Actuarial Valuation Report as at December 31, 2017

Lutheran Church - Canada Pension Plan

ASP Registration No. 00355610
CRA Registration No. 00355610

March, 2018

Ellement
Pensions | Benefits | Investments

75 Re	16 S	66 Dy	4 Be	57 La	34 Se	03 Li	01 H
105 Db	74 W	58 Ce	22 Ti	18 Ar	59 Pa	24 Cr	39 Y
50 Sn	74 Ru	10 Ca	103 Lr	66 Dy	45 Rh	82 Pb	31 Ga
47 Ag	06 C	13 Al	83 Bi	80 Hg	81 Tl	79 Au	39 V
28 Ni	07 N	32 Ge	51 Sb	78 Pt	76 Os	89 Ac	77 Ir
87 Fr	56 Ba	11 Na	73 Ta	19 K	38 Sr	55 Cs	02 He
10 Ne	08 O	54 Xe	70 Yb	100 Fm	98 Cf	97 Bk	09 F
36 Kr	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
107 Bh	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd
106 Sg	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
40 Zr	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd

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APPENDICES

1. ACTUARIES' OPINION

This Actuarial Valuation Report (Report) has been prepared for the Lutheran Church – Canada (Plan Sponsor) of the Lutheran Church – Canada Pension Plan (Plan) and presents the results of the valuation for funding purposes on a going concern and solvency (wind-up) basis as at December 31, 2017 (Valuation Date). This Report recommends the required contributions to the Plan; and provides the information and the actuarial certification required by the Alberta Superintendent of Pensions (ASP) and the Canada Revenue Agency (CRA).

The Plan self-insures all benefits and therefore is exposed to investment and demographic risks, which must continue to be monitored in the future. Benefits may alternatively be purchased at an insurance carrier to eliminate a portion of these risks. This strategy may be cost effective in an appropriate economic climate and should be reviewed on an on-going basis by the Plan Sponsor.

- The value of the Plan's assets would be less than the actuarial liabilities by $19,709,059 if the Plan had been wound up on the Valuation Date (Solvency Valuation).
- The Plan has no excess surplus based on the requirements found in Section 147.2 of the Income Tax Act.
- This Report reflects an asset write-down equal to $2,712,980 on the going concern balance sheet and none on the solvency test balance sheet.
- This Report reflects no contingency adjustment on the going concern and solvency test balance sheets.
- Asset and liabilities have been rounded to the nearest dollar in this Report. In the Subsequent Events section of this Report, we nevertheless describe the uncertainty implicit in the actuarial calculations. Due to the limited scope of our engagement, other than interest discount sensitivity analysis discussed in Section 8, an analysis of the potential range of future measurements of the Plan's financial health due to alternative actuarial assumptions, future Plan experience, or changes in legislation was not performed, nor was it required to be performed.
- On December 2, 2015, Concordia University of Edmonton (Concordia) and the Plan Sponsor entered into a Pension Transfer Agreement which quantified the covenants agreed upon for facilitating the Concordia withdrawal as an employer in the Plan. In accordance with the Transfer Agreement, effective January 1, 2015, Concordia assumed responsibility for its share of the actuarial value of pension obligations equal to $31,686,066. Concordia's share of assets (equal to $30,535,348) was subsequently transferred out of the Plan upon receiving approval from CRA, in May and June 2016.
- As at December 31, 2017, Cloverdale has terminated their participation in the Plan. As at December 31, 2017, this group represents $2,134,050 of the solvency liability.
- On March 28, 2017, an annuity purchase buy-in was completed with Canada Life for an amount equal to $22,446,733, representing at the time roughly 50% of the pensioner liabilities.
- This Report does not reflect the change in the solvency interest rates after the Valuation Date, nor is it required to do so.
- We are not aware of any other matters or subsequent events occurring since the completion of this Report which would materially adversely affect the financial position of the Plan as at December 31, 2017.

In our opinion:

- The financial data (Appendix I) is sufficient and reliable for the purpose of the Report.
- The membership data (Appendix II) on which the Report is based are sufficient and reliable for the purpose of the Report.
- The benefits used in the calculations are based on the Plan as amended to the Valuation Date (Appendix III).
- The assumptions and methods (Appendix IV & V) are appropriate for the purpose of the Report.
- This Report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

We hereby certify that, in our opinion, the assets of the Plan, together with the special contribution payments (if applicable), transfer ratio payments (if applicable), contributions in arrears with interest (if applicable), and investment income, are sufficient to provide the benefits promised by the Plan, in respect of service completed up to the Valuation Date, provided future experience is equal to or better than the experience anticipated in the actuarial assumptions. Nevertheless, emerging experience differing from the assumptions, will result in gains or losses, which will be revealed in subsequent valuations.

The opinion is this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

This Report is subject to approval by the ASP and CRA. It is required that the next actuarial valuation report occur no later than December 31, 2020.

Respectfully submitted,

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March 27, 2018

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March 27, 2018

2. EXECUTIVE SUMMARY

This Report has been prepared for the Plan as at December 31, 2017 for the primary purpose of establishing the funding recommendation for the Plan until the next such valuation is performed. The table below provides a summary of the results of this Report but is not intended to replace the detailed information presented in the Report. The results have been prepared as at December 31, 2017, with comparative results as at December 31, 2014.

Going Concern Valuation	**31-Dec-2017**	**31-Dec-2014**
Market Value of Assets	$ 78,874,768	$ 98,064,749
Accounts Receivable/(Payable)	407,014	-
Actuarial Liability	(76,405,948)	(101,701,493)
Surplus/(Unfunded Liability) Before Adjustments	$ 2,875,834	$ (3,636,744)
Asset Smoothing Adjustment	(2,712,980)	(4,324,333)
Contingency Adjustment	-	-
Surplus/(Unfunded Liability) After Adjustments	$ 162,854	$ (7,961,077)
Funded Ratio Before Adjustments	103.8%	96.4%
Funded Ratio After Adjustments	100.2%	92.2%

Solvency Valuation	**31-Dec-2017**	**31-Dec-2014**
Market Value of Assets	$ 78,874,768	$ 98,064,749
Accounts Receivable/(Payable)	407,014	-
Estimated Wind-Up Expenses	(250,000)	(375,000)
Solvency Liability	(98,740,841)	(134,425,177)
Hypothetical Wind-Up Excess/(Deficiency)	$ (19,709,059)	$ (36,735,428)
Solvency Ratio	80.0%	72.7%

Annual Contribution Requirements	**% DB Salary**	**2018 Expected**	**% DB Salary**	**2015 Actual**
Defined Benefit Plan				
Employers Contributions		$ 2,118,885		$ 1,779,136
Employee Contributions		70,113		89,708
Total Contributions **[A]**		$ 2,188,998		$ 1,868,844
Normal Actuarial Cost	16.3%	(285,710)	13.5%	(304,720)
Special Payments: Going Concern		-		(559,688)
Special Payments: Solvency [1]		(4,230,237)		(4,430,514)
Transfer Ratio Payments		(61,021)		(66,465)
Contributions in Arrears with Interest		-		-
Total Annual Contribution Requirements **[B]**		(346,731)		(930,873)
Contribution Margin/(Deficiency) (**[A]** + **[B]**)		$ 1,842,267		$ 937,971
Defined Contribution Plan	**% DC Salary**		**% DC Salary**	
Employers Contributions	6.0%	$ 1,170,761	6.0%	$ 1,286,592
Employee Contributions	4.0%	780,508	4.0%	857,728
		$ 1,951,269		$ 2,144,320
Total Contributions (DB + DC)	**% Total Salary**		**% Total Salary**	
Employers Contributions	15.5%	$ 3,289,646	12.9%	$ 3,065,728
Employee Contributions	4.0%	850,621	4.0%	947,436
		$ 4,140,267		$ 4,013,164
Total Estimated/Actual Employee Payroll				
DB Member Payroll		$ 1,752,820		$ 2,257,183
DB / DC Member Salaries		13,374,502		16,418,546
DC Member Payroll		5,009,829		3,861,758
NALC Payroll [2]		1,128,357		1,162,902
		$ 21,265,508		$ 23,700,389

[1] The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

[2] NALC salaries are not included in the expected payments for the Defined Benefit Plan.

[3] Lump sum termination payments must be topped up 19.9%.

3. GOING CONCERN VALUATION

The going concern valuation provides an assessment of the Plan's financial position at the Valuation Date on the premise that the Plan continues into the future indefinitely. On the basis of the asset information, membership data, going concern assumptions and methods and Plan provisions described in the Appendices, the going concern financial position of the Plan as at the Valuation Date is shown in the following table. Amounts have been rounded to the nearest dollar.

