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South Dakota Department of Labor, Job Service, Unemployment Division, and Office of Administrative Services Retirement Plan

Actuarial Valuation Report

July 1, 2017

Prepared by Deloitte Consulting LLP **May 2018**

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Actuarial Valuation Opinion

This report presents the results of the actuarial valuation of the South Dakota Department of Labor Job Service, Unemployment Division, and Office of Administrative Services Retirement Plan ("the Plan") as of July 1, 2017. In our opinion, this report is complete and accurate and represents fairly the actuarial position of the Plan for the purposes stated herein.

This actuarial valuation has been prepared based upon participant data and asset information provided by the South Dakota Department of Labor and the Principal Financial Group as of July 1, 2017. The actuary has analyzed the data and other information provided for reasonableness, but has not independently audited the data. The actuary has no reason to believe the data or other information provided is not complete and accurate, and knows of no further information that is essential to the preparation of the actuarial valuation.

In our opinion, all costs, liabilities, rates of interest, and other factors underlying these actuarial computations have been determined on the basis of actuarial assumptions and methods, which are each reasonable (or consistent with authoritative guidance) taking into account the experience of the Plan.

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 operations of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

Our scope did not include analyzing the potential range of such future measurements, and we did not perform that analysis.

The undersigned with actuarial credentials meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report was prepared solely for the benefit and internal use of the plan sponsor. This report is not intended for the benefit of any other party and may not be relied upon by any third party for any purpose, and Deloitte Consulting accepts no responsibility or liability with respect to any party other than the plan sponsor.

To the best of our knowledge, no employee of the Deloitte U.S. Firms is an officer or director of the employer. In addition, we are not aware of any relationship between the Deloitte U.S. Firms and the employer that may impair or appear to impair the objectivity of the work detailed in this report.

DELOITTE CONSULTING LLP

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Summary of Actuarial Valuation Results

		7/1/2016 Valuation	7/1/2017 Valuation
Participant Data			
A.	Active Participants	8	6
B.	Retirees and Beneficiaries	216	209
C.	Vested Terminated Participants	1	1
D.	Total Participants	225	216
E.	Payroll	$ 403,647	$ 294,986
Asset Information			
A.	Fair Market Value of Assets	$ 55,961,173	$ 57,686,227
Contribution Requirements			
A.	Present Value of Employer Future Cost	$ 0	$ 0
B.	Recommended Contribution for Plan Year	$ 0	$ 0
C.	Unfunded Actuarial Liability	$ 0	$ 0
Present Value of Accumulated Benefits			
A.	Present Value of Vested Accumulated Benefits	$ 54,518,920	$ 56,740,943
B.	Present Value of Nonvested Accumulated Benefits	$ 0	$ 0
C.	Total Present Value of Accumulated Benefits	$ 54,518,920	$ 56,740,943

Background and Comments

Background

The plan was frozen to new participants effective July 1, 1980.

Effective March 1, 1987, the South Dakota Department of Labor Job Service, Unemployment Division, and Office of Administrative Services Retirement Plan was separated into two plans. One plan (this plan) covered all active participants and vested terminations as of January 1, 1987, while the other covered all participants retired as of January 1, 1987. Effective April 1, 1987, the retired life plan was terminated. Annuities were purchased to cover the monthly benefit amounts for participants in the retired life plan.

This actuarial valuation report shows the liabilities and assets as of July 1, 2017 for the "active life" plan. This plan covers all participants who had not retired as of January 1, 1987, plus any cost-of-living increases granted after January 1, 1987 to pre-1987 retirees.

The plan was amended, effective February 20, 2013, to grant asset-based annual cost of living adjustments (COLAs), subject to Employee Retirement Board approval, with a maximum annual COLA of 3.5%.

Funded Status of Plan

As of July 1, 2017, the present value of projected benefits is less than the sum of the actuarial value of assets and the present value of future employee contributions. Thus, no future employer contributions are expected to be required, based on the actuarial assumptions outlined in Exhibit 2 of the Appendix.

