

Maine Public Employees Retirement System

Retiree Group Life Insurance Program

Participating Local Districts (PLDs) Actuarial Valuation and GASB Statement No. 74 Report as of June 30, 2019

Presented by Cheiron October 2019

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Via Electronic Mail and UPS Delivery

October 15, 2019

Board of Trustees Maine Public Employees Retirement System P.O. Box 349 Augusta, Maine 04332-0349

Re: Maine Public Employees Retirement System Retiree Group Life Insurance Program Actuarial Valuation Report for Participating Local Districts Plans.

Dear Members of the Board:

The purpose of this report is to provide accounting and financial reporting information under Governmental Accounting Standards Board (GASB) Statement No. 74 and present the estimated Postretirement Group Life Insurance obligations as of June 30, 2019, for the Maine Public Employees Retirement System (MainePERS or System) based on a roll-forward of the obligations as of June 30, 2018.

This report covers the participants of Participating Local Districts Plans (PLDs).

This report includes:

- Determination of the discount rate,
- Projection of the Total OPEB Liability (TOL) from the valuation date to the measurement date,
- Calculation of the Net OPEB Liability (NOL) at the discount rate as well as discount rates one percentage higher and lower than the discount rate, and
- Changes in the Net OPEB Liability.

We have determined the costs and liabilities for the substantive plan using actuarial assumptions and methods that we consider reasonable. The information shown in this report is primarily for financial disclosure purposes since the biennial full valuations are used to actually adjust funding strategies.

The current premium rates reflect rate changes adopted by the Board of Trustees based on a premium study conducted in 2016. The premiums were unchanged for PLD employees. PLD employees pay \$0.46 monthly per \$1,000 in coverage. Additional increases in future years will be determined by the next premium study in 2020.

In preparing our report, we relied on information (some oral and some written) supplied by the System. 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.

Board of Trustees Maine Public Employees Retirement System October 15, 2019 Page ii

Future actuarial measurements may differ significantly from the current measurements due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

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 for the Maine Public Employees Retirement System for the purposes described herein and for the use by the Plan auditor in completing an audit related to the matters 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 such other users.

Sincerely, Cheiron

John Colberg, FSA, MAAA, EA Principal Consulting Actuary

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Ryan Benitez, ASA, MAAA Associate Actuary



SUMMARY OF KEY RESULTS

Section I – Funding Results

The table below shows the results on a funding basis which reflects a discount rate of 6.750% in 2018 and 2019.

| Table I-1 Result Reflecting Funding Assumptions for PLDs | | | | | | | | |
|---|-------|---------------|-------|-----------------|--|--|--|--|
| | As of | June 30, 2018 | As of | f June 30, 2019 | | | | |
| Actuarial Liability | | | | | | | | |
| - Active Employees | \$ | 9,540,327 | \$ | 10,324,090 | | | | |
| - Retirees | \$ | 18,733,810 | \$ | 18,521,645 | | | | |
| Total | \$ | 28,274,137 | \$ | 28,845,735 | | | | |
| Less: Assets at Valuation Date ¹ | \$ | 15,821,928 | \$ | 16,259,162 | | | | |
| Unfunded Actuarial Liability (UAL) | \$ | 12,452,209 | \$ | 12,586,573 | | | | |

¹ The assets shown have been adjusted to reflect only assets dedicated to retiree benefits.



SUMMARY OF KEY RESULTS

Section II – Financial Reporting Results

This report is the third report under the Governmental Accounting Standards Board (GASB) Statement No. 74. The reporting date for the Maine Public Employees Retirement System Retiree Group Life Insurance Program presented in this report is June 30, 2019. Measurements as of the reporting date are based on the fair value of assets as of June 30, 2019 and the Total OPEB Liability (TOL) as of the valuation date June 30, 2018 using a blended discount rate of 5.13% rolled forward to June 30, 2019 and adjusted to a blended discount rate of 4.98%. There were no significant events between the valuation date and the measurement date, so the update procedures only included the change in discount rate, the addition of service cost and interest cost offset by actual benefit payments as permitted under GASB No. 74.

Beginning of year measurements presented in this report are based on the actuarial valuation as of June 30, 2018 rolled forward to June 30, 2019. Because the beginning and ending values are based on the same actuarial valuation and there were no significant events, no liability gains or losses due to experience are reported in either year shown in this report. During full valuation years, liability gains and losses will be reported reflecting the liability gains and losses between actuarial valuation dates as well as any significant events during the update period.

| Table II - 1 Summary of Results | | | | | | | |
|--|----|------------|----|------------|--|--|--|
| Measurement DateMeasurement Date06/30/201806/30/2019 | | | | | | | |
| Total OPEB Liability | \$ | 36,022,905 | \$ | 37,656,642 | | | |
| Plan Fiduciary Net Position | | 15,821,928 | | 16,259,162 | | | |
| Net OPEB Liability | \$ | 20,200,977 | \$ | 21,397,480 | | | |

Table II-1 below provides a summary of the key results during this reporting period ending on June 30, 2019.

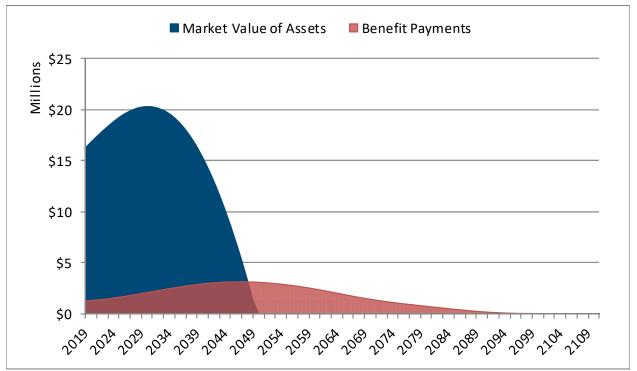


DETERMINATION OF DISCOUNT RATE

MainePERS's funding policy is for PLD employees to pay \$0.46 monthly per \$1,000 in coverage for all participants. Of the \$0.46 for actives, \$0.22 is allocated to fund retiree benefits.

The discount rate at June 30, 2019 is 6.750% for funding purposes, which is the assumed long-term expected rate of return on plan investments. We have performed a formal cash flow projection as described under Paragraphs 48-53 of GASB Statement 74.

The discount rate used to measure the Total OPEB Liability was 4.98% which is a blend of the assumed long-term expected rate of return of 6.750% on the Plan's investments and a municipal bond index rate of 3.50% based on the Bond Buyer GO 20-Year Municipal Bond Index as of June 30, 2019. Following the procedures described in paragraphs 43 - 53 of GASB Statement 74, projections of the System's fiduciary net position have indicated that it is not expected to be sufficient to make projected benefit payments for current plan members after 2050. Therefore the portion of future projected benefit payments after 2050 are discounted at the municipal bond index rate. The results of these projections are shown in the chart below.



This discount rate is intended to be used for accounting and financial reporting, but is not appropriate for estimating the price to settle the plan's liability.

A similar calculation was made as of June 30, 2018 using a blend of the assumed long-term expected rate of return of 6.750% on the System's investments and a municipal bond index rate of 3.87%. This calculation resulted in a blended discount rate of 5.13%.



DETERMINATION OF DISCOUNT RATE

The projection of cash flows used to determine the discount rate assumed that employer contributions continued to be made in accordance with the contribution policy in effect for the July 1, 2018 Actuarial Valuation.

Appendix B shows the details of this calculation as of June 30, 2019.



PROJECTION OF TOTAL OPEB LIABILITY

The TOL at the beginning of the current measurement year is measured as of a valuation date of June 30, 2018. The TOL at the end of the measurement year, June 30, 2019 is measured as of a valuation date of June 30, 2018 and projected to June 30, 2019. This is a roll forward valuation, and full valuations are completed at least every two years. There were no significant events during the current projection period of which we are aware. The table below shows the projection of the TOL at discount rates equal to the rate used for disclosure purposes as of June 30, 2019 and plus and minus one percent from that rate. The TOL has been determined using the entry age actuarial cost method as described in paragraph 54 of GASB Statement 74.