	31-Dec-2017		31-Dec-2014	
ASSETS	$	% of Liabilities	$	% of Liabilities
Market Value of Assets	$ 57,357,823		$ 98,064,749	
Annuity Buy-In	21,516,945		-	
Accounts Receivable/(Payable)	407,014		-	
Total Assets	$ 79,281,782	103.8%	$ 98,064,749	96.4%
LIABILITIES*				
Actives (2017: 252 / 2014: 443)				
- Active-R	$ 21,135,945	27.7%	$ 26,354,664	25.9%
- Active	7,853,668	10.3%	16,398,642	16.1%
- Disabled-R	939,686	1.2%	895,988	0.9%
- Disabled	140,926	0.2%	487,125	0.5%
	$ 30,070,225	39.4%	$ 44,136,419	43.4%
Deferreds et al (2017: 254 / 2014: 285)				
- Deferred-R	$ 5,430,331	7.1%	$ 4,713,839	4.6%
- Deferred	1,913,250	2.5%	1,800,481	1.8%
- US-R	2,758,633	3.6%	1,817,032	1.8%
- US	324,543	0.4%	941,289	0.9%
	$ 10,426,757	13.6%	$ 9,272,641	9.1%
Pensioners et al (2017: 379 / 2014: 432)				
- Pensioner-R	$ 17,473,851	22.9%	$ 44,816,006	44.1%
- Survivor-R	1,316,441	1.7%	3,476,427	3.4%
- Pensioner-R (Annuity Buy-In)	15,802,233	20.7%	-	-
- Survivor-R (Annuity Buy-In)	1,316,441	1.7%	-	-
	$ 35,908,966	47.0%	$ 48,292,433	47.5%
Total Liabilities (2017: 885 / 2014: 1,160)	$ 76,405,948	100.0%	$ 101,701,493	100.0%
Surplus/(Unfunded Liability) Before Adjustments	$ 2,875,834		$ (3,636,744)	
Asset Smoothing Adjustment	(2,712,980)		(4,324,333)	
Contingency Adjustment	-		-	
Surplus/(Unfunded Liability) After Adjustments	$ 162,854		$ (7,961,077)	
Funded Ratio Before Adjustments	103.8%		96.4%	
Funded Ratio After Adjustments	100.2%		92.2%	
* Please note that the "-R" refers to those members that are within the retirement window.				
Liability % for those members that are retired or eligible to retire		86.6%		80.7%
Liability % for those members that are not retired or eligible to retire		13.4%		19.3%

Going Concern	Number of Years Remaining	Annual Payment	31-Dec-2017 Unamortized	31-Dec-2014 Unamortized
Normal Actuarial Cost	-	$ 285,710	$ -	$ -
Unfunded Liability 31-Dec-2014	-	-	-	7,961,077
Unfunded Liability 31-Dec-2017	-	-	-	-
Solvency Deficiency 31-Dec-2014	-	-	-	-
Solvency Deficiency 31-Dec-2017	-	-	-	-
Transfer Ratio Payments	-	61,021	-	-
Contributions in Arrears with Interest	-	-	-	-
Total 31-Dec-2017		$ 346,731	$ -	$ 7,961,077

4. SOLVENCY / HYPOTHETICAL WIND-UP VALUATION

The solvency valuation is a financial assessment of the Plan that is required under the Employees' Pension Plans Act (EPPA) of Alberta and is performed in accordance with requirements prescribed by this Act. It is intended to provide an assessment of the Plan's financial position assuming a plan termination basis. The standards of practice of the Canadian Institute of Actuaries also requires that a valuation be prepared on a plan termination basis. This valuation is referred to as a hypothetical wind-up valuation.

On the basis of the asset information, membership data, solvency assumptions and methods and Plan provisions described in the Appendices, as well as the requirements of the EPPA, the solvency financial position of the Plan as at the Valuation Date is shown in the following table. Amounts shown have been rounded to the nearest dollar.

	31-Dec-2017		31-Dec-2014	
ASSETS	$	% of Liabilities	$	% of Liabilities
Market Value of Assets	$ 57,357,823		$ 98,064,749	
Annuity Buy-In	21,516,945		-	
Accounts Receivable/(Payable)	407,014		-	
Estimated Wind-Up Expenses	(250,000)		(375,000)	
Total Assets	$ 79,031,782	80.0%	$ 97,689,749	72.7%
LIABILITIES*				
Actives (2017: 252 / 2014: 443)				
- Active-R	$ 26,233,536	26.6%	$ 35,934,284	26.7%
- Active	10,756,399	10.9%	19,535,967	14.5%
- Disabled-R	1,206,840	1.2%	1,111,866	0.8%
- Disabled	183,858	0.2%	623,310	0.5%
	$ 38,380,633	38.9%	$ 57,205,427	42.5%
Deferreds et al (2017: 254 / 2014: 285)				
- Deferred-R	$ 7,308,572	7.4%	$ 6,898,532	5.1%
- Deferred	3,808,547	3.9%	3,771,043	2.8%
- US-R	3,479,230	3.5%	2,696,272	2.0%
- US	480,910	0.5%	1,265,887	0.9%
	$ 15,077,259	15.3%	$ 14,631,734	10.8%
Pensioners et al (2017: 379 / 2014: 432)				
- Pensioner-R	$ 22,151,484	22.4%	$ 58,157,624	43.4%
- Survivor-R	1,614,520	1.6%	4,430,392	3.3%
- Pensioner-R (Annuity Buy-In)	19,902,425	20.2%	-	-
- Survivor-R (Annuity Buy-In)	1,614,520	1.6%	-	-
	$ 45,282,949	45.8%	$ 62,588,016	46.7%
Total Liabilities (2017: 885 / 2014: 1,160)	$ 98,740,841	100.0%	$ 134,425,177	100.0%
Hypothetical Wind-Up Excess/(Deficiency)	$ (19,709,059)		$ (36,735,428)	
Solvency Ratio	80.0%		72.7%	

* Please note that the "-R" refers to those members that are within the retirement window.

Liability % for those members that are retired or eligible to retire		84.5%		81.3%
Liability % for those members that are <u>not</u> retired or eligible to retire		15.5%		18.7%

Solvency	Number of Years Remaining	Annual Payment	31-Dec-2017 Unamortized	31-Dec-2014 Unamortized
Normal Actuarial Cost	-	$ 285,710	$ -	$ -
Unfunded Liability 31-Dec-2014	-	-	-	3,744,328
Unfunded Liability 31-Dec-2017	-	-	-	
Solvency Deficiency 31-Dec-2014	-	-	-	32,990,100
Solvency Deficiency 31-Dec-2017[1]	5.00	4,230,237	19,709,059	-
Transfer Ratio Payments	-	61,021	-	-
Contributions in Arrears with Interest	-	-	-	-
Total 31-Dec-2017		$ 346,731	$ 19,709,059	$ 36,734,428

[1] The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

5. ANALYSIS OF RESULTS – GOING CONCERN

Cash Flow Gain/(Loss) Analysis		Financial Position		
		Assets	Liabilities	Surplus/ (Unfunded)
Going Concern Position 31-Dec-2014 (Report)		$ 93,740,416	$ 101,701,493	$ (7,961,077)
Adjustments	- Asset Smoothing Adjustment: Removed	4,324,333	-	4,324,333
Going Concern Position 31-Dec-2014 (Preliminary)		$ 98,064,749	$ 101,701,493	$ (3,636,744)
Asset Transfer	- Remove Concordia University of Edmonton	(30,535,348)	(32,008,800)	1,473,452
Contributions	- Employee Contributions	241,294	241,294	-
	- Employers Contributions Normal Cost	575,954	575,954	-
	- Required Special Payments: Going Concern	1,679,065	-	1,679,065
	- Additional Employers Contributions	6,095,402	-	6,095,402
Gross Investment Income	- Gross Expected Interest	14,900,600	16,855,919	(1,955,319)
	- Gross Investment Gain/(Loss)	2,788,425	-	2,788,425
Benefits	- Pensions (Retirement Experience)	(11,846,132)	(11,806,162)	(39,970)
	- Commuted Value Lump sums (Termination Experience)	(917,150)	(400,678)	(516,472)
	- Mortality Experience	-	(295,189)	295,189
	- Salary Experience (Salary / YMPE / Maximum Pension)	-	(878,468)	878,468
Expenses	- Operating Expenses	(847,462)	(931,069)	83,607
	- Investment Expenses	(917,615)	(931,069)	13,454
Methodology et al	- Data, Methodology, et al	-	198,519	(198,519)
Going Concern Position 31-Dec-2017 (Preliminary)		$ 79,281,782	$ 72,321,744	$ 6,960,038
Actuarial	- Termination Scale: Removed	-	306,172	(306,172)
	- Pre-Retirement Mortality: Removed	-	25,582	(25,582)
	- Salary Scale: Decreased 25 Basis Points to 2.75%	-	(363,025)	363,025
	- YMPE and ITA: Decreased 25 Basis Points to 2.75%	-	5,497	(5,497)
	- Interest Rate: Decreased 50 Basis Points to 5.50%	-	4,109,978	(4,109,978)
Going Concern Position 31-Dec-2017 (Before Adjustments)		$ 79,281,782	$ 76,405,948	$ 2,875,834
Adjustments	- Asset Smoothing Adjustment: Re-Established	(2,712,980)	-	(2,712,980)
Going Concern Position 31-Dec-2017 (After Adjustments)		$ 76,568,802	$ 76,405,948	$ 162,854

The retirement pensions in 2017, equal to $3,351,711, was compared to the membership records received (see Appendix I – Page 7: $3,415,548 = 12 x [379 x $751]) and found to be reasonable given the timing of retirements and deaths during the year.

6. CONTRIBUTUION REQUIREMENTS

Normal Cost

The defined benefit normal cost means the amount estimated, on the basis of a going concern valuation and using the methods and assumptions that are used to determine going concern liabilities, to be the cost of benefits under a plan's defined benefit provision for a fiscal year. The estimated normal cost rule is developed in the table below:

		2018
Total Normal Cost		285,710
Employee Contributions		70,113
Employers Normal Cost		215,597
Estimated Employee Defined Benefit Payroll	$	1,752,820
Employers Normal Cost as a % of Employee Payroll		12.3%

Special Payments – Going Concern and Solvency

There is a requirement to fund any going concern unfunded liability as determined based on legislation and regulations in Alberta. There are no going concern special payments as the Plan is in a surplus position. As the Plan has been granted regulatory forbearance on solvency funding requirements, no solvency funding is required.

