
Government of Guam Retirement Fund

Actuarial Valuation as of September 30, 2017

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**Government of Guam Retirement Fund –
Actuarial Valuation as of September 30, 2017**

As part of our engagement with the Board of Trustees, we performed an actuarial valuation of the Government of Guam Retirement Fund as of September 30, 2017. The purpose of this valuation is to determine the required contribution under the provisions of GCA Section 8137.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the Fund's staff. This information includes, but is not limited to, financial information, member census data, and plan provisions. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete the results may be different and the calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the Fund have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the Fund. The assumptions have been adopted by the Board of Trustees and are based on the 2011-2015 actuarial experience study.

This valuation report is only an estimate of the Fund's financial condition as of a single date. It can neither predict the Fund's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Fund benefits, only the timing of Fund contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report 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; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Fund's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and actuarial cost methods.

Actuarial computations presented in this report are for the purposes of determining the recommended funding amounts for the Fund. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in this report have been made on a basis consistent with our understanding of the Fund's funding requirements and goals. Determinations for other purposes may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

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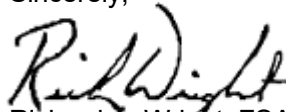
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The signing actuary is independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. The undersigned is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,

A handwritten signature in black ink that reads "Richard A. Wright".

Richard A. Wright, FSA, MAAA
Principal and Consulting Actuary

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SECTION I. VALUATION SUMMARY**INTRODUCTION**

Milliman, Inc. has been retained by the Government of Guam Retirement Fund to provide an actuarial valuation of the retirement fund. In our valuation we:

- Summarize the membership data.
- Calculate the actuarial accrued liability and normal cost.
- Determine the contribution requirements.
- Project the fund balance and security ratio forward 40 years.

This actuarial valuation reflects the plan changes made by P.L. 33-186, which were effective January 1, 2018. P.L. 33-186 provides for the following:

1. Increases the contribution rates to the existing Defined Contribution Retirement System (“DC Plan”) from 5.0% to 6.2% effective January 1, 2018.
2. Establishes a new Defined Benefit 1.75 Retirement System (“DB 1.75 Plan”, formerly known as the “Hybrid Plan”) and provides an opportunity for current employees in the DC Plan to transfer to the DB 1.75 Plan or the Government of Guam Retirement Security Plan (see item 3) effective January 1, 2018. The DB 1.75 Plan is closed to new employees on and after January 1, 2018.
3. Establishes a new cash balance retirement plan known as the Government of Guam Retirement Security Plan (GRSP) which will be the default retirement plan for new employees hired on and after January 1, 2018. Current employees in the DC Plan may transfer to the GRSP effective January 1, 2018.
4. Extends the period used to amortize the unfunded actuarial accrued liability (UAAL) of the Government of Guam Retirement Fund by two years from an end date of May 1, 2031 to an end date of May 1, 2033, effective January 1, 2018.
5. Provides that if the Government of Guam is authorized to extend Social Security coverage to government of Guam employees on a prospective basis, then all employees hired on or after the effective date shall be enrolled into Social Security and will not be eligible for the DB 1.75 Plan or the GRSP.

The results contained in this report represent our best estimates. However, it is likely that actual experience will vary from these estimates. To the extent that actual experience differs from the anticipated experience, actual plan costs will vary as well.

SECTION I. VALUATION SUMMARY

HIGHLIGHTS

- The required contribution under GCA Section 8137 is **26.56%** of payroll. Of this amount, 21.29% is for the unfunded actuarial accrued liability of the defined benefit plans (Old DB Plan and DB 1.75 Plan), 2.29% is for the normal cost of the DB plans, and 2.98% is for contributions and expenses for the defined contribution (DC) plan.

The primary reason for the decrease in the contribution rate was the 2-year extension of the amortization period for the unfunded actuarial accrued liability as provided for in P.L. 33-186. There was also a slight decrease in the contribution rate due to the net recognition of investment gains and losses over the last three years. These decreases were partially offset by a lower than expected increase in total payroll and some actuarial losses due to demographic experience that differed from the actuarial assumptions.

Contribution rate from 9/30/16 actuarial valuation	27.83%
2014-15 investment loss (final 1/3 rd recognition) *	0.63%
2015-16 investment gain (second 1/3 rd recognition) *	(0.24%)
2016-17 investment gain (first 1/3 rd recognition) *	(0.50%)
Total payroll increase of 0.39% (vs. assumption of 2.75%)	0.54%
Plan changes due to P.L. 33-186 (excluding amortization extension)	0.37%
2-year amortization extension of unfunded actuarial accrued liability	(2.26%)
Other factors, including demographic changes	<u>0.19%</u>
Contribution rate in 9/30/17 actuarial valuation	26.56%

* Investment returns that differ from the actuarial assumption of 7% are recognized over a 3 year period.

- Public Law 28-150 provided that the current employer contribution rate would increase over a 5-year period starting in the 2006-07 fiscal year until it reached the actuarial contribution rate, which is the rate specified in the Fund's actuarial valuation report. The employer contribution rate for the 2017-18 fiscal year is 27.83%.
- The defined benefit payroll for the 2016-17 fiscal year was \$131.5 million compared with \$141.3 million for the 2015-16 fiscal year. The total defined benefit and defined contribution payroll for the 2016-17 fiscal year, was \$508.3 million compared with \$506.3 million for the 2015-16 fiscal year, an increase of 0.39%. The long term assumption is a 2.75% annual growth in total payroll. If total payroll had increased by 2.75%, the required contribution rate would have been 26.02%.
- Based on the audited financial statements, we calculated an investment return on the total market value of assets of 12.0% for the fiscal year ending September 30, 2017. The average annual return on the market value of assets for the last 5 fiscal years has been 9.2%. The investment return on the actuarial value of assets, which recognizes investment gains and losses over a 3 year period, was 7.3% for the fiscal year ending September 30, 2017.
- The unfunded actuarial accrued liability increased from \$1.249 billion as of September 30, 2016, to \$1.267 billion as of September 30, 2017. The payment required to amortize the unfunded actuarial accrued liability under GCA Section 8137 has decreased from \$115.0 million to \$111.2 million. The payment as a percentage of payroll has decreased from 22.12% to 21.29%.

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SECTION I. VALUATION SUMMARY

RESULTS OF VALUATION

	9/30/2017		9/30/2016		
Participant Counts					
Active Old DB	Non-Uniformed	1,859		1,990	
	Uniformed	<u>199</u>		<u>218</u>	
	Total	2,058		2,208	
Active DB 1.75 Participants		3,353		0	
Active DC Participants		<u>5,674</u>		<u>8,858</u>	
Total Active Participants (Old DB, DB 1.75, DC)		11,085		11,066	
Retired (Old DB)		7,279		7,298	
Inactive and Terminated Members assumed to withdraw contributions (Old DB)		4,161		4,320	
Inactive and Terminated Members <u>not</u> assumed to withdraw contributions (Old DB)		128		143	
Total DB Participants (Old DB and DB 1.75)		16,979		13,969	
		(\$millions)		(\$millions)	
Actual Payroll for Prior Fiscal Year					
Defined benefit (Old DB) payroll		\$131.5		\$141.3	
Defined contribution (DC) payroll		<u>376.8</u>		<u>365.0</u>	
Total payroll (DB and DC)		\$508.3		\$506.3	
Expected Payroll for Next Fiscal Year					
Defined benefit (Old DB) payroll		\$126.7		\$130.0	
Defined benefit (DB 1.75) payroll		171.5		0.0	
Defined contribution (DC) payroll		<u>224.1</u>		<u>390.2</u>	
Total payroll (DB and DC)		\$522.3		\$520.2	
Financial Status					
Actuarial accrued liability		\$3,183.2		\$2,904.9	
Actuarial value of assets		<u>1,916.4</u>		<u>1,655.6</u>	
Unfunded actuarial accrued liability (UAAL)		\$1,266.8		\$1,249.3	
Security ratio		60.20%		56.99%	
		% of DB Payroll		% of DB Payroll	
Normal Cost					
Total normal cost ¹	\$ 40.4	13.54%	\$ 20.8	15.97%	
Estimated employee contributions	<u>(28.4)</u>	<u>(9.52%)</u>	<u>(12.4)</u>	<u>(9.55%)</u>	
Government normal cost	\$ 12.0	4.02%	\$ 8.3	6.42%	
		% of Total Payroll		% of Total Payroll	
Required Contribution per GCA §8137					
Unfunded actuarial accrued liability cost	\$ 111.2	21.29%	\$ 115.1	22.12%	
Government DB normal cost	12.0	2.29%	8.3	1.60%	
Expected government DC contributions ¹	<u>15.5</u>	<u>2.98%</u>	<u>21.4</u>	<u>4.11%</u>	
Total DB and DC contribution	\$ 138.7	26.56%	\$ 144.8	27.83%	

¹ Includes budgeted administrative expenses.

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SECTION I. VALUATION SUMMARY

5-YEAR HISTORICAL SUMMARY

The following table summarizes the principal valuation results over the last 5 years.

	9/30/2017	9/30/2016	9/30/2015	9/30/2014	9/30/2013
Participant Counts					
Active (Old DB)	2,058	2,208	2,460	2,692	2,878
Active (DB 1.75)	3,353	n/a	n/a	n/a	n/a
Retired (DB)	7,279	7,298	7,197	7,226	7,196
Inactives (DB)	<u>4,289</u>	<u>4,463</u>	<u>4,701</u>	<u>4,941</u>	<u>5,394</u>
Total (DB)	16,979	13,969	14,358	14,859	15,468
Active (DC)	5,674	8,858	8,697	8,181	7,885
Actual Payroll					
DB payroll (Old DB)	\$131.5	\$141.3	\$155.5	\$169.9	\$164.3
DB payroll (DB 1.75)	n/a	n/a	n/a	n/a	n/a
DC payroll	<u>376.8</u>	<u>365.1</u>	<u>355.9</u>	<u>335.0</u>	<u>296.0</u>
Total payroll	\$508.3	\$506.3	\$511.4	\$504.9	\$460.3
Financial Status					
Accrued liability	\$3,183.2	\$2,904.9	\$2,927.7	\$2,931.7	\$2,855.4
Actuarial assets	<u>1,916.4</u>	<u>1,655.6</u>	<u>1,629.4</u>	<u>1,562.5</u>	<u>1,413.0</u>
UAAL	\$1,266.8	\$1,249.3	\$1,298.3	\$1,369.2	\$1,442.3
Security ratio	60.20%	56.99%	55.66%	53.30%	49.49%
Contribution Rate					
DB Normal Cost (as % of DB payroll)	4.02%	6.42%	6.71%	6.32%	6.37%
% of Total Payroll					
UAAL Rate	21.29%	22.12%	21.60%	22.42%	24.09%
DB Normal Cost	2.29%	1.60%	1.87%	1.94%	2.05%
DC Contribution	<u>2.98%</u>	<u>4.11%</u>	<u>3.94%</u>	<u>3.80%</u>	<u>3.71%</u>
Actuarial Rate ¹	26.56%	27.83 %	27.41%	28.16%	29.85%
Budget Rate ²	**	27.83 %	27.41%	28.16%	29.85%
Investment Yield (Market Value)	12.0%	9.5%	0.6%	10.0%	14.1%

¹ "Actuarial Rate" is the contribution rate determined in the actuarial valuation. Contribution rates apply to the fiscal year beginning one year after the valuation date.

² "Budget Rate" is the contribution rate set by the legislature. The budget rate for 2018-19 has not yet been determined.

SECTION I. VALUATION SUMMARY

ACTUARIAL ASSUMPTIONS

The following are the major assumptions used in the actuarial valuation. The assumptions are based upon the actuarial experience study for the period October 1, 2011, through September 30, 2015. The rationale for each significant assumption is provided in that experience study and in the discussion below. To the extent that actual experience differs from the assumptions below, future pension costs will differ.

Interest Rate: The interest rate used to discount future benefit payments to the present was 7.0% as of September 30, 2017. This assumption is unchanged from the prior valuation. The Fund's expected 30-year returns on various asset classes, which have been provided to us by GGRF's investment consultant, are shown below. The target asset allocation is the expected long-term asset allocation and is based on the Fund's investment policy.

Asset Class	(a) Target Asset Allocation	30-Year Geometric Return ¹	(b) Expected Nominal Return ²	(a) x (b) Component Return
U.S. Equities (large cap)	29%	7.63%	8.78%	2.55%
U.S. Equities (small cap)	7%	7.63%	9.45%	0.66%
Non-U.S. Equities	13%	7.63%	9.15%	1.19%
Non-U.S. Equities (small cap)	4%	7.63%	9.15%	0.37%
Non-U.S. Equities (emerging markets)	1%	7.63%	10.75%	0.11%
U.S. Fixed Income (aggregate)	25%	4.75%	4.85%	1.21%
Risk Parity	8%	7.50%	8.36%	0.67%
High Yield Bonds	8%	6.90%	7.35%	0.59%
Global Real Estate (REITs)	5%	6.80%	8.71%	0.44%
Expected average return for one year				7.79%
Expected geometric mean (30 years)				7.17%

¹ Provided by GGRF investment consultant

² One year nominal returns were derived from expected 30 year geometric returns based upon standard deviations provided by the GGRF investment consultant

Using the expected 30-year returns for each asset class and the standard deviations and correlations of each asset class, we have calculated the 30-year geometric mean of the portfolio to be 7.17%. Note that if investments fail to achieve the assumed interest rate, future pension costs will increase.

