MORNEAU SHEPELL

Shared Risk Plan for CUPE Employees of New Brunswick Hospitals

Actuarial Valuation Report as at December 31, 2017

Report prepared in September 2018

Registration number: Canada Revenue Agency #0385849
NB Superintendent of Pensions: NB 0385849

Business. Needs. People.

Table of Contents

Introduction

The Pension Plan for CUPE Employees of New Brunswick Hospitals ("Former CUPE Plan") was converted to the Shared Risk Plan for CUPE Employees of New Brunswick Hospitals ("CUPE SRP Plan") effective July 1, 2012.

This valuation is conducted as at December 31, 2017 for the Board of Trustees ("Trustees"), the Superintendent of Pensions ("Superintendent") and the Canada Revenue Agency ("CRA") for the following purposes:

- to document the results of a funding policy valuation, as required under subsection 100.61(1) of the New Brunswick *Pension Benefits Act* ("PBA") and subsections 14(5) to 14(7) of Regulation 2012-75, and provide the related actuarial opinion;
- to document the results of the risk management procedures as required under paragraph 100.7(1)(e) of the PBA;
- to document the results of a going concern actuarial valuation required under subsection 14(1) of Regulation 2012-75 in order to determine the maximum eligible employer contribution for the CUPE SRP Plan under subsection 147.2(2) of the *Income Tax Act (Canada)* ("ITA") and provide the related actuarial opinion; and
- to document the results of a hypothetical wind-up valuation of the CUPE SRP Plan as required under the Canadian Institute of Actuaries' Standards of Practice, and provide the related actuarial opinion.

The Board of Trustees is also seeking the approval of the Superintendent for the following items, as required under the PBA and Regulation:

- approval of the generational mortality table used in the funding policy valuation as required under sub-paragraph 14(7)(c)(ii) of Regulation 2012-75;
- approval of the asset liability model used, as described in Section 2, including the stochastic projection assumptions found under Appendix C, as required under subsection 15(1) of Regulation 2012-75; and
- approval of the economic assumptions used in the asset liability model, as described under Appendix C, as required under subsection 15(3) of Regulation 2012-75.

The Trustees for the CUPE SRP Plan retained the services of Morneau Shepell Ltd ("Morneau Shepell") to prepare this report.

The last actuarial valuation report prepared for the CUPE SRP Plan was performed as at December 31, 2016.

The next actuarial valuation report for the CUPE SRP Plan will be due no later than one year following the effective date of this report in accordance with the requirements of subsection 100.61(1).

A collective agreement between CUPE and Treasury Board covering members of the Plan was signed on November 28, 2017 retroactive to July 1, 2015. The retroactive salary adjustments processed in 2018 as a result of this ratified collective agreement are not included in the results of this valuation because the adjustments occurred after December 31, 2017. However, we expect that additional contributions received by the Plan on retroactive salary adjustments will offset the increase in actuarial liability associated with the retroactive adjustments to accrued pensions.

Effective January 1, 2018, amendments to the PBA and Regulation 2012-75 (the shared risk regulation) came into effect. More specifically, the addition of subsection 7(2.1) to Regulation 2012-75, effective January 1, 2018, now allows contingent indexing (cost-of-living adjustments) to be provided when the primary risk management test exceeds 95.0% (changed from its prior level of 97.5%). Other types of benefit improvements or permanent benefit changes still require a level of 97.5% to be implemented, and would therefore not be affected by this change. On the advice of the Board of Trustees, CUPE Local 1252 and the Province of New Brunswick (collectively referred to as the "Parties") have amended the Funding Policy for the Plan effective January 1, 2018 to take advantage of the provisions of subsection 7(2.1). The impact of this change is included in this valuation. Other changes to the PBA and Regulation 2012-75 that occurred on January 1, 2018 did not materially affect the results of this valuation.

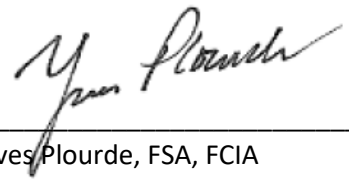
To our knowledge, there are no other events subsequent to the valuation date which would materially impact the results of the valuation.

The recommendations and opinions are given exclusively from a financial viewpoint. This valuation report does not constitute a legal opinion on the rights and duties of the Trustees or the members of the plan over the pension fund.

Actuarial valuation results are only estimates. Actuarial valuations are performed based on assumptions and methods that are in accordance with sound actuarial principles. Emerging experience differing from these assumptions will result in gains or losses, which may affect future open group funded ratios of the plan and future risk management procedures results, which in turn will impact the types and timing of any actions to be taken by the Trustees in accordance with the Funding Policy. These gains and losses will be revealed in future actuarial valuations.

The undersigned is available to provide supplementary information and explanation as appropriate, concerning this report.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 28, 2018
Date

This report was peer reviewed by Paul Lai Fatt, FSA, FCIA

Section 1 – Funding Policy Valuation

A funding policy valuation is required annually under subsection 100.61(1) of the PBA and subsections 14(5) to 14(7) of Regulation 2012-75. The results of the funding policy valuation of the CUPE SRP Plan as at December 31, 2017 are found below.

The funding policy valuation results presented in this section are based on asset information found in Appendix A, membership data found in Appendix B, and plan provisions summarized in Appendix D, and Funding Policy summarized in Appendix E of this report. The methods and assumptions used in the funding policy actuarial valuation are described later in this section.