Transfer Ratio Payments

The amount of any solvency deficiency payments related to a solvency ratio of less than one in respect of lump sum settlements is known as transfer ratio payments. There is a requirement to top up lump sum termination payments by 19.9%. This is estimated to be 61,021 in 2018.

Contributions in Arrears with Interest

Contributions with interest not paid in previous years are due immediately. No contribution in arrears with interest are included in this year's minimum required contribution.

Minimum Contribution

The minimum contribution is equal to the normal cost plus any contributions in arrears with interest, transfer ratio payments, and going concern and solvency special payments. The minimum contribution for the purposes of this Report is estimated to be $276,618 in 2018.

Maximum Contribution

The maximum contribution in any year is equal to the normal cost plus the greater of the going concern deficiency and the solvency deficiency minus the required use of any excess surplus. The maximum contribution is equal to $19,924,656.

Maximum Permitted Surplus

The maximum permitted actuarial surplus under Section 147.2 of the Income Tax Act is now equal to 25% of the going concern actuarial liabilities, or $19,101,487 In addition, paragraph 147.2(2)(c) allows recognition of off balance sheet liabilities for cost-of-living and other adjustments, which are reasonably expected to occur in the future. Thus, there is no offside surplus at this time.

7. ANALYSIS OF RESULTS - SOLVENCY

The solvency valuation interest rate assumption for annuity purchases has increased 0.42% from 2.60% to 3.02%. The solvency valuation less than 10-year interest rate assumption for cash settlements has increased by 0.10% from 2.50% to 2.60%, while the greater than 10-year rate has decreased by 0.40% from 3.80% to 3.40%. This has resulted in an overall blended increase in the interest rates used for the solvency valuation causing a 3.04% decrease in liabilities equal to $3,090,763

Effective October 1, 2015, the Canadian Institute of Actuaries (CIA) has adopted a new commuted value mortality standard. The new required mortality table is the 2014 Canadian Pensions' Mortality Table (CPM2014) with generational projection using Scale B. The cost of the new mortality standard is equal to $6,040,368, or a liability increase of 6.31%.

Pursuant to the Standards of the Canadian Institute of Actuaries (CIA) it is now required to disclose the incremental cost in the next three years on a hypothetical wind-up/solvency basis. This cost is equal to $2,976,000 as at December 31, 2017.

The incremental cost on a solvency basis represents the present value at the Valuation Date of the expected aggregate change in the solvency liability between December 31, 2017 and December 31, 2020, adjusted upwards for expected benefit payments during this period.

The solvency incremental cost reflects expected decrements and related changes in membership status, accrual of service, expected changes in benefits, and a projection of pensionable earnings based on the going concern assumptions summarized in Appendix IV. The projection of the solvency liability to December 31, 2020 assumes that no new members enter the Plan for the purposes of determining the incremental cost.

8. SENSITIVITY TEST (DURATION)

The impact on pension liabilities of changes in the actuarial assumptions depends largely upon the number of years over which benefits will be paid and the exact pattern of the expected benefits cash flow.

The demographics of the group covered by a valuation basis have an impact on the resulting change in liability for a given change in an actuarial assumption.

Different parts of the valuation are affected differently by a change in a specific valuation assumption. One of the more significant assumptions is the assumed rate of return.

There are rules of thumb to estimate the effect upon liabilities of a change in the assumed rate of return. These rules of thumb can be expressed mathematically by introducing the concept of duration where:

% change in liability = - duration x % change in assumed rate

The approximation is usually quite good for small changes in the assumed rate (we will test a negative 1% change – the "Estimated Duration" shown below is the effect of a 1% decrease in the assumed rate of return).

The following table summarizes the application of the above formula to the Plan data as at December 31, 2017.

		Sensitivity of a Decrease in the Assumed Rate of Return			
Going Concern Liability Category	**5.50% Liability**	**4.50% Liability**	**$ Change in Liability**	**% Change in Liability**	**Estimated Duration**
Actives & Disableds	$ 30,070,225	$ 35,450,698	$ 5,380,473	17.9%	17.9
Deferreds et al	10,426,757	12,230,191	1,803,434	17.3%	17.3
Pensioners et al	35,908,966	38,953,179	3,044,213	8.5%	8.5
Total	$ 76,405,948	$ 86,634,068	$ 10,228,120	13.4%	13.4

		Sensitivity of a Decrease in the Assumed Rate of Return			
Normal Cost	**5.50% Normal Cost**	**4.50% Normal Cost**	**$ Change in Normal Cost**	**% Change in Normal Cost**	**Estimated Duration**
Total	$ 285,710	$ 320,766	35,056	12.3%	12.3

		Sensitivity of a Decrease in the Assumed Rate of Return			
Solvency Liability Category	**2.60%/3.40%/3.02% Liability**	**1.60%/2.40%/2.02% Liability**	**$ Change in Liability**	**% Change in Liability**	**Estimated Duration**
Actives & Disableds	$ 38,380,633	$ 45,916,666	$ 7,536,033	19.6%	19.6
Deferreds et al	15,077,259	18,119,880	3,042,621	20.2%	20.2
Pensioners et al	45,282,949	49,916,038	4,633,089	10.2%	10.2
Total	$ 98,740,841	$ 113,952,584	$ 15,211,743	15.4%	15.4

The higher the duration, the more sensitive the financial position of the Plan is to a change in actuarial assumptions.

Active participant liabilities are generally more sensitive (volatile) to a change in the assumed rates than other participants. Pensions in payment liabilities are the least sensitive.

A 1% decrease in the going-concern assumed rate of return would result in a 13.4% increase in the going concern liability and a 12.3% increase in the 2018 normal actuarial cost.

9. MARGIN FOR ADVERSE DEVIATIONS (MfADs)

MfAD = Margin for Adverse Deviation – the difference between the assumption for a calculation and the corresponding best estimate assumption.

PfAD = Provision for Adverse Deviation – the $ value of the MfAD calculated as the difference between the results based on the assumptions and the corresponding results based on the best estimate assumption.

The actuarial assumptions must be, individually and in aggregate, appropriate for the purpose of the valuation. The assumptions are the sum of the actuarial best estimate plus a MfAD. Best estimates are developed by the actuary; however, it is the responsibility of the Lutheran Church – Canada Board of Directors (Administrator) to determine the extent of any MfADs.

Pension plan funding has a main goal of security of benefits for the Plan participants. Funding may also have the goal of achieving stable benefit levels or contributions over time. A variable Provision for Adverse Deviation (PfAD) (e.g. as a percentage of actuarial liabilities), one that increases or decreases as Plan experience is favourable or unfavourable, respectively, can enhance the stability of the plan benefits and contributions.

A PfAD in the going concern valuation alone, while enhancing benefit security, would not necessarily be sufficient to ensure that all accrued benefits could be covered where the Plan is actually to wind-up, hence a PfAD may also be developed on the solvency balance sheet as the opportunity permits. In choosing an appropriate PfAD the Committee must examine several factors, including:

- The financial strength of the employers (less financial ability and willingness then more PfAD);
- The uncertainty of future Plan experience (more uncertainty, more PfAD);
- The appropriate time horizon for consideration (1 year, 3 years, etc., longer outlooks increase the PfAD);
- The maturity of the Plan liabilities (more retirees may require a larger PfAD);
- The asset mix of the Plan (more equity requires a larger PfAD).

Individual MfADs

Each actuarial assumption developed in Appendix IV and V may simply be a best estimate with no MfAD or may have a MfAD implicitly imbedded. The most notable is in the development of the assumed rate of return. There is a MfAD of 0.08% present in the assumed rate of return of 5.50% (please refer to Appendix IV, page 4 for further detail).

Contribution Margin

Before any special payments for deficits, if the expected employee and employers contributions exceed the normal actuarial cost, present value of these “unallocated” contributions represent the contribution margin.

Contingency Adjustment

There is no contingency adjustment on the going concern and solvency balance sheets.

10. ADDITIONAL COMMENTARY AND SUBSEQUENT EVENTS

- This Report does not reflect the change in the going concern or solvency test discount rates after the Valuation Date, nor is it required. An actuarial valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict the pension plan's future financial condition or its ability to pay benefits in the future.

  Over time, the Plan's actual cost will depend on a number of factors, including the level of the benefits in the Plan, the number of individuals paid benefits, the amount of Plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the Valuation Date.

  To prepare this Report, actuarial assumptions, as described in Appendices IV and V, are used to select a single scenario from the range of possibilities. The results of that single scenario are included in this Report. However, the future is uncertain, and the Plan's actual experience will differ from those assumptions; these differences may be significant or material. In addition, different assumptions or scenarios may also be within the reasonable range and results based on those assumptions would be different. Actuarial assumptions may also be changed from one valuation to the next because of changes in regulatory requirements, plan experience, changes in expectations about the future and other factors.

  Because actual Plan experience will differ from the assumptions, decisions about benefit changes, investment policy, funding amounts, benefit security and/or benefit-related issues should be made only after careful consideration of alternative future financial conditions and scenarios, and not solely on the basis of an actuarial valuation report or reports.