Table 2 projects the June 30, 2018 TOL recalculated using the June 30, 2019 discount rate as well as for plus and minus one percent of this discount rate. The liabilities are then rolled forward to June 30, 2019.

| Total OPEB Liability Se | | ole II - 2 ity at 6/30/201 | . 9 I | Measurement | Da | te | | |
|--|----------|--|--------------|--|----|----------------------|--|--|
| Discount Rate | | 3.98% 4.98% | | | | 5.98% | | |
| Total OPEB Liability, 6/30/2018 Actives | \$ | 17,463,896 | \$ | 13,881,055 | \$ | 11,175,996 | | |
| Deferred Vested Retirees | Ŷ | 0 26,164,694 | | 0 23,017,793 | | 0 20,426,084 | | |
| Total | \$ | 43,628,590 | \$ | 36,898,848 | \$ | | | |
| Service Cost, Beginning of Year Service Cost at Valuation Date Service Cost Rate Expected Payroll During Year Service Cost | \$ \$ | 735,022 0.27% 276,287,000 735,022 | · | 515,025 0.19% 276,287,000 515,025 | | 0.13% 276,287,000 | | |
| Benefit Payments | \$ | (1,581,540) | \$ | (1,581,540) | \$ | (1,581,540) | | |
| Interest | \$ | 1,734,506 | \$ | 1,824,309 | \$ | 1,864,918 | | |
| Change in Benefits Change in Assumptions Other Significant Events | | 0 0 0 | | 0 0 0 | | 0 0 0 | | |
| Total OPEB Liability, 6/30/2019 | \$ | 44,516,578 | \$ | 37,656,642 | \$ | 32,248,580 | | |



NOTE DISCLOSURES

Table 3 below shows the changes in TOL, the plan fiduciary net position (i.e., fair value of plan assets), and the Net OPEB Liability during the measurement year. There were no significant changes in benefits during the year. As previously noted we did not modify assumptions, except for the discount rate required under GASB 74, or adjust the participant data for this report. Therefore, no differences between expected and actual experience, i.e., experience adjustments, are included in this report.

| Table II - 3 Change in Net OPEB Liability - PLD | | | | | | | | |
|--|---------------------|--------------------------------|----|-------------------------------------|----|------------------------------------|--|--|
| | Increase (Decrease) | | | | | | | |
| | ŗ | Fotal OPEB Liability (a) | | an Fiduciary let Position (b) | | Net OPEB Liability (a) - (b) | | |
| Balances at 06/30/2018 | \$ | 36,022,905 | \$ | 15,821,928 | \$ | 20,200,977 | | |
| Changes for the year: | | | | | | | | |
| Service cost | | 488,545 | | | | 488,545 | | |
| Interest | | 1,832,881 | | | | 1,832,881 | | |
| Changes of benefits | | 0 | | | | 0 | | |
| Changes of assumptions | | 893,851 | | | | 893,851 | | |
| Differences between expected and actual experience | | 0 | | | | 0 | | |
| Contributions - employer | | | | 1,100,509 | | (1,100,509) | | |
| Contributions - member | | | | 0 | | 0 | | |
| Net investment income | | | | 1,037,784 | | (1,037,784) | | |
| Benefit payments | | (1,581,540) | | (1,581,540) | | 0 | | |
| Administrative expense | | 0 | | (119,519) | | 119,519 | | |
| Net changes | | 1,633,737 | | 437,234 | | 1,196,503 | | |
| Balances at 6/30/2019 | \$ | 37,656,642 | \$ | 16,259,162 | \$ | 21,397,480 | | |



NOTE DISCLOSURES

Changes in the discount rate would affect the measurement of the TOL. Lower discount rates produce a higher TOL and higher discount rates produce a lower TOL. Because the discount rate does not affect the measurement of assets, the percentage change in the NOL can be very significant for a relatively small change in the discount rate. Table 4 shows the sensitivity of the TOL and NOL to the discount rate.

| Table II - 4 Sensitivity of Net OPEB Liability to Changes in Discount Rate | | | | | | | | | |
|---|----|----------------------------|----|----------------------------|----|----------------------------|--|--|--|
| | | 1% Decrease 3.98% | | Discount Rate 4.98% | | 1% Increase 5.98% | | | |
| Total OPEB Liability Plan Fiduciary Net Position | \$ | 44,516,578 16,259,162 | \$ | 37,656,642 16,259,162 | \$ | 32,248,580 16,259,162 | | | |
| Collective Net OPEB Liability Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability | \$ | <u>28,257,416</u> 36.5% | \$ | <u>21,397,480</u> 43.2% | \$ | <u>15,989,418</u> 50.4% | | | |

A one percent decrease in the discount rate increases the TOL by approximately 18.2% and increases the NOL by approximately 32.1%. A one percent increase in the discount rate decreases the TOL by approximately 14.4% and decreases the NOL by approximately 25.3%.



REQUIRED SUPPLEMENTARY INFORMATION

| Table II - 5 Schedule of Changes in Net OPEB Liability and Related | Ratio | 98 |
|---|-----------|-------------|
| | | FY 2019 |
| Total OPEB Liability | | |
| Service cost (BOY) | \$ | 488,545 |
| Interest (includes interest on service cost) | | 1,832,881 |
| Changes of benefit terms | | 0 |
| Differences between expected and actual experience | | 0 |
| Changes of assumptions | | 893,851 |
| Benefit payments, including refunds of member contributions | | (1,581,540) |
| Net change in total OPEB liability | | 1,633,737 |
| Total OPEB liability - beginning | | 36,022,905 |
| Total OPEB liability - ending | \$ | 37,656,642 |
| Plan fiduciary net position | | |
| Contributions - employer | \$ | 1,100,509 |
| Contributions - member | | 0 |
| Net investment income | | 1,037,784 |
| Benefit payments, including refunds of member contributions | | (1,581,540) |
| Administrative expense | | (119,519) |
| Net change in plan fiduciary net position | \$ | 437,234 |
| Plan fiduciary net position - beginning | | 15,821,928 |
| Plan fiduciary net position - ending | \$ | 16,259,162 |
| Net OPEB liability - ending | <u>\$</u> | 21,397,480 |
| Plan fiduciary net position as a percentage of the total OPEB liability | | 43.18% |
| Covered employee payroll (projected for FY 2019) | \$ | 283,884,893 |
| Net OPEB liability as a percentage of covered employee payroll | | 7.54% |

Notes to Schedule of Changes in Net OPEB Liability and Related Ratios None.

A ten-year schedule of changes in NOL and related ratios is to be included within the CAFR for MainePERS. However, based on GASB guidance, this ten-year history can be built one year at a time following implementation. We have shown only the current year of this *Schedule of Changes in Net OPEB Liability and Related Ratios* above and believe that you can accumulate these individual years in the MainePERS CAFR to build this schedule to show the full ten-year schedule over time. Notes to this schedule should be included for any factors significantly impacting the trends reported within the period shown in this schedule at that time. As of June 30, 2019, we have included such a note in the *Notes to Schedule of Changes in Net OPEB Liability and Related Ratios* above. However, it is our expectation that System staff will make the final determination regarding any notes needed for this schedule and are available to provide any information they may need for this purpose.



REQUIRED SUPPLEMENTARY INFORMATION

If an Actuarially Determined Contribution is calculated, the following schedule is required. An Actuarially Determined Contribution is a contribution amount determined in accordance with Actuarial Standards of Practice.

| Table II - 6 Schedule of Employer Contributions During Fiscal Year 2019 | |
|---|------------------------------|
| | PLD |
| Actuarially Determined Contribution Contributions in Relation to the Actuarially Determined Contribution | \$ 1,287,098 1,100,509 |
| Contribution Deficiency/(Excess) | \$ 186,589 |
| Covered Payroll* | \$ 283,884,893 |
| Contributions as a Percentage of Covered Payroll | 0.39% |
| * Projected payroll for roll-forward year | |

Notes to Schedule

Valuation Date: June 30, 2016

Timing: The ADC is calculated based on the prior biennial valuation, in this case, ADCs for 2018 and 2019 are based on the June 30, 2016 valuation.