Funding Policy Valuation Funded Status

The funding policy valuation funded status of the CUPE SRP Plan is determined by comparing the fair market value of the assets to the funding policy actuarial liabilities. The funding policy actuarial liabilities are based on the benefits earned up to the valuation date assuming the Plan continues indefinitely. The funding policy valuation funded status of the CUPE SRP Plan as at December 31, 2017, along with the results in the previous valuation as at December 31, 2016 are found below:

Table 1.1 – Funding Policy Valuation Funded Status

	December 31, 2017	December 31, 2016
	$	$
Market Value of Assets		
• Fair market value of assets (including receivables / payables)	$872,844,000	$792,114,000
Funding Policy Actuarial Liabilities		
• Active members	393,808,000	392,664,000
• Terminated and suspended members	71,190,000	61,746,000
• Retired members and beneficiaries	510,128,000	477,027,000
• Outstanding refunds	1,124,000	557,000
• Total funding policy valuation actuarial liabilities	976,250,000	931,994,000
Funding policy valuation excess (unfunded liability)	(103,406,000)	(139,880,000)
Termination value funded ratio [calculated in accordance with paragraph 14(6)(e) of Reg. 2012-75]	89.4%	85.0%

The termination value funded ratio is used in the calculation of the “termination value” of any individual’s pension benefits at termination of employment, death, marriage breakdown, or retirement, as the case may be, in accordance with the terms of the CUPE SRP Plan and subsection 18(1) of Regulation 2012-75. It is calculated in accordance with paragraph 14(6)(e) of Regulation 2012-75.

Funding Policy Valuation Normal Cost and Excess Contributions

The table below provides the funding policy valuation normal cost, being the value of the pension benefits being earned in the twelve-month period after the valuation date. It compares the funding policy valuation normal cost to the level of member and employer contributions in order to determine the level of contributions being made to the Plan in excess of the funding policy valuation normal cost. Results for the year following December 31, 2017 are presented below, along with the results found in the previous valuation as at December 31, 2016.

Table 1.2 – Funding Policy Valuation Normal Cost and Excess Contributions

	Year Following December 31, 2017		Year Following December 31, 2016	
	$	% of payroll	$	% of payroll
A. Member and employer contributions	62,601,000	19.1%	62,086,000	19.1%
B. Funding policy valuation normal cost	34,622,000	10.6%	34,539,000	10.6%
C. Excess contributions (A. – B.)	27,979,000	8.5%	27,547,000	8.5%
Estimated payroll for year following	327,756,000		325,057,000	

Determination of 15-Year Open Group Funded Ratio

The table below provides the 15-year open group funded ratio as calculated in accordance with the requirements of paragraph 14(6)(f) of Regulation 2012-75. This ratio is used extensively by the funding policy to determine the actions to be undertaken by the Trustees under the funding policy deficit recovery plan and the funding policy excess utilization plan. The 15-year open group funded ratio is calculated as follows as at December 31, 2017, along with the results found in the previous valuation as at December 31, 2016.

Table 1.3 – 15-Year Open Group Funded Ratio

	December 31, 2017	December 31, 2016
A. Market value of assets (including receivables / payables)	872,844,000	792,114,000
B. Present Value of Excess Contributions over next 15 years [calculated in accordance with Reg. 14(6)(c)]	347,420,000	339,715,000
C. Funding policy valuation actuarial liabilities	976,250,000	931,994,000
D. 15-Year Open Group Funded Ratio [(A. + B.) / C.]	125.0%	121.4%

Reconciliation of Funding Policy Valuation Funded Status with Previous Valuation

The table below describes the change in the Plan's funded status between the last funding policy valuation as at December 31, 2016 and this funding policy valuation as at December 31, 2017:

Table 1.4 – Reconciliation of Funded Status

	$	$
Funding policy valuation excess (unfunded liability) as at December 31, 2016		(139,880,000)
Expected changes in funded status		
• Interest on funding excess (unfunded liability)	(6,295,000)	
• Excess contributions (shortfall) over normal cost	27,655,000	
• Cost of implementation of Steps 1 to 5 effective January 1, 2018	(14,751,000)	
• Total		6,609,000
Expected funding policy valuation excess (unfunded liability) as at December 31, 2017		(133,271,000)
Actuarial gains (losses) due to the following factors:		
• Investment return on actuarial value of assets	31,569,000	
• Retirements	(418,000)	
• Terminations	(1,345,000)	
• Mortality	1,342,000	
• Data corrections	(316,000)	
• Administrative expenses	(573,000)	
• Miscellaneous factors	(394,000)	
• Total		29,865,000
Funding policy valuation excess (unfunded liability) as at December 31, 2017		(103,406,000)

Reconciliation of Total Normal Cost

The factors contributing to the change in the total normal cost from the last funding policy valuation as at December 31, 2016 to this funding policy valuation as at December 31, 2017 are shown below:

Table 1.5 – Reconciliation of Total Normal Cost

	% of payroll
Total normal cost as at December 31, 2016:	10.6%
Impact of changes in demographics:	-
Total normal cost as at December 31, 2017:	10.6%

Sensitivity Analysis on the Funding Policy Valuation Basis

The Standards of Practice of the Canadian Institute of Actuaries require valuation reports to disclose the sensitivity of the liabilities to changes in the discount rate assumption. The table below illustrates the effect of 1% decrease in the discount rate on the funding policy actuarial liabilities. With the exception of the discount rate, all other assumptions and methods used for this valuation were maintained.

