPD Tier A	22.3%	22.9%	103%
NE Rodeo-Hercules FPD Tier D	16.5%	16.7%	102%

There are two primary differences between Segal's application of the entry age actuarial cost method and Cheiron's. First, for members who are assumed to have a 100% probability of retiring, Cheiron assumes they retire immediately. Under this approach, no normal cost is assigned and the actuarial liability equals the present value of future benefits. Segal, on the other

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

hand, assigns a full year of normal cost, and the actuarial liability combined with that normal cost equals the present value of future benefits. This difference is strictly an allocation between normal cost and actuarial liability, and we believe both approaches are reasonable.

The second difference between Segal and Cheiron is the treatment of members who have reciprocal service from another system. Segal's approach spreads the present value of future benefits over the member's entire service period, including the period of reciprocal service. Cheiron's approach spreads the value of the benefits over the member's service with CCCERA. With Segal's approach, a member has an actuarial liability the moment they are hired if they have reciprocal service. Under Cheiron's approach, there is no actuarial liability for a member at the moment of hire. The liability accrues beginning at hire over the member's career in CCCERA service. As a result, Cheiron's approach produces a higher normal cost for members with reciprocal service and a lower actuarial liability. We believe this approach is required by GASB. However, the difference for funding CCCERA right now is not material. The higher normal cost rate under the Cheiron method is offset by a lower UAL rate resulting in a very similar contribution rate. We suggest that Segal use this approach for members with reciprocal service for the next valuation.

Valuation Value of Assets

Based on the statement of changes in fiduciary net position and related backup information, we independently calculated the Valuation Value of Assets for each cost group. Table II-4 below shows the comparison of Cheiron's calculation to Segal's calculation. We note that the Valuation Value of Assets for each cost group is within 1% - a very close match and well below the 5% threshold.

Table II-4
Valuation Value of Assets Comparison by Cost Group
($ in thousands)

	Segal	Cheiron	Difference	Ratio
General				
Cost Groups 1/2 - County and Small Districts (Tier 1, 3, 4 and 5)	$ 4,858,186	$ 4,857,314	$ (872)	100%
Cost Group 3 - Central Contra Costa Sanitary District	338,258	338,275	17	100%
Cost Group 4 - Contra Costa Housing Authority	56,455	56,456	2	100%
Cost Group 5 - Contra Costa County Fire Protection District	50,534	50,539	5	100%
Cost Group 6 - Small Districts (Non-Enhanced Tier 1 and 4)	7,192	7,192	(1)	100%
Safety				
Cost Groups 7/9 - County (Tier A, C, D and E)	1,779,772	1,780,173	402	100%
Cost Group 8 - Contra Costa and East Fire Protection Districts	913,885	914,250	365	100%
Cost Group 10 - Moraga-Orinda Fire District	166,368	166,430	62	100%
Cost Group 11 - San Ramon Valley Fire District	388,827	388,880	53	100%
Cost Group 12 - Rodeo-Hercules Fire Protection District	35,828	35,835	7	100%
Terminated Districts	55,714	55,676	(39)	100%
Total	$ 8,651,020	$ 8,651,020	$ 0	100%

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

While the differences are clearly not material, there are two sources. First, we understand from Segal that approximately $38,000 in benefit payments reported for the City of Pittsburg are dollar power payments that are not the responsibility of the terminated employer.

Second, there were approximately $4.3 million in "Other" deductions reported on the statement of changes in net fiduciary position. These items need to be allocated to the assets of the different cost groups. Segal allocated the "Other" deductions using a methodology as if they were benefit payments. However, these deductions were attributable to miscellaneous non-investment expenses ($2.4 million), legal fees ($1.1 million), retiree and member adjustments ($0.6 million), and IT disaster recovery ($0.1 million). As a result, we thought allocating the "Other" deductions similar to how administrative expenses are allocated was a more reasonable approach. However, the different approaches do not produce materially different results.