Mortality. The mortality table used as of September 30, 2017, is the RP-2000 combined mortality table, set forward by 3 years for males and 2 years for females. The mortality table used for disabled lives is the RP-2000 disability mortality table, set forward by 6 years for males and 4 years for females. Mortality improvement is assumed to be 30% of Scale BB, projected generationally from 2016. This is the same table used for the prior actuarial valuation.

Salary Increases. Salaries are assumed to increase 7.5% per year for employees in their first 5 years of service, 6.0% for service between 6 and 10 years, 5.0% for service between 11 and 15 years, and 4.0% for service after 15 years. These are the same rates used in the prior actuarial valuation.

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SECTION I. VALUATION SUMMARY

Total Payroll Growth. Total payroll for defined benefit and defined contribution members is assumed to increase 2.75% per year. This is the same assumption used in the prior actuarial valuation.

Retirement Age. We have assumed 50% of employees will retire when first eligible for unreduced retirement. Thereafter, 20% of employees will retire at each year until age 75, at which time all remaining employees are assumed to retire. This is the same assumption used in the prior actuarial valuation.

Return of Contributions. We have assumed that any current Old DB Plan employees who terminate employment prior to retirement and who have less than 20 years of service will elect a return of contributions in lieu of a deferred benefit. Old DB Plan employees with at least 20 years of service who terminate employment are assumed to retire upon eligibility for unreduced benefits. Old DB Plan employees with between 20 and 24 years of service who terminate employment and are ineligible for the service retirement benefit and DB 1.75 Plan employees who terminate employment with less than 25 years of service are assumed to retire at age 60 with an unreduced benefit with no survivor benefits.

Current terminated or inactive members with at least 5 years of service and a contributions balance that exceeds \$10,000 who have not withdrawn their contributions and for whom sufficient earnings data are available to value their retirement benefits are assumed to retire upon eligibility for unreduced benefits. All other terminated and inactive members are assumed to elect to withdraw their contributions. These assumptions are unchanged from the prior actuarial valuation.

Administrative Expenses. Total administrative expenses are assumed to be \$7,082,000, which is the amount budgeted for the year ending September 30, 2018. Of this amount, \$4,957,000 is allocated to the defined benefit plan and \$2,125,000 to the defined contribution plan. In addition, we have assumed that expenses related to the DB 1.75 Plan will be 5% of the normal cost of that plan.

Rates of Withdrawal. The assumed rates of withdrawal are shown in Appendix B. The withdrawal rates are unchanged from the prior actuarial valuation.

Rates of Disability. The assumed rates of disability are shown in Appendix B. These rates are based on the 1974-78 Society of Actuaries Long Term Disability Non-Jumbo table, with rates reduced by 50% for males and 75% for females. The disability rates are unchanged from the prior actuarial valuation.

Probability of Marriage. We have assumed that 75% of retirees will be married at retirement. This assumption is unchanged from the prior actuarial valuation.

Leave Adjustments. We have assumed that unused leave increases a member's service by 1.5 years. For Old DB Plan members, we have assumed that unused leave increases average earnings by 5% at retirement. These assumptions are unchanged from the prior actuarial valuation.

Survivor Benefit – Minor Children. We have assumed there to be an average of 0.2 eligible child survivors at the time of a retiree's death, with payments to the child survivor continuing for 6 years. These assumptions are unchanged from the prior actuarial valuation.

SECTION I. VALUATION SUMMARY

Asset Valuation Method. Investment gains/losses relative to the assumed investment return are phased in over a period of 3 years. Certain receivables and liabilities whose payments are deducted from employer contributions to the Fund are excluded from the actuarial value of assets. This valuation method is unchanged from the prior valuation.

A complete summary of actuarial assumptions is in Appendix B.

FUNDING METHOD

GCA Section 8137 required a contribution sufficient to fully fund the unfunded actuarial accrued liability by 2031 (within 80 years from May 1, 1951). P.L. 33-186 extended this period by 2 years to 2033. The required contribution shown in this report includes a payment for the normal cost of active members of the Fund, and amortizes the unfunded actuarial accrued liability over the remaining 15.58 years as a level percentage of total payroll (including both defined benefit and defined contribution members).

Exhibits 17 and 18 project the employer and employee contributions, fund balance, actuarial accrued liability and security ratio forward 40 years based upon the current funding method.

SECTION II. FUND ASSETS

EXHIBIT 1. SUMMARY OF DB PLAN ASSETS

Listed below are the assets reported for the defined benefit (DB) pension plan in the Fund's financial statements, excluding certain receivables and liabilities whose payments are deducted from employer contributions to the Fund.

	9/30/2017	9/30/2016
Investments		
Common stocks	\$ 1,110,502,896	\$ 956,950,473
U.S. government securities	232,829,593	246,567,269
Corporate bonds and notes	303,153,981	295,367,509
Money market funds	23,864,447	40,801,515
Mutual funds	<u>76,530,912</u>	<u>100,615,203</u>
Total investments	1,746,881,829	1,640,301,969
Receivables		
Employer contributions, net	2,192,359	1,074,223
Employer contributions, unfunded liability	4,401,290	1,413,129
Member contributions	851,023	366,991
Interest and penalties on contributions	293,978	372,402
Supplemental/insurance benefits advanced	2,000,350	3,511,215
Notes receivable ERIP	0	3,118
Notes receivable for service credits	481,712	537,788
Accrued investment income	4,664,261	5,008,642
Other receivables	637,754	535,674
Due from brokers for unsettled trades	2,693,741	32,067,172
Due from DC plan	<u>778,118</u>	<u>615,612</u>
Total receivables	18,994,586	45,505,966
Cash and cash equivalents	2,865,211	4,061,906
Prepaid expenses	12,116	3,090
Property and equipment	<u>728,973</u>	<u>805,458</u>
Total assets	\$ 1,769,482,715	\$ 1,690,678,389
Liabilities		
Accounts payable and accrued expenses	\$ 2,856,690	\$ 2,772,336
Due to brokers for unsettled trades	<u>7,436,345</u>	<u>40,724,796</u>
Total liabilities	\$ 10,293,035	\$ 43,497,132
Valuation Assets	<u>\$ 1,759,189,680</u>	<u>\$ 1,647,181,257</u>
Excluded Assets ¹		
Supplemental/COLA benefits receivable	\$ 26,450,176	\$ 32,557,914
Deferred revenue for service credits	<u>(660,577)</u>	<u>(705,023)</u>
Total excluded assets	\$ 25,789,599	\$ 31,852,891

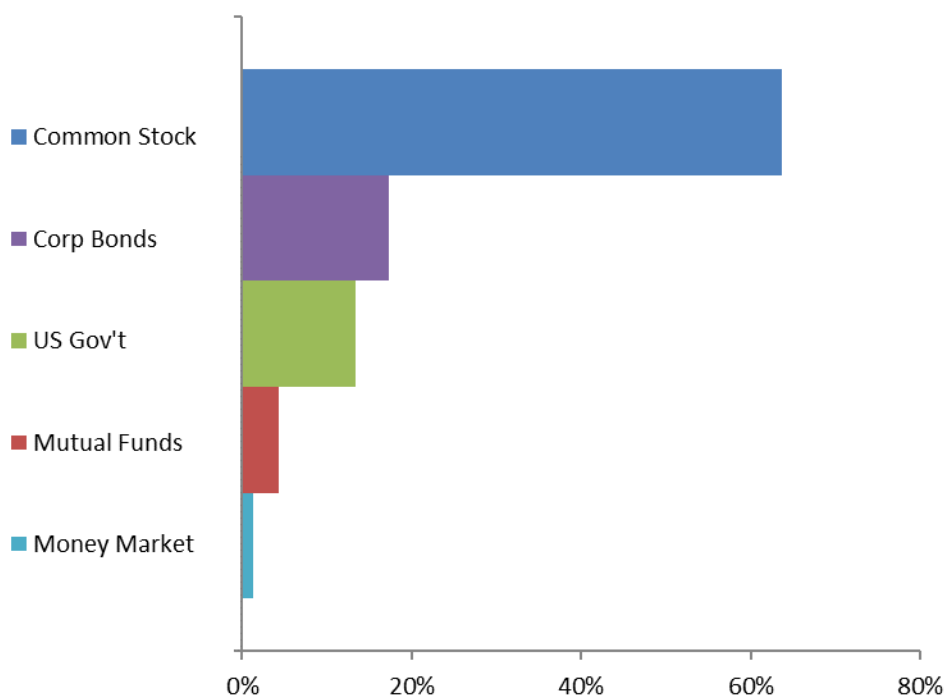
¹ Excluded because payments towards these receivables are deducted from employer contributions.

SECTION II. FUND ASSETS

EXHIBIT 2. DB PLAN ASSET ALLOCATION

The allocation of assets among various investment classes is an important determinant of expected future investment returns.

	DB ASSET ALLOCATION	
	9/30/2017	9/30/2016
Common stocks	63.5%	58.4%
Corporate bonds and notes	17.4%	18.0%
U.S. government securities	13.3%	15.0%
Mutual funds	4.4%	6.1%
Money market funds	<u>1.4%</u>	<u>2.5%</u>
Total	100.0%	100.0%



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SECTION II. FUND ASSETS

EXHIBIT 3. CHANGES IN DB PLAN ASSETS

Assets increase or decrease each year due to employer contributions, investment income, benefit payments to retiring participants, plan expenses paid by the trust fund, and any realized and unrealized gains and losses from investments.

	FISCAL YEAR ENDING	
	9/30/2017	9/30/2016
Beginning Balance	\$ 1,647,181,257	\$ 1,576,428,084
Contributions		
Employer contributions	119,211,434	118,432,015
Member contributions	13,476,517	13,812,825
Decrease/(increase) in excluded assets	<u>6,063,292</u>	<u>5,987,448</u>
Total contributions	138,751,243	138,232,288
Investment Income		
Net appreciation in fair value	161,667,955	107,455,032
Interest	22,858,704	26,886,457
Dividends	12,862,678	13,459,859
Other investment income	283,806	3,224,611
Investment expenses	<u>(4,907,570)</u>	<u>(4,790,928)</u>
Total investment income	192,765,573	146,235,031
Benefit Payments		
Age and service annuities	179,682,483	174,153,820
Disability annuities	5,625,697	5,975,489
Survivor annuities	28,437,070	27,368,041
Refunds to separated employees	1,113,513	2,035,400
Interest on refunded contributions	831,859	1,284,833
Balances transferred to DC plan	<u>0</u>	<u>0</u>
Total benefit payments	215,690,622	210,817,583
Administrative Expenses	3,817,771	2,896,563
Ending Balance	\$ 1,759,189,680	\$ 1,647,181,257

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SECTION II. FUND ASSETS

EXHIBIT 4. ACTUARIAL VALUE OF ASSETS

The actuarial value of assets is equal to the market value of DB plan assets adjusted to phase in gains and losses relative to the assumed rate of return over a 3-year period, and to exclude certain receivables and liabilities whose payments are deducted from employer contributions to the Fund.

	9/30/2017	9/30/2016
Valuation assets at market value	\$ 1,759,189,680	\$ 1,647,181,257
(Gains)/Losses excluded from actuarial value (see below)	<u>(66,321,803)</u>	<u>8,411,122</u>
Actuarial value of assets	\$ 1,692,867,877	\$ 1,655,592,379
Actuarial value as % of market value	96.2%	100.5%
DC Transfers to DB 1.75 Plan (Jan to Apr 2018)	\$ 228,638,083	\$ 0
Discounted value as of 9/30/17	\$ 223,539,347	\$ 0
Actuarial value of assets plus discounted value of DC Transfers to DB 1.75 Plan	\$ 1,916,407,224	\$ 1,655,592,379

3-Year Phase-in of Gains and (Losses)

Year	Expected Return ¹	Actual Return	Gain/(Loss)	Percent Excluded	Excluded From Market Value
2016/2017	\$112,523,992	\$192,765,573	\$ 80,241,581	66.67%	\$ 53,494,387
2015/2016	107,752,783	146,235,031	38,482,248	33.33%	12,827,416
2014/2015	111,758,849	9,560,987	(102,197,862)	0.00%	<u>0</u>
Total					\$ 66,321,803

¹ Expected return is based on the assumed investment return, which is 7.0%.