Table 1.6 – Sensitivity of Actuarial Liabilities on the Funding Policy Valuation Basis

	December 31, 2017	Discount rate 1% lower
	$	$
Actuarial liabilities		
• Active members	393,808,000	477,409,000
• Terminated and suspended members	71,190,000	86,234,000
• Retired members and beneficiaries	510,128,000	559,536,000
• Outstanding refunds	1,124,000	1,124,000
• Total	976,250,000	1,124,303,000
Increase in actuarial liabilities		148,053,000

Sensitivity Analysis on the Funding Policy Valuation Total Normal Cost

The table below illustrates the effect on the total normal cost of using a discount rate 1% lower than the one used for the funding policy valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 1.7 – Sensitivity of Funding Policy Total Normal Cost

	As at December 31, 2017		Discount rate 1% lower	
	$	% of payroll	$	% of payroll
Total normal cost	34,622,000	10.6%	43,264,000	13.2%
Increase in total normal cost			8,642,000	2.6%

Funding Policy Valuation Actuarial Methods

Asset Valuation Method

The assets used under the funding policy valuation are equal to the fair market value of the assets. This is a requirement of paragraph 14(6)(d) of Regulation 2012-75.

Actuarial Cost Method

The funding policy valuation actuarial liabilities and total normal cost were calculated using the accrued benefit (or unit credit) actuarial cost method in accordance with the requirement of paragraph 14(7)(a) of Regulation 2012-75.

The funding policy valuation actuarial liabilities are equal to the actuarial present value of benefits earned by members for services prior to the valuation date, taking into account the actuarial assumptions as indicated hereafter. For greater certainty, it does not take into account the impact of any future salary increases, and the impact of any future increases in accrued pensions due to cost-of-living adjustments or other adjustments as may be granted from time to time by the Trustees in accordance with the plan terms and the funding policy.

The funding policy valuation normal cost is equal to the actuarial present value of benefits expected to be earned by members in the year following the valuation date. A salary increase estimate has been made to calculate the estimated normal cost and estimated member and employer contributions for the year following the valuation date.

The ratio of the total normal cost to the covered payroll for the period will tend to stabilize over time if the demographic characteristics of the active and disabled members remain stable. All other things being equal, an increase in the average age of the active and disabled members will result in an increase in this ratio.

For valuation purposes, to determine eligibility for benefits and for any other use, the age used is the age on the date of the nearest birthday.

Funding Policy Valuation Actuarial Assumptions

The main actuarial assumptions employed for the funding policy actuarial valuation are summarized in the following table. Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future funding policy actuarial valuations. Experience gains and losses emerging in future funding policy actuarial valuations will impact among other things the open group funded ratio of the plan, which in turn will impact the types and timing of any actions to be taken by the Trustees in accordance with the funding policy. All rates and percentages are annualized unless otherwise noted.

Table 1.8 – Funding Policy Valuation Actuarial Valuation Assumptions

		December 31, 2017							
Discount rate		4.50% per annum							
Salary increase for year following valuation (for normal cost purposes only, and inclusive of promotional increases)		2.75%							
YMPE increase for year following valuation (for normal cost purposes only)		2.75%							
Mortality		2014 Public Sector Mortality Table (CPM2014Publ) projected with Improvement Scale B (CPM-B) with size adjustment factors of 131% for males and 123% for females							
Retirement									
Retirement Age		Age at Conversion							
	Under 25 or joined Plan after conversion date	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+
55	0%	0%	0%	0%	0%	0%	0%	12.5%	25%
56	0%	0%	0%	0%	0%	12.5%	25%	15%	5%
57	0%	0%	0%	12.5%	25%	15%	5%	5%	5%
58	0%	12.5%	25%	15%	5%	5%	5%	5%	5%
59	25%	15%	5%	5%	5%	5%	5%	5%	5%
60	5%	5%	5%	5%	5%	5%	5%	17.5%	30%
61	5%	5%	5%	5%	5%	17.5%	30%	17.5%	5%
62	5%	5%	5%	17.5%	30%	17.5%	5%	5%	5%
63	5%	17.5%	30%	17.5%	5%	5%	5%	5%	5%
64	30%	17.5%	5%	5%	5%	5%	5%	5%	5%
65	25%	22.5%	20%	17.5%	15%	12.5%	10%	7.5%	5%
Termination (membership) Sample rates of termination other than by death, disability or retirement		Age		Male		Female			
		20		7.6%		12.6%			
		25		6.6%		9.7%			
		30		5.4%		7.5%			
		35		3.4%		5.7%			
		40		2.6%		4.1%			
		45		1.8%		2.8%			
		50		0.9%		1.4%			
		55		0%		0%			
Expenses		A 5% loading is added to the total normal cost to cover non-investment administration expenses payable from the fund							

Additional assumptions are required to determine the level of future cash flows to and from the pension plan, such as member and employer contributions, normal costs, benefit payments and expenses. These cash flows are calculated on a deterministic basis for each year following the valuation date for a period of 20 years, and allows the determination of the funding policy actuarial liability and assets at each future date, as well as the determination of the present value of 15-year excess contributions in accordance with paragraph 14(6)(c) of Regulation 2012-75. Furthermore, all this information is used in the stochastic analysis required under the risk management procedures for the Plan.

Table 1.9 – Additional Funding Policy Actuarial Valuation Assumptions for Purposes of Calculating Future Year Cash Flows and Actuarial Liability

	December 31, 2017		
New entrants	Every termination and retirement is replaced by a new entrant subject to a net decrease in active membership of 0.5% per year for 7 years, and stable active membership thereafter for the next 13 years. New entrants are assumed to be 75% female, 25% male.		
Distribution of new entrants and salary at entry:	Age	Distribution	Average Salary at Entry
	25	30%	42,900
	30	30%	42,900
	40	20%	42,900
	50	20%	42,900
Work Percentage	85%		
Inflation	2.25% per annum		
Salary increases	2.75% per annum		
YMPE increases	2.75% per annum		

Rationale for Material Actuarial Assumptions

The assumptions have been reviewed in light of current economic and demographic conditions.