- Solvency Ratio Impact: The Employment Pension Plans Act (Regulations) of Alberta states:

  "Where a plan has solvency ratio of less than 1, a transfer shall be considered to impair the solvency of the plan, but the Administrator may make the transfer where:

  (a) the employers have remitted sufficient money to the plan the eliminate any transfer deficiency relating to the transfer, or

  (b) the transfer deficiency for any person is less than 5% of the Year's Maximum Pensionable Earnings (YMPE) for the year in which the transfer is made and the total of all such transfer deficiencies since the last review date does not exceed 5% of the market value of the assets of the plan at the time of transfer, or

  (c) the transfer is an amount equal to the commuted value of a benefit less the transfer deficiency related to the benefit."

  Any amount withheld must be paid to the individual within 5 years from the date of initial transfer. This hold back amount need not be made if the Administrator can demonstrate that the margin in the contributions is adequate for this purpose.

  This Solvency Ratio is subject to the approval of the Superintendent of Pensions.

- As at December 31, 2017, Cloverdale has terminated their participation in the Plan. As at December 31, 2017, this group represents $2,134,050 of the solvency liability.

- The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

- We are not aware of any other matters or subsequent events occurring since the completion of this Report which would materially adversely affect the financial position of the Plan as at December 31, 2017.

APPENDIX I

Asset Data

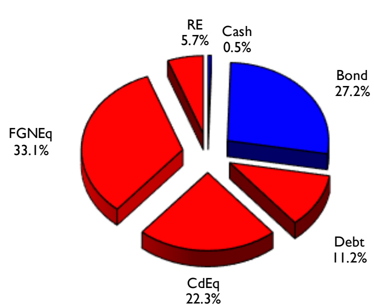
Asset Class Mix

A breakdown of the market value of the assets of the Plan using the unaudited custodial statements is shown below:

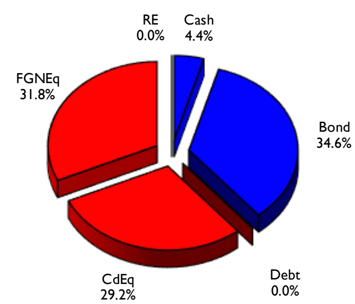
Asset Class Mix		31-Dec-2017 Market Value	%	31-Dec-2014 Market Value	%	Investment Policy Range	Target
	Transaction Account	$ -	-	$ 258,130	0.2%		
1	Cash & Net Assets (Cash)	407,014	0.5%	4,085,217	4.2%	0-10%	2.00%
2	Fixed Income (Bond) *	21,583,405	27.2%	33,897,822	34.6%	15-45%	23.00%
	Private Debt (Debt)	8,883,000	11.2%	-	-	0-20%	10.00%
	Total Fixed Income	$ 30,873,419	38.9%	$ 38,241,169	39.0%		
3	Canadian Equities (CdEq)	17,649,103	22.3%	28,634,031	29.2%	15-40%	30.00%
4	Foreign Equities (FGNEq)	26,235,153	33.1%	31,189,549	31.8%	24-36%	30.00%
5	Real Estate (RE)	4,524,107	5.7%	-	-	0-10%	5.00%
	Total Equity	$ 48,408,363	61.1%	$ 59,823,580	61.0%		
	Total Market Value	$ 79,281,782	100.0%	$ 98,064,749	100.0%		

* Fixed Income includes the Annuity Buy-In equal to $21,516,945

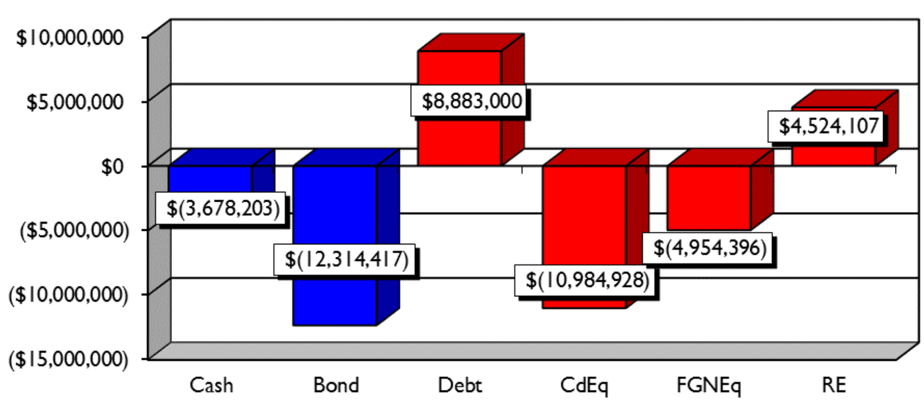
31-Dec-2017
(61.1% Equity)



31-Dec-2014
(61.0% Equity)



Change in Asset Class Holdings Since Previous Valuation



Historical Cash Flow

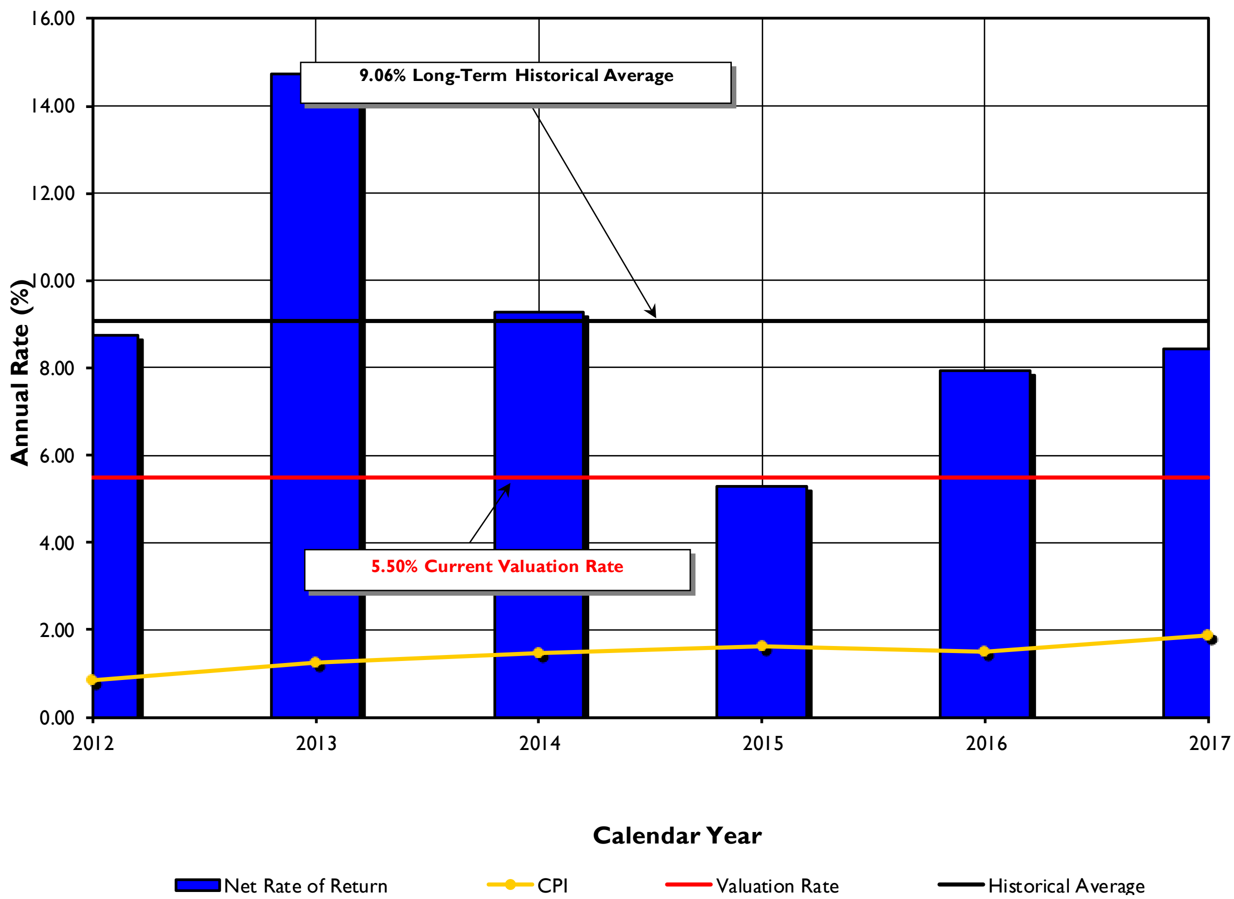
	Opening	Transfer	Contributions		Investment	Benefits		Expenses		Closing	Gross	Net
Year	Market Value	Out	Employee	Employers	Income	Pensions	Lump Sums	Operating	Investment	Market Value	Return	Return
2012	73,669,697		-	5,466,914	7,191,274	(3,529,302)	(624,671)	(517,997)	(179,778)	81,476,137	9.72%	8.74%
2013	81,476,137		198,248	2,725,764	12,526,054	(3,850,020)	(697,588)	(361,032)	(281,443)	91,736,120	15.59%	14.73%
2014	91,736,120		207,601	2,712,656	9,018,234	(4,258,499)	(738,472)	(269,533)	(343,358)	98,064,749	9.98%	9.27%
2015	98,064,749	(30,425,177) *	89,708	1,779,136	4,989,263	(4,600,475)	(243,195)	(278,017)	(404,492)	68,971,500	6.16%	5.29%
2016	68,971,500	(110,171) **	77,116	3,481,624	6,003,485	(3,893,946)	(315,583)	(296,057)	(269,729)	73,648,239	8.79%	7.93%
2017	73,648,239		74,470	3,089,661	6,696,277	(3,351,711)	(358,372)	(273,388)	(243,394)	79,281,782	9.16%	8.42%
			$ 647,143	$ 19,255,755	$ 46,424,587	$ (23,483,953)	$ (2,977,881)	$ (1,996,024)	$ (1,722,194)	"6-Year Average"	9.90%	9.06%
										"3-Year Average"	8.04%	7.21%

* Concordia University of Edmonton withdrew as a participating employer in the Plan. The Pension Transfer Agreement between Concordia and LCC was equal to $30,425,177

** Payable to Concordia University of Edmonton

Net Return = Gross Return net of both Operating and Investment expenses.
Dollar-weighted rates of return were calculated on the basis of mid-year cash flow; arithmetic averages.
Time-weighted returns may vary.