Table 7 shows that the plan assets exceeded plan liabilities as of July 1, 2017 by $0.5 million, based on the actuarial assumptions and methods outlined in Exhibits 2 and 3 of the Appendix (as of July 1, 2016, the plan assets exceeded plan liabilities by $0.8 million). The components that create this $0.3 million loss are as follows:

- A gain of $3.6 million due to asset returns more favorable than expected (actual 11.54% vs. 4.75% expected);
- A loss of $0.3 million due to demographic changes primarily caused by higher than expected July 1, 2017 COLA (actual 1.0% vs. 0.6% expected);
- A gain of $0.5 million due to the change in mortality projection scale assumption from MP-2016 to MP-2017 to reflect the most current publicly available table; and
- A loss of $4.1 million due to the change in COLA assumption (this change is a function of the COLA methodology, which is expected to pay higher COLAs when liabilities decrease and lower COLAs when liabilities increase).

Governmental Accounting Standards Board (GASB) Requirements

GASB Statement Nos. 67 and 68, which are effective for fiscal years beginning after June 15, 2013 and 2014, respectively, replace GASB Statement Nos. 25 and 27 and require governmental defined benefit plans and employers to disclose additional information in both the footnote and required supplementary information sections of their financial statements.

GASB information is no longer provided in this report as the plan does not issue stand-alone financial statements. Furthermore, the State has informed us that they do not intend to disclose any information for this plan under GASB 67/68 because "SDCL 61-2-15 specifies that no obligation may be incurred against the State's General Fund to pay for this program. The assets of the plan are not included in the State's financial statements because the assets are remitted to a third-party who administers the plan for the participants. The State has no liability for losses under the plan."

Participant Data

Comparison of Plan Participant Information

Employees of the South Dakota Department of Labor Job Services Division, Unemployment Division, and Office of Administrative Services Division who were hired before July 1, 1980 are eligible to participate in the plan. Table 1 displays various data concerning the participant group.

Table 1

	7/1/2016	7/1/2017
Active participants	8	6
Vested terminated participants	1	1
Retired participants and beneficiaries*	216	209
Data for active participants:		
Total payroll	$403,647	$294,986
Average salary	$50,456	$49,164
Average age	63.47	64.34
Average past service	37.81	38.58
Data for retired participants and beneficiaries in "new" plan:		
Average monthly benefit including COLAs	$1,882	$1,898
Average age	72.15	72.22
Data for retired participants and beneficiaries in "old" plan:		
Average monthly COLA benefit only	$862	$818
Average age	86.49	87.40

* A total of 33 (40 as of 7/1/2016) of the retired participants and beneficiaries receive monthly payments from annuities purchased when the retired life plan was terminated in 1987. Only cost-of-living adjustments granted after January 1, 1987 are included as liabilities of this plan.

Reconciliation of Participants

Table 2 reconciles the number of plan participants as of July 1, 2017 with the number of participants as of the previous valuation date.

Table 2

	Actives	Vested Terminations	Retirees	Beneficiaries
Participants as of July 1, 2016	8	1	183	33
Vested terminations				
Retired	(2)		2	
Deaths with beneficiar(y/ies)			(5)	6
Deaths without beneficiary			(9)	(1)
Data corrections	___	___	___	___
Participants as of July 1, 2017	6	1	171	38

Service Groups by Age Groups

Table 3 displays the distribution of active participants by age and service.

Table 3

Age Group	30+ Years of Service
55-59	1
60-64	1
65+	4
Total	6

Asset Information

Value of Assets as of June 30, 2017

Table 4 shows the fair market value of assets as of June 30, 2017, as reported by Principal Life Insurance Company.

Table 4

Large U.S. Equity		
Equity Income Account	$	4,090,528
Large-Cap Value Account		3,934,884
Large-Cap S&P 500		3,506,569
Large-Cap Growth I Account		8,739,106
Small/Mid U.S. Equity		
Mid-Cap Value III Account		1,178,958
Mid-Cap Growth III Account		1,234,779
Small-Cap Value II Account		551,921
Small-Cap Growth I Account		621,584
International Equity		
International Emerging Markets Account		1,058,863
Overseas Account		6,167,459
International Small-Cap Account		1,127,275
Balanced/Asset Allocation		
Diversified Real Asset Account		1,173,659
Fixed Income		
High Yield I Account		2,316,996
Bond Market Index Account		4,595,258
Core Plus Bond Account		13,909,171
U.S. Property Account		3,479,217
Total Value of Assets as of June 30, 2017	**$**	**57,686,227**

Summary of Transactions for the Year Ended June 30, 2017

Table 5 is a summary of the transactions of the funds from July 1, 2016 through June 30, 2017.