Inflation

Given the historical increases in consumer prices in Canada, the rates expected by the market, the portfolio managers' expectation, the Bank of Canada policy and the long-term forecasts of the Conference Board of Canada, Morneau Shepell believes that the expected long-term annual rate of inflation should be between 1.85% and 2.35%.

Consistent with this range and prior years, we have continued to use an inflation assumption of 2.25% per annum.

Discount Rate Development

The elements considered in the development of the discount rate assumption for purposes of the funding policy valuation are summarized in the table below.

Table 1.10 – Development of Funding Policy Valuation Discount Rate

	%
Expected long-term nominal return based on the results of our stochastic analysis (using long-term target asset mix, and including impact of rebalancing and diversification)	5.43
Value added for active management (not exceeding the additional fees paid for active management [active management fees estimated at 0.30%] over passive management [passive management fees estimated at 0.10%])	0.20
Assumed margin for adverse deviation (originally set to achieve a high probability of exceeding the discount rate over the next 20 years)	(0.83)
Expected investment related expenses paid from the fund	(0.30)
Discount rate	4.50

The expected long-term nominal return by asset class is provided in Appendix C. It should be noted that the return assumptions for bonds has been determined mainly on current market conditions while the return assumptions for equities and alternative investments are based more on long-term expectations.

Investment Expenses

The allowance for investment management expenses paid from the fund as built into the discount rate is 0.30% of assets based on recent Plan history and our expectation for future investment expenses.

Rate of Salary Increase

Based on the historical trends for this group we have assumed that long-term future salary increases will equal 2.75% per annum, including merit and promotion. Based on prior studies, merit and promotion increases for this group does not provide for much movement to higher earnings levels over a career.

Mortality

We used the CPM-2014Publ Mortality Table, and the CPM-B Improvement Scale, which varies by gender, age and calendar year. Adjustment factors of 131.0% and 123.0% for males and females, respectively, were also applied to the mortality table to take into account the level of pensioner benefits among plan beneficiaries, as well as the expected mortality for employees in the medical and social services industry relative to the general public sector. The same adjustments were used for other participants before and after retirement. This is the same mortality assumption as used in the previous valuation.

The mortality rates described above result in the following life expectancies for females and males.

Table 1.11 - Life expectancy for Females and Males

Females				Life expectancy by Age in Year…	
Age	2018	2023	2028	2033	2038
55	32.7	33.0	33.2	33.5	33.7
60	27.9	28.1	28.4	28.6	28.9
65	23.2	23.5	23.7	23.9	24.2
70	18.8	19.0	19.2	19.4	19.7
75	14.6	14.8	15.0	15.2	15.3
80	10.7	10.9	11.1	11.2	11.4
Males				**Life expectancy by Age in Year…**	
Age	2018	2023	2028	2033	2038
55	30.0	30.3	30.6	30.9	31.2
60	25.4	25.7	26.0	26.3	26.5
65	21.0	21.3	21.5	21.7	22.0
70	16.6	16.9	17.2	17.4	17.6
75	12.6	12.8	13.0	13.2	13.4
80	8.9	9.2	9.3	9.5	9.6

Termination

We have used the same termination rates as used in the previous valuation. We will continue to monitor this assumption for reasonableness.

Rate of Increase in YMPE

We have used a rate of increase of 2.75% per annum for all years. The YMPE is not affected by the salary increase considerations specific to this group of plan members. The YMPE is automatically updated to its revised base level at each valuation date.

Retirement

Given the changing early retirement subsidies for service after the Conversion Date, we estimate that Plan members will slowly start to delay retirement as we move away from the Conversion Date. As a result, we adopted retirement assumptions that vary depending on the member's age at conversion, and an ultimate retirement assumption for new members after conversion. A younger member at the valuation date will be expected to retire later on average than an older worker at the same date. This assumption was adopted at the initial conversion to the shared risk plan and did not change for this valuation. We will continue to monitor this assumption for reasonableness.

Opinion on Funding Policy Valuation

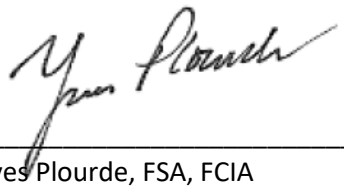
In my opinion, for the purposes of the funding policy valuation section of the report:

- The membership data on which the valuation is based is sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This funding policy valuation report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the funding policy valuation of this report were reasonable and consistent with the objectives of the plan at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 28, 2018
Date

Section 2 – Risk Management Goals and Procedures

Meeting Risk Management Goals

The Plan was designed to achieve or exceed the risk management goals prescribed under the PBA and Regulation 2012-75. Certain procedures were developed to test whether these goals can be achieved given the contribution rules and benefits defined in the plan. These goals and procedures are described separately below, along with the results of the stochastic analysis that are relevant under the PBA as at December 31, 2017.

Risk Management Goals

The primary risk management goal under the PBA is to achieve a 97.5% probability that base benefits will not be reduced over the 20 years following the valuation.

The goal is measured by taking into account the following funding management plans:

1. the funding deficit recovery plan except for reduction in past or future base benefits, and
2. the funding excess utilization plan excluding permanent benefit changes.

The funding deficit recovery plan and the funding excess utilization plan are described in Sections V and VI of the Funding Policy, respectively.