Key Methods and Assumptions Used to Determine Contribution Rates for FY 2019

| Actuarial Cost Method: | Entry Age Normal |
|------------------------------|--|
| Asset Valuation Method: | Market Value |
| Amortization Method: | Level percent closed with 12 years remaining for FY 2019 |
| Discount Rate: | 6.875% |
| Salary Inflation: | 2.750% |
| Administrative Expense Load: | 8.66% |

A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2019 can be found in the June 30, 2016 Actuarial Valuation report.



REQUIRED SUPPLEMENTARY INFORMATION

Table II-7 that follows is provided in this report at the request of MainePERS staff, showing the development of the average remaining service life for the Program. GASB 75 requires some items be recognized by employers into OPEB expense over a period "equal to the average of the expected remaining service lives of all employees that are provided with OPEB through the OPEB plan (active employees and inactive employees) determined as of the beginning of the measurement period." For the current measurement year ending on June 30, 2019, these values are thus developed based on the prior full biennial valuation data as of June 30, 2018. The development of this value is shown below, including reflection of the decision by MainePERS to round the resulting value to the nearest whole year.

| Table II - 7 Average Expected Remaining Service Life For Measurement Year Ending June 30, 2019 | | | | | | | | |
|--|----------------------------------|--------------|--------------------------------------|--|--|--|--|--|
| Status | Total Expected Future Service | Count | Average Remaining Service Life | | | | | |
| Actives | 51,268 | 5,495 | 9 | | | | | |
| Inactives | <u>0</u> | <u>2,850</u> | <u>0</u> | | | | | |
| Total Membership | 51,268 | 8,345 | 6 | | | | | |



APPENDIX A – PARTICIPANT DATA

Participant Data as of June 30, 2018

| TABLE A-1ACTIVE MEMBER DATAAverageAverage | | | | | | | | |
|---|-------------------------|-----------------------------------|-------|--------|--|-----------|--|--|
| Group | Count | Age | Servi | ce | Avera | ge Salary | | |
| PLDs | 5,495 | 5 49. | 5 1 | 0.7 | \$ | 50,280 | | |
| | NON-AO Group PLDs | TABL CTIVE M Count 2,850 | | A B | ATA verage enefit ¹ 17,136 | | | |

¹Ultimate benefit (40% of initial base benefit)

Note that all assumptions are based on the MainePERS Pension assumptions, which were updated after the experience study performed two years ago except for the discount rate which was lowered for last year's valuation.



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

Table B-1 - Projection of Contributions

Projections Commence June 30, 2019

* Total covered-employee payroll increases 2.75% per year

| Year | Payroll for Current Employees | Payroll for Future Employees | Total Employee Payroll* | Premium Contribution Rate | UAL Rate | Employer Contributions for Current Employees | Contributions Related to Payroll of Future Employees | Total Contributions |
|------|-------------------------------------|---------------------------------|----------------------------|---------------------------------|-------------|---|--|------------------------|
| | (a) | (b) | (c) = (a) + (b) | (d) | (e) | (f) = (a) x (d) | (g) = (b) x (e) | (h) = (f) + (g) |
| 1 | \$ 283,884,893 | \$ 0 | \$ 283,884,893 | 0.26% | 0.16% | \$ 738,101 | \$ 0 | \$ 738,101 |
| 2 | 243,455,282 | 48,236,445 | 291,691,727 | 0.26% | 0.16% | 632,984 | 76,818 | 709,802 |
| 3 | 223,818,994 | 75,894,255 | 299,713,250 | 0.26% | 0.16% | 581,929 | 120,864 | 702,794 |
| 4 | 206,869,990 | 101,085,373 | 307,955,364 | 0.26% | 0.16% | 537,862 | 160,982 | 698,844 |
| 5 | 191,244,668 | 125,179,468 | 316,424,136 | 0.26% | 0.16% | 497,236 | 199,353 | 696,589 |
| 6 | 177,160,822 | 147,964,979 | 325,125,800 | 0.26% | 0.16% | 460,618 | 235,639 | 696,258 |
| 7 | 163,689,572 | 170,377,188 | 334,066,760 | 0.26% | 0.16% | 425,593 | 271,332 | 696,925 |
| 8 | 151,347,221 | 191,906,375 | 343,253,596 | 0.26% | 0.16% | 393,503 | 305,618 | 699,120 |
| 9 | 139,970,326 | 212,722,743 | 352,693,069 | 0.26% | 0.16% | 363,923 | 338,768 | 702,691 |
| 10 | 129,210,473 | 233,181,656 | 362,392,129 | 0.26% | 0.16% | 335,947 | 371,350 | 707,297 |
| 11 | 118,744,255 | 253,613,657 | 372,357,912 | 0.26% | 0.16% | 308,735 | 403,889 | 712,624 |
| 12 | 109,535,892 | 273,061,863 | 382,597,755 | 0.26% | 0.16% | 284,793 | 434,861 | 719,654 |
| 13 | 100,719,874 | 292,399,320 | 393,119,193 | 0.26% | 0.16% | 261,872 | 465,656 | 727,528 |
| 14 | 92,488,128 | 311,441,843 | 403,929,971 | 0.26% | 0.16% | 240,469 | 495,982 | 736,451 |
| 15 | 84,341,497 | 330,696,548 | 415,038,045 | 0.26% | 0.16% | 219,288 | 526,646 | 745,934 |
| 16 | 76,355,422 | 350,096,170 | 426,451,591 | 0.26% | 0.16% | 198,524 | 557,541 | 756,065 |
| 17 | 69,605,822 | 368,573,189 | 438,179,010 | 0.26% | 0.16% | 180,975 | 586,966 | 767,941 |
| 18 | 63,176,350 | 387,052,583 | 450,228,933 | 0.26% | 0.16% | 164,259 | 616,395 | 780,653 |
| 19 | 57,685,333 | 404,924,896 | 462,610,229 | 0.26% | 0.16% | 149,982 | 644,857 | 794,839 |
| 20 | 51,919,634 | 423,412,376 | 475,332,010 | 0.26% | 0.16% | 134,991 | 674,299 | 809,290 |
| 21 | 46,651,427 | 441,752,213 | 488,403,640 | 0.26% | 0.16% | 121,294 | 703,506 | 824,800 |
| 22 | 41,620,680 | 460,214,060 | 501,834,740 | 0.26% | 0.16% | 108,214 | 732,907 | 841,121 |
| 23 | 37,566,834 | 478,068,361 | 515,635,196 | 0.26% | 0.16% | 97,674 | 761,341 | 859,015 |
| 24 | 33,354,334 | 496,460,830 | 529,815,164 | 0.26% | 0.16% | 86,721 | 790,631 | 877,353 |
| 25 | 29,029,861 | 515,355,220 | 544,385,081 | 0.26% | 0.16% | 75,478 | 820,721 | 896,199 |
| 26 | 25,046,391 | 534,309,279 | 559,355,670 | 0.26% | 0.16% | 65,121 | 850,906 | 916,027 |
| 27 | 21,065,884 | 553,672,067 | 574,737,951 | 0.26% | 0.16% | 54,771 | 881,742 | 936,514 |
| 28 | 18,235,415 | 572,307,829 | 590,543,245 | 0.26% | 0.16% | 47,412 | 911,420 | 958,833 |
| 29 | 15,704,542 | 591,078,642 | 606,783,184 | 0.26% | 0.16% | 40,832 | 941,314 | 982,145 |
| 30 | 13,191,904 | 610,277,818 | 623,469,722 | 0.26% | 0.16% | 34,299 | 971,889 | 1,006,188 |
| 31 | 11,625,683 | 628,989,456 | 640,615,139 | 0.26% | 0.16% | 30,227 | 1,001,688 | 1,031,915 |
| 32 | 10,052,621 | 648,179,434 | 658,232,055 | 0.26% | 0.16% | 26,137 | 1,032,249 | 1,058,385 |
| 33 | 8,628,666 | 667,704,771 | 676,333,437 | 0.26% | 0.16% | 22,435 | 1,063,343 | 1,085,778 |
| 34 | 7,312,125 | 687,620,482 | 694,932,606 | 0.26% | 0.16% | 19,012 | 1,095,060 | 1,114,071 |
| 35 | 6,054,765 | 707,988,488 | 714,043,253 | 0.26% | 0.16% | 15,742 | 1,127,497 | 1,143,239 |
| 36 | 4,942,526 | 728,736,917 | 733,679,443 | 0.26% | 0.16% | 12,851 | 1,160,539 | 1,173,390 |
| 37 | 4,127,744 | 749,727,883 | 753,855,627 | 0.26% | 0.16% | 10,732 | 1,193,968 | 1,204,700 |
| 38 | 3,193,608 | 771,393,049 | 774,586,657 | 0.26% | 0.16% | 8,303 | 1,228,471 | 1,236,774 |
| 39 | 2,409,957 | 793,477,833 | 795,887,790 | 0.26% | 0.16% | 6,266 | 1,263,641 | 1,269,907 |
| 40 | 1,971,096 | 815,803,608 | 817,774,704 | 0.26% | 0.16% | 5,125 | 1,299,196 | 1,304,321 |
| 41 | 1,617,987 | 838,645,522 | 840,263,509 | 0.26% | 0.16% | 4,207 | 1,335,573 | 1,339,779 |
| 42 | 1,121,222 | 862,249,533 | 863,370,755 | 0.26% | 0.16% | 2,915 | 1,373,163 | 1,376,078 |
| 43 | 819,337 | 886,294,114 | 887,113,451 | 0.26% | 0.16% | 2,130 | 1,411,455 | 1,413,585 |
| 44 | 569,112 | 910,939,959 | 911,509,071 | 0.26% | 0.16% | 1,480 | 1,450,704 | 1,452,184 |
| 45 | 395,753 | 936,179,817 | 936,575,570 | 0.26% | 0.16% | 1,029 | 1,490,899 | 1,491,928 |
| 46 | 282,435 | 962,048,963 | 962,331,398 | 0.26% | 0.16% | 734 | 1,532,097 | 1,532,831 |
| 47 | 182,794 | 988,612,718 | 988,795,512 | 0.26% | 0.16% | 475 | 1,574,401 | 1,574,876 |
| 48 | 99,409 | 1,015,887,980 | 1,015,987,388 | 0.26% | 0.16% | 258 | 1,617,837 | 1,618,096 |
| 49 | 50,147 | 1,043,876,895 | 1,043,927,042 | 0.26% | 0.16% | 130 | 1,662,411 | 1,662,541 |
| 50 | 21,134 | 1,072,613,902 | 1,072,635,035 | 0.26% | 0.16% | 55 | 1,708,176 | 1,708,230 |



