

ORWIGSBURG BOROUGH

54-117-3 N

GASB 68 Report

Measurement Date of:

December 31, 2019

For questions, please contact:
Cynthia Cranmer
Pennsylvania Municipal Retirement System
Chief Financial Officer
717-787-2065
RS-Cynthia.Cranmer@pa.gov

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SUMMARY

The purpose of this report is to provide accounting and financial reporting information under Governmental Accounting Standards Board Statement 68 as amended by Statements 73 and 82 for Orwigsburg Borough (the Employer). This information includes:

- Employees covered by benefit terms
- Calculation of the Net Pension Liability at the discount rate as well as discount rates 1% higher and lower than the discount rate,
- Changes in the Net Pension Liability,
- Schedule of Employer Contributions,
- Disclosure of Deferred Inflows and Outflows,
- Calculation of Annual Pension Expense, and
- Description of Actuarial Assumptions and Methods/Glossary of Terms

Highlights

The Pennsylvania Municipal Retirement System (PMRS) is an agent multiple-employer defined benefit pension plan. The Measurement Date for the Net Pension Liability (NPL) is December 31, 2019, which is no earlier than the end of the Employer’s prior fiscal year as allowed by Paragraph 20 of GASB 68. The table below provides a summary of the key results for the current and prior measurement periods.

Summary of Results			
Measurement Date			
	12/31/2019	12/31/2018	
Net Pension Liability	\$ 340,073	\$ 641,664	
Deferred Inflows	204,632	0	
Deferred Outflows	<u>(83,958)</u>	<u>(191,410)</u>	
Net Impact on Statement of Net Position	\$ 460,747	\$ 450,254	
Total Payroll	\$ 398,773	\$ 402,472	
Total Pension Expense (\$ Amount)	\$ 145,500	\$ 227,484	
Total Pension Expense (% of Payroll)	36.49%	56.52%	

Any employer contributions made between the Measurement Date and the Reporting Date would be reported as deferred outflows to offset the cash outflow reported. The Total Pension Liability (TPL) for the Employer is measured as of December 31, 2019 based on the actuarial valuation of one year prior then rolled forward to this date. The beginning of year TPL as of December 31, 2018 is based upon the actuarial valuation of the same date. This TPL reflects any plan changes identified in the prior year’s report. It is our understanding that there were no other significant changes during this projection period. In alternating years, the beginning of year TPL will be based on the actuarial valuation one year prior and then rolled forward to the measurement date, and the end of year TPL will be based on the actuarial valuation on the same date.

A breakdown of the components of the net pension expense is shown later in the report.

CERTIFICATION

The purpose of this report is to provide accounting and financial reporting information under GASB 68 as amended by GASB 73 and GASB 82 for the Employer. This report is for their use and the use of their auditors in preparing financial reports in accordance with applicable law and accounting requirements. This report is not appropriate for other purposes, including the measurement of funding requirements for the Employer under Act 205.

In preparing our report, we relied on information (some oral and some written) supplied by PMRS. 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, Data Quality. It is our understanding that PMRS, as the plan administrator, reviews the data for accuracy based on information provided by the Employer.

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 economic or demographic assumptions; changes in economic or demographic 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 PMRS for the purposes described herein and for the use by the Employer and the Employer's 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 other users besides PMRS.



Janet Cranna, FSA, EA, FCA, MAAA
Principal Consulting Actuary



Bonnie Rightnour, FSA, EA, MAAA
Consulting Actuary

DETERMINATION OF DISCOUNT RATE

The determination of the discount rate is based on the Long-Term Expected Rate of Return for individual participating municipalities, which PMRS develops and is also referred to as the Regular Interest Rate. For more information, please refer to the publication titled Long-Term Expected Rate of Return on Plan Assets for the December 31, 2019 measurement.

Based on the assumptions outlined in the publication described above, the plan fiduciary net position was determined to be available to make all projected benefit payments of current plan members based on the assumption that all MMO payments as determined and required under Act 205 will be paid accordingly. Therefore, the municipal long-term expected rate of return for municipal and member accounts was applied to discount all periods of projected benefit payments to determine the Total Pension Liability.

NOTES DISCLOSURES

The table below shows the changes in the Total Pension Liability, the Plan Fiduciary Net Position (i.e., fair value of Plan assets), and the Net Pension Liability as of the Measurement Date.

This report does not reflect changes in benefits, assumptions, or reserve accounts after January 1, 2020. Because the beginning and end of year TPL are based upon the same actuarial valuation dates, there is no difference between expected and actual experience reported this year, per GASB 68 paragraph 22. The beginning of year TPL is based on the January 1, 2019 actuarial valuation with liabilities measured at December 31, 2018. The end of year TPL is based on the same actuarial valuation with liabilities rolled forward to December 31, 2019. Except as noted below, the TPL as of December 31, 2019 was based on the data, actuarial methods and assumptions, and plan provisions described in Appendices A and E.

	Change in Net Pension Liability		
	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at 12/31/2018	\$ 2,324,100	\$ 1,682,436	\$ 641,664
Changes for the year:			
Service cost	76,507		76,507
Interest	123,416		123,416
Changes of benefits			
Changes of assumptions			
Differences between expected and actual experience			
Contributions - employer		134,627	(134,627)
Contributions - PMRS assessment		380	(380)
Contributions - employee			
PMRS investment income		91,667	(91,667)
Market value investment income*		278,389	(278,389)
Transfers			
Benefit payments	(100,955)	(100,955)	
PMRS administrative expense		(380)	380
Additional administrative expense		(3,169)	3,169
Net changes	98,968	400,559	(301,591)
Balances at 12/31/2019	\$ 2,423,068	\$ 2,082,995	\$ 340,073

*Reflects the net investment income/(loss) of \$245,720 and the income/(loss) due to the difference between expected and actual asset values of \$32,669, which includes the impact from allocation of assets in support of the underlying retiree liabilities.