Table 5

(a)	Total Value of Assets as of July 1, 2016				$	55,961,173
(b)	Income					
	(i)	Employer contributions	$	0		
	(ii)	Payment refunds and other additions		11,271		
	(iii)	Investment income		6,186,463		
	(iv)	Total income	$	6,197,734		
(c)	Disbursements					
	(i)	Payments	$	4,429,441		
	(ii)	Expenses		43,239		
	(iii)	Total disbursements	$	4,472,680		
(d)	Total Value of Assets as of June 30, 2017				$	57,686,227

The rate of return on plan assets from July 1, 2016 through June 30, 2017 as calculated by Principal Financial Group was 11.54%.

Contribution Requirements

The present value of projected benefits represents the expected cost of all benefits to be paid from the plan, based on the actuarial assumptions used in the valuation. As of July 1, 2017, the present value of projected benefits is less than the sum of the actuarial value of assets and the present value of future employee contributions. Thus, no future employer contributions are expected to be required, based on the actuarial assumptions outlined in Exhibit 2 of the Appendix.

Plan Costs as of July 1, 2017

Table 6 shows the determination of the future employer obligation at the current valuation date.

Table 6

(a)	Present Value of Projected Benefits		
	(i) Active participants	$	3,702,841
	(ii) Retirees and beneficiaries		53,512,956
	(iii) Vested terminations		118,129
	Total	$	57,333,926
(b)	Actuarial Value of Assets		57,686,227
(c)	Present Value of Total Future Cost: (a) - (b), not less than $0		0
(d)	Present Value of Future Employee Contributions		0
(e)	Present Value of Employer Future Cost: (c) - (d), not less than $0	$	0

Recommended Contribution for Plan Year Ending June 30, 2018

The recommended employer contribution is the employer normal cost, plus a 25-year amortization payment toward the unfunded actuarial liability if an unfunded liability is expected as of the end of the plan year. Table 7 develops this contribution for the July 1, 2017 to June 30, 2018 plan year. The normal cost and unfunded actuarial liability are determined based on the entry age actuarial cost method, which provides for level annual costs as a percentage of payroll. This method is described in detail in Exhibit 3 of the Appendix.

Table 7

I.	Recommended employer contribution, before test of unfunded liability			
	(a)	Total normal cost	$	41,089
	(b)	Expected employee contributions		0
	(c)	Employer normal cost (a) – (b)	$	41,089
	(d)	25-year amortization payment toward unfunded actuarial liability		N/A*
	(e)	Interest to June 30, 2018 on (c) + (d)		1,952
	(f)	Recommended employer contribution, before test of unfunded liability: (c) + (d) + (e), but not less than $0	$	43,041
II.	Test of unfunded liability			
	(g)	Unfunded actuarial liability		
		(i) Actuarial liability as of July 1, 2017	$	57,179,656
		(ii) Actuarial value of assets as of July 1, 2017		57,686,227
		(iii) Unfunded actuarial liability: (i) - (ii)	$	(506,571)
	(h)	Interest to June 30, 2018 on (c) + (g)		(22,110)
	(i)	Expected unfunded liability as of June 30, 2018: (c) + (g) + (h), but not less than $0	$	0
III.	Recommended employer contribution: lesser of (f) and (i)		$	0

Present Value of Accumulated Benefits

The actuarially computed value of accumulated benefits as of July 1, 2017 is $56,740,943. All participants of the plan are fully vested. When the fair market value of assets of $57,686,227 is deducted, the unfunded vested liability is $0.

Present Value of Accumulated Benefits as of July 1, 2017

Table 8 shows the present value of vested and accumulated benefits as of July 1, 2017.

Table 8

	Number of Vested Participants	**Actuarial Present Value**
Retirees and Beneficiaries*	209	$ 53,512,956
Terminated Participants with Vested Benefits	1	118,129
Active Participants	6	3,109,858
Total Present Value of Vested Accumulated Benefits	216	$ 56,740,943
Present Value of Nonvested Accumulated Benefits		0
Total Present Value of Accumulated Benefits		$ 56,740,943

The present values in Table 8 were computed using the actuarial assumptions set forth in Exhibit 2, except that no future salary increases are assumed.

* A total of 33 of the retired participants receive monthly benefits from annuities purchased when the retired life plan was terminated in 1987. Only cost-of-living increases granted after January 1, 1987 are included for these participants as liabilities of this plan.