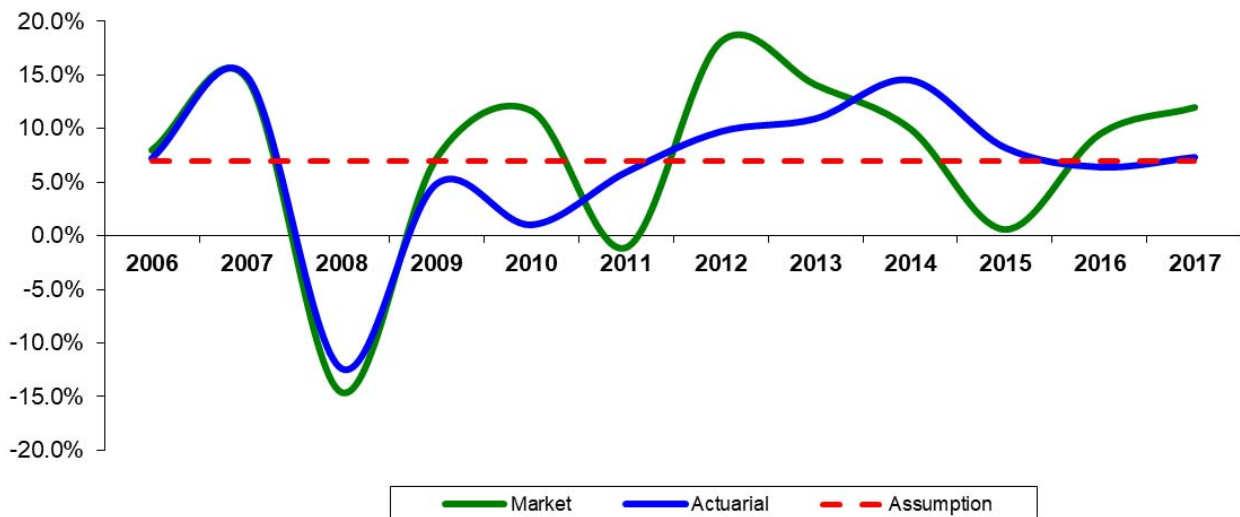
SECTION II. FUND ASSETS

EXHIBIT 5. HISTORICAL RETURNS ON DB PLAN ASSETS

The following table shows the historical return on DB plan assets over the last 15 years. The assumed actuarial valuation rate is 7.0%.

Fiscal Year Ending 9/30	Return on Market Value	Return on Actuarial Value
2017	12.0%	7.3%
2016	9.5%	6.4%
2015	0.6%	8.2%
2014	10.0%	14.5%
2013	14.1%	10.9%
2012	18.1%	9.7%
2011	(1.1)%	5.9%
2010	11.7%	1.0%
2009	7.2%	4.8%*
2008	(14.6%)	(12.4%)
2007	14.7%	14.9%
2006	8.0%	7.2%
2005	9.7%	10.7%
2004	9.3%	10.4%
2003	9.9%	13.0%
Average of last 5 years	9.2%	9.4%
Average of last 10 years	6.3%	5.4%

* Based on the asset valuation method as of September 30, 2008



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SECTION III. MEMBERSHIP DATA

EXHIBIT 6a. ACTIVE EMPLOYEES (Old DB Plan)

	9/30/2017	9/30/2016
Reconciliation of Old DB Census		
Members reported in raw data	6,416	6,735
Number excluded due to:		
Reported as inactive	4,053	4,236
Reported as terminated	222	224
Zero earnings	4	3
Refund of contributions	0	0
Duplicate inactive records	66	60
Included as retirees or deceased	<u>13</u>	<u>4</u>
Total exclusions	4,358	4,527
Active employees (Old DB Plan) in valuation	2,058	2,208
Active Employees – Non-Uniformed		
Number vested	1,834	1,970
Number not vested	<u>25</u>	<u>20</u>
Total	1,859	1,990
Average age	54.5	53.8
Average service	26.2	25.5
Average earnings	\$ 60,187	\$ 57,722
Average accumulated contributions	\$ 166,398	\$ 156,871
Active Employees – Uniformed		
Number vested	199	218
Number not vested	<u>0</u>	<u>0</u>
Total	199	218
Average age	50.9	50.2
Average service	27.2	26.6
Average earnings	\$ 95,272	\$ 89,611
Average accumulated contributions	\$ 225,401	\$ 209,865
Active Employees – Total Old DB Plan		
Number vested	2,023	2,188
Number not vested	<u>25</u>	<u>20</u>
Total	2,058	2,208
Average age	54.1	53.5
Average service	26.3	25.6
Average earnings	\$ 63,580	\$ 60,871
Average accumulated contributions	\$ 172,103	\$ 162,103

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EXHIBIT 6b. ACTIVE EMPLOYEES (DB 1.75 Plan)

	9/30/2017	9/30/2016
Reconciliation of DB 1.75 Census		
Members reported in raw data	3,353	n/a
Number excluded due to:		
Reported as inactive	0	n/a
Reported as terminated	0	n/a
Zero earnings	0	n/a
Refund of contributions	0	n/a
Duplicate inactive records	0	n/a
Included as retirees or deceased	<u>0</u>	<u>n/a</u>
Total exclusions	0	n/a
Active employees in valuation	3,353	n/a
Active Employees – DB 1.75 Plan		
Number vested	2,201	n/a
Number not vested	<u>1,152</u>	<u>n/a</u>
Total	3,353	n/a
Average age	43.8	n/a
Average service	10.4	n/a
Average earnings	\$ 52,121	\$ n/a
Average accumulated contributions	\$ 32,932	\$ n/a
Active Employees – Total Old DB and DB 1.75		
Number vested	4,234	2,188
Number not vested	<u>1,177</u>	<u>20</u>
Total	5,411	2,208
Average age	47.7	53.5
Average service	16.4	25.6
Average earnings	\$ 56,479	\$ 60,871
Average accumulated contributions	\$ 85,864	\$ 162,103

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SECTION III. MEMBERSHIP DATA

EXHIBIT 7. ACTIVE EMPLOYEES BY AGENCY

	9/30/17 DC Less DB 1.75	1/1/18 DB 1.75	9/30/17 Old DB	9/30/16 DC	9/30/16 Old DB
Agency For Human Resources Development ¹	0	0	0	37	5
Bureau of Budget & Management Research	1	12	5	12	6
Bureau of Statistics and Plans	17	10	8	27	8
Chamorro Land Trust ²	0	0	0	8	1
Chief Medical Examiner	3	0	0	3	0
Customs & Quarantine	63	30	34	95	36
Dept of Administration ³	43	64	45	108	45
Dept of Agriculture	42	17	23	52	24
Dept of Corrections	100	103	26	213	26
Dept of Labor ¹	34	23	16	33	13
Dept of Land Management	24	7	27	24	27
Dept of Law	104	75	33	162	35
Dept of Mental Health & Substance Abuse	115	54	29	167	28
Dept of Military Affairs	12	15	6	33	7
Dept of Parks and Recreation	18	17	13	39	14
Dept of Public Health & Social Services	173	149	86	315	93
Dept of Public Works	165	74	94	248	100
Dept of Revenue and Taxation	79	55	40	118	42
Dept of Youth Affairs	33	29	15	60	15
D.I.S.I.D.	9	5	3	14	4
Governor's Office	94	16	3	90	4
Guam Energy Office	2	0	1	1	1
Guam Environmental Protection Agency	18	26	8	39	8
Guam Fire Dept	18	144	80	164	90
Guam Legislature	22	21	6	41	8
Guam Police Dept	132	143	69	276	76
Judiciary Of Guam	208	134	73	323	75
KGTF	2	1	5	4	5
Lt. Governor's Office	17	1	0	18	0
Mayor's Council	190	23	13	206	17
Public Auditors	10	7	0	14	1
Public Defender	34	17	13	47	14
General Fund Total	1,782	1,272	774	2,991	828
Dept of Chamorro Affairs ²	30	4	9	31	10
Dept of Education	2,243	911	665	3,172	717
Government of Guam Retirement Fund	12	20	14	24	12
Guam Airport Authority	74	99	63	169	64
Guam Community College	97	101	50	198	54
Guam Economic Development Agency	15	11	6	26	5
Guam Housing & Urban Renewal Agency	33	44	18	78	18
Guam Housing Corporation	6	12	6	16	6
Guam Memorial Hospital Authority	639	243	118	848	123
Guam Power Authority	166	191	116	337	127
Guam Visitors Bureau	13	19	4	31	7
Guam Waterworks Authority	179	111	34	283	41
Port Authority Of Guam	148	141	63	262	72
University Of Guam	237	174	118	392	124
Others Total	3,892	2,081	1,284	5,867	1,380
GRAND TOTAL	5,674	3,353	2,058	8,858	2,208

¹ For 2017, the Department of Labor includes AHRD

² The Department of Chamorro Affairs' includes Guam CAHA and Guam Public Library, and Chamorro Land Trust (2017 only)

³ Department of Administration includes Civil Service Commission and Guam Election

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EXHIBIT 8. RETIRED EMPLOYEES (DB)

	9/30/2017	9/30/2016
Service Retirees		
Count	5,197	5,203
Average age	69.8	69.3
Average benefit	\$34,978	\$34,094
Median benefit	\$31,626	\$30,984
Disabled Retirees		
Count	242	269
Average age	68.1	67.8
Average benefit	\$22,840	\$21,900
Median benefit	\$20,734	\$19,865
Survivors		
Count	1,670	1,635
Average age	72.0	71.5
Average benefit	\$17,064	\$16,592
Median benefit	\$14,729	\$14,493
Child Pensioners		
Count	170	191
Average age	15.6	16.8
Average benefit	\$2,880	\$2,880
Median benefit	\$2,880	\$2,880
Total Retirees and Survivors		
Count	7,279	7,107
Average age ¹	70.2	69.7
Average benefit ¹	\$30,357	\$29,606
Median benefit ¹	\$26,733	\$26,202

¹ Excludes child pensioners.

SECTION III. MEMBERSHIP DATA

EXHIBIT 9. TERMINATED AND INACTIVE MEMBERS (DB)

	9/30/2017	9/30/2016
Reported as Inactive		
Count	4,053	4,230
Accumulated contributions	\$ 10,611,768	\$ 12,051,874
Reported as Terminated		
Count	222	224
Accumulated contributions	\$ 536,563	\$ 536,926
Zero Earnings		
Count	14	9
Accumulated contributions	\$ 1,240,002	\$ 761,149
Refund of Contributions		
Count	0	0
Accumulated contributions	\$ 0	\$ 0
Total Terminateds and Inactives		
Count	4,289	4,463
Accumulated contributions	\$ 12,388,333	\$ 13,349,949
<hr/>		
Assumed to Withdraw Contributions		
Count	4,161	4,320
Accumulated contributions	\$ 3,294,346	\$ 3,156,366
Not Assumed to Withdraw Contributions		
Count	128	143
Average age	55.4	55.2
Average benefit	\$ 13,897	\$ 13,862
Accumulated contributions	\$ 9,093,987	\$ 10,193,582

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SECTION III. MEMBERSHIP DATA

EXHIBIT 10. RECONCILIATION OF MEMBERSHIP DATA (DB)

	Act	Assumed to Withdraw Contributions				No With'd Inact	Ret	Surv	Disab	Child	Total
		Inact	Term	Zero	Refund						
9/30/2016	2,208	4,093	224	3	0	143	5,203	1,635	269	191	13,969
Additions from:											
Actives		4	0	0	0	4	130	5	4	0	147
Inactives	2		0	0	0	0	6	0	0	0	8
Terminations	0	0		0	0	0	0	0	0	0	0
Zero earnings	0	1	0		0	0	0	0	0	0	1
Refunds	0	0	0	0		0	0	0	0	0	0
Inactives no w/d	5	7	0	1	0		2	0	0	0	15
Retiree	1	1	0	0	0	0		0	0	0	2
Survivor	0	0	0	0	0	0	0		0	0	0
Disability	0	0	0	0	0	0	0	0		0	0
Child	0	0	0	0	0	0	0	0	0		0
Other adds ¹	0	2	0	1	0	0	13	90	0	17	123
Subtotal	8	15	0	2	0	4	151	95	4	17	296
Subtractions due to:											
Actives		-2	0	0	0	-5	-1	0	0	0	-8
Inactives	-4		0	-1	0	-7	-1	0	0	0	-13
Terminations	0	0		0	0	0	0	0	0	0	0
Zero earnings	0	0	0		0	-1	0	0	0	0	-1
Refunds	0	0	0	0		0	0	0	0	0	0
Inactives no w/d	-4	0	0	0	0		0	0	0	0	-4
Retiree	-130	-6	0	0	0	-2		0	0	0	-138
Survivor	-5	0	0	0	0	0	0		0	0	-5
Disability	-4	0	0	0	0	0	0	0		0	-4
Child	0	0	0	0	0	0	0	0	0		0
Other drops ²	-11	-165	-2	0	0	-4	-155	-60	-31	-38	-466
Subtotal	-158	-173	-2	-1	0	-19	-157	-60	-31	-38	-639
9/30/2017	2,058	3,935	222	4	0	128	5,197	1,670	242	170	13,626
DB 1.75	<u>3,353</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3,353</u>
Total	5,411	3,935	222	4	0	128	5,197	1,670	242	170	16,979

¹ Other additions indicate members or beneficiaries who were reported this year but who were not included in the prior year's valuation (e.g. a new beneficiary, etc.).