NOTES DISCLOSURES

According to Governmental Accounting Standards Board (GASB) Statements No. 67 and 68, PMRS is required to allocate/distribute all funds to the respective participating employers for financial reporting purposes to determine the respective employer “plan fiduciary net position.”

PMRS has determined that net investment income or loss and administrative expenses will be allocated to the employer/municipality accounts pro-rata based on their beginning Fiduciary Net Position balance adjusted for cash flows throughout the year. The “Additional administrative expenses” are the expenses in excess of the “PMRS administrative expense” (i.e. \$20 per participant expense paid by each plan). The “PMRS investment income” is based on the regular interest used to credit accounts annually. The “Market value investment income” reflects the investment income/loss during the year net of PMRS investment income and the income/loss due to the difference between expected and actual asset values, including the impact from allocation of assets in support of the underlying retiree liabilities.

Changes in the discount rate affect the measurement of the TPL. Lower discount rates produce a higher TPL and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the NPL can be very significant for a relatively small change in the discount rate. The table below shows the sensitivity of the NPL to the discount rate with two additional measures, plus and minus one percent from the rate used for disclosure.

Sensitivity of Net Pension Liability to Changes in Discount Rate			
	1% Decrease 4.25%	Discount Rate 5.25%	1% Increase 6.25%
Total Pension Liability	\$ 2,752,567	\$ 2,423,068	\$ 2,150,036
Plan Fiduciary Net Position	<u>2,082,995</u>	<u>2,082,995</u>	<u>2,082,995</u>
Net Pension Liability	<u>\$ 669,572</u>	<u>\$ 340,073</u>	<u>\$ 67,041</u>
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	75.67%	85.97%	96.88%

NOTES DISCLOSURES

The following table contains the number of active employees, inactive employees entitled to but not yet receiving benefits, and inactive employees or beneficiaries currently receiving benefits from the Plan based on the most recent actuarial valuation date of January 1, 2019.

Employees Covered by Benefit Terms	
Inactive employees or beneficiaries currently receiving benefits	8
Inactive employees entitled to but not yet receiving benefits	1
Active employees	<u>7</u>
Total Participant Count	16

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REQUIRED SUPPLEMENTARY INFORMATION

The schedules of Required Supplementary Information will eventually build up to 10 years of information. The schedule below shows the changes in NPL and related ratios required by GASB. Benefit payments include employee refunds, if applicable.

Schedule of Changes in Net Pension Liability						
Measurement Date as of:	12/31/2019	12/31/2018	12/31/2017	12/31/2016	12/31/2015	12/31/2014
<u>Total Pension Liability</u>						
Service cost (beginning of year)	\$ 76,507	\$ 82,524	\$ 61,181	\$ 58,865	\$ 56,130	\$ 67,849
Interest (includes interest on service cost)	123,416	109,884	104,844	98,072	93,482	90,445
Changes of benefits						
Differences expected vs. actual experience		167,916		84,419		(14,351)
Changes of assumptions				59,118	15,359	
Transfers						
Benefit payments	(100,955)	(92,291)	(90,446)	(87,333)	(81,243)	(72,885)
Net change in total pension liability	\$ 98,968	\$ 268,033	\$ 75,579	\$ 213,141	\$ 83,728	\$ 71,058
Total pension liability - beginning	2,324,100	2,056,067	1,980,488	1,767,347	1,683,619	1,612,561
Total pension liability - ending	\$ 2,423,068	\$ 2,324,100	\$ 2,056,067	\$ 1,980,488	\$ 1,767,347	\$ 1,683,619
<u>Plan fiduciary net position</u>						
Contributions - employer	\$ 134,627	\$ 94,834	\$ 89,386	\$ 87,238	\$ 93,899	\$ 92,743
Contributions - PMRS assessment	380	340	380	360	320	
Contributions - employee						
PMRS investment income	91,667	85,654	81,159	80,554	63,387	80,293
Market value investment income	278,389	(157,275)	184,053	13,334	(82,316)	(150,307)
Transfers						
Benefit payments	(100,955)	(92,291)	(90,446)	(87,333)	(81,243)	(72,885)
PMRS administrative expense	(380)	(340)	(340)	(340)	(320)	(340)
Additional administrative expense	(3,169)	(3,822)	(3,732)	(3,946)	(2,642)	(3,079)
Net change in plan fiduciary net position	\$ 400,559	\$ (72,900)	\$ 260,460	\$ 89,867	\$ (8,915)	\$ (53,575)
Plan fiduciary net position - beginning	1,682,436	1,755,336	1,494,876	1,405,009	1,413,924	1,467,499
Plan fiduciary net position - ending	\$ 2,082,995	\$ 1,682,436	\$ 1,755,336	\$ 1,494,876	\$ 1,405,009	\$ 1,413,924
Net pension liability - ending	\$ 340,073	\$ 641,664	\$ 300,731	\$ 485,612	\$ 362,338	\$ 269,695
Plan fiduciary net position as a percentage of the total pension liability	85.97%	72.39%	85.37%	75.48%	79.50%	83.98%
Covered employee payroll	\$ 398,773	\$ 402,472	\$ 298,385	\$ 274,271	\$ 263,041	\$ 325,027
Net pension liability as a percentage of covered employee payroll	85.28%	159.43%	100.79%	177.06%	137.75%	82.98%

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REQUIRED SUPPLEMENTARY INFORMATION

An Actuarially Determined Contribution is a contribution amount determined in accordance with Actuarial Standards of Practice. The Actuarially Determined Contribution provided is based on the Minimum Municipal Obligation as defined in Act 205 which conforms to these standards.