Historical Rates of Return (ROR) and Inflation (CPI)



A P P E N D I X   II

Membership Data

This Report and the membership data used to calculate employee benefits and consequently, the going concern and solvency liabilities reflects the employee salary rates in effect on December 31, 2017.

The data used in the development of this Report was provided by the employers of Lutheran Church - Canada. Internal consistency checks were performed on the data to ensure reasonableness. The Plan Text was reviewed to ensure that the data provided was appropriate for the purposes of the Actuarial Valuation Report.

A membership reconciliation was performed on the current valuation data and the data provided at the last valuation. The following fields were compared to the previous valuation data to ensure consistency:

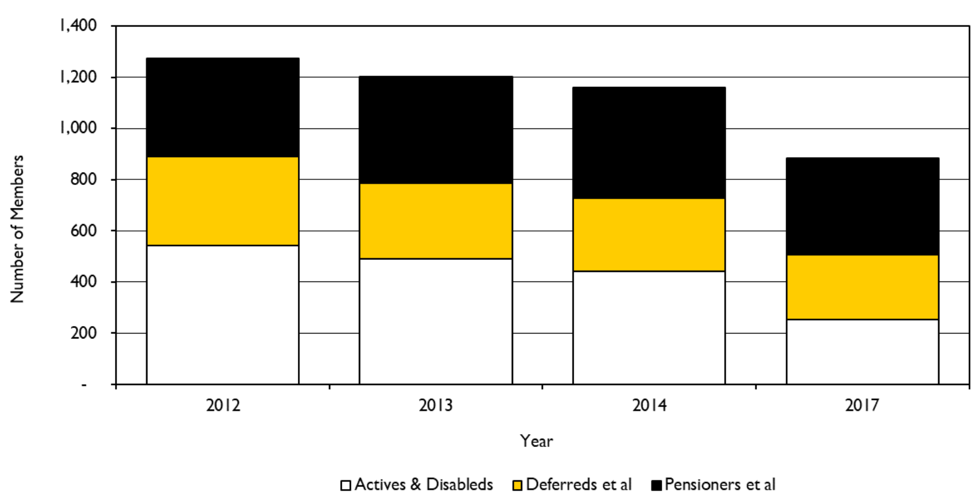
- date of birth;
- date of hire;
- date of enrollment;
- date of termination;
- date of retirement;
- spouse date of birth; and
- gender.

Further data analysis was conducted on service and salary fields, ensuring that the values can be reconciled and are reasonable. All pensions in payment will be checked against the custodial and financial statements for consistency and compared against amounts communicated in previous valuations.

In the event that data is missing or contains limitations, the actuary may use reasonable adjustments and assumptions to perform the required valuations. After review, no data is missing and the data does not contain any material defects. This Report does not make use of any data adjustments or assumptions and is reasonable and appropriate for the purposes of the valuation.

Historical Membership

Year	*Actives & Disableds*	*Deferreds et al*	*Pensioners et al*	*Total*
2012	544	345	386	1,275
2013	492	296	416	1,204
2014	443	285	432	1,160
2017	252	254	379	885



Membership Reconciliation

		Actives		Deferreds et al		Pensioners et al		
		Active	*Disabled*	*US*	*Deferred*	*Pensioner*	*Survivor*	*Total*
Membership as at 31-Dec-2014		433	10	55	230	377	55	1,160
Remove Concordia University of Edmonton		(107)	(2)	(2)	(53)	(73)	(8)	(245)
Adjustments		-	-	-	-	-	-	-
New Entrants		-	-	-	-	-	-	-
Return to work		-	-	-	-	-	-	-
Disabled		(3)	3	-	-	-	-	-
Retirements	- cash refund	-	-	-	-	-	-	-
	- pension	(24)	(2)	(3)	(10)	39	-	-
Terminations	- transferred/cash refund	(16)	-	-	(3)	-	-	(19)
	- vested	(37)	(1)	-	38	-	-	-
	- US transfer	(2)	-	2	-	-	-	
Deaths	- no benefit remaining	-	-	-	-	(10)	(1)	(11)
	- pension to survivor	-	-	-	-	(17)	17	-
Membership as at 31-Dec-2017		244	8	52	202	316	63	885

Membership Data

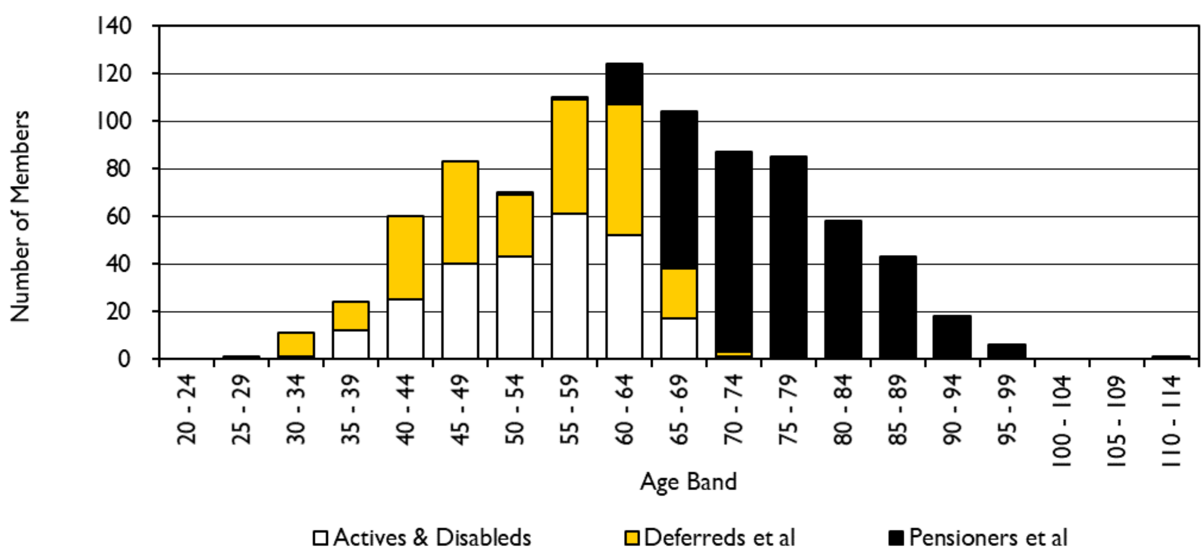
	31-Dec-2017			31-Dec-2014		
	Number	*Average Age*	*Average Monthly Pension*	*Number*	*Average Age*	*Average Monthly Pension*
Actives						
- Active-R	127	60.2	$ 1,632	184	59.7	$ 1,174
- Active	117	47.0	688	249	44.9	644
- Active LTD-R	4	60.0	1,658	5	60.2	1,467
- Active LTD	4	44.8	402	5	47.2	951
	252	53.8	$ 1,175	443	51.2	$ 877
Deferreds et al						
- US-R	41	60.5	$ 491	31	60.0	$ 495
- US	11	46.2	332	24	50.1	407
- Deferred-R	86	61.4	483	87	60.4	484
- Deferred	116	44.3	267	143	43.4	250
	254	52.8	$ 379	285	51.0	$ 361
Pensioners et al						
- Pensioner-R	316	75.6	$ 819	377	74.0	$ 902
- Survivor-R	63	80.0	412	55	75.1	546
	379	76.3	$ 751	432	74.2	$ 856
Total	885	63.2	$ 765	1,160	59.7	$ 742

Plan Year Profile

	Actives & Disableds at 31-Dec-2017							
	Plan Years							
Age Band	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**> 30**	**Total**
20 - 24	-							-
25 - 29	-	-						-
30 - 34	1	-	-					1
35 - 39	8	4	-					12
40 - 44	5	12	8	-	-			25
45 - 49	5	14	18	3	-	-		40
50 - 54	7	7	12	12	5	-	-	43
55 - 59	8	11	8	10	19	5	-	61
60 - 64	7	12	3	4	7	3	16	52
65 - 69	2	7	2	-	-	2	4	17
70 - 74	-	-	1	-	-	-	-	1
Total 31-Dec-2017	43	67	52	29	31	10	20	252
Total 31-Dec-2014	32	128	103	55	60	38	27	443

Age Profile

	Average Monthly Pension							
	Actives & Disableds		Deferreds et al		Pensioners et al		Total	
Age Band	Count	Average Monthly Pension	Count	Average Monthly Pension	Count	Average Monthly Pension	Count	Average Monthly Pension
20 - 24	-	-	-	-	-	-	-	-
25 - 29	-	-	1	78.96	-	-	1	79
30 - 34	1	106	10	102	-	-	11	103
35 - 39	12	229	12	167	-	-	24	198
40 - 44	25	601	35	244	-	-	60	393
45 - 49	40	647	43	311	-	-	83	473
50 - 54	43	892	26	368	1	277	70	689
55 - 59	61	1,071	48	521	1	115	110	822
60 - 64	52	2,181	55	539	17	593	124	1,235
65 - 69	17	2,059	21	317	66	734	104	866
70 - 74	1	182	2	117	84	976	87	947
75 - 79	-	-	1	123	84	788	85	780
80 - 84	-	-	-	-	58	684	58	684
85 - 89	-	-	-	-	43	662	43	662
90 - 94	-	-	-	-	18	482	18	482
95 - 99	-	-	-	-	6	154	6	154
100 - 104	-	-	-	-	-	-	-	-
105 - 109	-	-	-	-	-	-	-	-
110 - 114	-	-	-	-	1	128	1	128
31-Dec-2017	252	1,175	254	379	379	751	885	765
31-Dec-2014	443	877	285	361	432	856	1,160	742



APPENDIX III

Summary of Plan Provisions

The following description of the Plan is a summary only. For more complete information, reference should be made to the Plan text.