² Other drops indicate members or beneficiaries who were in the prior year's valuation but who were not reported in this year's census data (e.g. members who received a complete refund, retirees or beneficiaries who are now deceased, children who have reached the maximum age, etc.).

SECTION IV. VALUATION EXHIBITS

EXHIBIT 11a. ACTUARIAL ACCRUED LIABILITY (Old DB Plan)

The actuarial accrued liability has been calculated using the Entry Age Normal actuarial cost method, and is equal to the present value of benefits for all Old DB Plan members less the present value of future normal costs for active Old DB Plan employees.

	Old DB Plan 9/30/2017	Old DB Plan 9/30/2016
Present Value of Benefits		
Active employees –		
Retirement	\$ 852,448,699	\$ 869,431,636
Disability	12,920,482	14,253,025
Death	15,636,841	16,626,915
Withdrawal	<u>27,807,424</u>	<u>32,620,263</u>
Total active PVB	908,813,446	932,931,839
Retirees and Survivors		
Retirees	1,770,345,913	1,754,518,896
Disabled retirees	46,694,397	50,201,112
Survivors	<u>250,172,724</u>	<u>242,317,598</u>
Total retirees and survivors	2,067,213,034	2,047,037,606
Terminated and inactive members		
Assumed to retire	14,432,835	16,369,006
Assumed to elect return of contributions	<u>3,294,346</u>	<u>3,156,366</u>
Total terminated and inactive members	17,727,181	19,525,372
Total PVB	\$ 2,993,753,661	\$ 2,999,494,817
Present Value of Future Normal Cost		
Active employees –		
Retirement	\$ 65,415,106	\$ 72,043,379
Disability	4,153,300	4,122,850
Death	3,843,584	3,547,323
Withdrawal	<u>14,311,397</u>	<u>14,872,399</u>
Total active PVFNC	\$ 87,723,387	\$ 94,585,951
Actuarial Accrued Liability		
Active members	\$ 821,090,059	\$ 838,345,888
Retirees and survivors	2,067,213,034	2,047,037,606
Terminations and inactives	<u>17,727,181</u>	<u>19,525,372</u>
Total accrued liability	\$ 2,906,030,274	\$ 2,904,908,866

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 11b. ACTUARIAL ACCRUED LIABILITY (DB 1.75 Plan)

The actuarial accrued liability has been calculated using the Entry Age Normal actuarial cost method, and is equal to the present value of benefits for all DB 1.75 Plan members less the present value of future normal costs for active DB 1.75 Plan employees.

	DB 1.75 Plan 9/30/2017	DB 1.75 Plan 9/30/2016
Present Value of Benefits		
Active employees –		
Retirement	\$ 330,850,805	\$ 0
Disability	18,278,333	0
Death	16,718,260	0
Withdrawal	<u>78,268,618</u>	<u>0</u>
Total active PVB	444,116,016	0
Retirees and Survivors		
Retirees	0	0
Disabled retirees	0	0
Survivors	<u>0</u>	<u>0</u>
Total retirees and survivors	0	0
Terminated and inactive members		
Assumed to retire	0	0
Assumed to elect return of contributions	<u>0</u>	<u>0</u>
Total terminated and inactive members	0	0
Total PVB	\$ 444,116,016	\$ 0
Present Value of Future Normal Cost		
Active employees –		
Retirement	\$ 94,092,595	\$ 0
Disability	8,207,905	0
Death	7,200,717	0
Withdrawal	<u>57,473,493</u>	<u>0</u>
Total active PVFNC	\$ 166,974,710	0
Actuarial Accrued Liability		
Active members	\$ 277,141,306	\$ 0
Retirees and survivors	0	0
Terminations and inactives	<u>0</u>	<u>0</u>
Total accrued liability	\$ 277,141,306	\$ 0

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 12. CALCULATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

The unfunded actuarial accrued liability is used to determine the funding requirements. The unfunded actuarial accrued liability equals the actuarial accrued liability less the valuation assets.

	9/30/2017	9/30/2016
OLD DB PLAN		
Actuarial Accrued Liability		
Active members	\$ 821,090,059	\$ 838,345,888
Retirees and survivors	2,067,213,034	2,047,037,606
Terminations and inactives	<u>17,727,181</u>	<u>19,525,372</u>
Total accrued liability	\$ 2,906,030,274	\$ 2,904,908,866
Actuarial Value of Assets	<u>1,692,867,877</u>	<u>1,655,592,379</u>
Unfunded Actuarial Accrued Liability	\$ 1,213,162,397	\$ 1,249,316,487
Security Ratio = (Assets/AAL)	58.25%	56.99%
DB 1.75 PLAN		
Actuarial Accrued Liability		
Active members	\$ 277,141,306	\$ 0
Retirees and survivors	0	0
Terminations and inactives	<u>0</u>	<u>0</u>
Total accrued liability	\$ 277,141,306	\$ 0
Actuarial Value of Assets ¹	<u>223,539,347</u>	<u>0</u>
Unfunded Actuarial Accrued Liability	\$ 53,601,959	\$ 0
Security Ratio = (Assets/AAL)	80.66%	n/a
TOTAL (Old DB Plan plus DB 1.75 Plan)		
Actuarial Accrued Liability		
Active members	\$ 1,098,231,365	\$ 838,345,888
Retirees and survivors	2,067,213,034	2,047,037,606
Terminations and inactives	<u>17,727,181</u>	<u>19,525,372</u>
Total accrued liability	\$ 3,183,171,580	\$ 2,904,908,866
Actuarial Value of Assets	<u>1,916,407,224</u>	<u>1,655,592,379</u>
Unfunded Actuarial Accrued Liability	\$ 1,266,764,356	\$ 1,249,316,487
Security Ratio = (Assets/AAL)	60.20%	56.99%

¹ Actuarial assets for DB 1.75 Plan is the discounted value of defined contribution plan transfers.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 13. CALCULATION OF ACTUARIAL GAIN/LOSS

	Year Ending 9/30/2017	Year Ending 9/30/2016
Unfunded Actuarial Accrued Liability, beginning of year	\$ 1,249,316,487	\$ 1,298,266,628
Additions:		
Normal cost	8,072,162	9,361,310
Interest to end of year	<u>88,017,205</u>	<u>91,533,956</u>
Total additions	96,089,367	100,895,266
Deductions:		
Employer contributions for year	125,274,726	124,419,463
Interest on contributions	<u>4,310,458</u>	<u>4,281,030</u>
Total deductions	129,585,184	128,700,493
Other Changes:		
Plan amendments	53,601,959	0
Changes in assumptions and methods	<u>0</u>	<u>(13,482,669)</u>
Net other changes	53,601,959	(13,482,669)
Expected UAAL, end of year	\$ 1,269,422,629	\$ 1,256,978,732
Actual UAAL, end of year	<u>1,266,764,356</u>	<u>1,249,316,487</u>
Actuarial Gain/(Loss)	\$ 2,658,273	\$ 7,662,245
Components of Actuarial Gain/(Loss):		
Investment gain/(loss) on actuarial value of assets	\$ 4,919,877	\$ (9,781,158)
Other gains/(losses)	<u>(2,261,604)</u>	<u>17,443,403</u>
Total actuarial gain/(loss)	\$ 2,658,273	\$ 7,662,245

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 14. NORMAL COST

The normal cost has been calculated using the Entry Age Normal actuarial cost method.

	9/30/2017		9/30/2016	
OLD DB Plan				
Expected payroll for next fiscal year	\$ 126,728,423		\$ 129,999,048	
Normal cost ¹		<i>% of Old DB Payroll</i>		<i>% of Old DB Payroll</i>
Retirement	\$ 12,044,495	9.50%	\$ 12,465,744	9.60%
Disability	753,000	0.59%	708,066	0.54%
Withdrawal	2,573,371	2.03%	2,510,359	1.93%
Death	<u>705,820</u>	<u>0.56%</u>	<u>614,530</u>	<u>0.47%</u>
Total active normal cost	\$ 16,076,686	12.69%	\$ 16,298,699	12.54%
Assumed DB administrative expenses	<u>4,957,000</u>	<u>3.91%</u>	<u>4,457,000</u>	<u>3.43%</u>
Total normal cost and expenses	\$ 21,033,686	16.60%	\$ 20,755,699	15.97%
Expected member contributions	<u>(12,096,234)</u>	<u>(9.55%)</u>	<u>(12,405,790)</u>	<u>(9.55%)</u>
Government portion of normal cost	\$ 8,937,452	7.05%	\$ 8,349,909	6.42%
DB 1.75 Plan				
Expected payroll for next fiscal year	\$ 171,450,950		\$ n/a	
Normal cost ¹		<i>% of DB 1.75 Payroll</i>		<i>% of DB 1.75 Payroll</i>
Retirement	\$ 10,559,525	6.16%	\$ 0	0.00%
Disability	883,745	0.52%	0	0.00%
Withdrawal	6,192,797	3.61%	0	0.00%
Death	<u>801,292</u>	<u>0.47%</u>	<u>0</u>	<u>0.00%</u>
Total active normal cost	\$ 18,437,359	10.75%	\$ 0	0.00%
Assumed DB administrative expenses	<u>891,203</u>	<u>0.52%</u>	<u>0</u>	<u>0.00%</u>
Total normal cost and expenses	\$ 19,328,562	11.27%	\$ 0	0.00%
Expected member contributions	<u>(16,287,840)</u>	<u>(9.50%)</u>	<u>0</u>	<u>0.00%</u>
Government portion of normal cost	\$ 3,040,722	1.77%	\$ 0	0.00%
TOTAL DB Plans				
Expected payroll for next fiscal year	\$ 298,179,373		\$ 129,999,048	
Total active normal cost ¹	\$ 34,514,045	<i>% of DB Payroll</i>	\$ 16,298,699	<i>% of DB Payroll</i>
Assumed DB administrative expenses	<u>5,848,203</u>	<u>1.96%</u>	<u>4,457,000</u>	<u>3.43%</u>
Total normal cost and expenses	\$ 40,362,248	13.54%	\$ 20,755,699	15.97%
Expected member contributions	<u>(28,384,074)</u>	<u>(9.52%)</u>	<u>(12,405,790)</u>	<u>(9.55%)</u>
Government portion of normal cost	\$ 11,978,174	4.02%	\$ 8,349,909	6.42%

¹ Includes interest to mid-year.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 15. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

Pursuant to GCA Section 8137, as modified by P.L. 33-186, the unfunded liabilities of the Government of Guam Retirement Fund are to be completely funded within 82 years from May 1, 1951. As of September 30, 2017, there are 15.58 years remaining in the funding period. The amortization of the unfunded actuarial accrued liability is calculated as a constant percentage of total payroll, which is assumed to grow at 2.75% per year.

	9/30/2017	9/30/2016
Total payroll (DB and DC) for fiscal year following	\$ 522,278,746	\$ 520,246,146
Unfunded actuarial accrued liability	1,266,764,356	1,249,316,487
Remaining funding period	15.58 years	14.58 years
Annual amortization	\$ 111,167,185	\$ 115,041,140
As % of total payroll (DB and DC)	21.29%	22.12%

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 16. ACTUARIALLY DETERMINED CONTRIBUTION