Determination of Cost of Living Adjustment for July 1, 2018

Present Value of Future Benefits for Related Cost of Living Adjustments as of April 15, 2018

The plan was amended, effective February 20, 2013, to grant asset-based annual cost of living adjustments (COLAs), subject to Employee Retirement Board approval, with a maximum annual COLA of 3.5%.

Table 9 provides the Present Value of Future Benefits (PVFB) using the Settlement-Based Discount Rate (4.0%) and projected to April 15, 2018 under all possible COLAs from 0.1% to 3.5%. If the Employee Retirement Board approves, the COLA to be paid on July 1, 2018 will be the largest rate for which the average of the Plan's asset value as of the close of market for each day of the month of April 2018 exceeds the PVFB shown.

Table 9

COLA	PVFB	COLA	PVFB
0.10%	48,944,000	1.90%	58,713,000
0.20%	49,423,000	2.00%	59,335,000
0.30%	49,909,000	2.10%	59,967,000
0.40%	50,401,000	2.20%	60,608,000
0.50%	50,901,000	2.30%	61,260,000
0.60%	51,408,000	2.40%	61,921,000
0.70%	51,922,000	2.50%	62,592,000
0.80%	52,444,000	2.60%	63,274,000
0.90%	52,973,000	2.70%	63,966,000
1.00%	53,510,000	2.80%	64,670,000
1.10%	54,055,000	2.90%	65,384,000
1.20%	54,607,000	3.00%	66,109,000
1.30%	55,168,000	3.10%	66,846,000
1.40%	55,737,000	3.20%	67,595,000
1.50%	56,315,000	3.30%	68,355,000
1.60%	56,901,000	3.40%	69,128,000
1.70%	57,496,000	3.50%	69,913,000
1.80%	58,100,000		

Appendices

Exhibit 1: Summary of the Principal Provisions of the Plan

Effective Date	March 1, 1987. Last amended effective February 20, 2013.
Covered Employees	Full-time employees of the South Dakota Department of Labor, Job Service, Unemployment Insurance Division, and Office of Administrative Services hired before July 1, 1980 who had not retired before January 1, 1987. Cost of living increases granted after January 1, 1987 for retirees as of January 1, 1987 are also paid from this plan.
Credited Service	The number of years and months of service before August 1, 1961, plus the number of years and months of service after August 1, 1961.
Average Monthly Compensation	Average of monthly compensation for the five consecutive years which produce the highest average.
Participant Contributions	No required contributions shall be made by participants on or after January 1, 1990. These contributions are considered picked-up by the employer under IRC section 414(h)(2).
Normal Retirement Benefit	Eligibility: Earliest of the following: a) attained age 65, or b) attained age 62 and completed 10 years of Credited Service, or c) attained age 60 and completed 20 years of Credited Service, or d) attained age 55 and completed 30 years of Credited Service. Form: Monthly annuity guaranteed for 10 years and life thereafter; optional forms may be elected in advance of retirement. Benefit: 2.0% of the five-year Average Monthly Compensation times years of Credited Service.
Accrued Benefit	The accrued benefit at any date is the Normal Retirement Benefit earned through that date.
Early Retirement Benefit	Eligibility: Within 10-year period before normal retirement date. Form: Same as Normal Retirement Benefit. Benefit: Accrued Benefit on early retirement date reduced by 1/6 of 1% corresponding to the number of months that the early retirement date precedes the normal retirement date.
Late Retirement Benefit	Eligibility: Any time after normal retirement date. Form: Same as Normal Retirement Benefit. Benefit: Accrued benefit as of the late retirement date.
Termination Benefit	Eligibility: Less than five years of service. Form: Lump sum. Benefit: Return of employee contributions with interest. Eligibility: Five or more years of service. Form: Same as Normal Retirement Benefit with commencement deferred until normal retirement date. Benefit: Equal to the sum of: a) The amount of retirement annuity which could be provided at normal retirement date by the participant's contribution accumulation, and b) The excess, if any, of the Accrued Benefit as of the date of termination over a) above.