Effective January 1, 2012, the plan was amended and restated.

- to require each employee who becomes a member of the plan on or after January 1, 2012 to participate in the Defined Contribution (DC) provisions (referred to as DC members);
- to require each member who has attained age 55 and whose age plus credited service equals or exceeds 80 years as of December 31, 2012 to continue to participate in the DB provisions and to require each such member to make required contributions under the DB provisions as of January 1, 2013 (referred to as DB members); and
- to require each member who has not met the eligibility requirements in the above paragraph as of December 31, 2012 to cease accruing credited service under the DB provisions and to commence accruing benefits under the DC provisions as of January 1, 2013 (referred to as DB/DC members).

Effective Date

The effective date of the restated Plan is January 1, 2012.

Eligibility

Eligibility and membership are effective on the first day of the calendar month next following the date of employment.

Member and Employers DC Contributions

Effective January 1, 2012, each active DC member will be required to contribute 4% of earnings under the defined contribution provision.

Effective January 1, 2013, each active DB/DC member will be required to contribute 4% of earnings under the defined contribution provision.

Disabled DC and DB/DC members are not required to contribute under the defined contribution provision.

The Church will contribute 6% of earning in respect of the above active and disabled DC and DB/DC members.

Member DB Contributions

Effective January 1, 2013, each active DB member will be required to contribute 4% of earnings under the defined benefit provision.

Normal Retirement

Normal retirement is at the first day of the month coincident with or next following the member's 65th birthday.

Monthly pension equals to the Accrued Pension (DB Benefit) plus a monthly pension that the member can purchase from the member's contribution account balance (DC Benefit).

Maximum DB Pension equals the lesser of:

- $2914.44 or other amount as determined by the Income Tax Act, times total defined benefit Credited Service (pre-1992 service not exceeding 35 years); or

- 2% times the average of the member's highest three years of indexed compensation times total credited service.

Early Retirement

DC Benefit

Monthly pension the member can purchase from the member's contribution account balance.

DB Benefit

Benefit may commence on the first day of the month coincident with or next following the member's 55th birthday and the completion of two years of Continuous Service.

Monthly pension:

- Retirement at Age 60 to 65: Monthly Accrued Pension reduced by 0.55% per month that retirement precedes age 65.

- Retirement at Age 55 to 60: Monthly Accrued Pension reduced by 33% plus an additional 0.27% for each month that retirement precedes age 60.

The above reduction does not apply if at the date of termination of employment, the member has attained age 62 and the total of his age and Credited Service equals or exceeds 85 years.

Maximum pension upon early retirement equals the monthly Maximum DB Pension reduced by 1/12 of 3% for each month before the earliest of age 60, 30 years of Continuous Services, or the date age plus Continuous Service equals 80.

Postponed Retirement

Where a member continues employment after normal retirement age, Accrued Pension is calculated at postponed retirement date including accruals after normal retirement age plus the monthly pension the member can purchase from the member's contribution account balance.

Normal Forms of Pension

Member with no spouse

Pension payable for life of member with a guarantee of at least ten years of pension payments.

Member with a spouse

Pension payable for life of member with a guarantee of five years and, thereafter, 66 2/3% of pension continued to surviving spouse.

Termination Benefits

DC Benefit

Entitlement to the distribution of member's account balance.

DB Benefit

Monthly pension equals to the Accrued Pension commencing at normal retirement age.

An Inactive Member who is at least age 55 has the right to receive an early retirement benefits subject to reduction described above.

Member may elect to transfer the commuted value of his vested benefit to a locked in registered vehicle if at the date of termination of employment, the member has not attained age 55.

Death Benefits

Before Retirement

If the member has an eligible spouse and dies after age 55, the spouse will receive a pension payable for life equal to 66 2/3% of the amount the member would have received had the member retired on his date of death.

If the member has an eligible spouse and dies prior to attaining age 55, the spouse will receive for life a pension equal to 66 2/3% of the amount the member would have received had the member lived to age 55 and retired.

The spouse or beneficiary shall receive 100% of the commuted value in respect of service after 1999 (all valued as Alberta members).

After Retirement

Based on form of pension elected by the member.

Ad hoc Pension Increases

Effective January 1, 2002, each member who retired prior to 2002 and who was in receipt of pension payments, received an ad hoc pension increase equal to 1%.

Definitions

Average YMPE

The lesser of:

- The average of the YMPE for the year of determination and the two preceding years; or
- Final Average Earnings.

Accrued Pension

DC Benefit – The value of the member's contribution account balance.

DB Benefit – Equal to the greater of:

- 1.25% of the Final Average Earnings up to the Average YMPE, plus 1.60% of the Final Average Earnings in excess of the Average YMPE multiplied by Credited Service; or
- $48 multiplied by Credited Service.

Continuous Service – Total service with Lutheran Church – Canada.

Credited Service – Total service while an active member of the defined benefit provisions of the plan.

Final Average Earnings – Average monthly regular earnings for the 60 consecutive months in which regular earnings were highest within the last 20 years of Credited Service.

A P P E N D I X IV

Going Concern Assumptions and Valuation Methods

	Actuarial Assumptions and Methods	*31-Dec-2017*	*31-Dec-2014*
1.	Actuarial Cost Method	Projected Unit Credit	same
2.	Asset Valuation Method	market value plus an asset smoothing adjustment	same
3.	Expense Reserve		
	- balance sheet	nil	same
	- contribution rate	nil	same
	- assumed rate of return	0.65%	0.70%
4.	Contingency Adjustment	nil	same
5.	Assumed Rate of Return		
	- inflation rate	2.00%	2.00%
	- real rate	3.50%	4.00%
	- total nominal rate	5.50%	6.00%
6.	Assumed Salary Increase Rate		
	- inflation rate	2.00%	2.00%
	- productivity rate	0.75%	1.00%
	- merit	0.00%	0.00%
	- total nominal rate	2.75%	3.00%
7.	Assumed Annual Salary (Last Salary - Actives)	$60,215	$60,414
8.	Indexing		
	- if retired or eligible to retire	n/a	same
	- otherwise	n/a	same
9.	Annual Employee Contributions Interest Credit	5-year fixed term yield rates average	same
10.	Annual Rate of Increase in CPP Earnings Maximum	2.75%	3.00%
11.	Rate of CRA Maximum Pension Increase under the Income Tax Act	2018: $2,944 Indexed at 2.75% thereafter	2015: $2,819 Indexed at 3.00% thereafter
12.	Retirement Age		
	- Active - if retired or eligible to retire	See Table 1 (Appendix IV, Page 6)	same
	- Inactive - if retired or eligible to retire	immediate	same
	- otherwise	age 65	same
13.	Termination Rates	nil	See Table 2 (Appendix IV, Page 6)
14.	Disability Rates	nil	nil
15.	Mortality Rates	CPM 2014 Private Mortality Projected using Scale B	same
16.	Unisex Weightings*		
	- if retired or eligible to retire	sex distinct	sex distinct
	- otherwise	sex distinct	60% males / 40% females
17.	Proportion of Employees with a Spouse	85%	same
18.	Age of Spouse		
	- retired members and beneficiaries	actual	same
	- otherwise	+/-3	same
19.	Proportion of Employees Choosing an Annuity		
	- retired members and beneficiaries	n/a	same
	- otherwise	n/a	same

* Liabilities are calculated using actual Member gender. The unisex percentage for individual calculations is calculated using a liability weighted methodology based on active Members. The unisex weighting is 85% male and 15% female.

Going Concern Actuarial Cost Method

Actuarial cost methods are used to recognize and fund pension benefits over the working lifetimes of employees who will ultimately receive a pension benefit from the Plan. Different actuarial cost methods use different approaches to assign the costs of future pension benefits, in all cases the contributions plus investment income should equal or exceed the benefit at retirement plus any associated expenses.

The projected unit credit cost method was used to calculate the going concern liabilities and normal cost presented in this Report. This cost method accounts for salary increases by projecting employee earnings to the assumed retirement date. The benefit is then calculated at the assumed retirement date and redistributed across the employee's career. The liabilities presented in this report only reflect service accrued up to the valuation date and the normal cost reflects service that will be earned in the year following the valuation date.

Employment Pension Plans Act

Pursuant to the Employment Pension Plans Act (EPPA) of Alberta and the Regulations to the EPPA, the required contributions to be paid into the Plan, on at least a monthly basis (or within 30 days of the relevant month end) include:

Normal Actuarial Cost

In respect of current service, an amount equal to the normal actuarial cost allocated as stated in the most recent actuarial Valuation report or cost certificate filed with this Report.