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

Table B-1 - Projection of Contributions

Projections Commence June 30, 2019

* Total covered-employee payroll increases 2.75% per year

| Year | Payroll for Current Employees | Payroll for Future Employees | Total Employee Payroll* | ER Rate | AL Rate | Employer Contributions for Current Employees | Related to Payroll of Future Employees | Total Contributions |
|----------|-------------------------------------|---------------------------------|--------------------------------|----------------|----------------|---|---|------------------------|
| | (a) | (b) | (c) = (a) + (b) | (e) | (f) | (h) = (a) x (e) | (i) = (b) x (f) | (j) = (g) + (h) + |
| 51 | 9,810 | 1,102,122,689 | 1,102,132,499 | 0.26% | 0.16% | 26 | 1,755,169 | (i) 1,755,195 |
| 52 | 1,457 | 1,132,439,686 | 1,132,441,142 | 0.26% | 0.16% | 4 | 1,803,450 | 1,803,454 |
| 53 | 1,157 | 1,163,583,274 | 1,163,583,274 | 0.26% | 0.16% | 0 | 1,853,047 | 1,853,047 |
| 54 | 0 | 1,195,581,814 | 1,195,581,814 | 0.26% | 0.16% | 0 | 1,904,006 | 1,904,006 |
| 55 | 0 | 1,228,460,314 | 1,228,460,314 | 0.26% | 0.16% | ů 0 | 1,956,366 | 1,956,366 |
| 56 | ů 0 | 1,262,242,972 | 1,262,242,972 | 0.26% | 0.16% | ů 0 | 2,010,167 | 2,010,167 |
| 57 | 0 | 1,296,954,654 | 1,296,954,654 | 0.26% | 0.16% | 0 | 2,065,446 | 2,065,446 |
| 58 | 0 | 1,332,620,907 | 1,332,620,907 | 0.26% | 0.16% | 0 | 2,122,246 | 2,122,246 |
| 59 | 0 | 1,369,267,982 | 1,369,267,982 | 0.26% | 0.16% | 0 | 2,180,608 | 2,180,608 |
| 60 | 0 | 1,406,922,852 | 1,406,922,852 | 0.26% | 0.16% | 0 | 2,240,574 | 2,240,574 |
| 61 | 0 | 1,445,613,230 | 1,445,613,230 | 0.26% | 0.16% | 0 | 2,302,190 | 2,302,190 |
| 62 | 0 | 1,485,367,594 | 1,485,367,594 | 0.26% | 0.16% | 0 | 2,365,500 | 2,365,500 |
| 63 | 0 | 1,526,215,203 | 1,526,215,203 | 0.26% | 0.16% | 0 | 2,430,552 | 2,430,552 |
| 64 | 0 | 1,568,186,121 | 1,568,186,121 | 0.26% | 0.16% | 0 | 2,497,392 | 2,497,392 |
| 65 | 0 | 1,611,311,239 | 1,611,311,239 | 0.26% | 0.16% | 0 | 2,566,070 | 2,566,070 |
| 66 | 0 | 1,655,622,298 | 1,655,622,298 | 0.26% | 0.16% | 0 | 2,636,637 | 2,636,637 |
| 67 | 0 | 1,701,151,911 | 1,701,151,911 | 0.26% | 0.16% | 0 | 2,709,145 | 2,709,145 |
| 68 | 0 | 1,747,933,589 | 1,747,933,589 | 0.26% | 0.16% | 0 | 2,783,646 | 2,783,646 |
| 69 | 0 | 1,796,001,763 | 1,796,001,763 | 0.26% | 0.16% | 0 | 2,860,196 | 2,860,196 |
| 70 | 0 | 1,845,391,811 | 1,845,391,811 | 0.26% | 0.16% | 0 | 2,938,852 | 2,938,852 |
| 71 | 0 | 1,896,140,086 | 1,896,140,086 | 0.26% | 0.16% | 0 | 3,019,670 | 3,019,670 |
| 72 | 0 | 1,948,283,938 | 1,948,283,938 | 0.26% | 0.16% | 0 | 3,102,711 | 3,102,711 |
| 73 | 0 | 2,001,861,747 | 2,001,861,747 | 0.26% | 0.16% | 0 | 3,188,036 | 3,188,036 |
| 74 | 0 | 2,056,912,945 | 2,056,912,945 | 0.26% | 0.16% | 0 | 3,275,707 | 3,275,707 |
| 75 | 0 | 2,113,478,051 | 2,113,478,051 | 0.26% | 0.16% | 0 | 3,365,788 | 3,365,788 |
| 76 | 0 | 2,171,598,697 | 2,171,598,697 | 0.26% | 0.16% | 0 | 3,458,348 | 3,458,348 |
| 77 | 0 | 2,231,317,661 | 2,231,317,661 | 0.26% | 0.16% | 0 | 3,553,452 | 3,553,452 |
| 78 70 | 0 | 2,292,678,897 | 2,292,678,897 | 0.26% | 0.16% | 0 | 3,651,172 | 3,651,172 |
| 79 80 | 0 | 2,355,727,567 | 2,355,727,567 | 0.26% | 0.16% | 0 | 3,751,579 | 3,751,579 |
| 80 81 | 0 | 2,420,510,075 2,487,074,102 | 2,420,510,075 2,487,074,102 | 0.26% 0.26% | 0.16% 0.16% | 0 0 | 3,854,748 3,960,753 | 3,854,748 3,960,753 |
| 81 | 0 | 2,487,074,102 | 2,487,074,102 | 0.26% | 0.16% | 0 | 4,069,674 | 4,069,674 |
| 82 83 | 0 | 2,625,744,027 | 2,625,744,027 | 0.26% | 0.16% | 0 | 4,181,590 | 4,181,590 |
| 83 | 0 | 2,697,951,988 | 2,697,951,988 | 0.26% | 0.16% | 0 | 4,181,590 | 4,296,584 |
| 85 | 0 | 2,772,145,667 | 2,772,145,667 | 0.26% | 0.16% | 0 | 4,414,740 | 4,414,740 |
| 86 | 0 | 2,848,379,673 | 2,848,379,673 | 0.26% | 0.16% | 0 | 4,536,145 | 4,536,145 |
| 87 | 0 | 2,926,710,114 | 2,926,710,114 | 0.26% | 0.16% | 0 | 4,660,889 | 4,660,889 |
| 88 | 0 | 3,007,194,642 | 3,007,194,642 | 0.26% | 0.16% | 0 | 4,789,064 | 4,789,064 |
| 89 | 0 | 3,089,892,495 | 3,089,892,495 | 0.26% | 0.16% | 0 | 4,920,763 | 4,920,763 |
| 90 | ů 0 | 3,174,864,539 | 3,174,864,539 | 0.26% | 0.16% | 0 | 5,056,084 | 5,056,084 |
| 91 | ů 0 | 3,262,173,314 | 3,262,173,314 | 0.26% | 0.16% | ů 0 | 5,195,126 | 5,195,126 |
| 92 | 0 | 3,351,883,080 | 3,351,883,080 | 0.26% | 0.16% | 0 | 5,337,992 | 5,337,992 |
| 93 | 0 | 3,444,059,864 | 3,444,059,864 | 0.26% | 0.16% | 0 | 5,484,787 | 5,484,787 |
| 94 | 0 | 3,538,771,511 | 3,538,771,511 | 0.26% | 0.16% | 0 | 5,635,619 | 5,635,619 |
| 95 | 0 | 3,636,087,727 | 3,636,087,727 | 0.26% | 0.16% | 0 | 5,790,598 | 5,790,598 |
| 96 | 0 | 3,736,080,140 | 3,736,080,140 | 0.26% | 0.16% | 0 | 5,949,840 | 5,949,840 |
| 97 | 0 | 3,838,822,344 | 3,838,822,344 | 0.26% | 0.16% | 0 | 6,113,460 | 6,113,460 |
| 98 | 0 | 3,944,389,958 | 3,944,389,958 | 0.26% | 0.16% | 0 | 6,281,580 | 6,281,580 |
| 99 | 0 | 4,052,860,682 | 4,052,860,682 | 0.26% | 0.16% | 0 | 6,454,324 | 6,454,324 |