Exhibit 1 (continued)

Disability Benefit	Form:	Same as Normal Retirement Benefit with commencement deferred until normal retirement date.
	Benefit:	Accrued Benefit assuming the participant continued to accrue Credited Service up to their normal retirement date, using monthly compensation as of date of disablement to calculate benefit.
Death Benefit	Form:	Single-sum payment in addition to Spouse and/or Dependent Child Death Benefit.
	Benefit:	Participant's Required Contribution Account on the date he died shall be payable to the Participant's Beneficiary.
Spouse Death Benefit	Eligibility:	Must have been married at least one year.
	Form:	Monthly annuity payable until the earlier of the death of the spouse or the remarriage of the spouse, if before age 60.
	Benefit:	For participants whose latest date of employment occurred before age 47, the greater of: a) 55% of the Accrued Benefit (using the Average Monthly Compensation for the five consecutive years which produces the highest average) on the date of death, or b) 22% of Average Monthly Compensation on date of death. For participants whose latest date of employment occurred after age 47: 55% of the amount which would have been paid had the participant survived and remained employed to age 60, assuming his Average Monthly Compensation did not change.
Dependent Child Death Benefit	Eligibility:	Participant has at least one dependent child that has not attained age 19 (age 24 for a child who is attending school on a full-time basis).
	Form:	If dependent child of participant who did not have a spouse on the date of death, temporary monthly annuity until the youngest dependent child attains age 22. If dependent child of participant who did have a spouse on the date of death, temporary monthly annuity until the youngest dependent child is no longer considered a dependent child.
	Benefit:	For dependent children of a participant who has a spouse on the date of death, the least of: a) 60% of Average Monthly Compensation on date of death divided by number of dependent children, or b) $75, or c) $225 divided by number of children. For dependent children of a participant who does not have a spouse on the date of death, the least of: a) 75% of Average Monthly Compensation on date of death divided by number of dependent children, or b) $90, or c) $270 divided by the number of dependent children.
Additional Death Benefit	Eligibility:	Participant with 10 years of Credited Service as of July 1, 1976, no spouse or dependent children.
	Form:	Monthly annuity to beneficiary payable for 10 years.
	Benefit:	Accrued Benefit on June 30, 1976, using Average Monthly Compensation on July 1, 1976.

Exhibit 1 (continued)

Cost of Living	Effective February 20, 2013, the plan was amended to grant cost of living adjustments to retirees and beneficiaries each July 1, subject to Employee Retirement Board approval, in the amount of the lesser of a or b rounded down to the nearest 0.1%, but not less than 0%: a) 3.5% b) The adjustment factor determined such that the following two items are equal: i) The average of the Plan’s asset value as of the close of market for each day of the month of April immediately preceding the July 1 adjustment date. ii) The Plan's present value of future benefits as of the April 15 immediately preceding the Adjustment Date, which is determined by adjusting the present value of future benefits from the Plan's most recent actuarial valuation report to the April 15 immediately preceding the Adjustment Date for interest and expected benefit payments, and by using the Settlement-Based Discount Rate from the most recent actuarial valuation report and a future cost of living adjustment assumption, which is determined in order to equate the liabilities to the assets.
Changes from Prior Valuation	None.

Exhibit 2: Statement of Actuarial Assumptions

Investment Return	4.75% until July 1, 2027 and 4% thereafter.
Settlement-Based Discount Rate	4.0%.
Inflation Rate	2.0%.
Mortality	Mortality rates are based on RP-2014 Employees and Healthy Annuitants tables for males and females without collar or amount adjustments, using RP-2014 rates published in the final RP-2014 report adjusted to the 2006 base year by factoring out the projection under Scale MP-2014 as described in Section 8.3 of the Society of Actuaries' Retirement Plans Experience Committee ("RPEC") Response to Comments on RP-2014 Mortality Tables Exposure Draft, with generational mortality improvements using the most recent scale published by the Society of Actuaries' RPEC (Scale MP-2017 as of July 1, 2017).
Termination:	Table 7 from the Actuary's Pension Handbook. Sample rates are as follows:

Age	Percentage of Participants Expected to Terminate in One Year
25	9.67%
30	9.30
35	8.71
40	7.75
45	6.35
50	4.23
55	1.55
60	0.15

Retirement	100% on the expected retirement date as provided by SDDOL for each active employee and 2.5% in each year prior to the expected retirement date. The expected retirement ages range from age 65 to age 70, with an average expected retirement age of 67.
Salary Scale	3.5% per annum.
Disability	None.
Expenses	None – investment return assumption is net of expenses.
Spouse Death Benefits	Males are assumed to be three years older than their female spouses.
Dependent Death Benefits	Dependent status for those children currently receiving benefits is assumed to cease at the later of age 22 and 1 year after the valuation date. Ten percent of participants are assumed to have dependent children. All participants with dependent children are assumed to be survived by a spouse. Dependent status period for children is assumed to be three years from date of participant death.