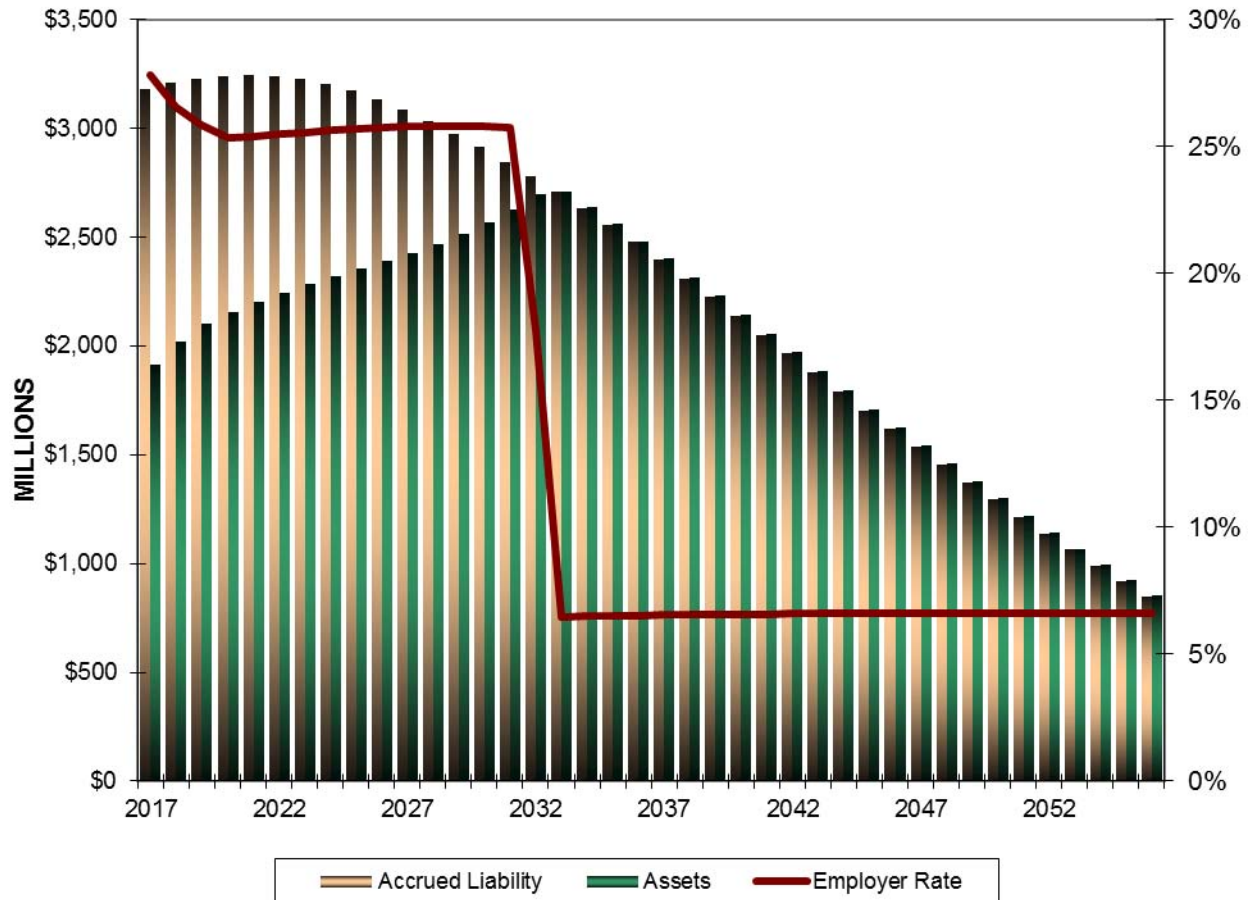
The Actuarially Determined Contribution (ADC) is equal to the sum of (1) the government normal costs for the defined benefit plans (Old DB and DB 1.75), (2) the amortization payment towards the unfunded actuarial accrued liability of the defined benefit plans (Old DB and DB 1.75), and (3) the expected government contributions to the defined contribution (DC) plan. The required contribution is then divided by the sum of the DB and DC payroll to determine the contribution rate as a percentage of payroll.

	9/30/2017	9/30/2016
Expected payroll for next fiscal year		
Old defined benefit (Old DB)	\$ 126,728,423	\$ 129,999,048
Defined Benefit 1.75 (DB 1.75)	171,450,950	0
Defined contribution (DC)	<u>224,099,373</u>	<u>390,247,098</u>
Total payroll (DB and DC)	\$ 522,278,746	\$ 520,246,146
Government normal cost including expenses (DB)	\$ 11,978,174	\$ 8,349,909
As % of DB payroll	4.02%	6.42%
As % of total payroll (DB and DC)	2.29%	1.60%
Amortization of UAAL (DB)	\$ 111,167,185	\$ 115,041,140
As % of total payroll (DB and DC)	21.29%	22.12%
Government DC contributions	\$ 15,570,962	\$ 21,399,355
As % of DC payroll	6.95%	5.48%
As % of total payroll (DB and DC)	2.98%	4.11%
Total DB and DC contributions	\$ 138,716,321	\$ 144,790,404
% of total payroll (DB and DC)	26.56%	27.83%

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 17. PROJECTION OF CONTRIBUTION RATE¹



¹ The contribution rate is the combined employer rate for the DB and DC plans.

SECTION IV. VALUATION EXHIBITS

EXHIBIT 17. PROJECTION OF CONTRIBUTION RATE (values)

Year Ending	PAYROLL ¹		CONTRIB RATE		CONTRIBUTIONS			Invest Gain ³	Benefits/ Expenses	DB Fund Actuarial
	DB	DC	DB	DC ²	DB	DC ²	EE			
2017										\$1,916.41
2018	\$298.18	\$224.10	27.83%	21.42%	\$82.98	\$48.01	\$28.38	\$135.31	\$(227.77)	2,021.68
2019	283.34	253.30	26.56%	19.95%	75.25	50.54	26.92	139.45	(233.73)	2,105.76
2020	268.43	282.97	25.86%	19.26%	69.41	54.50	25.50	143.10	(239.97)	2,157.31
2021	253.09	313.47	25.37%	18.78%	64.21	58.89	24.04	146.38	(246.48)	2,203.42
2022	237.53	344.62	25.40%	18.83%	60.34	64.88	22.56	149.36	(253.33)	2,246.41
2023	221.94	376.21	25.49%	18.92%	56.56	71.18	21.08	152.14	(260.33)	2,286.30
2024	206.59	408.01	25.57%	19.02%	52.83	77.59	19.63	154.70	(267.28)	2,323.08
2025	192.51	438.99	25.65%	19.10%	49.38	83.87	18.29	157.10	(272.99)	2,358.12
2026	179.82	469.05	25.72%	19.18%	46.24	89.96	17.08	159.44	(277.47)	2,392.83
2027	168.73	497.98	25.77%	19.24%	43.48	95.81	16.03	161.84	(280.21)	2,429.27
2028	159.42	525.63	25.80%	19.28%	41.13	101.35	15.15	164.42	(281.35)	2,469.53
2029	151.15	552.74	25.82%	19.31%	39.02	106.71	14.36	167.32	(281.44)	2,515.09
2030	143.41	579.83	25.82%	19.31%	37.02	111.99	13.62	170.63	(280.70)	2,567.28
2031	136.21	606.92	25.80%	19.31%	35.14	117.17	12.94	174.43	(279.28)	2,627.33
2032	129.58	633.99	25.76%	19.27%	33.38	122.17	12.31	178.81	(277.20)	2,696.48
2033	123.27	661.29	17.76%	11.28%	21.89	74.60	11.71	181.70	(274.43)	2,711.67
2034	116.21	689.94	6.47%	0.00%	7.52	0.02	11.04	179.79	(271.73)	2,638.07
2035	108.88	719.43	6.49%	0.03%	7.07	0.20	10.34	174.73	(268.68)	2,561.50
2036	102.15	748.94	6.51%	0.05%	6.65	0.40	9.70	169.47	(265.20)	2,482.32
2037	95.58	778.92	6.53%	0.08%	6.24	0.59	9.08	164.06	(261.26)	2,400.84
2038	89.02	809.53	6.54%	0.10%	5.82	0.78	8.46	158.49	(257.02)	2,317.21
2039	82.59	840.66	6.55%	0.12%	5.41	0.98	7.85	152.80	(252.18)	2,231.94
2040	76.62	872.02	6.57%	0.14%	5.03	1.19	7.28	147.02	(246.71)	2,145.64
2041	70.89	903.84	6.58%	0.15%	4.66	1.39	6.73	141.18	(240.92)	2,058.59
2042	65.48	936.06	6.59%	0.17%	4.31	1.58	6.22	135.32	(234.64)	1,971.31
2043	60.32	968.75	6.60%	0.18%	3.98	1.77	5.73	129.44	(228.08)	1,884.08
2044	55.38	1,002.00	6.60%	0.20%	3.66	1.96	5.26	123.59	(221.21)	1,797.28
2045	50.70	1,035.76	6.61%	0.21%	3.35	2.14	4.82	117.77	(214.11)	1,711.21
2046	46.34	1,069.99	6.61%	0.22%	3.06	2.32	4.40	112.01	(206.85)	1,626.12
2047	42.29	1,104.75	6.62%	0.23%	2.80	2.49	4.02	106.34	(199.28)	1,542.46
2048	38.12	1,140.46	6.62%	0.23%	2.52	2.65	3.62	100.75	(192.03)	1,459.96
2049	34.10	1,176.88	6.62%	0.24%	2.26	2.82	3.24	95.25	(184.59)	1,378.94
2050	30.26	1,214.02	6.62%	0.25%	2.00	2.99	2.87	89.85	(177.30)	1,299.36
2051	26.40	1,252.10	6.62%	0.25%	1.75	3.15	2.51	84.55	(170.15)	1,221.18
2052	22.63	1,291.03	6.62%	0.26%	1.50	3.32	2.15	79.34	(163.05)	1,144.45
2053	18.83	1,330.96	6.62%	0.26%	1.25	3.48	1.79	74.22	(156.11)	1,069.11
2054	15.31	1,371.60	6.62%	0.27%	1.01	3.65	1.45	69.21	(149.04)	995.44
2055	12.29	1,412.76	6.62%	0.27%	0.81	3.81	1.17	64.33	(141.75)	923.85
2056	9.81	1,454.42	6.62%	0.27%	0.65	3.95	0.93	59.61	(134.23)	854.80

¹ Payroll is assumed to increase 2.75% per year.

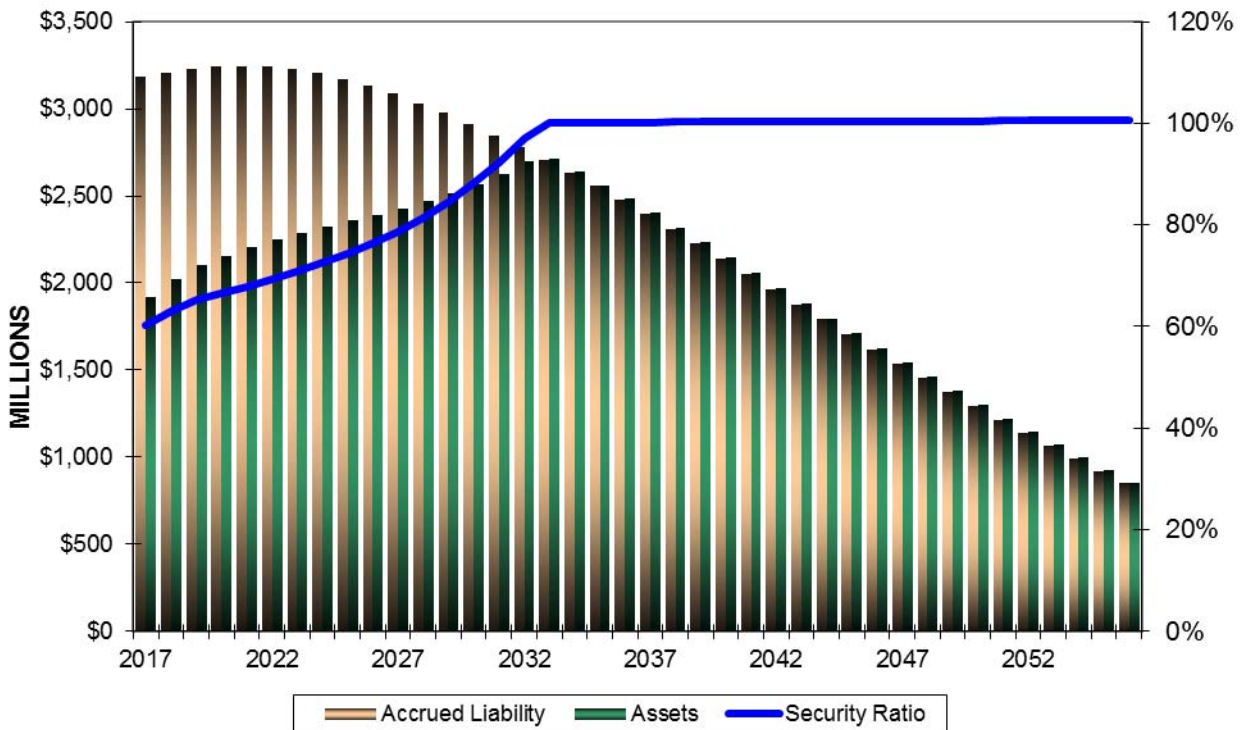
² DC rate and contributions are those for payment towards UAAL and plan expenses only.

³ Investment earnings are assumed to be 7.0% per year on the market value of assets.