Schedule of Employer Contributions						
Last 10 Measurement Years (if available)						
	2019	2018	2017	2016	2015	2014
Actuarially Determined Contribution (ADC)	\$ 134,987	\$ 95,174	\$ 89,726	\$ 87,578	\$ 94,219	\$ 92,683
Contributions in Relation to the ADC*	<u>135,007</u>	<u>95,174</u>	<u>89,766</u>	<u>87,598</u>	<u>94,219</u>	<u>92,743</u>
Contribution Deficiency/(Excess)	<u>\$ (20)</u>	<u>\$ 0</u>	<u>\$ (40)</u>	<u>\$ (20)</u>	<u>\$ 0</u>	<u>\$ (60)</u>
Covered Employee Payroll**	\$ 398,773	\$ 402,472	\$ 298,385	\$ 274,271	\$ 263,041	\$ 325,027
Contributions as a Percentage of Covered Employee Payroll	33.86%	23.65%	30.08%	31.94%	35.82%	28.53%

*Information provided by PMRS and not reconciled to determine the cause of any deviation from the Actuarially Determined Contribution (if applicable).

**Beginning in 2015, amount is actual payroll. In 2014, amount is expected payroll based on the most recent actuarial valuation. These amounts may not match the MMO payroll.

Notes to Schedules:

Valuation Date: Actuarially determined contribution rates are calculated as of January 1 for the odd valuation year at least two years prior to the end of the fiscal year in which the contributions were reported. Therefore, the Actuarially Determined Contribution for calendar year 2019 is based on the January 1, 2017 actuarial valuation.

A summary of the key assumptions and methods used to determine the 2019 contribution rates:

- Actuarial Cost Method: Entry Age
- Amortization Period: Level dollar based on the amortization periods in Act 205
- Asset valuation method: Based on the municipal reserves
- Discount Rate: 5.25%
- Inflation: 2.8%
- Salary increases: age related scale with merit and inflation component

REQUIRED SUPPLEMENTARY INFORMATION

- COLA increases: 2.8% for those eligible for a COLA
- Pre-Retirement Mortality: Males: RP 2000 Non-Annuitant Male table projected 15 years with Scale AA
Females: RP 2000 Non-Annuitant Female table projected 15 years with Scale AA, setback five years
- Post-Retirement Mortality: Males: RP2000 Annuitant Male table projected 5 years with Scale AA
Females: RP2000 Annuitant Female table projected 10 years with Scale AA

For a complete listing of all assumptions and methods, please refer to the PMRS January 1, 2017 actuarial valuation report.

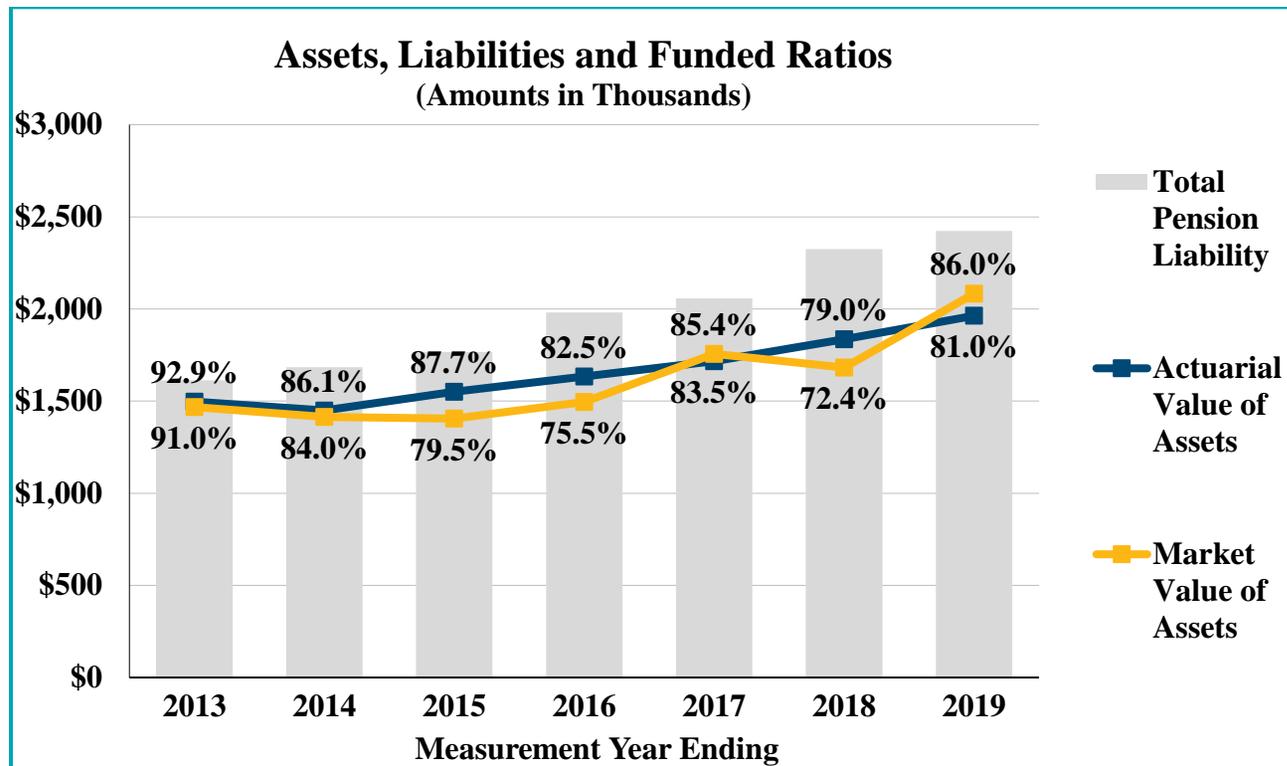
Plan Changes: Please refer to Appendix A for current year plan changes and to the Plan's Act 205 filings and/or GASB 68 reports for prior year plan changes.