Exhibit 2 (continued)

Cost of Living	Assumed adjustments are as follows: **July 1st** / **Expected COLA in each year** 2018: 1.4% 2019: 1.5 2020: 1.6 2021: 1.7 2022: 1.8 2023: 1.8 2024: 1.9 2025: 2.0 2026: 2.1 2027+: 2.2
Assets	Market value.
Return on Employee Contributions	4.0% per annum.
Data Adjustments	Principal Financial Group provides census data annually as of July 1 before inclusion of the current year's COLA, if applicable. On May 31, 2017, the Employee Retirement Board approved a COLA adjustment of 1.0% effective July 1, 2017. We applied this COLA adjustment to the appropriate benefit payment amounts provided to us.
Changes from Prior Valuation	• Mortality projection scale was updated to use the most recent scale published by the Society of Actuaries' Retirement Plans Experience Committee, Scale MP-2017 as of July 1, 2017 (previously Scale MP-2016).

Cost of Living – assumed adjustments:

July 1st	Expected COLA in each year
2018	1.4%
2019	1.5
2020	1.6
2021	1.7
2022	1.8
2023	1.8
2024	1.9
2025	2.0
2026	2.1
2027+	2.2

Exhibit 3: Rationale for Assumptions

Rationale for significant assumptions is described below.

Investment Return	July 1, 2027 and before: The investment return was determined using the weighted average of the expected return of the Plan's target asset allocation, provided by the Plan's investment advisor, Principal Financial Group. After July 1, 2027: The plan is expected to be settled by July 1, 2027. The investment return is assumed to be the expected settlement-based discount rate.
Settlement-Based Discount Rate	The settlement-based discount rate was determined using a building block approach with a 2.0% long-term inflation assumption and a 2.0% long-term risk premium (mid-term government bonds).
Inflation Rate	The inflation rate was determined based on the assumption provided by the Plan's investment advisor, Principal Financial Group as of December 2016 (1.95%), and the Congressional Budget Office's economic outlook from 2016 through 2026 (2.00%).
Mortality	The RP-2014 and MP-2014 tables were released by the Retirement Plans Experience Committee ("RPEC") of the Society of Actuaries in October 2014. The RP-2014 tables continue to represent the most current and complete benchmarks of U.S. private pension plan mortality experience. The plan is not sufficiently large to have fully credible mortality experience. The plan population is predominantly a blue collar workforce. RPEC has released annual updates to the MP-2014 mortality improvement scale each October since 2014. RPEC released Mortality Improvement Scale MP-2017 in October 2017 as an update to the MP-2016 scale. The MP-2017 scale includes an additional year (2015) of experience compared to the experience considered in the development of Scale MP-2016, which included experience through 2014. Therefore, Scale MP-2017 incorporates the most current available information from the Social Security Administration (SSA), extended further by RPEC using a methodology similar to that used by SSA.
Retirement	The expected retirement date was provided by SDDOL for each active employee.
Cost of Living	The cost of living adjustment in each year was determined as the minimum of 3.5% or the adjustment factor such that the projected present value of future benefits after adjustment is equal to projected asset value on April 15th of each year, in accordance with the plan provisions.

Exhibit 4: Statement of Actuarial Funding Method

The actuarial cost method used in this valuation is the entry age normal method.

This method is one of the family of projected benefit cost methods. An estimate of the projected monthly benefit payable at retirement is required initially to determine costs and liabilities under this method.

The normal cost contribution is determined as a level percent of each participant's pay from entry date to retirement date, so the accumulated contributions at retirement will equal the liability for the projected benefit. The total normal cost is equal to the sum of the individual participant costs.

The present value of future benefits is equal to the value of the projected benefit payable at retirement, discounted back to the participant's current age. Discounts include such items as interest and mortality. The present value of future normal cost contributions is equal to the discounted value of the normal costs payable from the member's current age to retirement age.

The difference between the present value of future benefits and the present value of future normal cost contributions represents the actuarial liability at the participant's current age.

When assets and the present value of future employee contributions are subtracted from the actuarial liability, the remainder represents the unfunded actuarial liability.

The annual contribution is determined by adding the employer normal cost for the plan year to an amortization payment toward the unfunded actuarial liability. If assets are projected to exceed the actuarial liability as of the end of the plan year for which the valuation is performed, no employer contribution is recommended.