Employer Contributions

As part of our review, we have verified the calculations of the employer contribution rates, by Cost Group and by employer.

One challenge in matching the cost calculations is caused by the fact that differences in the Actuarial Liability (AL) are leveraged by the assets, especially in a well-funded system like CCCERA and can result in discrepancies in the UAL payment. For example, we calculated the total Actuarial Liability within 1% of Segal's AL. Relative to the size of the UAL, this result produces a UAL that is 7% less than Segal's.

We have computed the UAL payment rate using two different methodologies. For the first methodology ("Method #1") the UAL payment rate is determined by applying the ratio of our calculated UAL amount to Segal's UAL amount, both excluding the terminated employer liabilities, to Segal's UAL payment rate of 19.92%. For the second methodology ("Method #2"), the difference of $68.4 million in Segal's actuarial liability compared to Cheiron's is set-up as a new amortization base using CCCERA's amortization policy to amortize changes in the UAL over an 18-year period. The base is a credit base since Cheiron's calculated AL is lower than Segal's.

Our replication of the employer contribution rates by Cost Group is shown on the next page in Table II-5. We have shown the Cheiron rates based on the two different methodologies described in the paragraph above. The leveraged UAL payment calculated under Method #1 produces employer contribution rates slightly outside of the 5% threshold for Cost Groups 1 and 2. However, Method #2 produces employer contribution rates within 3% of Segal for all Cost Groups. Employer rates by individual rate group are shown in Appendix A under this methodology.

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

Table II-5
Employer Contribution Rate Comparison by Cost Group

	Segal	Cheiron Method #1		Cheiron Method #2	
		Rate	Ratio	Rate	Ratio
General					
Cost Group 1 - County and Small Districts (Tier 1 and 4)	31.11%	29.11%	94%	30.25%	97%
Cost Group 2 - County and Small Districts (Tier 3 and 5)	26.42%	24.68%	93%	25.82%	98%
Cost Group 3 - Central Contra Costa Sanitary District	49.86%	48.79%	98%	49.35%	99%
Cost Group 4 - Contra Costa Housing Authority	42.22%	40.44%	96%	41.35%	98%
Cost Group 5 - Contra Costa County Fire Protection District	32.80%	32.26%	98%	32.40%	99%
Cost Group 6 - Small Districts (Non-Enhanced Tier 1 and 4)	15.60%	15.56%	100%	15.56%	100%
Safety					
Cost Group 7 - County (Tier A and D)	70.32%	70.50%	100%	71.51%	102%
Cost Group 8 - Contra Costa and East Fire Protection Districts	69.14%	69.46%	100%	69.87%	101%
Cost Group 9 - County (Tier C and E)	61.10%	59.96%	98%	60.97%	100%
Cost Group 10 - Moraga-Orinda Fire District	70.81%	70.02%	99%	70.36%	99%
Cost Group 11 - San Ramon Valley Fire District	75.79%	76.63%	101%	76.40%	101%
Cost Group 12 - Rodeo-Hercules Fire Protection District	85.28%	84.71%	99%	84.96%	100%

Employee Contribution Rates

As part of the audit, we replicated the calculations of the individual member contribution rates based on the applicable provisions of the County Employees'' Retirement Law (the CERL). For Non-PEPRA Cost Groups, we understand the member contribution rates to be made up of the following components:

- A Basic rate providing for an annuity equal to:
    - General Tier 1 and Tier 3 (Non-Enhanced): Entry-age rates that provide for ½ of the 31676.11 benefit payable at 55, or
    - General Tier 1 and Tier 3 (Enhanced): 1/120th of One-Year Final Average Compensation at a retirement age of 60, or
    - Safety Tier A (Non-Enhanced): ½ of the 31664 benefit payable at age 50, or
    - Safety Tier A (Enhanced): 1/100th of One-Year Final Average Compensation at a retirement age of 50, or
    - Safety Tier C (Enhanced): 1/100th of Three-Year Final Average Compensation at a retirement age of 50
- A COLA rate providing for one-half of the cost of the COLA

Pre-PEPRA Safety members with 30 or more years of service are exempt from paying member contributions.