Going Concern Payments

An unfunded liability must be funded by equal payments in an amount that is sufficient to amortize the liability over a term not exceeding 15 years from the review date that established the liability.

Solvency Payments

A solvency deficiency must be funded by equal payments that are sufficient to amortize the deficiency over a term not exceeding 5 years, or such period permitted by ASP, from the review date that established the deficiency. Solvency relief was elected as at December 31, 2012 and existing solvency payments were consolidated and re-amortized over a 10-year period.

Transfer Ratio Payments

The amount of any solvency deficiency payments related to a solvency ratio of less than one in respect of lump sum settlements.

Contributions in Arrears with Interest

All contribution requirements not remitted in accordance with the actuarial valuation report shall be payable in the ensuing year, with interest, subject to the approval of the ASP and CRA.

It should be noted that the contribution levels do not anticipate any Plan change, change in actuarial basis, plan membership change, nor any experience gains (or losses), which may arise in the future. Should any of the above occur, a re-examination of the above recommendation may be necessary.

Amortization schedules for going concern unfunded liabilities and solvency deficiencies may be adjusted if experience gains arise after the amortization schedules are determined. For 2018, it is recommended that the contributions equal the normal actuarial cost, going concern special payments, solvency test special payments, transfer ratio payments, and contributions in arrears with interest, as applicable.

The opinion is this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

Asset Smoothing Adjustment

This Report uses an adjusted market value of assets. The adjusted market value of assets is calculated using a 5-year asset smoothing adjustment with a 10% corridor. The following table develops the asset smoothing as at December 31, 2017:

Calendar Year	Gross Investment Income	Rate of Return Gross	Rate of Return Assumed	Investment Gain/ (Loss)	Asset Smoothing Adjustment Proportion		Asset Smoothing Adjustment Amount
2013	$ 12,526,054	15.59%	6.70%	$ 7,142,824	0.00%		$ -
2014	9,018,234	9.98%	6.70%	2,963,909	20.00%		592,782
2015	4,989,263	6.16%	6.70%	(437,370)	40.00%		(174,948)
2016	6,003,485	8.79%	6.70%	1,427,450	60.00%		856,470
2017	6,696,277	9.16%	6.70%	1,798,345	80.00%		1,438,676
					Calculated Asset Smoothing Adjustment:	Preliminary	$ 2,712,980
					Minimum Asset Smoothing Adjustment (-10.00% of assets):	Min	(7,928,178)
					Maximum Asset Smoothing Adjustment (+10.00% of assets):	Max	7,928,178
						Ires	2,712,980
					Provision for future Adverse Deviation:	PfAD	-
					Final Asset Smoothing Adjustment 31-Dec-2017:	Ires+PfAD	$ 2,712,980

Expense Provisions

Expenses of operation and investment are generally allocated, or not, in three areas:

A. Directly in the development of the contribution rate. No allocation was made for the Plan's Actuarial Valuation Report (AVR). Some actuaries use this exclusively for expense allocation and others do not. This Plan does, however, have some implicit allocation in the development of the normal actuarial cost through the use of the 5.50% discount rate used in the calculations. For this AVR, the operating expenses were placed in the development of the implicit rate of return calculation.

B. Directly on the balance sheet. No such allocation was made on the going concern balance sheet.

C. Directly in the development of the assumed rate of return. After recognizing the allocation in A. above we find that an additional allocation 0.35% is required to provide for operating expenses, plus a separate provision of 0.30% to provide for investment and custodial fees. Some actuaries use this exclusively for expense allocation and others do not. For next year it is expected that operating & investment expenses will be approximately 0.65%.

The following table details the allocation for the 2017 Plan year:

Expense Analysis	2017 Expense	A. Directly to Contribution Rate	B. Directly to Balance Sheet	C. Directly to Assumed Rate $	C. Directly to Assumed Rate % of Assets
Operating Expenses**	273,388	$ -	$ -	$ 273,388	0.36%
Investment Expenses	243,394	-	-	243,394	0.32%
Total Expenses	$ 516,782	$ -	$ -	$ 516,782	0.68%
				Budget	**0.65%**

* Average Assets at Market Value = $73,648,239 x 0.5 + $79,281,782 x 0.5 = $76,465,011

** Includes actuarial, administration, accounting, audit, AIR fees, etc.

Contingency Adjustment Assumption

A contingency adjustment provides for the possibility of future adverse investment and/or demographic experience. This Report does not reflect a contingency adjustment on either the going concern or solvency test balance sheets.

Development of the Going Concern Rate of Return

The discount rate assumption is 5.50% per year.

The overall expected return ("best estimate") is 5.53%, which is based on an inflation rate of 2.00%, resulting in a real rate of return on the pension fund assets of 3.53% per year. This best estimate rate of return was developed using best estimate returns for each major asset class in which the pension fund is invested and then using a building block approach, based on the Plan's investment policy, to develop an overall best estimate rate of return for the entire pension fund. Any additional gains from rebalancing and diversification have been included.

Inflation	2.00%
Real Rate of Return (expected protfolio mix)*	3.53%
Overall expected return	5.53%
Expenses	
Investing	(0.30%)
Operating	(0.35%)
Additional returns due to active management	0.25%
Rebalancing and Diversification	0.45%
Margin for adverse deviations (MfAD)	(0.08%)
Discount Rate	**5.50%**

Salary Increase Rate

The salary increase rate is developed based on a building block approach using the following components: inflation, productivity, and merit. The inflation and productivity assumptions are based on the following schedule:

	31-Dec-2017			31-Dec-2014	
Age Band	Count	Average Pensionable Salary*	3-Year Change %	Count	Average Pensionable Salary*
25 - 29	-	-	(100.0%)	8	40,288
30 - 34	1	43,924	(17.3%)	17	53,141
35 - 39	12	59,945	3.0%	36	58,210
40 - 44	25	68,048	16.2%	41	58,552
45 - 49	40	58,915	(2.7%)	65	60,535
50 - 54	43	62,185	(0.0%)	87	62,203
55 - 59	61	59,726	(2.1%)	100	60,980
60 - 64	52	58,709	(5.6%)	65	62,199
65 - 69	17	56,974	(12.7%)	22	65,227
70 -74	1	14,300	(76.0%)	2	59,596
Total/Average	252	$ 60,215	(0.3%)	443	$ 60,414

* Last salaries of Active and Disabled Members only.

Retirement Age Assumption

We note that there are many acceptable going concern retirement age assumptions, and certainly it would be appropriate to use the first subsidized age.

The retirement age assumption should consider:

- the plan design features
- historical experience and
- the future outlook for retirement experience.

For a plan that includes material early retirement subsidies, it is viewed as inappropriate to use a retirement age assumption that ignores the possibility of members taking advantage of the plan's early retirement options.

Table 1 – Retirement Rates

Age	Male and Female
55	0.050
56	0.050
57	0.050
58	0.050
59	0.050
60	0.100
61	0.100
62	0.200
63	0.200
64	0.200
65	0.100

Table 2 – Termination Rates

Age	Male and Female
25	0.1851
30	0.1219
35	0.0878
40	0.0700
45	0.0621
50	0.0563
55+	0.0000

APPENDIX V

Solvency Assumptions and Valuation Methods

Actuarial Assumptions and Methods	*31-Dec-2017*			*31-Dec-2014*		
1. Actuarial Cost Method	accrued benefit cost method			same		
2. Asset Valuation Method	market value of assets			same		
3. Expense Reserve						
- balance sheet	$250,000			$375,000		
- contribution rate	nil			same		
- assumed rate of return	nil			same		
4. Contingency Adjustment	nil			same		
5. Assumed Rate of Return	Annuity Purchases	Cash Settlements <10 Yrs	Cash Settlements >10 Yrs	Annuity Purchases	Cash Settlements <10 Yrs	Cash Settlements >10 Yrs
- inflation rate	2.45%	1.25%	1.80%	1.98%	1.21%	2.18%
- real rate	0.57%	1.35%	1.60%	0.62%	1.29%	1.62%
- total nominal rate	3.02%	2.60%	3.40%	2.60%	2.50%	3.80%
6. Assumed Salary Increase Rate						
- inflation rate	n/a			same		
- productivity rate	n/a			same		
- merit	n/a			same		
- total nominal rate	n/a			same		
7. Assumed Annual Salary	n/a			same		
8. Indexing						
- If retired or eligible to retire	n/a			same		
- otherwise	n/a			same		
9. Annual Employee Contributions Interest Credit	n/a			same		
10. Annual Rate of Increase in CPP Earnings Maximum	n/a			same		
11. Rate of CRA Maximum Pension Increase under the Income Tax Act	2018: $2,944			2015: $2,819		
12. Retirement Age						
- if retired or eligible to retire	immediate			same		
- otherwise	age 65			same		
13. Termination Rates	nil			same		
14. Disability Rates	nil			same		
15. Mortality Rates	CPM2014 Mortality Table Projected using Scale B			UP1994 Generational Mortality Projected using Scale AA		
16. Unisex Weightings						
- if retired or eligible to retire	sex distinct			sex distinct		
- otherwise	sex distinct			60% males / 40% females		
17. Proportion of Employees with a Spouse	85%			same		
18. Age of Spouse						
- retired members and beneficiaries	actual			same		
- otherwise	+/-3			same		
19. Proportion of Employees Choosing an Annuity						
- retired members and beneficiaries	100%			same		
- otherwise	0%			same		

* Liabilities are calculated using actual member gender. The unisex percentage for individual calculations is calculated using a liability weighted methodology based on active Members. The unisex weighting is 85% male and 15% female.