Assets, Liabilities and Funded Ratio:

In the graph on the following page, the bars show the Plan's liability (referred to as TPL for GASB 68 purposes and Actuarial Accrued Liability for funding purposes). The blue and gold lines show the Actuarial Value of Assets and the Market Value of Assets, respectively. The Market Value of Assets is the Plan Fiduciary Net Position used for GASB 68 purposes. The Actuarial Value of Assets is the asset value used for calculating the Actuarially Determined Contribution (i.e. the Minimum Municipal Obligation). The Actuarial Value of Assets equals the sum of the Member Reserve, the Municipal Reserve, the DROP Reserve and the Retiree Liability. For December 31, 2019 the Actuarial Value of Assets is estimated based on a roll forward of retiree liability from the prior year's actuarial valuation and financial data indicating new retiree transfers as of December 31, 2019. Both the Market Value of Assets and the components of the Actuarial Value of Assets for the current year are provided in Appendix D. The funded ratios related to both asset measures are shown adjacent to the respective lines in the graph on the following page.

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REQUIRED SUPPLEMENTARY INFORMATION



Measurement Year Ending	2013	2014	2015	2016	2017	2018	2019
1. Total Pension Liability	\$ 1,612,561	\$ 1,683,619	\$ 1,767,347	\$ 1,980,488	\$ 2,056,067	\$ 2,324,100	\$ 2,423,068
2. Actuarial Value of Assets*	\$ 1,497,477	\$ 1,449,262	\$ 1,550,785	\$ 1,633,131	\$ 1,716,317	\$ 1,836,093	\$ 1,962,788
3. AVA Funded Ratio [2. / 1.]	92.9%	86.1%	87.7%	82.5%	83.5%	79.0%	81.0%
4. Market Value of Assets*	\$ 1,467,499	\$ 1,413,924	\$ 1,405,009	\$ 1,494,876	\$ 1,755,336	\$ 1,682,436	\$ 2,082,995
5. MVA Funded Ratio [4. / 1.]	91.0%	84.0%	79.5%	75.5%	85.4%	72.4%	86.0%

*Amounts may not match the Act 205 Forms due to unpaid MMOs. Actuarial Value of Assets are estimated amounts for odd year-end Measurement Dates.

EMPLOYER REPORTING AMOUNTS

The impact of investment gains or losses for expensing is recognized over a period of five years. The impact of experience gains or losses and assumption changes on the TPL are recognized in the pension expense over the average expected remaining service life of all active and inactive members of the Plan, as provided below.

There were no experience gains or losses between the beginning of year and end of year liabilities because the liabilities are based on the same actuarial valuation dates.

Schedule of Deferred Inflows and Outflows*		
	Deferred Inflows of Resources	Deferred Outflows of Resources
Differences between expected and actual experience	\$ 0	\$ 83,958
Changes in assumptions	0	0
Net difference between projected and actual earnings on pension plan investments	204,632	0
Total	\$ 204,632	\$ 83,958
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:		
Year ended December 31:		
2020	(21,721)	
2021	(19,053)	
2022	(24,223)	
2023	(55,677)	
2024	0	
Thereafter \$	0	
The recognition period for experience and assumptions change gains/losses is 5 years.		

*See Appendix C for more details on the deferred inflows and outflows.

EMPLOYER REPORTING AMOUNTS

The annual pension expense recognized can be calculated two different ways. First, it is the change in the amounts reported for the Employer’s Statement of Net Position that relate to the plan and are not attributable to employer contributions. That is, it is the change in NPL plus the changes in deferred outflows and deferred inflows plus employer contributions.

Alternatively, annual pension expense can be calculated by its individual components. While GASB does not require or suggest the organization of the individual components shown in the table below, we believe it helps to understand the level and volatility of pension expense, as outlined below.

Calculation of Pension Expense				
Measurement Date as of				
		12/31/2019		12/31/2018
Change in Net Pension Liability	\$	(301,591)	\$	340,933
Change in Deferred Outflows		107,452		(113,500)
Change in Deferred Inflows		204,632		(95,123)
Employer Contributions		135,007		95,174
Pension Expense	\$	145,500	\$	227,484
Pension Expense as % of Payroll		36.49%		56.52%
Operating Expenses				
Service cost	\$	76,507	\$	82,524
Employee contributions		0		0
PMRS administrative expense		380		340
Additional administrative expense		3,169		3,822
Total	\$	80,056	\$	86,686
Financing Expenses				
Interest cost	\$	123,416	\$	109,884
Expected return on assets		(91,667)		(85,654)
Total	\$	31,749	\$	24,230
Changes				
Change of Benefits*	\$	0	\$	0
Recognition of assumption changes		17,849		17,852
Recognition of liability gains and losses		63,083		60,213
Recognition of investment gains and losses		(47,237)		38,503
Total	\$	33,695	\$	116,568
Pension Expense	\$	145,500	\$	227,484

*Change in benefits in 2018 includes any excess interest award as applicable

APPENDIX A

DATA, PLAN PROVISIONS AND RISK DISCLOSURE

Data

The participant data used in this report was provided by PMRS and is effective on December 31, 2018.