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

Table B-2 - Projection of the Pension Plan's Fiduciary Net Position

Projections Commence June 30, 2019

* From Table 1 - Projection of Contributions, column (h)

| Year | Projected Beginning Fiduciary Net Postion (a) | Projected Total Contributions* (b) | Projected Benefit Payments (c) | Projected Investment Earnings (d) | Projected Ending Fiduciary Net Position (e) = (a) + (b) - (c) + (d) |
|----------|---|--|---|--|--|
| 1 | \$ 16,259,162 | \$ 738,101 | \$ 1,249,827 | \$ 1,080,505 | \$ 16,827,941 |
| 2 | 16,827,941 | 709,802 | 1,296,227 | 1,116,417 | 17,357,933 |
| 3 | 17,357,933 | 702,794 | 1,345,064 | 1,150,338 | 17,866,001 |
| 4 | 17,866,001 | 698,844 | 1,393,604 | 1,182,890 | 18,354,130 |
| 5 | 18,354,130 | 696,589 | 1,444,657 | 1,214,069 | 18,820,130 |
| 6 | 18,820,130 | 696,258 | 1,524,740 | 1,242,854 | 19,234,502 |
| 7 | 19,234,502 | 696,925 | 1,610,074 | 1,268,013 | 19,589,366 |
| 8 | 19,589,366 | 699,120 | 1,695,999 | 1,289,187 | 19,881,674 |
| 9 | 19,881,674 | 702,691 | 1,785,466 | 1,306,066 | 20,104,966 |
| 10 | 20,104,966 | 707,297 | 1,880,961 | 1,318,121 | 20,249,423 |
| 11 | 20,249,423 | 712,624 | 1,978,531 | 1,324,809 | 20,308,325 |
| 12 | 20,308,325 | 719,654 | 2,075,100 | 1,325,813 | 20,278,692 |
| 13 | 20,278,692 | 727,528 | 2,171,086 | 1,320,887 | 20,156,021 |
| 14 | 20,156,021 | 736,451 | 2,265,804 | 1,309,759 | 19,936,426 |
| 15 | 19,936,426 | 745,934 | 2,362,013 | 1,292,057 | 19,612,404 |
| 16 | 19,612,404 | 756,065 | 2,455,098 | 1,267,431 | 19,180,802 |
| 17 | 19,180,802 | 767,941 | 2,545,842 | 1,235,680 | 18,638,581 |
| 18 | 18,638,581 | 780,653 | 2,632,106 | 1,196,638 | 17,983,767 |
| 19 | 17,983,767 | 794,839 | 2,714,039 | 1,150,189 | 17,214,756 |
| 20 | 17,214,756 | 809,290 | 2,790,634 | 1,096,218 | 16,329,630 |
| 21 22 | 16,329,630 15,327,778 | 824,800 841,121 | 2,861,292 2,924,007 | 1,034,641 965,475 | 15,327,778 14,210,368 |
| 22 | 14,210,368 | 859,015 | 2,924,007 | 888,800 | 12,978,625 |
| 23 24 | 12,978,625 | 877,353 | 3,027,243 | 804,683 | 11,633,417 |
| 24 | 11,633,417 | 896,199 | 3,064,987 | 713,254 | 10,177,884 |
| 26 | 10,177,884 | 916,027 | 3,094,772 | 614,675 | 8,613,814 |
| 20 | 8,613,814 | 936,514 | 3,115,531 | 509,091 | 6,943,889 |
| 28 | 6,943,889 | 958,833 | 3,127,201 | 396,725 | 5,172,245 |
| 29 | 5,172,245 | 982,145 | 3,129,713 | 277,830 | 3,302,507 |
| 30 | 3,302,507 | 1,006,188 | 3,121,878 | 152,681 | 1,339,498 |
| 31 | 1,339,498 | 1,031,915 | 3,105,738 | 21,567 | 0 |
| 32 | 0 | 1,058,385 | 3,080,945 | 0 | 0 |
| 33 | 0 | 1,085,778 | 3,047,728 | 0 | 0 |
| 34 | 0 | 1,114,071 | 3,007,027 | 0 | 0 |
| 35 | 0 | 1,143,239 | 2,958,655 | 0 | 0 |
| 36 | 0 | 1,173,390 | 2,902,194 | 0 | 0 |
| 37 | 0 | 1,204,700 | 2,837,926 | 0 | 0 |
| 38 | 0 | 1,236,774 | 2,766,777 | 0 | 0 |
| 39 | 0 | 1,269,907 | 2,689,702 | 0 | 0 |
| 40 | 0 | 1,304,321 | 2,607,282 | 0 | 0 |
| 41 | 0 | 1,339,779 | 2,519,533 | 0 | 0 |
| 42 | 0 | 1,376,078 | 2,426,432 | 0 | 0 |
| 43 | 0 | 1,413,585 | 2,329,235 | 0 | 0 |
| 44 | 0 | 1,452,184 | 2,228,110 | 0 | 0 |
| 45 | 0 | 1,491,928 | 2,123,757 | 0 | 0 |
| 46 | 0 | 1,532,831 | 2,017,793 | 0 | 0 |
| 47 | 0 | 1,574,876 | 1,911,044 | 0 | 0 |
| 48 | 0 | 1,618,096 | 1,804,594 | 0 | 0 |
| 49 | 0 | 1,662,541 | 1,699,425 | 0 | 0 |
| 50 | 0 | 1,708,230 | 1,597,503 | 0 | 0 |