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

We have verified the calculations of the member contribution rates based on the applicable provisions of the CERL for sample ages and have found these rates to be correct. Our Basic (non-COLA) rates were well within 1% of Segal's rates for General Tiers 1 and 3, and Safety Tiers A and C.

We have verified the calculations of the COLA member rates for all 12 cost groups, and the resulting total member contribution rates are within 5% of Segal's calculations for 11 of the cost groups. The other cost group is within 6% and since that cost group has very few active members we can expect some variation in the results. The total contribution rates – Basic plus COLA – are all within 5%.

The Segal methodology is commonly used by '37 Act systems (determining Basic rates and then applying a COLA load based on each years' valuation results) and appears to meet the requirement that "*Any increases in contribution shall be shared equally between the county or district and the contributing members*" (CERL 31873). However, we have previously shared with Segal's consultants an alternative methodology for determining employee COLA contribution rates, which involves calculating a distinct COLA rate for each individual entry-age, rather than applying a certain percentage load to the Basic rates. This methodology has the advantage of avoiding annual changes to the COLA contribution rates; the COLA rates will only change if there is a modification to the benefit provisions or actuarial assumptions.

For the PEPRA members, the member contributions rates are equal to 50% of the total normal cost rates. Our comparison of the employer normal cost rates is shown in Table III-2 above

We have also calculated a weighted-average member contribution rate for each Cost Group and compared to Segal's average member rates for consistency. The comparison is shown in Table II-6 on the following page and again all results are within 5% of Segal's.

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

Table II-6
Average Member Contribution Rate Comparison by Cost Group

	Segal	Cheiron	Ratio
General			
Cost Group 1 - County and Small Districts (Tier 1 and 4)	10.82%	10.98%	102%
Cost Group 2 - County and Small Districts (Tier 3 and 5)	10.70%	10.91%	102%
Cost Group 3 - Central Contra Costa Sanitary District	11.29%	11.27%	100%
Cost Group 4 - Contra Costa Housing Authority	11.54%	11.72%	102%
Cost Group 5 - Contra Costa County Fire Protection District	11.32%	11.31%	100%
Cost Group 6 - Small Districts (Non-Enhanced Tier 1 and 4)	13.22%	13.36%	101%
Safety			
Cost Group 7 - County (Tier A and D)	17.99%	17.93%	100%
Cost Group 8 - Contra Costa and East Fire Protection Districts	17.25%	17.34%	101%
Cost Group 9 - County (Tier C and E)	16.02%	16.40%	102%
Cost Group 10 - Moraga-Orinda Fire District	17.30%	17.37%	100%
Cost Group 11 - San Ramon Valley Fire District	16.99%	17.21%	101%
Cost Group 12 - Rodeo-Hercules Fire Protection District	13.39%	13.68%	102%

SECTION II – REVIEW OF ACTUARIAL VALUATION RESULTS

Census Data

The CCCERA Staff and Segal provided us with the data that was used in the December 31, 2018 actuarial valuation. We reviewed the information in both files and find that the data used in the valuation is valid, complete, and contain the necessary data elements for purposes of performing the actuarial valuation of CCCERA.

We also find that the methods and requirements provided in the Actuarial Standard of Practice No. 23 *Data Quality* have been adhered to, to the extent applicable for the valuation of pension plan obligations.

In Table II-7 below, we compare the raw December 31, 2018 data file provided by CCCERA to Segal's processed data file and found only minor differences between the files.

