Via Electronic Mail

January 29, 2018

Mr. David C. Craik
Pension Administrator
Delaware Public Employees' Retirement System
McArdle Building
860 Silver Lake Boulevard, Suite 1
Dover, Delaware 19904

Re: Closed State Police June 30, 2017 Actuarial Valuation

Dear Dave:

We have completed our Actuarial Valuation of the 494 members remaining in the Closed State Police Plan as of June 30, 2017. Our results are as follows.

Valuation Results	
Actuarial Liability (AL)	$ 275,756,600
Actuarial Value of Assets (AVA)	3,085,300
AVA Unfunded AL (UAL)	$ 272,671,300
Funded Ratio on AVA (AVA/AL)	1.1%
Market Value of Assets (MVA)	1,967,900
Funded Ratio on MVA (MVA/AL)	0.7%
Present Value Accumulated Plan Benefits (PVAB)	$ 275,756,600
MVA	1,967,900
Unfunded PVAB	$ 273,788,700
Accrued Benefit Funded Ratio (MVA/PVAB)	0.7%

The Actuarial Value of Assets is a smoothed asset value that recognizes 20% of the difference between the expected actuarial value and the Market Value of Assets. The expected actuarial value equals the prior year's actuarial value adjusted with contributions, payments, and investment earnings of 7.2%, the assumption as of last year's valuation date. This method tempers the volatile fluctuations in market value.

The Closed State Police Plan is funded on a pay-as-you-go basis. We have calculated an Actuarially Determined Contribution amount for disclosure purposes, using a closed amortization period with 19 years remaining as of the June 30, 2017 valuation date. The amortization uses a level dollar method and a discount rate of 7.0% for a resulting contribution amount of $25,552,100 (including a margin for expenses) for fiscal year 2018.

Data and Assumptions

In completing the valuation and preparing our report, we relied on information, some oral and some written, supplied by staff of the Office of Pensions. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

We found the data to be reasonably consistent and comparable with data used in the prior valuation. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

Appendix A outlines the actuarial assumptions used. Appendix B contains a summary of the data, and Appendix C contains the disclosure information.

The Actuarial Liability was based on a 7.00% net investment return and mortality tables as outlined in Appendix A.

We believe these assumptions reflect our best estimate of anticipated future experience of the Plan. Our results are dependent upon future experience conforming to these assumptions. It is certain that actual experience will not conform exactly to these assumptions. Actual amounts will differ from projected amounts to the extent actual experience differs from expected experience.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board, including the use of assumptions and methods for funding purposes that comply with the Actuarial Standards of Practice. 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 for the Delaware Closed State Police Pension Plan for the purposes described herein and for the use by the Plan's auditor in completing an audit related to the matters herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

Fiona E. Liston, FSA, MAAA, EA
Principal Consulting Actuary

Elizabeth Wiley, FSA, FCA, MAAA, EA
Consulting Actuary

Attachments

APPENDIX A – ACTUARIAL ASSUMPTIONS

A. Long-Term Assumptions Used to Determine Plan Costs and Liabilities

1. Demographic Assumptions

a. Rates of Mortality

Mortality rates are based on the sex-distinct employee, healthy annuitant, and disabled annuitant mortality tables described below, including adjustment factors applied to the published tables for each group. Future mortality improvements are reflected by applying a custom projection scale on a generational basis to adjusted base tables from the base year shown below.

i. Sample Rates of Mortality for Healthy Annuitant Lives at Selected Ages (number of deaths per 10,000 members):

(2017 Values Shown)		
Age	Male	Female
50	43	27
55	62	36
60	83	52
65	118	80
70	183	129
75	299	211
80	503	357
85	877	633
90	1,545	1,131
95	2,439	1,862
100	3,491	2,789

Rates are based on 110% and 100% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Employee Mortality Table for ages prior to start of the Healthy Annuitant Mortality Table, both projected from the 2006 base rates using the RPEC-2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0% for ages 115-120, and convergence to the ultimate rate in the year 2020. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

APPENDIX A – ACTUARIAL ASSUMPTIONS

ii. Sample Rates of Mortality for Disabled Annuitant Lives at Selected Ages (number of deaths per 10,000 members):