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

| Year | Projected Beginning Fiduciary Net Postion | Projected Total Contributions* | Projected Benefit Payments | Projected Investment Earnings | Projected Ending Fiduciary N Position |
|----------|--|-----------------------------------|----------------------------------|-------------------------------------|--|
| | (a) | (b) | (c) | (e) | (f) = (a) + (b) (c) -(d) + (e) |
| 51 | 0 | 1,755,195 | 1,500,600 | 0 | (c) -(u) + (c |
| 52 | 0 | 1,803,454 | 1,409,254 | 0 | |
| 53 | 0 | 1,853,047 | 1,323,787 | 0 | |
| 54 | 0 | 1,904,006 | 1,244,296 | 0 | |
| 55 | 0 | 1,956,366 | 1,169,646 | 0 | |
| 56 | 0 | 2,010,167 | 1,099,023 | 0 | |
| 57 | 0 | 2,065,446 | 1,031,751 | 0 | |
| 58 | 0 | 2,122,246 | 967,403 | 0 | |
| 59 | 0 | 2,122,210 | 905,009 | ů 0 | |
| 60 | 0 | 2,240,574 | 843,724 | 0 | |
| 61 | 0 | 2,302,190 | 783,409 | 0 | |
| 62 | 0 | 2,365,500 | 724,422 | 0 | |
| 63 | 0 | 2,430,552 | 665,589 | 0 | |
| 64 | 0 | 2,497,392 | 607,288 | 0 | |
| 65 | 0 | | - | 0 | |
| | | 2,566,070 | 550,387 | | |
| 66 | 0 | 2,636,637 | 493,995 | 0 | |
| 67 | 0 | 2,709,145 | 438,372 | 0 | |
| 68 | 0 | 2,783,646 | 383,493 | 0 | |
| 69 | 0 | 2,860,196 | 330,467 | 0 | |
| 70 | 0 | 2,938,852 | 279,871 | 0 | |
| 71 | 0 | 3,019,670 | 232,547 | 0 | |
| 72 | 0 | 3,102,711 | 189,186 | 0 | |
| 73 | 0 | 3,188,036 | 150,542 | 0 | |
| 74 | 0 | 3,275,707 | 117,150 | 0 | |
| 75 | 0 | 3,365,788 | 88,852 | 0 | |
| 76 | 0 | 3,458,348 | 65,856 | 0 | |
| 77 | 0 | 3,553,452 | 47,619 | 0 | |
| 78 | 0 | 3,651,172 | 33,573 | 0 | |
| 79 | 0 | 3,751,579 | 23,074 | 0 | |
| 80 | 0 | 3,854,748 | 15,437 | 0 | |
| 81 | 0 | 3,960,753 | 10,048 | 0 | |
| 82 | 0 | 4,069,674 | 6,350 | 0 | |
| 83 | 0 | 4,181,590 | 3,897 | 0 | |
| 84 | 0 | 4,296,584 | 2,319 | 0 | |
| 85 | 0 | 4,414,740 | 1,339 | 0 | |
| 86 | 0 | 4,536,145 | 748 | 0 | |
| 87 | 0 | 4,660,889 | 406 | 0 | |
| 88 | 0 | 4,789,064 | 214 | 0 | |
| 89 | ů 0 | 4,920,763 | 109 | ů 0 | |
| 90 | 0 | 5,056,084 | 54 | 0 | |
| 91 | 0 | 5,195,126 | 27 | 0 | |
| 92 | 0 | 5,337,992 | 13 | 0 | |
| 92 93 | 0 | 5,484,787 | 6 | 0 | |
| 93 94 | 0 | 5,635,619 | 3 | 0 | |
| 94 95 | | | | | |
| | 0 | 5,790,598 | 1 | 0 | |
| 96 07 | 0 | 5,949,840 | 1 | 0 | |
| 97 08 | 0 | 6,113,460 | 0 | 0 | |
| 98 99 | 0 0 | 6,281,580 6,454,324 | 0 0 | 0 0 | |



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

Table B-3 - Actuarial Present Values of Projected Benefit Payments

Projections Commence June 30, 2019

* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

** From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (c)

| | - | Projected | - | | | | |
|------|--|---|---|--|--|--|--|
| Year | Projected Beginning Fiduciary Net Position* | Benefit Payments for current Plan participants** | "Funded" Portion of Benefit Payments | "Unfunded " Portion of Benefit Payments | Present Value of "Funded" Benefit Payments | Present Value of "Unfunded" Benefit Payments | Present Value o Benefit Paymen Using the Single Discount Rate |
| (a) | (b) | (c) | (d) = (c) if (b) >= (c) | (e) = (c) - (d) | $(f) = (d) / (1+6.75\%)^{(a)}$ | (g) = (e) / (1+3.50%)^(a) | (h) = (c) / (1+4.98%)^(a) |
| 1 | \$ 16,259,162 | \$ 1,249,827 | \$ 1,249,827 | \$ 0 | \$ 1,209,667 | \$ 0 | \$ 1,219,84 |
| 2 | 16,827,941 | 1,296,227 | 1,296,227 | 0 | 1,175,247 | 0 | 1,205,15 |
| 3 | 17,357,933 | 1,345,064 | 1,345,064 | 0 | 1,142,413 | 0 | 1,191,28 |
| 4 | 17,866,001 | 1,393,604 | 1,393,604 | 0 | 1,108,796 | 0 | 1,175,76 |
| 5 | 18,354,130 | 1,444,657 | 1,444,657 | 0 | 1,076,736 | 0 | 1,161,05 |
| 6 | 18,820,130 | 1,524,740 | 1,524,740 | 0 | 1,064,566 | 0 | 1,167,32 |
| 7 | 19,234,502 | 1,610,074 | 1,610,074 | 0 | 1,053,063 | 0 | 1,174,22 |
| 8 | 19,589,366 | 1,695,999 | 1,695,999 | 0 | 1,039,122 | 0 | 1,178,25 |
| 9 | 19,881,674 | 1,785,466 | 1,785,466 | 0 | 1,024,765 | 0 | 1,181,60 |
| 10 | 20,104,966 | 1,880,961 | 1,880,961 | 0 | 1,011,312 | 0 | 1,185,79 |
| 11 | 20,249,423 | 1,978,531 | 1,978,531 | 0 | 996,506 | 0 | 1,188,17 |
| 12 | 20,308,325 | 2,075,100 | 2,075,100 | 0 | 979,058 | 0 | 1,187,09 |
| 13 | 20,278,692 | 2,171,086 | 2,171,086 | 0 | 959,574 | 0 | 1,183,13 |
| 14 | 20,156,021 | 2,265,804 | 2,265,804 | 0 | 938,115 | 0 | 1,176,21 |
| 15 | 19,936,426 | 2,362,013 | 2,362,013 | 0 | 916,111 | 0 | 1,168,03 |
| 16 | 19,612,404 | 2,455,098 | 2,455,098 | 0 | 892,004 | 0 | 1,156,51 |
| 17 | 19,180,802 | 2,545,842 | 2,545,842 | 0 | 866,486 | 0 | 1,142,40 |
| 18 | 18,638,581 | 2,632,106 | 2,632,106 | 0 | 839,200 | 0 | 1,125,12 |
| 19 | 17,983,767 | 2,714,039 | 2,714,039 | 0 | 810,607 | 0 | 1,105,15 |
| 20 | 17,214,756 | 2,790,634 | 2,790,634 | 0 | 780,781 | 0 | 1,082,47 |
| 21 | 16,329,630 | 2,861,292 | 2,861,292 | 0 | 749,930 | 0 | 1,057,27 |
| 22 | 15,327,778 | 2,924,007 | 2,924,007 | 0 | 717,908 | 0 | 1,029,22 |
| 23 | 14,210,368 | 2,979,557 | 2,979,557 | 0 | 685,290 | 0 | 999,06 |
| 24 | 12,978,625 | 3,027,243 | 3,027,243 | 0 | 652,232 | 0 | 966,93 |
| 25 | 11,633,417 | 3,064,987 | 3,064,987 | 0 | 618,608 | 0 | 932,58 |
| 26 | 10,177,884 | 3,094,772 | 3,094,772 | 0 | 585,124 | 0 | 897,00 |
| 27 | 8,613,814 | 3,115,531 | 3,115,531 | 0 | 551,802 | 0 | 860,21 |
| 28 | 6,943,889 | 3,127,201 | 3,127,201 | 0 | 518,847 | 0 | 822,50 |
| 29 | 5,172,245 | 3,129,713 | 3,129,713 | 0 | 486,429 | 0 | 784,14 |
| 30 | 3,302,507 | 3,121,878 | 3,121,878 | 0 | 454,531 | 0 | 745,10 |
| 31 | 1,339,498 | 3,105,738 | 1,339,498 | 1,766,240 | 182,693 | 618,542 | 706,11 |
| 32 | 0 | 3,080,945 | 0 | 3,080,945 | 0 | 1,042,469 | 667,27 |
| 33 | 0 | 3,047,728 | 0 | 3,047,728 | 0 | 996,357 | 628,78 |
| 34 | 0 | 3,007,027 | 0 | 3,007,027 | 0 | 949,808 | 590,97 |
| 35 | 0 | 2,958,655 | 0 | 2,958,655 | 0 | 902,926 | 553,90 |
| 36 | 0 | 2,902,194 | 0 | 2,902,194 | 0 | 855,744 | 517,58 |
| 37 | 0 | 2,837,926 | 0 | 2,837,926 | ů 0 | 808,497 | 482,12 |
| 38 | 0 | 2,766,777 | 0 | 2,766,777 | ů 0 | 761,572 | 447,75 |
| 39 | 0 | 2,689,702 | 0 | 2,689,702 | 0 | 715,321 | 414,65 |
| 40 | 0 | 2,607,282 | 0 | 2,607,282 | 0 | 669,953 | 382,89 |
| 41 | ů 0 | 2,519,533 | 0 | 2,519,533 | 0 | 625,512 | 352,46 |
| 42 | 0 | 2,426,432 | 0 | 2,426,432 | 0 | 582,028 | 323,34 |
| 43 | 0 | 2,329,235 | 0 | 2,329,235 | 0 | 539,819 | 295,68 |
| 44 | 0 | 2,228,110 | 0 | 2,228,110 | 0 | 498,921 | 269,43 |
| 45 | 0 | 2,123,757 | 0 | 2,123,757 | 0 | 459,472 | 244.64 |
| 46 | 0 | 2,017,793 | 0 | 2,017,793 | 0 | 421,785 | 221,41 |
| 47 | 0 | 1,911,044 | 0 | 1,911,044 | 0 | 385,962 | 199,76 |
| 48 | 0 | 1,804,594 | 0 | 1,804,594 | 0 | 352,138 | 179,69 |
| 49 | 0 | 1,699,425 | 0 | 1,699,425 | 0 | 320,402 | 161,20 |
| 50 | 0 | 1,597,503 | 0 | 1,597,503 | 0 | 291,001 | 144,34 |