There are two secondary risk management goals under the PBA. These are:

- On average provide contingent indexing on base benefits (all members) that are in excess of 75% of CPI over the next 20 years.
- On average be expected to provide at least 75% of the value of the ancillary benefits described in the plan documents at conversion over the next 20 years.

For the purposes of meeting these goals, base benefits include the accrual of extra service of members and any contingent indexing provided based on the financial performance represented by each scenario tested.

If as a result, through the testing process, a scenario allows for indexing in a given future year, then this contingent indexing amount becomes part of the base benefits that is to be protected. In other words, the base benefit is dynamically adjusted based on the stochastic results for each economic scenario tested.

Risk Management Procedures

The risk management goals are measured using an asset liability model with future economic scenarios developed using a stochastic process.

The model was run with 2,000 alternative economic scenarios over 20 years. This exceeds the minimum requirements under the PBA of 1,000 economic scenarios.

For each of these scenarios and for each year, the financial position of the Plan is measured. For each of these measurements, a decision consistent with the funding deficit recovery plan or the funding excess utilization

plan, as applicable, is modeled with the exceptions noted under the goals above. When modeling the funding deficit recovery plan actions over the 20-year period of each of the 2,000 economic scenarios, each of the five steps identified in the funding deficit recovery plan under Section V of the Funding Policy is implemented in sequence until such time as the open group funded ratio of the plan reaches 100% or higher. A "benefit reduction trial" is recorded (for purposes of the primary risk management goal calculation) when step 5 of the funding deficit recovery plan found in Section V of the Funding Policy is triggered (i.e. a reduction in past base benefits) at any point in the 20-year period of an economic scenario. For conservatism, our stochastic model also recorded a "benefit reduction trial" (for purposes of the primary risk management goal calculation) when any action beyond step 1 was required. The primary risk management measure is therefore the proportion of those 2,000 scenarios that do not lead to a base benefit reduction over a 20-year period. In order to pass the primary risk management goal, at least 1,950 of those 2,000 scenarios must not trigger a "benefit reduction trial" at any point over the 20-year period.

The asset liability model using a stochastic process requires that a number of important modeling assumptions be made. The main assumptions are described below:

- The economic assumptions are developed for each asset class and for key economic parameters based on a combination of past experience, current economic environment and a reasonable range of future expectations. These assumptions are reviewed annually and updated as required. They are also subject to approval by the Superintendent of Pensions. These assumptions are found in Appendix C.

- For purposes of this report, The Plan's contributing member population is assumed to reduce by 0.5% per year for a period of seven years following December 31, 2017, and remain stable thereafter in each subsequent year of the projection period. This is to reflect the impact of remaining former FacilicorpNB employees whose replacements upon termination would be members of the Public Service Pension Plan as a result of Service New Brunswick's restructuring. As such, departures from the Plan, for any reason, are assumed to be replaced by the number of new entrants such that the overall contributing member population reduces by 0.5% per year for a period of seven years following December 31, 2017, and remains stable thereafter in each subsequent year of the projection period. The new entrant population reflects the profile of new Plan members expected in the future based on Plan experience. The profile of new entrants used for this analysis is found under Table 1.9 in Section 1 of this report.

The risk management goals were tested as at December 31, 2017, the effective date of this report. The results of these tests combined with the results of the funding policy actuarial valuation at the same date will determine the actions the Board of Trustees is required to take, or can consider, under the terms of the Funding Policy.

The primary risk management goal must be achieved or exceeded:

- At July 1, 2012 (i.e. the Conversion Date), which it was based on the results found in the initial actuarial valuation report as at that date;

- At the date a permanent benefit change as defined in the Regulations is made;

- At the date a benefit improvement as defined in the Regulations is made; or

- At the date the contribution adjustments are fully implemented.

Notwithstanding the above, effective from January 1, 2018, where a benefit improvement relates to contingent indexing, such benefit improvement may be implemented provided there is at least a 95.0% probability that past base benefits will not be reduced over the following 20 years and provided the Board of Trustees confirms that

the asset mix of the Plan has not been changed in a manner that increased investment risks in the six-month period before the contingent indexing occurred.

The secondary risk management goals must be achieved or exceeded:

- At July 1, 2012 (i.e. the Conversion Date), which it was based on the results found in the initial actuarial valuation report as at that date; or
- At the date a permanent benefit change as defined in the Regulations is made.

The definitions of permanent benefit change and benefit improvement are as follows:

"permanent benefit change" means a change that is intended to permanently change the formula for the calculation of the base benefits or ancillary benefits after the date of the change, including a change made in accordance with the funding excess utilization plan.

"benefit improvement" means an escalated adjustment for past periods or an increase in other ancillary benefits allowed under the funding policy.

Results of stochastic analysis as at December 31, 2017

The stochastic analysis undertaken as at December 31, 2017, took into account the main following items:

- Membership Data as at December 31, 2017 summarized in Appendix B;
- Economic and demographic assumptions as at December 31, 2017 for the funding policy valuation summarized in Section 1;
- Pension fund target asset mix as summarized in Table A.4 of Appendix A;
- Stochastic projection assumptions as summarized in Appendix C;
- Risk management procedures described above;
- CUPE SRP Plan provisions as summarized in Appendix D;
- Funding deficit recovery plan found under Section V of the CUPE SRP Plan's Funding Policy (except for reduction in past or future base benefits); and
- Funding excess utilization plan found under Section VI of the CUPE SRP Plan's Funding Policy (excluding permanent benefit changes).