Solvency Cost Method

A solvency and hypothetical wind-up valuation determines the funded status of the Plan on the assumption that the Plan is terminated and wound up at the valuation date. Under this scenario current earnings and YMPE values are used to determine employee benefits. Contingent benefits are included in the calculation when appropriate.

This Report uses an accrued benefit cost method when calculating the solvency/hypothetical wind-up funded status. This cost method determines employee benefits based on service accrued up to the valuation date and assumes no increases in future earnings.

Solvency/Hypothetical Wind-Up Asset Valuation Method

This Report uses the market value of assets.

Wind-Up Expenses

Solvency and hypothetical wind-up valuations require that the actuary explicitly reflect any costs associated with the wind-up on the solvency/hypothetical wind-up balance sheet. This Report reflects a wind-up expense allowance of $250,000.

Annuity Purchases

1. Basis: Assumption for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2017 and December 30, 2018.
2. Members valued: Members who are retired or who are eligible to retire.
3. Retirement Age: Immediate (current age).
4. Mortality: CPM2014 Mortality Table projected using Scale B.
5. Interest Rate: In accordance with the Guidance provided by the Canadian Institute of Actuaries. The annuity purchase rate was determined to be 3.02%

Commuted Value (CV) Basis – Non-Indexed rates are required for the Plan

1. Basis: Commuted values (CVs) were calculated in accordance with the Canadian Institute of Actuaries (CIA) Standard of Practice – Practice-Specific Standards for Pension Plans, Section 3500.
2. Members Valued: Members who are not retired or eligible to retire.
3. Retirement Age: Optimal retirement age was assumed that provided the largest CV.
4. Mortality: CPM2014 Mortality Table projected using Scale B.
5. Interest Rates: The non-indexed interest rate changes monthly. For example, the non-indexed interest rates for December, 2017 were 2.60% for the first 10 years, and 3.40% thereafter.

Development of the Annuity Purchase Rate – Non-Indexed

On March 5, 2018, the Canadian Institute of Actuaries (CIA) released an Educational Note "Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update - Effective December 31, 2017, Applicable to valuations with Effective Dates Between December 31, 2017, and December 30, 2018" outlining how to determine the annuity purchase rate to be used for solvency valuations as at December 31, 2017. The cost of purchasing non-indexed annuities would be estimated based on the following process:

Determine the duration of the portion of the liabilities assumed to be settled through the purchase of annuities based on a discount rate of 3.02% (CANSIM V39062 plus 80 bps at December 31, 2017).

Liabilities were calculated for the members who were retired or eligible to retire as at December 31, 2017 (age 55 or older) using a discount of 3.02% and 3.03% to determine the duration. Their liabilities are as follows:

	Liabilities	
Discount Rate	3.02%	3.03%
Active-R	26,233,536	26,199,153
Disabled-R	1,206,840	1,205,256
Deferred-R	10,787,802	10,773,769
Pensioner-R/Survivor-R	45,282,950	45,240,368
Total	83,511,128	83,418,546

Using these liabilities, duration was determined to be 11.10 for this group of members retired or eligible to retire. To determine the spread above the unadjusted CANSIM V39062, we interpolated using the following table:

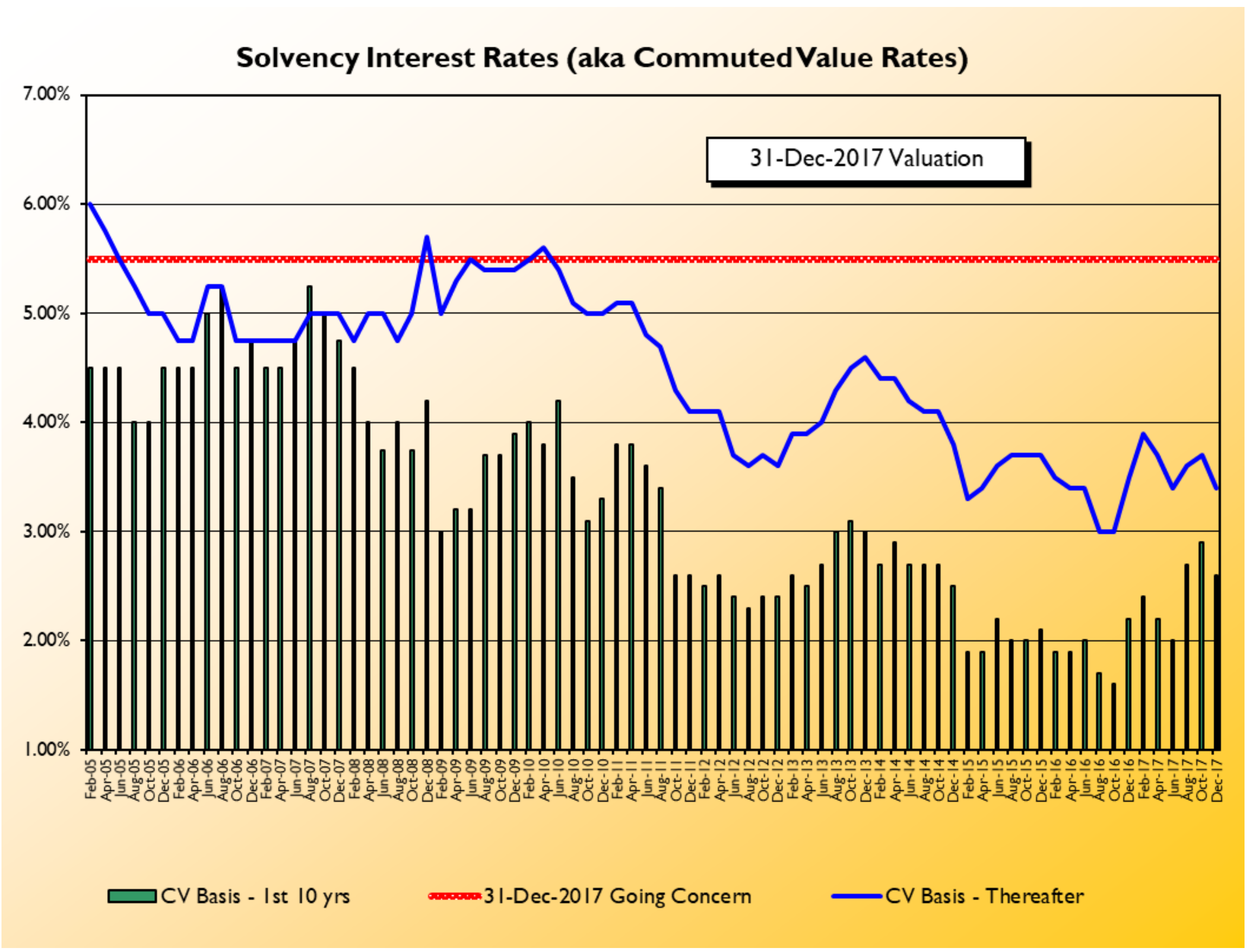
Illustrative Block	Duration based on 3.02% discount rate	Spread above unadjusted CANSIM V39062
Low Duration	8.6	+ 70 bps
Medium Duration	11.1	+ 80 bps
High Duration	13.6	+ 90 bps

The spread calculated was 0.80%. Therefore, the CAMSIM V39062 as at December 31, 2017 (2.22%) plus the spread (0.80%) is equal to the Annuity Purchase rate of 3.02%.

Development of the Solvency Test Rate of Return – Non-Indexed

The discount rates for cash settlements in the solvency Valuation are based on the same rates that are used for the commuted value calculations including the 1-month lag as required by the Canadian Institute of Actuaries (CIA) standards. Effective for events commencing in October, 2015, the Canadian Institute of Actuaries (CIA) standards utilize the 2014 Canadian Pensioners Mortality Table (CPM2014) with generational projection using Scale B, and the dual interest rates, one applicable to the first 10 years and the other applicable thereafter. These rates are based on the following CANSIM series and formulas:

Lump Sum Formula				Spot Rate	Used Rate
CANSIM V122542 NOVEMBER, 2017 RATE (i_7)			=	1.72%	n/a
CANSIM V122544 NOVEMBER, 2017 RATE (i_L)			=	2.23%	n/a
First 10 Years:	=	$i_7 + 0.90\%$	=	2.62%	2.60%
After 10 Years:	=	$i_L + 0.50 * (i_L - i_7) + 0.90\%$	=	3.39%	3.40%



75 Re	16 S	66 Dy	4 Be	57 La	34 Se	03 Li	01 H
105 Db	74 W	58 Ce	22 Ti	18 Ar	59 Pa	24 Cr	39 Y
50 Sn	74 Ru	10 Ca	103 Lr	66 Dy	45 Rh	82 Pb	31 Ga
47 Ag	06 C	13 Al	83 Bi	80 Hg	81 Tl	79 Au	39 V
28 Ni	07 N	32 Ge	51 Sb	78 Pt	76 Os	89 Ac	77 Ir
87 Fr	56 Ba	11 Na	73 Ta	19 K	38 Sr	55 Cs	02 He
10 Ne	08 O	54 Xe	70 Yb	100 Fm	98 Cf	97 Bk	09 F
36 Kr	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
107 Bh	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd
106 Sg	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
40 Zr	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd

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