Table II-7
Summary of Member Data Comparison as of December 31, 2018

	Segal	Cheiron	Ratio
Active Members			
Total Number	10,021	10,037	100.2%
Average Age	46.2	46.2	100.0%
Average Service	9.9	9.8	98.9%
Projected Compensation	$896,390,768	$897,085,767	100.1%
Average Compensation	$89,451	$89,378	99.9%
Account Balances	$1,104,621,126	$1,103,659,963	99.9%
Service Retirees			
Total Number	7,214	7,173	99.4%
Average Age	70.5	70.6	100.1%
Average Monthly Benefit	$4,147	$4,146	100.0%
Disabled Retirees			
Total Number	908	914	100.7%
Average Age	66.3	66.1	99.6%
Average Monthly Benefit	$4,818	$4,713	97.8%
Beneficiaries			
Total Number	1,425	1,392	97.7%
Average Age	72.6	73.0	100.6%
Average Monthly Benefit	$2,645	$2,618	99.0%
Vested Terminated Members			
Total Number	3,477	3,410	98.1%
Average Age	46.5	46.5	100.0%

Plan Provisions

We compared the summary of plan provisions shown in Section 4, Exhibit III of Segal's December 31, 2018 Valuation Report to the benefits in the County Employees'' Retirement Law of 1937 (CERL). In general, the plan provisions shown in Segal's exhibit match what is in the CERL, and based on our close match of the Segal liabilities as part of our parallel valuation, we conclude that Segal has appropriately reflected these provisions in the actuarial valuation.

We have one comment regarding how Segal has coded their valuation system compared to how the Plan is administered. In reviewing information on CCCERA's website and the recent CAFRs, we deduced that since benefit payments are paid at the beginning of the month, the asset value on the valuation date (December 31) includes a liability for "retirement allowances payable" for the December benefit payments. Therefore, the next payments that will be deducted from Plan assets will not occur until approximately one month after the valuation date.

As a result, we would generally code our valuation system to assume that benefit payments will be made at the end of each month. However, we have confirmed with Segal that their valuation system is coded to assume that benefit payments will be paid from plan assets at the beginning of each month, which results in a slightly conservative estimate of the liabilities (by approximately 1/12 of a year of interest, or about 0.58%). If Segal were to adopt an end of month payment assumption, it would lower the employer contribution rates by approximately 0.6% of pay in aggregate.

We also note that in Segal's original draft of the Actuarial Valuation Report dated September 13, 2019, we did not match the calculation of the average employee contribution rate for Cost Group #12 (the Rodeo-Hercules Fire Protection District). Upon further investigation, we determined that the cause of the discrepancy was because Segal was anticipating that the non-enhanced members of this group would continue to make member contributions after reaching 30 years of service.

This did not match our understanding of the CERL provisions governing members under this benefit provision (Section 31664), which states "Contributions shall not be made by safety members having credit for 30 years of continuous service." We brought our concerns to Staff, who researched the issue and found that contributions should in fact cease for these members. CCCERA provided instructions to Segal to revise the valuation results to no longer assume contributions would be made after 30 years of service for these members, at which point our calculations of the average employee rate for this group fell within the desired tolerance level.

Contents of the Reports

We find the actuarial valuation report to be in compliance with Actuarial Standards of Practice.

Projections

We commend Segal for including projections of the outstanding balance of the Unfunded Actuarial Liability (UAL) and UAL payment projections, if all assumptions are met in future years. However, we believe that the report would be significantly improved and more useful to readers if it contained projections of future Employer contributions, employee contributions, Plan assets, and Plan liabilities. At a minimum, these projections should be based on all assumptions being met. A pension fund is a long-term proposition, and focusing the valuation results primarily on what changed from the prior year to the current year is, in our opinion, not reflective of best practices.

Under CCCERA's asset smoothing method there are gains and losses to be realized over the next four years, if the investment returns actually achieve the target 7.00%. Also, the gradual interplay of the new PEPRA Tiers in slowly reducing the normal costs is normally of interest to stakeholders. These dynamics and their impact on the projected contribution rate and funded status are essential to the communication of the valuation results.

The new Actuarial Standard of Practice on risk (ASOP 51) requires that "*the actuary should assess the risks identified... including the potential effects of the identified risks on the plan's future financial condition. The assessment should take into account circumstances specific to the plan (for example, funding policy...*)" (Section 3.3). The methods for assessing risk (Section 3.4) include the scenario testing suggested in the above paragraph.