Based on the above, the results of the stochastic analysis for the various risk management goals as at December 31, 2017 are as follows:

Table 2.1 – Results of Stochastic Analysis for the Various Risk Management Goals

Risk Management Goal	Goal under PBA	Result for CUPE SRP Plan as at December 31, 2017
Primary Goal [Regulation 7(1)] - There is at least a 97.5% probability that the past base benefits at the end of each year will not be reduced over a 20-year period	In order to provide "contingent indexing": **95.0%** In order to provide "other benefit changes": **97.5%**	**99.60**% **PASSED**
Secondary Goal 1 [Regulation 7(3)(a)] - Expected contingent indexing of base benefits of active members for service before the conversion date shall, on average over the next 20-year period, exceed 75% of the increase in the Consumer Price Index; or Expected contingent indexing of base benefits of retirees and deferred vested members for service rendered before the conversion date shall, on average over the next 20-year period, exceed 75% of the escalated adjustments specified in the pension plan immediately before it was converted to a shared risk plan (i.e. 2.0% per year)	We estimated that the combined impact of the Secondary Goal 1 for active members, retirees and deferred vested members represents an average indexing of 70.0% of the increase in the Consumer Price Index (CPI). Note: This is the weighted average of 75% of CPI for active members, and 66⅔% of CPI for retirees and deferred vested members (75% of 2.0% over assumed CPI of 2.25%).	**91.8**% of the assumed increase in CPI **PASSED**
Secondary Goal 2 [Regulation 7(3)(b)] - The amount of ancillary benefits (other than contingent indexing) that are expected to be provided shall, on average over the next 20-year period, exceed 75% of the value of the ancillary benefits specified in the plan text	**75%** of the value of ancillary benefits will be provided	Above **99.60%** of the value of ancillary benefits is expected to be provided (See Note below) **PASSED**

Note: The Funding Policy only provides for the reduction of one type of ancillary benefit under the Funding Deficit Recovery Plan at actions 2 and 3. This is the replacement of early retirement reductions for post-conversion service under action 2, and for pre-conversion service at action 3, by a full actuarial reduction for members not yet eligible to receive an immediate pension. In order to simplify the stochastic analysis and remain conservative, every time action is required beyond step 1 (increase in contributions), the model triggers a "benefit reduction scenario" for purpose of meeting the primary risk management goal. Therefore, it is expected that on average the Secondary Goal 2 above will exceed the primary risk management result of 99.60%, well above the minimum 75% level required under the PBA.

Section 3 – Going Concern Valuation

The going concern actuarial valuation is conducted in accordance with subsection 14(1) of Regulation 2012-75 to the New Brunswick *Pension Benefits Act* ("PBA") in order to determine the maximum eligible employer contribution for the CUPE SRP Plan under subsection 147.2(2) of the *Income Tax Act (Canada)* ("ITA") and provide the required actuarial opinion.

The going concern actuarial valuation results presented in this section are based on asset information found in Appendix A, membership data found in Appendix B, and plan provisions summarized in Appendix D. The methods and assumptions used in the going concern valuation are described later in this section.

Going Concern Funded Status

The funded status of the CUPE SRP Plan on the going concern basis is determined by comparing the actuarial value of the assets to the actuarial liabilities. The actuarial liabilities are based on the benefits earned up to the valuation date assuming the Plan continues indefinitely. It also has a provision for future cost-of-living adjustments to be provided by the Trustees in accordance with the plan terms and the funding policy. Such a provision is acceptable under paragraph 147.2(2)(c) of the ITA.

The table below provides the going concern funded status at December 31, 2017 along with the comparative results of the last going concern valuation conducted as at December 31, 2014.

Table 3.1 – Going Concern Funded Status

	December 31, 2017	December 31, 2014
	$	$
Market Value of Assets		
• Fair market value of assets (including receivables / payables)	$872,844,000	$677,709,000
Going Concern Actuarial Liabilities		
• Active members	$654,908,000	$622,360,000
• Terminated and suspended members	118,080,000	61,644,000
• Retired members and beneficiaries	637,502,000	525,975,000
• Outstanding refunds	1,124,000	1,062,000
• Total going concern valuation actuarial liabilities	1,411,614,000	1,211,041,000
Going concern valuation excess (unfunded liability)	(538,770,000)	(533,332,000)
Going concern funded ratio	61.8%	56.0%

Sensitivity Analysis on the Going Concern Basis

The Standards of Practice of the Canadian Institute of Actuaries require valuation reports to disclose the sensitivity of the liabilities to changes in the discount rate assumption. The table below illustrates the effect of 1% decrease in the discount rate on the going concern actuarial liabilities. With the exception of the discount rate, all other assumptions and methods used for this valuation were maintained.

Table 3.2 – Sensitivity of Actuarial Liabilities on the Going Concern Basis

	December 31, 2017	Discount Rate 1% lower
	$	$
Actuarial liabilities		
• Active members	654,908,000	825,419,000
• Terminated and suspended members	118,080,000	149,047,000
• Retired members and beneficiaries	637,502,000	709,248,000
• Outstanding refunds	1,124,000	1,124,000
• Total	1,411,614,000	1,684,838,000
Increase in actuarial liabilities		273,224,000

Going Concern Residual Normal Cost

The table below summarizes the estimated going concern residual normal cost of pension benefits being earned in the twelve-month period after the valuation date (the normal cost), along with the same information as at the date of the last going concern valuation, December 31, 2014.