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SECTION IV. VALUATION EXHIBITS

EXHIBIT 18. PROJECTION OF SECURITY RATIO



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SECTION IV. VALUATION EXHIBITS

EXHIBIT 18. PROJECTION OF SECURITY RATIO (values)

Year Ending	EMPLOYER CONTRIBUTIONS					Security Ratio
	Payroll ¹	DB Rate	Contribs DB Plan	DB Fund AVA ²	Accrued Liability	
2017				\$1,916.41	\$3,183.17	60.20%
2018	\$ 522.28	27.83%	\$129.78	2,021.68	3,208.56	63.01%
2019	536.64	26.56%	124.70	2,105.76	3,227.79	65.24%
2020	551.40	25.86%	122.91	2,157.31	3,240.20	66.58%
2021	566.56	25.37%	122.18	2,203.42	3,244.97	67.90%
2022	582.14	25.40%	124.39	2,246.41	3,241.22	69.31%
2023	598.15	25.49%	126.99	2,286.30	3,228.17	70.82%
2024	614.60	25.57%	129.74	2,323.08	3,205.26	72.48%
2025	631.50	25.65%	132.64	2,358.12	3,173.23	74.31%
2026	648.87	25.72%	135.65	2,392.83	3,132.88	76.38%
2027	666.71	25.77%	138.79	2,429.27	3,085.59	78.73%
2028	685.05	25.80%	142.03	2,469.53	3,032.76	81.43%
2029	703.89	25.82%	145.32	2,515.09	2,975.19	84.54%
2030	723.24	25.82%	148.64	2,567.28	2,913.48	88.12%
2031	743.13	25.80%	151.97	2,627.33	2,848.11	92.25%
2032	763.57	25.76%	155.23	2,696.48	2,779.57	97.01%
2033	784.57	17.76%	96.21	2,711.67	2,708.38	100.12%
2034	806.14	6.47%	7.29	2,638.07	2,634.21	100.15%
2035	828.31	6.49%	7.04	2,561.50	2,557.17	100.17%
2036	851.09	6.51%	6.84	2,482.32	2,477.58	100.19%
2037	874.49	6.53%	6.64	2,400.84	2,395.75	100.21%
2038	898.54	6.54%	6.44	2,317.21	2,311.84	100.23%
2039	923.25	6.55%	6.26	2,231.94	2,226.35	100.25%
2040	948.64	6.57%	6.10	2,145.64	2,139.86	100.27%
2041	974.73	6.58%	5.95	2,058.59	2,052.67	100.29%
2042	1,001.54	6.59%	5.81	1,971.31	1,965.27	100.31%
2043	1,029.08	6.60%	5.68	1,884.08	1,877.98	100.33%
2044	1,057.38	6.60%	5.56	1,797.28	1,791.13	100.34%
2045	1,086.46	6.61%	5.45	1,711.21	1,705.04	100.36%
2046	1,116.33	6.61%	5.35	1,626.12	1,619.96	100.38%
2047	1,147.03	6.62%	5.27	1,542.46	1,536.33	100.40%
2048	1,178.58	6.62%	5.16	1,459.96	1,453.88	100.42%
2049	1,210.99	6.62%	5.08	1,378.94	1,372.93	100.44%
2050	1,244.29	6.62%	5.00	1,299.36	1,293.44	100.46%
2051	1,278.51	6.62%	4.91	1,221.18	1,215.38	100.48%
2052	1,313.66	6.62%	4.84	1,144.45	1,138.79	100.50%
2053	1,349.79	6.62%	4.76	1,069.11	1,063.60	100.52%
2054	1,386.91	6.62%	4.70	995.44	990.09	100.54%
2055	1,425.05	6.62%	4.67	923.85	918.65	100.57%
2056	1,464.24	6.62%	4.64	854.80	849.74	100.60%

¹ Payroll is assumed to increase 2.75% per year.

² Actuarial Value of Assets. Investment earnings are assumed to be 7.0% per year on the market value of assets.

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APPENDIX A. SUMMARY OF PLAN PROVISIONS

The following description is only a brief summary of the more important provisions of the retirement plan. Actual plan provisions are contained in Chapter 8 of the Guam Code, as modified by Public Law 33-186.

Membership Conditions and Exclusions (Old DB Plan): All employees of the Government of Guam hired on or before September 30, 1995 are required to participate as a condition of employment, except:

- a) Persons who are compensated on a fee basis;
- b) Independent contractors;
- c) Persons employed for a specific project;
- d) Persons employed in the Senior Citizens' Community Employment Program; and
- e) Persons with less than 20 years of service prior to September 30, 1995 who elect to transfer to the Government of Guam Defined Contribution Fund. Participants have an annual opportunity to transfer.

Membership is optional for:

- a) Temporary, seasonal, intermittent and part-time employees;
- b) Persons employed for a specific period of time and not domiciled in Guam; and
- c) Employees of a public corporation of the Government of Guam.

Membership is also applicable to members of the Legislature with special provisions for:

- a) The determination of average annual salary for pension computation purposes; and
- b) Contributions.

Membership Conditions and Exclusions (DB 1.75 Plan): All employees of the Government of Guam who were in the Defined Contribution Plan and were still employed had the option to transfer to the Defined Benefit 1.75 Plan effective January 1, 2018. Employees hired on or after January 1, 2018 are not eligible for the Old DB or DB 1.75 plans.

Pension Credits: Employees are entitled to pension credit for:

- a) Service rendered to the Government prior to May 1, 1951 when the Fund began operations.
- b) Service on or after May 1, 1951 for which contributions are required to be made by the employees.
- c) Casual or part-time employment under prescribed conditions for which contributions must be made.
- d) Unused and accumulated sick and annual (vacation) leaves with 12 days of service counted as a full month; 6 to 11 days, ½ month; and less than 6 days disregarded.
- e) For employees hired before June 1, 1989, pension credit is granted up to a maximum of 5 years for Federal service, provided the employee terminates membership in the Federal Civil Service Retirement Fund and makes a contribution to the Government of Guam Retirement Fund equal to the amount contributed by the member and his employer during the period which is equal in length to the period for which service credit is requested, and which ends on the member's

SECTION V. APPENDICES

termination date of such employment with interest from the date of such termination to the date of payment.

- f) For employees hired before June 1, 1989, educational leave time or periods of termination for educational training purposes, if contributions are made to the Fund with interest. Members who first joined the fund prior to January 31, 1987, may receive credit for up to the normal period of time required to complete degree without having been employed by the government prior to the period during which the degree was earned.
- g) Military service prior to May 1, 1951, if not considered for any Federal Government Pension other than for disability. If entry into military service occurred after May 1, 1951, total pension credit is limited to 5 years in the aggregate, provided the employee was in the service of the Government of Guam at date of entry into military service and returned to the Government of Guam service within one year following discharge from military service under conditions other than dishonorable, or within 6 months after completion of education under the various education benefits programs for veterans; otherwise the total credit is limited to three years.

Schedule for Computing Service: The following schedule shall govern the computation of pension credit: 12 days or more during any month constitutes a month of service; 6 to 11 days, ½ month; less than 6 days is disregarded. Nine months or more during any year constitutes a year of service.

Vesting of Pension Credit: Vesting occurs after at least 5 years of service.

Upon separation from service, an employee may optionally leave the contribution credits in the Fund and qualify for a deferred retirement annuity, based upon the total pension credit. If the pension credit is 25 years or more, no refund of contributions is payable and the employee must accept a deferred retirement annuity.

Conditions for Service Retirement: With respect to any employee who originally became a member of the Fund prior to October 1, 1981:

- a) Such member may retire on a service retirement annuity at age 60 or over, or at age 55 in the case of a member of the uniformed personnel after at least 10 years of service. Upon retirement, a member of the uniformed personnel shall be considered one grade above that held at date of retirement.
- b) A member with at least 25 years of service may retire at any age on an unreduced retirement annuity.
- c) Any retired employee with at least 25 years of credit service shall be entitled to the full retirement annuity on and after September 30, 1981.
- d) Any member, active or inactive, may retire after 20 years of service, regardless of age. In such case, the retirement annuity shall be reduced ¼ of 1% for each month that the age of the member is less than 60 years (3% per year).

With respect to an employee who became a member of the Fund on or after October 1, 1981, and prior to August 22, 1984, the following provisions shall govern:

- a) Such member may retire on a service retirement annuity at age 60 or over, or at age 55 if a member of the uniformed personnel after at least 15 years of service and upon retirement shall be considered one rank grade above that held at such date.
- b) A member with at least 30 years of service shall be eligible for service retirement, regardless of age, without reduction for early retirement.

SECTION V. APPENDICES

- c) Any member, whether in an active or inactive status, may retire after 25 years of service, at any age, on an annuity reduced $\frac{1}{4}$ of 1% per month (3% per year) for each month member's age is less than 60.

With respect to any employee becoming a member of the Fund on or after August 22, 1984, and a member of the Old DB Plan:

- a) Such member may retire on a service retirement annuity at age 65 or over, or at age 60 in the case of a member of the uniformed personnel after at least 15 years of service. Upon retirement, a member of the uniformed personnel shall be considered one grade above that held at date of retirement.
- b) A member with at least 30 years of service may retire at any age on an unreduced retirement annuity.
- c) Any member, active or inactive, may retire after 25 years of service, regardless of age. In such case, the retirement annuity shall be reduced $\frac{1}{4}$ of 1% for each month that the age of the member is less than 65 years (3% per year).

With respect to any employee in the DB 1.75 Plan:

- a) Such member may retire on a service retirement annuity at age 62 or over.
- b) Any member, active or inactive, may retire after the attainment of age 55 with 25 years of service. In such case, the retirement annuity shall be reduced $\frac{1}{2}$ of 1% for each month that the age of the member is less than 62 years (6% per year).

Amount of Service Retirement Annuity (Old DB Plan): A basic annuity of 2.00% of "average annual salary" for each of the first 10 years of credited service; and 2.5% of "average annual salary" for each full year of pension credit above 10 years, plus twenty dollars (\$20.00) multiplied by years of credited service reduced by an amount equal to one hundredth of one percent (.01%) of said amount for each one dollar (\$1.00) that a member's average annual salary exceeds the amount of six thousand dollars (\$6,000).

The minimum amount of service retirement annuity payable by the Fund is \$1,200 per year. The maximum retirement annuity is 85% of "average annual salary."

Amount of Service Retirement Annuity (DB 1.75): A basic annuity of 1.75% of "average annual salary" for each year of credited service. The minimum amount of service retirement annuity payable by the Fund is \$1,200 per year. The maximum retirement annuity is 85% of "average annual salary."

Average Annual Salary: Average of three highest annual salaries received by a member during the entire period of pension credit. A minimum of \$6,000 applies to Old DB Plan members.

The annual salary of the member shall include the basic rate of salary on which contributions were made by the member and any salary on which the member made contributions as required under GCA, Section 8136(a). Effective October 1, 1986, salary can include payment for unused annual leave upon retirement for Old DB Plan members.

SECTION V. APPENDICES

In case of members of the Legislature, the average annual salary is the salary of the Director of Administration at the member's date of retirement, or the average of the three highest annual salaries received by the member during the period of membership credit, whichever is greater.

Automatic Increase in Annuity: Effective July 1, 1984, any member retiring from service and entitled to benefits after September 1, 1972, is to receive each year, on the anniversary date of retirement, an increment of \$600 if the annual annuity is \$3,500 or less; \$400 if the annuity is between \$3,500 and \$6,300 per year; \$300 if the annuity is between \$6,300 and \$10,100; and \$200 if the annuity exceeds \$10,100 per year.

Disability Retirement: Upon total and permanent disability due to physical or mental causes, an employee under age 65 is entitled to a disability retirement annuity. For employees hired prior to August 22, 1984, the amount of the disability retirement annuity will be 66-2/3% of the employee's salary in effect on the date of disability. Subsequent employees will have an annuity amount based on 66-2/3% (50% for DB 1.75 Plan members) of the average of the highest three years of salary. If the disability was not due to occupational causes, the employee must have Government of Guam service credit of at least six years, or five years in the case of terminal illness, in order to qualify, except that new members since May 28, 1985, may not retire if a disability arises from impairment or conditions existing prior to employment.

A disability retirement annuitant must submit to a medical examination at least once a year during the first five years of disability, and at least once every three years thereafter, by a physician or physicians designated by the Board in order to establish continuing disability and entitlement to benefits. Should a disability annuitant resume gainful employment in a position other than the particular job in which he was engaged when declared disabled, the disability retirement benefit shall continue as initially determined.

A member receiving disability retirement benefits since December 1, 1972, is entitled to receive on the anniversary date of retirement, an annual increase of \$300 if the benefit is \$3,000 per year or less; \$250 per year where the annuity is between \$3,000 and \$6,000 per year; \$200 per year where the annuity is between \$6,000 and \$10,000 per year; and \$100 if the annuity exceeds \$10,000 per year.

Re-entry Into Service: A member on retirement who re-enters services as an employee eligible for membership shall have the annuity suspended during the period of employment without losing rights to automatic increases in the retirement annuity during the period of re-employment. This provision does not apply to Department of Education employees who occupy positions dealing with the Chamorro Language and Culture Program in Guam schools, persons employed as classroom teachers, guidance or health counselors when critical need arises, nor elected officials.

Benefits to Survivors: Benefits are payable to a surviving spouse and children under age 21, upon the death of a member while in service after at least three years of service, or occurring while on retirement. The benefit to children of an annuitant or member whose death occurs while in service after at least three years of service is payable until age 25 if they are full-time students in an accredited educational institution, or payable regardless of age if disabled and disability occurred before age 18.

If only a spouse survives the active or retired member, the annuity payable is 60% of the service or disability retirement annuity earned by the member, subject to a minimum of \$1,200 per year.

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The annuity to a child is \$2,880 per year, subject to a maximum payment to five or more minor children of \$14,400 per year. The term “child” or “children” includes any natural child or adopted child under age 21, or any permanently disabled child whose incapacity began before the child attained age 21.