We note that on page 8 of the valuation Segal states *"A more detailed assessment of the risks tailored to specific interests or concerns of the Board would provide the Board with a better understanding of the inherent risks and is recommended."* If the projections we recommended be included in the valuation report become part of a risk report, we still maintain that those baseline projections be included in the valuation report. This would enable a reader of the valuation to have complete information about future expectations without having the review a second report.

APPENDIX A – COMPARISON OF EMPLOYER RATES BY RATE GROUP (18 YEAR AMORTIZATION OF UAL DIFFERENCE)

Employer Contribution Rate Comparison by Rate Group - General

			Segal	Cheiron	Ratio
Cost Group 1	Rate Group 1	County General Tier 1 w/ Courts	27.98%	27.11%	97%
Cost Group 1	Rate Group 2	District General Tier 1 w/o POB	37.08%	36.04%	97%
Cost Group 1	Rate Group 3	District General Tier 1 w/ POB (Moraga)	25.93%	24.88%	96%
Cost Group 1	Rate Group 4	District General Tier 1 w/ UAAL PrePmt (First Five)	28.61%	27.77%	97%
Cost Group 1	Rate Group 5	District General Tier 1 w/ UAAL PrePmt (LAFCO)	36.05%	35.02%	97%
Cost Group 1	Rate Group 6	County General Tier 4 (3% COLA) w/Courts	24.79%	24.18%	98%
Cost Group 1	Rate Group 7	District General Tier 4 (3% COLA) w/o POB	33.89%	33.12%	98%
Cost Group 1	Rate Group 8	District General Tier 4 (3% COLA) w/ POB (Moraga)	22.74%	21.96%	97%
Cost Group 1	Rate Group 9	District General Tier 4 (3% COLA) w/ UAAL PrePmt (First Five	25.42%	24.85%	98%
Cost Group 1	Rate Group 10	District General Tier 4 (3% COLA) w/ UAAL PrePmt (LAFCO)	32.86%	32.09%	98%
Cost Group 1	Rate Group 11	County General Tier 4 (2% COLA) w/ Courts	23.70%	23.07%	97%
Cost Group 2	Rate Group 12	County General Tier 3 w/ Courts	28.21%	27.63%	98%
Cost Group 2	Rate Group 13	District General Tier 3 w/o POB	37.31%	36.57%	98%
Cost Group 2	Rate Group 14	County General Tier 5 (3/4% COLA) w/ Courts	24.18%	23.79%	98%
Cost Group 2	Rate Group 15	District General Tier 5 (3/4% COLA) w/o POB	33.28%	32.72%	98%
Cost Group 2	Rate Group 16	County General Tier 5 (2% COLA) w/ Courts	23.03%	22.54%	98%
Cost Group 3	Rate Group 17	District General Tier 5 (2% COLA) w/o POB	32.13%	31.48%	98%
Cost Group 3	Rate Group 18	CCCSD General Tier 1	50.84%	50.39%	99%
Cost Group 3	Rate Group 19	CCCSD General Tier 4 (3% COLA)	45.87%	45.27%	99%
Cost Group 4	Rate Group 20	Contra Costa Housing Authority General Tier 1	43.43%	42.49%	98%
Cost Group 4	Rate Group 21	Contra Costa Housing Authority General Tier 4 (3% COLA)	38.99%	38.42%	99%
Cost Group 5	Rate Group 22	CCCFPD General Tier 1	33.66%	33.39%	99%
Cost Group 5	Rate Group 23	CCCFPD General Tier 4 (3% COLA)	33.63%	33.19%	99%
Cost Group 5	Rate Group 24	CCCFPD General Tier 4 (2% COLA)	30.80%	30.23%	98%
Cost Group 6	Rate Group 25	Non-Enhanced District General Tier 1	16.58%	16.47%	99%
Cost Group 6	Rate Group 26	Non-Enhanced District General Tier 4 (3% COLA)	12.76%	12.93%	101%