Table 3.3 – Going Concern Residual Normal Cost

	As at December 31, 2017		As at December 31, 2014	
	$	% of payroll	$	% of payroll
Total Normal Cost	60,563,000	18.5	57,645,000	17.2
Less Member Contributions	29,498,000	9.0	30,216,000	9.0
Residual Normal Cost	31,065,000	9.5	27,429,000	8.2
Total Annualized Payroll	327,756,000		335,731,000	

Sensitivity Analysis on the Going Concern Residual Normal Cost

The table below illustrates the effect on the residual normal cost of using a discount rate 1% lower than the one used for the going concern valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 3.4 – Sensitivity of Going Concern Residual Normal Cost

	As at December 31, 2017		Discount Rate 1% lower	
	$	% of payroll	$	% of payroll
Total normal cost	60,563,000	18.5	80,549,000	24.6
Less Member contributions	29,498,000	9.0	29,498,000	9.0
Residual Normal Cost	31,065,000	9.5	51,051,000	15.6
Increase in residual normal cost			19,986,000	6.1

Maximum Eligible Employer Contribution under the Income Tax Act

The maximum eligible employer contribution in accordance with the ITA is equal to the residual normal cost, plus the greater of the going concern unfunded liability and the hypothetical wind-up deficiency. Under a shared risk plan, the hypothetical wind-up liability will typically be nil. However, the anti-avoidance rule under Section 16 of Regulation 2012-75 may be triggered if a wind-up occurs in the first ten years following the conversion of the shared risk plan. For purposes of calculating the maximum eligible employer contribution, we have ignored the hypothetical wind-up deficiency that could exist for the first ten years after conversion.

On the basis of the methods and assumptions in this report, the maximum eligible employer contribution for the year following December 31, 2017 is equal to $569,835,000 (representing $31,065,000 of residual normal cost and $538,770,000 of going concern unfunded liability).

When spreading the going concern unfunded liability over the next three years (period for which this going concern valuation is valid under the PBA), the maximum eligible employer contribution for the three years following January 1, 2018 (ignoring interest and salary increases) would be as follows:

Table 3.5 – Maximum Eligible Employer Contributions Spread Over Three Years

			December 31, 2017	
Year Following	Going Concern Unfunded Liability	Residual Normal Cost	Total	
	$	$	$	% of payroll
December 31, 2017	179,590,000	31,065,000	210,655,000	64.3%
December 31, 2018	179,590,000	31,065,000	210,655,000	64.3%
December 31, 2019	179,590,000	31,065,000	210,655,000	64.3%

Based on the above, the employer contribution requirements under the terms of the Plan of 10.1% of payroll are eligible contributions under the ITA. Furthermore, should employer contributions be increased to 10.6% of payroll as would be required under the Funding Policy if the 15-year open group funded ratio of the plan dropped below 100% for two years in a row, those higher employer contributions would also be eligible contributions under the ITA up to the date of the next going concern valuation scheduled no later than December 31, 2020.

Going Concern Valuation Actuarial Methods

The asset valuation method and the actuarial cost method under the going concern valuation are identical to the asset valuation method and the actuarial cost method under the funding policy valuation. The going concern valuation assumptions are also identical, except for the addition of a provision for future cost-of-living adjustments.

Discount rate

In order to balance the need to fund intended benefits in a secure and responsible manner, while recognizing the necessity for CRA to monitor the impact of over-conservatism in assumptions, we developed a methodology to select an appropriate discount rate which we believe will balance those concerns. The discount rate selected is determined by using the nominal investment return that can be expected to be achieved from the long-term asset mix of the CUPE SRP Plan over the next 20 years at least 2/3 of the time, minus 1.0% (to account for inclusion of any margins for adverse deviation and any and all expenses to be paid from the fund), with the caveat that the going concern valuation discount rate cannot be lower than the funding policy valuation discount rate. This leads to a net discount rate of 4.50% per year, which is the same discount rate as used in the funding policy valuation. In the previous going concern valuation as at December 31, 2014, a discount rate of 4.50% per year was used when applying the same methodology.

Assumed contingent indexing on accrued pensions and pensions in payment

A provision for future cost-of-living adjustments on the amount of the accrued pensions of active members, and terminated deferred vested members, and on the amounts of current and future pension payments is made. This provision satisfies the requirements of paragraph 147.2(2)(c) of the ITA.

The funding policy clearly states that the benefit intention (benefit target) is a benefit based on a best 5 year average earnings formula with a fixed 2% annual indexing after retirement; the same as existed prior to the conversion. While this is by no means a guaranteed outcome, the contributions have been set at a level that there is a high likelihood of achieving these benefit intentions (or targets).

As a result, and in accordance with the PBA, we have conducted the going concern valuation based on these benefit intentions, which would provide for indexing of accrued pensions before assumed retirement at 2.75% per year (similar to the long-term salary increase assumption in our funding policy valuation), and indexing of pensions after retirement of 2.25% per year (reflecting the inflation assumption in our funding policy valuation).

Other Going Concern actuarial assumptions

All other assumptions in our going concern valuation are identical to the assumptions used under the funding policy actuarial valuation detailed in Table 1.8 of Section 1 of this report, and the rationale for the choice of those assumptions also applies for the going concern valuation.

The additional assumptions detailed in Table 1.9 of Section 1 are not required under the going concern actuarial valuation, and therefore do not apply.

Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future going concern actuarial valuations.

Opinion on Going Concern Valuation

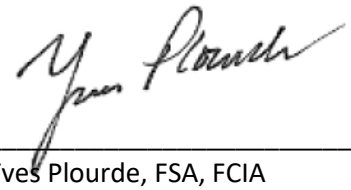
In my opinion, for the purposes of the going concern valuation section of the report:

- The membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This going concern valuation report has been prepared, and my opinion given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the going concern valuation of this report were reasonable at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 28, 2018
Date

Section 4 – Hypothetical Wind-up Valuation

A hypothetical wind-up valuation assumes that the Plan is wound-up on the valuation date and member's benefit entitlements are calculated as of that date. Although this type of valuation is not required under Part 2 of the New Brunswick *Pension Benefits Act* for a shared risk plan, the Standards of Practice of the Canadian Institute of Actuaries require that actuarial valuation reports provide information with respect to hypothetical wind-up situations.