All data was provided by PMRS and reviewed for reasonability, but not audited, by Cheiron.

Plan Provisions

For a summary of the data and key provisions of the Plan please refer to the most recent Act 205 filings.

For this report, the best estimate Plan Fiduciary Net Position was applied based on a roll forward of the retiree liabilities and financial data as of December 31, 2019.

Risk Disclosure

Actuarial valuation reports for pension plans with valuation dates after November 1, 2018 must include a risk section to comply with the requirements under the Actuarial Standards of Practice 51. This actuarial standard addresses the “Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions”. A discussion of the risks associated with plans participating in PMRS can be found in the January 1, 2019 Pennsylvania Municipal Retirement System Actuarial Valuation Report.

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APPENDIX B

RECONCILIATION OF DEFERRED INFLOWS AND OUTFLOWS

	Deferred (Inflows)				Deferred Outflows			
	Differences between expected and actual experience	Changes in assumptions	Net difference between projected and actual earnings on pension plan investments	Total	Differences between expected and actual experience	Changes in assumptions	Net difference between projected and actual earnings on pension plan investments	Total
12/31/2018	\$ 0	\$ 0	\$ 0	\$ 0	\$ 147,041	\$ 17,849	\$ 26,520	\$ 191,410
Adjustments due to investment earnings*	\$ 0	\$ 0	\$ 26,520	\$ 26,520	\$ 0	\$ 0	\$ (26,520)	\$ (26,520)
2019 deferred amounts	0	0	(278,389)	(278,389)	0	0	0	0
Recognition amounts	0	0	47,237	47,237	(63,083)	(17,849)	0	(80,932)
Net changes	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ (204,632)</u>	<u>\$ (204,632)</u>	<u>\$ (63,083)</u>	<u>\$ (17,849)</u>	<u>\$ (26,520)</u>	<u>\$ (107,452)</u>
12/31/2019	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ (204,632)</u>	<u>\$ (204,632)</u>	<u>\$ 83,958</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 83,958</u>

*This represents the adjustment due to aggregation of deferred amounts arising from differences between projected and actual pension plan investment earnings per paragraph 33b in GASB 68.

APPENDIX C

FURTHER INFORMATION REGARDING DEFERRED INFLOWS AND OUTFLOWS

Detailed Schedule of Collective Inflows and Outflows of Resources

Recognition of differences between expected and actual experience

From Measurement Year Ending	Remaining Recognition Period	Remaining (Inflows) and Outflows	Recognition Year							
			2019	2020	2021	2022	2023	2024	Thereafter	
2019	5	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2018	3	125,937	41,979	41,979	41,979	0	0	0	0	0
2017	2	0	0	0	0	0	0	0	0	0
2016	1	21,104	21,104	0	0	0	0	0	0	0
2015	1	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
Total		\$ 147,041	\$ 63,083	\$ 41,979	\$ 41,979	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

Recognition of changes in assumptions

From Measurement Year Ending	Remaining Recognition Period	Remaining (Inflows) and Outflows	Recognition Year							
			2019	2020	2021	2022	2023	2024	Thereafter	
2019	5	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2018	3	0	0	0	0	0	0	0	0	0
2017	2	0	0	0	0	0	0	0	0	0
2016	1	14,778	14,778	0	0	0	0	0	0	0
2015	1	3,071	3,071	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
Total		\$ 17,849	\$ 17,849	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

APPENDIX C

FURTHER INFORMATION REGARDING DEFERRED INFLOWS AND OUTFLOWS

Detailed Schedule of Collective Inflows and Outflows of Resources

Recognition of net difference between projected and actual earnings on pension plan investments

From Measurement Year Ending	Remaining Recognition Period	Remaining (Inflows) and Outflows	Recognition Year						
			2019	2020	2021	2022	2023	2024	Thereafter
2019	5	\$ (278,389)	\$ (55,678)	\$ (55,678)	\$ (55,678)	\$ (55,678)	\$ (55,677)	\$ 0	\$ 0
2018	4	125,820	31,455	31,455	31,455	31,455	0	0	0
2017	3	(110,431)	(36,811)	(36,811)	(36,809)	0	0	0	0
2016	2	(5,333)	(2,667)	(2,666)	0	0	0	0	0
2015	1	16,464	16,464	0	0	0	0	0	0
Total		\$ (251,869)	\$ (47,237)	\$ (63,700)	\$ (61,032)	\$ (24,223)	\$ (55,677)	\$ 0	\$ 0
Grand Total		\$ (86,979)	\$ 33,695	\$ (21,721)	\$ (19,053)	\$ (24,223)	\$ (55,677)	\$ 0	\$ 0