A survivor annuitant is entitled to an automatic increase in annuity each year on the anniversary date of the annuity of \$600 if the annuity is \$3,500 per year or less; \$400 if the annuity is between \$3,500 and \$6,300 per year; \$300 if the annuity is between \$6,300 and \$10,100; and \$200 if the annuity is more than \$10,100 per year.

A surviving spouse or minor child surviving the member is entitled, in addition to the above, a death benefit of \$1,000 payable in a lump sum.

A survivor's annuity terminates upon death or re-marriage under the age of 40, attainment of age 21 of the child, or the termination of the incapacity of a disabled child.

Optional Privilege at Retirement: Upon retirement from service, any unmarried employee, if in good health as determined by medical examination, may elect to receive, on an actuarial equivalent basis in lieu of the full retirement annuity, a reduced retirement annuity payable during the annuitant's lifetime, plus an annuity to a designated beneficiary to become payable at death of the annuitant. The annuity to the beneficiary is to be paid at the same rate and under the same conditions that apply to a survivor of a married member whose death occurs while in service.

Death Benefit – Active and Retired Members Without Survivors: Upon death of a member while in service, leaving no survivors eligible for annuities, the designated beneficiary or estate is entitled to a refund of the contribution credits, plus interest, together with a death benefit of \$1,000 payable in a lump sum.

Upon death of a retired member, if no survivors' annuities are payable, the death benefit to a designated beneficiary or the estate of the member consists of the excess, if any, of: (1) the total contribution credits of the member at retirement, plus interest, over (2) the total amount of annuity payments made to the retired member, plus the sum of \$1,000.

Death Benefit – Inactive Members: Upon the death of an inactive member with at least 20 years of pension credit, and survived by a spouse or minor children, the following benefit options are provided: (a) the surviving spouse or children, as the case may be, may elect to receive the annuities prescribed if the death of a member occurs while in service; or (b) a refund of the deceased member's total contribution credits, plus interest.

Refund of Members' Contributions: Upon complete separation from service, or transfer to the Government of Guam Defined Contribution Fund, a member with less than 25 years of pension credit may receive a refund of the total contributions, plus interest (except that no interest is payable if the total pension credit is less than one year).

Contributions by Members: Each Old DB Plan member shall contribute to the Fund 9½% of salary earned and accruing after October 1, 1997; and at the member's option, 10½% of non-base pay subsequent to October 1, 1997. Each DB 1.75 Plan member shall contribute to the Fund 9½% of salary earned and accruing after January 1, 2018.

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APPENDIX B. ACTUARIAL COST METHOD AND ASSUMPTIONS

	September 30, 2017		September 30, 2016	
Actuarial Cost Method	Entry Age Normal		Entry Age Normal	
Interest Rate	7.00%		7.00%	
Long-term Expected Rate of Return on Plan Assets	7.00%		7.00%	
Salary Increases	<u>Service</u>	<u>% Increase</u>	<u>Service</u>	<u>% Increase</u>
	0 – 5	7.5%	0 – 5	7.5%
	6 – 10	6.0%	6 – 10	6.0%
	11 – 15	5.0%	11 – 15	5.0%
	16 – 20	4.0%	16 – 20	4.0%
	Over 20	4.0%	Over 20	4.0%
Total Payroll Growth (DB and DC)	2.75%		2.75%	
Cost of Living Adjustment	Specified in Plan		Specified in Plan	
Mortality	RP-2000 Combined Healthy table +3 for males +2 for females projected generationally using 30% of Scale BB		RP-2000 Combined Healthy table +3 for males +2 for females projected generationally using 30% of Scale BB	
Disability Incidence	1974-78 SOA LTD Non-Jumbo, with rates reduced by 50% for males and 75% for females		1974-78 SOA LTD Non-Jumbo, with rates reduced by 50% for males and 75% for females	
Post-disability mortality	RP-2000 Disabled table +6 for males +4 for females projected generationally using 30% of Scale BB		RP-2000 Disabled table +6 for males +4 for females projected generationally using 30% of Scale BB	
Withdrawal Rates	Service-based rates (see attached)		Service-based rates (see attached)	
Retirement Age	50% assumed to retire at earliest eligibility for unreduced benefits.		50% assumed to retire at earliest eligibility for unreduced benefits.	
	20% per year thereafter until age 75		20% per year thereafter until age 75	
	100% at age 75		100% at age 75	

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	September 30, 2017	September 30, 2016
Return of Contributions	<p>100% of current Old DB Plan employees who withdraw before retirement and who have less than 20 years of service are assumed to elect a return of contributions</p> <p>Terminated or inactive members with at least 5 years of service and an account balance of at least \$10,000 and who have not withdrawn their contributions are assumed to retire upon eligibility for unreduced benefits. All other employees who have previously withdrawn are assumed to elect a return of contributions.</p> <p>Contributions earn 4.5% interest</p>	<p>100% of current employees who withdraw before retirement and who have less than 20 years of service are assumed to elect a return of contributions</p> <p>Terminated or inactive members with at least 5 years of service and an account balance of at least \$10,000 and who have not withdrawn their contributions are assumed to retire upon eligibility for unreduced benefits. All other employees who have previously withdrawn are assumed to elect a return of contributions.</p> <p>Contributions earn 4.5% interest</p>
Marital Status	<p>Retiree data included spouse information. For active employees, 75% are assumed to have spouses at retirement. The assumed age difference is 3 years (+3 for a male spouse; -3 for a female spouse).</p>	<p>Retiree data included spouse information. For active employees, 75% are assumed to have spouses at retirement. The assumed age difference is 3 years (+3 for a male spouse; -3 for a female spouse).</p>
Leave Adjustments	<p>Assumed to add 1.5 years of service (Old DB and DB 1.75) and increase average earnings (Old DB only) by 5% at retirement</p>	<p>Assumed to add 1.5 years of service and increase average earnings by 5% at retirement</p>
Administrative Expenses	<p>\$7,082,000 per year (equal to budgeted expense for year ending 9/30/18), allocated 70% to DB and 30% to DC. In addition, the normal cost for DB 1.75 Plan members is increased by 5% to account for additional expenses.</p>	<p>\$6,344,000 per year (equal to budgeted expense for year ending 9/30/17), allocated 70% to DB and 30% to DC</p>
Survivor Benefit – Minor Children	<p>Assumed to be 0.2 eligible child survivors at time of retiree death, with payments to minor child continuing for 6 years</p>	<p>Assumed to be 0.2 eligible child survivors at time of retiree death, with payments to minor child continuing for 6 years</p>
Asset Valuation Method	<p>3-year phase-in of gains/losses relative to interest rate assumption</p>	<p>3-year phase-in of gains/losses relative to interest rate assumption</p>
Data Inconsistencies	<p>None</p>	<p>None</p>

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Probabilities of Separation from Active Service
(per 100 working at each age)

MALE					FEMALE				
Age	Death	Disability	Service	Withdrawal	Age	Death	Disability	Service	Withdrawal
20	0.04	0.05	0	15.0	20	0.02	0.03	0	15.0
21	0.04	0.05	1	14.0	21	0.02	0.03	1	14.0
22	0.04	0.05	2	13.0	22	0.02	0.03	2	13.0
23	0.04	0.05	3	12.0	23	0.02	0.03	3	12.0
24	0.04	0.05	4	11.0	24	0.02	0.03	4	11.0
25	0.04	0.05	5	10.0	25	0.02	0.03	5	10.0
26	0.04	0.05	6	9.0	26	0.02	0.03	6	9.0
27	0.04	0.05	7	8.0	27	0.02	0.03	7	8.0
28	0.05	0.05	8	7.0	28	0.03	0.03	8	7.0
29	0.06	0.05	9	6.0	29	0.03	0.03	9	6.0
30	0.06	0.05	10	5.0	30	0.04	0.03	10	5.0
31	0.07	0.05	11	4.5	31	0.04	0.03	11	4.5
32	0.08	0.05	12	4.0	32	0.04	0.03	12	4.0
33	0.08	0.05	13	3.5	33	0.05	0.03	13	3.5
34	0.09	0.05	14	3.0	34	0.05	0.03	14	3.0
35	0.10	0.05	15	2.5	35	0.06	0.03	15	2.5
36	0.10	0.05	16	2.0	36	0.06	0.03	16	2.0
37	0.11	0.05	17	2.0	37	0.06	0.03	17	2.0
38	0.11	0.05	18	2.0	38	0.07	0.03	18	2.0
39	0.12	0.05	19	2.0	39	0.08	0.03	19	2.0
40	0.13	0.10	20 & over	2.0	40	0.09	0.05	20 & over	2.0
41	0.14	0.10			41	0.09	0.05		
42	0.15	0.10			42	0.10	0.05		
43	0.16	0.10			43	0.11	0.05		
44	0.17	0.10			44	0.12	0.05		
45	0.19	0.18			45	0.13	0.09		
46	0.20	0.18			46	0.14	0.09		
47	0.21	0.18			47	0.16	0.09		
48	0.24	0.18			48	0.17	0.09		
49	0.27	0.18			49	0.19	0.09		
50	0.29	0.32			50	0.20	0.16		
51	0.32	0.32			51	0.22	0.16		
52	0.36	0.32			52	0.24	0.16		
53	0.42	0.32			53	0.27	0.16		
54	0.47	0.32			54	0.31	0.16		
55	0.53	0.53			55	0.35	0.27		
56	0.59	0.53			56	0.39	0.27		
57	0.67	0.53			57	0.44	0.27		
58	0.77	0.53			58	0.51	0.27		
59	0.88	0.53			59	0.58	0.27		
60	1.00	0.76			60	0.67	0.38		
61	1.13	0.76			61	0.76	0.38		
62	1.27	0.76			62	0.86	0.38		
63	1.44	0.76			63	0.97	0.38		
64	1.61	0.76			64	1.10	0.38		

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SECTION V. APPENDICES

APPENDIX C. SUMMARY OF PARTICIPANT DATA

Active Non-Uniformed – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	47	34	81	\$ 2,355,210	\$ 1,813,652	\$ 4,168,863
45 – 49	156	215	371	8,366,197	11,824,050	20,190,246
50 – 54	238	316	554	13,762,421	18,528,448	32,290,870
55 – 59	211	240	451	12,277,051	13,899,884	26,176,935
60 – 64	94	160	254	6,095,241	9,182,893	15,278,134
65 – 69	33	68	101	2,358,150	4,025,721	6,383,870
70 & Over	<u>23</u>	<u>24</u>	<u>47</u>	<u>1,573,041</u>	<u>1,434,131</u>	<u>3,007,172</u>
Total	802	1,057	1,859	\$46,787,311	\$60,708,779	\$107,496,089

* Not shown if less than 20 members.

Age	SERVICE									Total
	0 - 4	5 - 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	3	3	9	8	48	10	-	-	-	81
45 – 49	4	7	9	12	156	175	8	-	-	371
50 – 54	7	9	8	19	105	293	103	10	-	554
55 – 59	7	6	11	15	87	191	95	38	1	451
60 – 64	3	6	1	8	48	120	39	20	9	254
65 – 69	1	1	1	3	19	47	17	5	7	101
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>11</u>	<u>18</u>	<u>7</u>	<u>4</u>	<u>7</u>	<u>47</u>
Total	25	32	39	65	474	854	269	77	24	1,859

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Active Uniformed – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	13	-	13	*	*	*
45 – 49	69	2	71	\$ 6,278,367	*	\$ 6,278,367
50 – 54	68	5	73	6,545,966	*	6,545,966
55 – 59	34	3	37	3,305,275	*	3,305,275
60 – 64	4	-	4	*	-	*
65 – 69	-	-	-	*	-	*
70 & Over	<u>1</u>	<u>-</u>	<u>1</u>	<u>*</u>	<u>-</u>	<u>*</u>
Total	189	10	199	\$ 16,129,608	*	\$ 16,129,608

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	SERVICE									Total
	0 – 4	5 – 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	-	-	-	2	7	4	-	-	-	13
45 – 49	-	-	-	1	21	45	4	-	-	71
50 – 54	-	-	-	-	9	42	22	-	-	73
55 – 59	-	-	-	-	5	18	11	3	-	37
60 – 64	-	-	-	-	1	1	-	2	-	4
65 – 69	-	-	-	-	-	-	-	-	-	-
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>1</u>
Total	-	-	-	3	43	110	38	5	-	199

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Active Total – Old DB Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	60	34	94	\$ 3,212,527	\$ 1,813,652	\$ 5,026,179
45 – 49	225	217	442	14,644,564	11,949,818	26,594,382
50 – 54	306	321	627	20,308,387	18,986,742	39,295,129
55 – 59	245	243	488	15,582,327	14,134,986	29,717,312
60 – 64	98	160	258	6,441,668	9,182,893	15,624,561
65 – 69	33	68	101	2,358,150	4,025,721	6,383,870
70 & Over	<u>24</u>	<u>24</u>	<u>48</u>	<u>1,650,521</u>	<u>1,434,131</u>	<u>3,084,652</u>
Total	991	1,067	2,058	\$64,198,143	\$61,527,943	\$125,726,086

* Not shown if less than 20 members.