Employer Contribution Rate Comparison by Rate Group - Safety

			Segal	Cheiron	Ratio
Cost Group 7	Rate Group 27	County Safety Tier A	70.90%	72.19%	102%
Cost Group 7	Rate Group 28	County Safety Tier D	61.52%	61.12%	99%
Cost Group 8	Rate Group 29	CCCFPD Safety Tier A	67.38%	68.44%	102%
Cost Group 8	Rate Group 30	East CCCFPD Safety Tier A	113.06%	113.68%	101%
Cost Group 8	Rate Group 31	CCCFPD Safety Tier D	56.84%	57.44%	101%
Cost Group 8	Rate Group 32	East CCCFPD Safety Tier D	102.52%	102.68%	100%
Cost Group 8	Rate Group 33	CCCFPD Safety Tier E	53.85%	53.72%	100%
Cost Group 9	Rate Group 34	County Safety Tier C	66.34%	66.20%	100%
Cost Group 9	Rate Group 35	County Safety Tier E	58.22%	58.10%	100%
Cost Group 10	Rate Group 36	Moraga-Orinda FD Safety Tier A	72.57%	72.28%	100%
Cost Group 10	Rate Group 37	Moraga-Orinda FD Safety Tier D	63.39%	62.63%	99%
Cost Group 11	Rate Group 38	San Ramon Safety Tier A	78.23%	78.87%	101%
Cost Group 11	Rate Group 39	San Ramon Safety Tier D	65.82%	66.29%	101%
Cost Group 12	Rate Group 40	NE Rodeo-Hercules FPD Safety Tier A	86.58%	86.38%	100%
Cost Group 12	Rate Group 41	NE Rodeo-Hercules FPD Safety Tier D	80.76%	80.22%	99%

APPENDIX B – GLOSSARY OF TERMS

1. Actuarial Assumptions

Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, investment income, and salary increases. Demographic assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

2. Actuarial Gain (Loss)

The difference between actual experience and actuarial assumption anticipated experience during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial funding method.

3. Actuarial Liability

The Actuarial Liability is the present value of all benefits accrued as of the valuation date using the methods and assumptions of the valuation. It is also referred to by some actuaries as the "accrued liability" or "actuarial accrued liability."

4. Actuarial Present Value

The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

5. Actuarial Value of Assets

The Actuarial Value of Assets equals the Market Value of Assets adjusted according to the smoothing method. The smoothing method is intended to smooth out the short-term volatility of investment returns in order to stabilize contribution rates and the funded status.

6. Actuarial Cost Method

A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal costs and the Actuarial Liability. It is sometimes referred to as the "actuarial funding method."

7. Funded Status

The Actuarial Value of Assets divided by the Actuarial Liability. The funded status can also be calculated using the Market Value of Assets.

8. Governmental Accounting Standards Board

The Governmental Accounting Standards Board (GASB) defines the accounting and financial reporting requirements for governmental entities. GASB Statement No. 67 defines the plan accounting and financial reporting for governmental pension plans, and GASB Statement No. 68 defines the employer accounting and financial reporting for participating in a governmental pension plan.

9. Market Value of Assets

The fair value of the Plan's assets assuming that all holdings are liquidated on the measurement date.

10. Normal Cost

The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. It is sometimes referred to as "current service cost." Any payment toward the Unfunded Actuarial Liability is not part of the normal cost.

11. Present Value of Projected Benefits

The estimated amount of assets needed today to pay for all benefits promised in the future to current members of the Plan, assuming all actuarial assumptions are met.

12. Present Value of Future Normal Costs

The actuarial present value of retirement association benefits allocated to future years of service.

13. Unfunded Actuarial Liability (UAL)

The difference between the Actuarial Liability and the Actuarial Value of Assets. This is sometimes referred to as the "unfunded accrued liability."

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