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APPENDIX D

MARKET VALUE OF ASSETS RECONCILIATION

	Member/ Municipal		Allocated Retiree		Undistributed		Total
	Reserve	DROP Reserve	Reserve	Disability Reserve	Earnings		
Reported 12/31/2018 GASB 68 MVA	\$ 577,728	\$ 0	\$ 1,229,373	\$ 34	\$ (124,700)	\$	1,682,436
Adjustment for restatement*	0	0	0	0	0		0
12/31/2018 GASB 68 MVA	\$ 577,728	\$ 0	\$ 1,229,373	\$ 34	\$ (124,700)	\$	1,682,436
Changes of assumptions	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$	0
Transfers	(115,689)	0	115,689	0	0		0
Contributions - employer	134,467	0	0	160	0		134,627
Contributions - PMRS assessment	0	0	0	0	380		380
Contributions - employee	0	0	0	0	0		0
Excess Interest Award	0	0	0	0	0		0
PMRS investment income	26,732	0	64,929	6	0		91,667
Market value investment income	0	0	0	0	245,720		245,720
Benefit payments	0	0	(100,955)	0	0		(100,955)
PMRS administrative expense	0	0	0	0	(380)		(380)
Additional administrative expense	0	0	0	0	(3,169)		(3,169)
Net changes	\$ 45,510	\$ 0	\$ 79,663	\$ 166	\$ 242,551	\$	367,890
Preliminary 12/31/2019 GASB 68 MVA	\$ 623,238	\$ 0	\$ 1,309,036	\$ 200	\$ 117,851	\$	2,050,326
Differences between expected and actual experience*	0	0	22,608	140	9,921		32,669
Final 12/31/2019 GASB 68 MVA	\$ 623,238	\$ 0	\$ 1,331,645	\$ 340	\$ 127,773	\$	2,082,995

*For an explanation of the differences between expected and actual experience and the adjustment due to the restated assets, please refer to Appendix D. The Allocated Retiree Reserve is based on the prior year's Retiree Liability and rolled forward to the end of the year. This estimated Retiree Liability for odd year-end Measurement Dates is added to the Municipal, Member and DROP accounts to determine the estimated Actuarial Value of Assets. For even year-end Measurement Dates, the actual Retiree Liability is added to the Municipal, Member and DROP accounts to determine the Actuarial Value of Assets. Employer contributions are net of the PMRS administrative expense assessment, which is then offset by the "Contributions – PMRS assessment" in the Undistributed Earnings.

Amounts may not add due to rounding. Amounts may not match the Act 205 Forms due to unpaid MMOs.

APPENDIX D

MARKET VALUE OF ASSETS RECONCILIATION

The Pennsylvania Municipal Retirement System maintains the following funds:

- Members' Reserve Account
- Municipal Reserve Account
- DROP Participant's Reserve Account
- Retired Members' Reserve Account
- Disability Reserve Account
- Undistributed Earnings Designation Account

The separate accounts are maintained for each member/plan within the Members' Reserve Account, the Municipal Reserve Account and the DROP Participant Reserve Account. The Market Value of Assets Reconciliation shows these reserves directly.

Separate accounts are not maintained within the Retired Members' Reserve Account, the Disability Reserve Account and the Undistributed Earnings Designation Account. These accounts are allocated to individual plans for GASB 68 purposes based on the following methodology. The Market Value of Assets within this GASB report reflects accounting requirements on a stand-alone basis and may differ from the Market Value of Assets reported on the Act 205 Form, which historically reflected reserves for an ongoing PMRS plan without adjusting for the Retired Members' Reserve Account, the Disability Reserve Account and the Undistributed Earnings Designation Account. The Market Value of Assets on the Act 205 Form may also differ due to unpaid MMO.

The excess interest award is a transfer from undistributed earnings to the municipal, member and/or retiree account and does not impact the Market Value of Assets. During 2018, this excess interest award as of December 31, 2018 increased the Actuarial Value of Assets for the plan which is used for determination of the MMO as reported on the Act 205. There was no excess interest award during 2019.

1. Retired Members' Reserve Account

The Retired Members' Reserve is allocated proportionally based on retiree liability as of the measurement date, which was rolled forward from the retiree liabilities as of the prior year and adjusted for new retiree asset transfers for each plan. This allocated portion was used in conjunction with municipal and member accounts to determine the Fiduciary Net Position of each plan.

Each year, retiree experience (gains)/losses are developed for each individual plan and for the System as a whole. These experience (gains)/losses are shown as differences between expected and actual experience. The amount under Allocated Retiree Reserve represents the individual plan's retiree experience (gain)/loss and the individual plan's share of the collective System retiree experience gain/(loss). For example, the experience gains/(losses) for the Allocated Retiree Reserve might represent the apportionment to the individual plans of the remaining assets when a retiree dies.

APPENDIX D

MARKET VALUE OF ASSETS RECONCILIATION

2. Disability Reserve Account

The Disability Reserve is allocated proportionally based on combined employer contributions and surplus transfers to the Disability Reserve in the year preceding the measurement date, excluding any amounts for plans that withdrew prior to the measurement date.

The amount shown as differences between expected and actual experience represent disability insurance premiums when negative and payouts in the event of a disability when positive.

3. Undistributed Earnings Designation Account

The Undistributed Earnings Designation Account is allocated proportionally based on the value of the reserve accounts as of the measurement date.

The amount shown as differences between expected and actual experience reflect the impact of cash flow timing on regular interest crediting. For example, actual timing of cash flows is used when crediting interest on the Members'/Municipal Reserves while mid-year timing is assumed for the Retiree Reserve. The excess interest award is a transfer from the Undistributed Earnings Account to the Municipal Account, Members' Account and Retired Members' Reserve Account. The net impact of this allocation on the Market Value of Assets is zero.