Age	SERVICE									Total
	0 - 4	5 – 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	-	-	-	-	-	-	-	-	-	-
20 – 24	-	-	-	-	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-	-	-	-	-
40 – 44	3	3	9	10	55	14	-	-	-	94
45 – 49	4	7	9	13	177	220	12	-	-	442
50 – 54	7	9	8	19	114	335	125	10	-	627
55 – 59	7	6	11	15	92	209	106	41	1	488
60 – 64	3	6	1	8	49	121	39	22	9	258
65 – 69	1	1	1	3	19	47	17	5	7	101
70 & Over	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>11</u>	<u>18</u>	<u>8</u>	<u>4</u>	<u>7</u>	<u>48</u>
Total	25	32	39	68	517	964	307	82	24	2,058

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Active – DB 1.75 Plan

Age	COUNT			ANNUAL SALARIES		
	Males	Females	Total	Males	Females	Total
Under 20	3	3	6	*	*	*
20 – 24	44	36	80	\$ 1,091,544	\$ 1,057,817	\$ 2,149,361
25 – 29	172	203	375	5,864,736	6,980,120	12,844,856
30 – 34	176	186	362	7,056,319	7,448,597	14,504,916
35 – 39	190	223	413	8,752,891	9,837,410	18,590,301
40 – 44	231	278	509	12,012,711	13,718,493	25,731,204
45 – 49	273	237	510	16,268,375	11,969,709	28,238,084
50 – 54	219	210	429	13,823,780	11,104,791	24,928,571
55 – 59	164	169	333	9,369,578	8,899,107	18,268,684
60 – 64	97	123	220	6,393,026	6,432,891	12,825,917
65 – 69	40	46	86	2,934,733	2,583,846	5,518,579
70 & Over	<u>24</u>	<u>6</u>	<u>30</u>	<u>1,472,586</u>	<u>*</u>	<u>1,472,586</u>
Total	1,633	1,720	3,353	\$85,040,279	\$80,032,781	\$165,073,059

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	SERVICE									Total
	0 - 4	5 - 9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 20	6	-	-	-	-	-	-	-	-	6
20 – 24	80	-	-	-	-	-	-	-	-	80
25 – 29	313	58	4	-	-	-	-	-	-	375
30 – 34	209	120	33	-	-	-	-	-	-	362
35 – 39	152	107	114	40	-	-	-	-	-	413
40 – 44	136	103	77	132	61	-	-	-	-	509
45 – 49	114	82	102	84	107	20	1	-	-	510
50 – 54	74	84	85	66	73	34	13	-	-	429
55 – 59	36	59	73	61	61	33	10	-	-	333
60 – 64	27	34	43	47	44	17	8	-	-	220
65 – 69	4	12	22	23	17	6	2	-	-	86
70 & Over	<u>1</u>	<u>3</u>	<u>6</u>	<u>7</u>	<u>10</u>	<u>1</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>30</u>
Total	1,152	662	559	460	373	111	36	-	-	3,353

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SECTION V. APPENDICES

Service Retirees

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	-	1	1	-	*	*
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	-	-	-	-	-	-
45 – 49	9	3	12	*	*	*
50 – 54	118	57	175	\$ 5,931,956	\$ 2,266,716	\$ 8,198,671
55 – 59	275	196	471	12,926,792	7,672,342	20,599,134
60 – 64	453	446	899	18,792,931	16,170,397	34,963,329
65 – 69	578	596	1,174	21,637,564	19,284,827	40,922,391
70 – 74	427	522	949	15,559,956	16,346,425	31,906,382
75 – 79	306	367	673	11,201,190	10,593,246	21,794,436
80 – 84	207	261	468	6,113,211	6,728,512	12,841,723
85 – 89	104	144	248	2,871,850	3,605,199	6,477,049
90 & Over	<u>50</u>	<u>77</u>	<u>127</u>	<u>1,302,195</u>	<u>1,627,983</u>	<u>2,930,178</u>
Total	2,527	2,670	5,197	\$96,337,646	\$84,295,646	\$180,633,293

* Not shown if less than 20 members. The totals only sum the cells that are displayed. Payees receiving benefits under Qualified Domestic Relations Orders (QDROs) are included with service retirees.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	1	-	-	-	-	1
40 – 44	-	-	-	-	-	-	-	-	-	-
45 – 49	-	1	1	1	-	1	3	-	5	12
50 – 54	-	3	5	12	10	12	33	30	70	175
55 – 59	-	1	8	25	45	53	109	103	127	471
60 – 64	3	7	30	41	99	122	222	180	195	899
65 – 69	3	16	57	85	124	196	329	208	156	1174
70 – 74	1	11	52	80	142	161	247	140	115	949
75 – 79	1	8	55	83	103	103	159	79	82	673
80 – 84	-	15	68	92	68	71	89	34	31	468
85 – 89	-	2	47	58	44	21	40	19	17	248
90 & Over	<u>-</u>	<u>-</u>	<u>34</u>	<u>38</u>	<u>14</u>	<u>16</u>	<u>15</u>	<u>4</u>	<u>6</u>	<u>127</u>
Total	8	64	357	515	650	756	1,246	797	804	5,197

This work product was prepared solely for the Government of Guam Retirement Fund for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing this Milliman work product.

SECTION V. APPENDICES

Disabled Retirees

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	1	-	1	*	-	*
45 – 49	1	4	5	*	*	*
50 – 54	11	4	15	*	*	*
55 – 59	11	9	20	*	*	*
60 – 64	25	18	43	\$ 651,811	*	\$ 651,811
65 – 69	24	28	52	636,352	\$ 568,755	1,205,107
70 – 74	18	23	41	*	521,398	521,398
75 – 79	16	20	36	*	386,106	386,106
80 – 84	8	10	18	*	*	*
85 – 89	3	6	9	*	*	*
90 & Over	<u>-</u>	<u>2</u>	<u>2</u>	<u>-</u>	<u>*</u>	<u>*</u>
Total	118	124	242	\$1,288,163	\$1,476,259	\$2,764,422

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	-	-	-	-	-	-
40 – 44	-	-	-	1	-	-	-	-	-	1
45 – 49	-	-	-	4	1	-	-	-	-	5
50 – 54	-	-	-	3	3	4	4	1	-	15
55 – 59	-	-	1	6	5	5	-	1	2	20
60 – 64	-	-	2	16	9	7	6	2	1	43
65 – 69	-	-	7	18	11	8	5	2	1	52
70 – 74	-	-	5	12	6	10	7	-	1	41
75 – 79	-	-	4	17	13	0	2	-	-	36
80 – 84	-	-	4	5	3	4	2	-	-	18
85 – 89	-	-	7	1	1	-	-	-	-	9
90 & Over	<u>-</u>	<u>-</u>	<u>1</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2</u>
Total	-	-	31	84	52	38	26	6	5	242

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SECTION V. APPENDICES

Surviving Spouses and Child Pensioners

Age	COUNT			ANNUAL BENEFITS**		
	Males	Females	Total	Males	Females	Total
Under 25	78	92	170	\$ 224,640	\$ 264,960	\$ 489,600
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	6	6	-	*	*
40 – 44	-	11	11	-	*	*
45 – 49	3	39	42	*	635,527	635,527
50 – 54	4	63	67	*	1,068,533	1,068,533
55 – 59	14	102	116	*	1,880,704	1,880,704
60 – 64	18	171	189	*	3,389,339	3,389,339
65 – 69	42	233	275	641,605	4,301,405	4,943,009
70 – 74	38	217	255	634,435	3,813,324	4,447,758
75 – 79	54	174	228	858,907	3,051,808	3,910,715
80 – 84	38	173	211	554,898	2,650,734	3,205,632
85 – 89	40	123	163	611,535	1,805,283	2,416,818
90 & Over	<u>20</u>	<u>87</u>	<u>107</u>	<u>295,508</u>	<u>1,242,215</u>	<u>1,537,722</u>
Total	349	1,491	1,840	\$3,821,527	\$24,103,832	\$27,925,359

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

** Annual benefits shown do not include ad hoc COLAs or Supplemental Annuity Payments.

Surviving Spouses Only

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	2	2	1	1	-	-	-	-	6
40 – 44	-	2	4	3	-	1	1	-	-	11
45 – 49	-	5	15	13	6	2	1	-	-	42
50 – 54	-	12	24	15	6	3	7	-	-	67
55 – 59	-	8	38	33	22	11	1	2	1	116
60 – 64	-	9	67	43	37	8	17	4	4	189
65 – 69	-	19	106	62	46	23	16	1	2	275
70 – 74	1	16	110	59	37	15	14	2	1	255
75 – 79	-	18	97	54	32	13	10	3	1	228
80 – 84	-	28	107	44	12	14	6	-	-	211
85 – 89	-	16	91	35	11	7	1	2	-	163
90 & Over	<u>-</u>	<u>6</u>	<u>71</u>	<u>20</u>	<u>8</u>	<u>1</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>107</u>
Total	1	141	732	382	218	98	75	14	9	1,670

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SECTION V. APPENDICES

Inactive and Terminated Members Who are Assumed Not to Withdraw Contributions

Age	COUNT			ANNUAL BENEFITS		
	Males	Females	Total	Males	Females	Total
Under 25	-	-	-	-	-	-
25 – 29	-	-	-	-	-	-
30 – 34	-	-	-	-	-	-
35 – 39	-	-	-	-	-	-
40 – 44	2	1	3	*	*	*
45 – 49	16	14	30	*	*	*
50 – 54	18	15	33	*	*	*
55 – 59	22	13	35	\$ 311,245	*	311,245
60 – 64	5	5	10	*	*	*
65 – 69	5	4	9	*	*	*
70 – 74	2	1	3	*	*	*
75 – 79	1	2	3	*	*	*
80 – 84	2	-	2	*	-	*
85 – 89	-	-	-	-	-	-
90 & Over	-	-	-	-	-	-
Total	73	55	128	\$311,245	-	\$311,245

* Not shown if less than 20 members. The totals only sum the cells that are displayed.

Age	ANNUAL BENEFIT LEVEL									Total
	<\$5k	\$5-10k	\$10-15k	\$15-20k	\$20-25k	\$25-30k	\$30-40k	\$40-50k	\$50k+	
Under 40	-	-	-	-	-	-	-	-	-	-
40 – 44	-	1	1	-	1	-	-	-	-	3
45 – 49	4	11	9	3	1	1	1	-	-	30
50 – 54	3	8	5	7	3	3	3	1	-	33
55 – 59	2	10	8	5	6	3	1	-	-	35
60 – 64	2	2	4	-	-	-	1	-	1	10
65 – 69	2	6	1	-	-	-	-	-	-	9
70 – 74	1	1	-	-	-	-	1	-	-	3
75 – 79	2	-	-	-	-	1	-	-	-	3
80 – 84	-	2	-	-	-	-	-	-	-	2
85 – 89	-	-	-	-	-	-	-	-	-	-
90 & Over	-	-	-	-	-	-	-	-	-	-
Total	16	41	28	15	11	8	7	1	1	128

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APPENDIX D. GLOSSARY OF KEY TERMS

Actuarial Accrued Liability or Total Pension Liability. The Present Value of Future Benefits allocated to past service in accordance with the actuarial cost method. GASB 67 uses the term Total Pension Liability.

Actuarial Cost Method. A method of allocating the present value of benefits to past and future periods. Actuarial cost methods take into consideration the effect of wage inflation.

Actuarial Gains and Losses. Changes to the Actuarial Accrued Liability due to deviations from the actuarial assumptions. These can include gains and losses from investments, employee turnover, disability, retirement, mortality, and administrative expenses.

Actuarial Value of Assets. A method of valuing Fund assets that may smooth gains and losses that occur in the market value over a period of time.

GASB. Government Accounting Standards Board. GASB Statements No. 67, and 68 are accounting standards issued by GASB that require certain items be disclosed in the Fund's financial statements.

Fiduciary Net Position. The market value of Fund assets.

Net Pension Liability. The dollar value of the Total Pension Liability that exceeds the market value of Fund assets. A fully funded plan will have no Net Pension Liability.

Normal Cost or Service Cost. The value of benefits earned for one year of service. The normal cost is calculated in accordance with the actuarial cost method. The accumulation of all normal costs assigned to past service equals the Actuarial Accrued Liability. GASB 68 uses the term Service Cost.

Present Value of Benefits. The sum of all benefits expected to be paid in the future by the retirement system, with the payments discounted to the present using the valuation interest rate. This includes benefits to be earned in the future for current employees.

Present Value of Future Normal Cost. The sum of all future normal costs expected for current employees, with the costs discounted back to the present using the valuation interest rate.

Security Ratio. The percentage of the Actuarial Accrued Liability that is funded by the Fund assets. A fully funded plan will have a security ratio of 100%.

Unfunded Actuarial Accrued Liability. The dollar value of the Actuarial Accrued Liability that exceeds the Actuarial Value of Assets. A fully funded plan will have no unfunded actuarial accrued liability.