(2017 Values Shown)		
Age	Male	Female
25	92	27
30	88	35
35	104	48
40	125	67
45	194	104
50	237	137
55	273	173
60	311	205
65	372	249
70	481	339
75	659	497
80	940	750
85	1,399	1,135
90	2,145	1,681
95	3,009	2,445
100	3,963	3,437

Rates are based on 120% of the RP-2014 Total Dataset Disabled Annuitant Mortality Table, projected from the 2006 base rates using the RPEC-2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0% for ages 115-120, and convergence to the ultimate rate in the year 2020. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

2. Economic Assumptions

a. Investment Rate of Return: 7.00%
b. Annual Assumed Cost-of-Living Increase Rate for Retirees: 2.50%

3. Rationale for Assumptions

The assumptions were adopted by the Board of Trustees upon the recommendation of the actuary, based on an experience study review performed in 2016 and covering the period July 1, 2010 to June 30, 2015.

The assumed investment rate of return was reduced from 7.2% to 7.0% to better reflect the investment consultant's future outlook.

APPENDIX B – DATA SUMMARY

Data Summary			
	Count	Average Age	Average Monthly Benefit
Healthy Retirees	317	72	4,203.88
Disabled Retirees	62	70	4,315.93
Beneficiaries	115	78	2,896.71

APPENDIX C – DISCLOSURE INFORMATION

Analysis of Financial Experience

Gain and Loss in Accrued Liability During Years Ended June 30 Resulting from Differences Between Assumed Experience and Actual Experience

Gain (or Loss) for Year ending June 30,
(expressed in thousands)

Type of Activity	2017	2016	2015	2014	2013	2012
Investment Income on Actuarial Assets	(279)	(256)	(56)	(114)	(95)	(69)
Combined Liability Experience	(9,197)	(54)	6,154	3,391	(2,739)	(9,977)
(Loss)/Gain During Year from Financial Experience	(9,476)	(310)	6,098	3,277	(2,834)	(10,046)
Non-Recurring Items	(5,447)	2,557	0	(9,314)	0	0
Composite Gain (or Loss) During Year	(14,923)	2,247	6,098	(6,037)	(2,834)	(10,046)

Solvency Test
Aggregate Accrued Liabilities for

(expressed in thousands)

Valuation Date June 30,	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Active Member State-Financed Contributions (3)	Actuarial Value of Reported Assets	Portion of Accrued Liabilities Covered by Reported Assets (1)	(2)	(3)
2017	$ 0	$ 275,757	$ 0	$ 3,085	N/A	1%	N/A
2016	0	283,043	0	2,990	N/A	1	N/A
2015	0	288,849	0	2,879	N/A	1	N/A
2014	0	297,523	0	2,460	N/A	1	N/A
2013	0	294,533	0	2,668	N/A	1	N/A
2012	125	292,866	817	2,748	1	1	0

APPENDIX C – DISCLOSURE INFORMATION

Note to Required Supplementary Information

The June 30, 2018 Total Pension Liability presented in the Delaware PERS CAFR was determined as part of the measurement at the date indicated. Additional information as of the latest measurement date follows:

Measurement date	July 1, 2016
Actuarial cost method	Entry age normal
Actuarial assumptions:	
Investment rate of return*	7.0%
Municipal bond rate	3.58%
Discount rate	3.58%
Projected salary increases	N/A
Cost-of-living adjustments	2.50%
* Includes inflation at	2.50%

The Actuarial Determined Contribution for Fiscal Year 2018 will use the contribution rate developed in this letter valuation. It was determined using the measurement date and key assumptions that follow:

Measurement date	July 1, 2017
Actuarial cost method	Entry age normal
Amortization method	Level dollar – closed
Amortization period	19 years
Asset valuation method	Smoothed market, 20% annual market weight
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases	N/A
Cost-of-living adjustments	2.50%
* Includes inflation at	2.50%

The actuarial assumptions used have been recommended by the actuary and adopted by the Plan's Board of Trustees based on the most recent review of the Plan's experience completed in 2016.

The State' Actuarially Determined Contributions to the Plan is composed of the unfunded actuarial liability amortization amount, and the administrative expenses amount. The actuarial liability is that portion of the present value of projected benefits that will not be paid by future State normal costs or future member contributions, which are zero since there are no longer any active participants. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial liability. The allowance for administrative expenses is based upon the Plan's actual administrative expenses.