4. Historical changes in the assets

- A. 2018 Excess Interest Award Distribution: The excess interest award is a transfer from undistributed earnings to the municipal, member and/or retiree account and does not impact the Market Value of Assets. During 2018, this excess interest award as of December 31, 2018 increased the Actuarial Value of Assets for the plan. The Actuarial Value of Assets is used for determination of the MMO as reported on the Act 205.
- B. 2017 Retiree Reserve Transfer: As of December 31, 2017, the Retiree Reserve was increased in total by \$45 million and restated in the PMRS ACFR. This increase in the Allocated Retiree Reserve was offset by a decrease in the Undistributed Earnings.

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Assumptions:

The actuarial assumptions used in this report are as follows. These assumptions are based on the PMRS Experience Study for the period covering January 1, 2009 through December 31, 2013 issued by the actuary in July 2015 as well as subsequent assumption changes approved by the Board. The assumption changes from the Experience Study were first used for the December 31, 2015 measurement date. Effective with the December 31, 2016 measurement date, the Investment Return Assumption for municipal assets decreased from 5.50% to 5.25%.

A. Healthy Life Mortality:

Rates of Pre-Retirement Mortality

Males: RP-2000 Male Non-Annuitant table projected 15 years with Scale AA

Females: RP-2000 Female Non-Annuitant table projected 15 years with Scale AA and then setback 5 years

Type of Death:

(a) 15% of pre-retirement deaths are assumed to be service related for municipal plans, and

(b) 50% of pre-retirement deaths are assumed to be service related for uniform plans.

Rates of Post-Retirement Mortality

Males: RP-2000 Male Annuitant table projected 5 years with Scale AA

Females: RP-2000 Female Annuitant table projected 10 years with Scale AA

Based on the information provided by PMRS and review of the actual mortality experience over a five-year period, these mortality tables provide projected mortality improvements for the future. Given that experience analysis is required to be performed every five years, the projection periods are sufficient to reflect anticipated improvements until the new assumptions, based on the experience study covering the period January 1, 2014 through December 31, 2018, are applied effective December 31, 2020.

B. Disabled Life Mortality Rates:

Males and females: RP-2000 Combined table set-forward 10 years

Disabled life mortality includes an implicit future mortality improvement based on the experience study findings.

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

C. Termination Rates Before Retirement:

Municipal Participants Number of Active Members in Plan		
Service	<25	25+
<1	15.0%	18.0%
1	15.0%	18.0%
2	11.0%	14.0%
3	8.0%	12.0%
4	7.0%	9.0%
5	6.0%	9.0%
6	5.5%	8.0%
7	5.5%	7.5%
8	5.5%	6.5%
9	4.0%	5.0%
10+	2.5%	4.0%

Uniform Participants Number of Active Members in Plan		
Service	<25	25+
<1	12.0%	13.0%
1	12.0%	10.0%
2	12.0%	7.0%
3	9.0%	7.0%
4	7.0%	6.0%
5	5.0%	5.0%
6	5.0%	4.0%
7	5.0%	3.0%
8	4.5%	3.0%
9	4.0%	3.0%
10+	3.0%	3.0%

D. Disability Incidence Rates:

Municipal - 40% of 1964 OASDI (Social Security) Experience for Males with adjustments. Sample rates are:

Age	Valuation Rate (%)
25	0.014%
35	0.029
45	0.064
55	0.134
65	0.658

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

Uniformed plans – 60% of 1964 OASDI (Social Security) Experience for Males with adjustments.
 Sample rates are:

Age	Valuation Rate (%)
25	0.031%
35	0.058
45	0.136
55	0.335
65	1.123

Type of Disability:

- (a) 15% of disablements are assumed to be service related for municipal plans, and
- (b) 50% of disablements are assumed to be service related for uniform plans.

E. Workers Compensation: Service-related disability benefits payable from municipal plans are offset by 25% of final average salary.

F. Salary Scale:

Age	Total Rate ¹ (including inflation)
25	7.05%
30	5.44%
35	4.55%
40	4.26%
45	3.97%
50	3.72%
55	3.44%
60	3.28%
65	2.80%

¹Add 2% for each of the first three years of service.

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

G. Rates of Retirement:

(a) Municipal Members:

Members are assumed to retire over a range of ages as shown below.

Age	Rate ¹
<45	2%
45	8%
46	10%
47 – 50	15%
51 – 54	17%
55	22%
56 – 59	14%
60 – 64	18%
65	25%
66 – 74	20%
75	100%

¹ Rates indicated are adjusted by adding 5% (and 10% for ages 60-62 under current rate assumptions) for the year in which the member is first eligible for normal retirement.

(b) Uniformed Members:

Members are assumed to retire over a range of ages as shown below.

Age	Rate
<49	0%
50	30%
51 – 54	10%
55	25%
56 – 58	20%
59 – 60	15%
61	20%
62	30%
63 – 64	20%
65	30%
66+	100%

For any members participating in a Deferred Retirement Option Program (DROP), the participant's date of entry into the DROP is considered the retirement date.

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

H. Marital Status and Spouse's Age (if applicable):

For plans with the 50% J&S form of payment, 80% of active members are assumed to be married. Male spouses are assumed to be three years older than female spouses.