APPENDIX B – DETAILS OF INTEREST RATE CALCULATION

Table B-3 - Actuarial Present Values of Projected Benefit Payments

Projections Commence June 30, 2019

* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

** From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (c)

| (ear | Projected Beginning Fiduciary Net Position* | Benefit Payments for current Plan participants** | "Funded" Portion of Benefit Payments | "Unfunded " Portion of Benefit Payments | Present Value of "Funded" Benefit Payments | Present Value of "Unfunded" Benefit Payments | Present Value Benefit Payme Using the Sing Discount Rat |
|----------|--|---|---|--|--|--|--|
| (a) | (b) | (c) | (d) = (c) if (b) >= (c) | (e) = (c) - (d) | (f) = (d) / (1+6.75%)^(a) | (g) = (e) / (1+3.50%)^(a) | (h) = (c) / (1+4.98%)^(a |
| 51 | \$ 0 | \$ 1,500,600 | \$ 0 | \$1,500,600 | \$ 0 | \$ 264,105 | \$ 129,1 |
| 52 | 0 | 1,409,254 | 0 | 1,409,254 | 0 | 239,641 | 115,5 |
| 53 | 0 | 1,323,787 | 0 | 1,323,787 | 0 | 217,495 | 103,3 |
| 54 | 0 | 1,244,296 | 0 | 1,244,296 | 0 | 197,522 | 92,5 |
| 55 | 0 | 1,169,646 | 0 | 1,169,646 | 0 | 179,393 | 82,9 |
| 56 | 0 | 1,099,023 | 0 | 1,099,023 | 0 | 162,861 | 74,2 |
| 57 | 0 | 1,031,751 | 0 | 1,031,751 | 0 | 147,722 | 66,3 |
| 58 | 0 | 967,403 | 0 | 967,403 | 0 | 133,825 | 59,2 |
| 59 | 0 | 905,009 | 0 | 905,009 | 0 | 120,960 | 52,8 |
| 60 | 0 | 843,724 | 0 | 843,724 | 0 | 108,956 | 46,9 |
| 61 | 0 | 783,409 | 0 | 783,409 | 0 | 97,746 | 41,4 |
| 62 | 0 | 724,422 | 0 | 724,422 | 0 | 87,329 | 36,5 |
| 63 | 0 | 665,589 | 0 | 665,589 | 0 | 77,524 | 31,9 |
| 64 | 0 | 607,288 | 0 | 607,288 | 0 | 68,341 | 27,8 |
| 65 | 0 | 550,387 | 0 | 550,387 | 0 | 59,843 | 24,0 |
| 66 | 0 | 493,995 | 0 | 493,995 | 0 | 51,896 | 20,5 |
| 67 | 0 | 438,372 | 0 | 438,372 | 0 | 44,495 | 17,3 |
| 68 | 0 | 383,493 | 0 | 383,493 | 0 | 37,608 | 14,4 |
| 69 | 0 | 330,467 | 0 | 330,467 | 0 | 31,312 | 11,8 |
| 70 | 0 | 279,871 | 0 | 279,871 | 0 | 25,621 | 9,5 |
| 71 | ů 0 | 232,547 | 0 | 232,547 | 0 | 20,569 | 7,5 |
| 72 | 0 | 189,186 | 0 | 189,186 | 0 | 16,168 | 5,8 |
| 73 | ů 0 | 150,542 | 0 | 150,542 | 0 | 12,430 | 4,4 |
| 74 | ů 0 | 117,150 | 0 | 117,150 | 0 | 9,346 | 3,3 |
| 75 | 0 | 88,852 | 0 | 88,852 | 0 | 6,849 | 2,3 |
| 76 | 0 | 65,856 | 0 | 65,856 | 0 | 4,905 | 1,0 |
| 77 | 0 | 47,619 | 0 | 47,619 | 0 | 3,426 | 1,1 |
| 78 | 0 | 33,573 | 0 | 33,573 | 0 | 2,334 | 1,1 |
| 79 | 0 | 23,074 | 0 | 23,074 | 0 | 1,550 | 4 |
| 80 | 0 | 15,437 | 0 | 15,437 | 0 | 1,002 | |
| 81 | 0 | 10,048 | 0 | 10,048 | 0 | 630 | - |
| 82 | 0 | 6,350 | 0 | 6,350 | 0 | 385 | - |
| 83 | 0 | 3,897 | 0 | 3,897 | 0 | 228 | |
| 83 84 | 0 | 2,319 | 0 | 2,319 | 0 | 131 | |
| 85 | 0 | 1,339 | 0 | 1,339 | 0 | 73 | |
| 86 | 0 | 748 | 0 | 748 | 0 | 40 | |
| 87 | 0 | 406 | 0 | 406 | 0 | 21 | |
| 88 | 0 | 214 | 0 | 214 | 0 | 11 | |
| 89 | 0 | 109 | 0 | 109 | 0 | 5 | |
| 89 90 | 0 | 54 | 0 | 54 | 0 | 3 | |
| 90 91 | 0 | 27 | 0 | 27 | 0 | 5 | |
| 91 92 | 0 | 13 | 0 | 13 | 0 | 1 | |
| 92 93 | 0 | 10 | 0 | 10 | 0 | 1 | |
| 93 94 | 0 | 6 3 | 0 | 6 3 | 0 | 0 | |
| | 0 | 3 | • | 3 | 0 | 0 | |
| 95 | 0 | 1 | 0 | 1 | 0 | 0 | |
| 96 07 | 0 | 1 | 0 | 1 | 0 | 0 | |
| 97 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 98 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 99 | 0 | 0 | 0 | 0 | \$ 26,087,521 | 0 | |



APPENDIX C – ASSUMPTIONS, AND METHODS

Economic Assumptions

Valuation Date:June 30, 2018Funding Investment Return:6.750% per yearGASB Beginning of Year Liability Return:5.13% per yearGASB End of Year Liability Return:4.98% per year

Cost-of-Living Increases in Life Benefits: N/A. Unlike pension benefits, Life Benefits do <u>not</u> increase with Cost of Living.