I. Social Security Projections (if applicable):

- (a) The Social Security Taxable Wage Base will increase by 3.3% compounded annually;
- (b) The Consumer Price Index will increase 2.8% compounded annually; and
- (c) The Average Total Wages of All Workers will increase by 3.3% compounded annually.

J. Post-Retirement Cost of Living Increases (if applicable)/Inflation:

2.8% per year, subject to plan limitations.

K. Investment Return Assumption for municipal assets:

5.25% compounded annually, net of investment and certain administration expenses. For detailed description and rationale, please refer to the file titled "2019 Long-Term Expected Rate of Return on Plan Assets" located under the 2018 GASB Reports section of the PMRS website (www.pMrs.state.pa.us).

L. Administrative Expenses:

The expense assumption is based on the expected expenses for the current year. The administrative expenses consist of two pieces: (1) the PMRS administrative expenses (i.e. the \$20 per participant charge paid directly by the municipality) and (2) the additional administrative expenses in excess of the PMRS administrative expense that are paid through the Undistributed Earnings.

Actuarial Cost Method:

Entry Age Normal Actuarial Cost Method.

Entry Age is defined as attained age less credited service. The normal cost rate is derived as a level percent of future compensation of current employees, on an individual basis. This rate is applied to the projected payroll and projected employee contributions are deducted. Actuarial gains (or losses), including the effect of contributions greater or lesser than the previously determined actuarial level, are reflected by decreases (or increases) in the unfunded actuarial liability.

APPENDIX E

ACTUARIAL ASSUMPTIONS AND METHODS

Historical Changes in Assumptions:

12/31/2015: Assumptions based on the PMRS Experience Study for the period covering January 1, 2009 through December 31, 2013 issued by the actuary in July 2015.

12/31/2016: Investment Return Assumption for municipal assets decreased from 5.50% to 5.25%.

Valuation Software:

Cheiron utilizes ProVal, an actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal and have a basic understanding of it and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this actuarial valuation.

APPENDIX F

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. Agent Multiple Employer Pension Plan

The assets of the participating government employers in an agent multiple-employer plan are pooled for investment purposes but separate accounts are maintained for each individual employer.

4. Deferred Inflow of Resources

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience gains on the Total Pension Liability, assumption changes reducing the Total Pension Liability, or investment gains that are recognized in future reporting periods.

5. Deferred Outflow of Resources

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience losses on the Total Pension Liability, plan or assumption changes increasing the Total Pension Liability, or investment losses that are recognized in future reporting periods.

6. Discount Rate

Based on the Long-Term Expected Rate of Return, which PMRS develops and is also referred to as the Regular Interest Rate.

7. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 68 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.

8. Excess Interest

As defined by the Pennsylvania Municipal Retirement Law (Act 15 of 1974), these are the investment earnings in the fund in excess of that required for allocation to regular interest and expenses. The Pennsylvania Municipal Retirement Board Policy Statement 05-2 (<http://www.pMrs.state.pa.us/doc/board/policy05-2-ExcInt.pdf>) describes how Excess Interest is calculated to award to the plans participating in PMRS.

APPENDIX F

GLOSSARY OF TERMS

9. Excess Interest Award

This is the amount of excess interest awarded by the Board of Trustees to plans participating in PMRS. If the plan is 95% or more funded as of the plan's most recent Act 205/Act 293 filing with the State, then the excess interest award increases pension benefits for participants in the plan and/or increases the municipal account for the plan. The exact terms of these increases are based on individual contracts each plan has with PMRS. If the plan is less than 95% funded, then the excess interest award increases the municipal account for the plan. Allocation of Excess Interest to Municipal Account, Members' Accounts, and Retired Members' Reserve Account is described in Pennsylvania Municipal Retirement Board Policy Statement Rule Number 97-1 (<http://www.pMrs.state.pa.us/doc/board/allocofexcinterest.pdf>).

10. Measurement Date

The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be rolled forward from the Actuarial Valuation Date to the Measurement Date.

11. Minimum Municipal Obligation (MMO)

The minimum employer contribution required to be paid to the pension fund annually, as statutorily defined.

12. Net Pension Liability

The liability of employers and nonemployer contributing entities for employees for benefits provided through a defined benefit pension plan. It is calculated as the Total Pension Liability less the Plan Fiduciary Net Position. The Net Pension Liability is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling a Plan's benefit obligation in the event of a plan termination or other similar action.

13. Plan Fiduciary Net Position

The fair or market value of assets based on the municipal and member accounts for each pension plan and an allocated portion of the Retired Members' Reserve Account.

14. Regular Interest Rate

As defined by the Pennsylvania Municipal Retirement Law (Act 15 of 1974), this is the rate fixed and annually reviewed by the board on the basis of earnings on investments to be applied to the municipal and member accounts including the retired member reserve account and the disability member reserve account.

15. Reporting Date

The last day of the employer's fiscal year that ends no later than 12 months after the measurement date.

APPENDIX F

GLOSSARY OF TERMS

16. 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 68. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

17. Total Pension 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 68. The Total Pension Liability is the actuarial liability calculated under the entry age actuarial cost method.

APPENDIX G

ADDITIONAL INFORMATION

The following PMRS Actuarial and Audit Reports are available under the “*Publications*” section of the PMRS website (<http://www.pmr.state.pa.us/>):

- PMRS Actuarial Valuation
- PMRS Annual Comprehensive Financial Report (ACFR)
- PMRS SSAE 18 (SOC 1 Type 2) Audit Report
- PMRS Schedule of Changes in Fiduciary Net Position by Participating Municipality report