Premium Expense Assumption:

To reflect administrative expenses associated with the distribution of benefits, the following loads have been added to the liabilities, normal cost, and benefit payments.

PLDs: 8.66% of claims

Rates of Salary Increase (Experience-based sample rates by service including both merit scale increase and yearly increase):

| Service | PLD |
|---------|-------|
| 0 | 9.00% |
| 5 | 2.75% |
| 10 | 2.75% |
| 15 | 2.75% |
| 20 | 2.75% |
| 25+ | 2.75% |

Demographic Assumptions

Rates of Termination (Experience-based sample rates by service):

| Service | PLDs | PLDs Special |
|---------|--------|-----------------|
| 0 | 25.00% | 25.00% |
| 5 | 9.00 | 4.00 |
| 10 | 6.00 | 2.50 |
| 15 | 4.00 | 2.50 |
| 20 | 2.50 | 2.50 |
| 25 | 2.50 | 2.50 |



APPENDIX C – ASSUMPTIONS, AND METHODS

Rates of Mortality

PLD Healthy Employees:

Rates for Active PLD employees are based on 104% and 120% of the RP-2014 Total Dataset Employee Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Healthy Annuitant Mortality Table rates after the end of the Total Employee 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 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

Rates for Retiree PLD employees are based on 104% and 120% 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 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

| | PLD | | | |
|-----|-------|--------|--|--|
| Age | Male | Female | | |
| 20 | 4 | 2 | | |
| 30 | 4 | 3 | | |
| 40 | 6 | 5 | | |
| 50 | 18 | 13 | | |
| 60 | 80 | 64 | | |
| 65 | 114 | 98 | | |
| 70 | 177 | 158 | | |
| 75 | 289 | 259 | | |
| 80 | 486 | 437 | | |
| 85 | 845 | 773 | | |
| 90 | 1,479 | 1,374 | | |
| 95 | 2,326 | 2,253 | | |

Sample Rates – Number of deaths per 10,000 members, showing values in 2015. Ages 20-50 show sample rates for actives, ages 60+ show sample rates for retirees.



APPENDIX C – ASSUMPTIONS, AND METHODS

Rates of Retirement (Experience-based sample retirements per 1,000 members by age):

PLD Regular:

| Age | Tier 1 | Tier 2 |
|-----|--------|--------|
| 45 | 50 | 50 |
| 50 | 50 | 50 |
| 55 | 50 | 50 |
| 60 | 200 | 50 |
| 65 | 250 | 200 |
| 70 | 1,000 | 1,000 |

PLD Special:

| Age | Assumption |
|-------|------------|
| 20 | 400 |
| 21-24 | 300 |
| 25 | 400 |
| 26-29 | 300 |
| 30 | 400 |
| 31-34 | 300 |
| 35+ | 1,000 |

Participants who are not members of MainePERS: Age 62

Rates of Disability (Experience-based sample disablements per 10,000 members by service):

| Age | PLDs |
|-----|------|
| 25 | 1.8 |
| 30 | 2.4 |
| 35 | 3.0 |
| 40 | 4.2 |
| 45 | 9.0 |
| 50 | 19.8 |
| 55 | 36.6 |
| 60 | 65.0 |

Participation Percent for Future Retirees:

100% of those currently enrolled (unique to this valuation).



APPENDIX C – ASSUMPTIONS, AND METHODS

Other Assumptions (Unique to this Valuation)

Conversion Charges: Applies to the cost of active group life insurance, not retiree group life insurance.

Form of Benefit Payment: Lump Sum

Actuarial Cost Method

The individual entry age normal method is used to determine liabilities. Under this funding method, a normal cost rate is calculated for each member. This rate is determined by taking the value, as of age at entry into the Program, of the member's projected future benefits, and dividing it by the value, also as of the member's entry age of his expected future salary. The normal cost for each member is the product of their annual salary at the valuation date and their normal cost rate. The normal cost amount for the group is then the sum of the normal costs for all members.

The Actuarial Liability is defined as the present value of future benefits, as of the valuation date, for all current members less the present value of future normal costs for all current members. For funding purposes, the Unfunded Actuarial Liability is then equal to the Actuarial Liability, less the actuarial value of the System's assets.

The discount rate used reflects the long-term funding policy to fully fund the benefits on an actuarial basis by FY 2031 for PLDs.

Asset Valuation Methods

Figures were reported by MainePERS without audit or change.

Rationale for Assumptions

The MainePERS Pension assumptions were adopted by the Board of Trustees at their July 14, 2016 meeting. The demographic assumptions adopted are based on an experience study covering the period from June 30, 2012 through June 30, 2015 and the economic assumptions are based on this experience study along with the advice of the MainePERS investment consultants.

Changes Since Last Valuation

The blended rate decreased from 5.13% to 4.98%, to reflect the blending of projections between the long term investment return assumption of 6.750% and the Bond Buyer GO 20-Year Municipal Bond Index: 3.50% as of June 30, 2019.



APPENDIX D – SUMMARY OF KEY PLAN PROVISIONS

Membership

| Service Retirement: | A retiree must have participated in the group life insurance program for at least ten years and possess coverage just prior to retirement. |
|------------------------|---|
| Disability Retirement: | An employee must have participated in the group life insurance program immediately prior to disablement. |

Basic Insurance

Average final compensation calculated for retirement purposes.

Amount of Insurance for a Retiree

| Service Retirement: | The Basic Insurance will be reduced by 15% per year until the amount equal to the greater of (a) 40% of the initial Basic Insurance, or (b) \$2,500. |
|------------------------|---|
| Disability Retirement: | The amount of basic life insurance in force prior to retirement will be continued until normal retirement age. At normal retirement age, the amount of insurance will be reduced as for service retirement. |

Retiree Contribution

PLD Employees: PLD must pay \$0.46 per month per \$1,000 of base benefit, based on the coverage amounts declining from 100% to 40%.

Normal Retirement Age

The specified age, the years of service requirement or any age and years of service combination at which a participant may become eligible for unreduced service retirement benefits.

Discontinued Coverages at Retirement

- Supplemental Life
- Accidental Death and Dismemberment
- Dependent Life

(Discontinued coverage may be ported to another group term product or converted to an individual policy. MainePERS is charged a fee for those active employees who convert to an individual policy upon termination from employment. Conversion charges are considered a cost of active, not retiree group life insurance. Therefore, it is not included in these liabilities.)



APPENDIX E – GLOSSARY OF TERMS

1. Actuarially Determined Contribution

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

2. Actuarial Valuation Date

The date as of which an actuarial valuation is performed. This date may be up to 24 months prior to the measurement date and up to 30 months prior to the employer's reporting date.

3. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 74 and 75 calculations. Under this method, the actuarial present value of the projected benefits of each individual, included in an actuarial valuation, is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the Total OPEB Liability.

4. Measurement Date

The date as of which the Total OPEB Liability and Plan Fiduciary Net Position are measured. The Total OPEB Liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

5. Net OPEB Liability

The liability of employers and non-employer contributing entities for employees for benefits provided through a defined benefit OPEB plan. It is calculated as the Total OPEB Liability less the Plan Fiduciary Net Position.

6. Plan Fiduciary Net Position

The fair or market value of assets.

7. Reporting Date

The last day of the Plan or employer's fiscal year.



APPENDIX E – GLOSSARY OF TERMS

8. Service Cost

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 74 and 75. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

9. Total OPEB Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 74 and 75. The Total OPEB Liability is the actuarial liability calculated under the entry age actuarial cost method.