Subsection 16(3) of Regulation 2012-75 under the *Pension Benefits Act* prescribes that if a shared risk plan is wound-up by the persons who established the plan within 5 years of its conversion date, the conversion of the plan is void and the plan has to be wound-up as a defined benefit plan under Part 1 of the PBA. In addition, effective January 1, 2018, subsection 16(3.1) of Regulation 2012-75 under the *Pension Benefits* Act prescribes that if a shared risk plan is wound-up by the persons who established the plan more than 5 years but less than 10 years after the conversion date, the plan conversion may be declared void at the discretion of the Superintendent. This may require the plan to be wound-up as a defined benefit plan under Part 1 of the PBA.

It is important to note that the former CUPE Plan was not subject to the PBA and the procedures to be followed if a wind-up occurred were not defined within the former CUPE Plan. As a result, the procedures for payments at wind-up were not defined. In conducting the hypothetical wind-up valuation as at December 31, 2017, we therefore made the assumption that the conversion to a shared risk plan would be void, and that the CUPE SRP plan would be wound-up as at December 31, 2017 in accordance with the rules found under Part 1 of the PBA. This assumption has been made solely on the basis that subsection 16(3.1) would apply on January 1, 2018, and does not represent a legal opinion on the validity of this scenario.

We have valued the wind-up liability using discount rates consistent with the requirements of the PBA for plan wind-ups under Part 1. The PBA requires that benefits paid out to each member upon wind-up be not less than the cost to purchase an annuity for that member. Accordingly, we have followed the Canadian Institute of Actuaries' recommendations for the estimated cost of annuity purchases as at December 31, 2017 (adjusted to provide fixed indexing of 2.0% per annum).

Hypothetical Wind-Up Funded Status

The hypothetical wind-up funded status is presented for information purposes. There is no requirement under the PBA to fund the hypothetical wind-up deficit of the CUPE SRP Plan while it is not in a wind-up state.

The hypothetical wind-up funded status under the scenario postulated above, including the results of the last hypothetical wind-up valuation, is presented in Table 4.1 below.

Table 4.1 – Hypothetical Wind-Up Funded Status

	December 31, 2017	December 31, 2016
	$	$
Assets		
• Market value of assets	$872,844,000	$792,114,000
• Provision for wind-up expenses	(1,500,000)	(1,500,000)
• Total	871,344,000	790,614,000
Hypothetical wind-up liabilities		
• Active members	1,020,311,000	1,014,888,000
• Terminated and suspended members	179,457,000	155,816,000
• Retired members and beneficiaries	762,032,000	705,627,000
• Outstanding refunds	1,124,000	557,000
• Total hypothetical wind-up liabilities	1,962,924,000	1,876,888,000
Assets less liabilities on the hypothetical wind-up basis	(1,091,580,000)	(1,086,274,000)

Sensitivity Analysis on the Hypothetical Wind-up Basis

The Standards of Practice of the Canadian Institute of Actuaries require valuation reports to disclose the sensitivity of the liabilities to changes in the discount rate assumption. The table below illustrates the effect on the actuarial liabilities of using discount rates 1% lower than those used for the hypothetical wind-up valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 4.2 – Sensitivity of Actuarial Liabilities on the Hypothetical Wind-up Basis

	December 31, 2017	Discount Rates 1% lower
	$	$
Actuarial liabilities		
• Active members	1,020,311,000	1,264,974,000
• Terminated and suspended members	179,457,000	224,437,000
• Retired members and beneficiaries	762,032,000	861,050,000
• Outstanding refunds	1,124,000	1,124,000
• Total	1,962,924,000	2,351,585,000
Increase in actuarial liabilities		388,661,000

Incremental Cost on the Hypothetical Wind-up Basis

The incremental cost on the hypothetical wind-up basis represents the present value of the expected aggregate change in the actuarial liabilities from December 31, 2017 to December 31, 2018, adjusted for expected benefit

payments in the inter-valuation period. This incremental cost is estimated to be $97,288,000 as at December 31, 2017.

Hypothetical Wind-up Asset Valuation Method

Wind-up assets are equal to the market value of assets less an allowance for wind-up expenses. This valuation method is the same as the one used in the last valuation.

Hypothetical Wind-up Actuarial Cost Method

The hypothetical wind-up liabilities are determined using the accrued benefit (or unit credit) actuarial cost method. The hypothetical wind-up liabilities are equal to the actuarial present value of all benefits earned by members for services prior to the valuation date assuming the Plan is wound up on the valuation date. This method is the same as the one used in the last valuation.

For valuation purposes, to determine eligibility for benefits and for any other uses, the age used is the age on the date of the nearest birthday. This method is the same as the one used in the last valuation.

Hypothetical Wind-up Actuarial Assumptions

The main actuarial assumptions used in the hypothetical wind-up valuation correspond to those prescribed by the PBA.

Although the Former CUPE Plan was not subject to the PBA before it was converted to the CUPE SRP Plan, in the absence of specific direction to the contrary in the Former CUPE Plan, we have valued the hypothetical wind-up liability using discount rates consistent with the requirements of the PBA if the Plan were to be wound up. The PBA requires that benefits paid out to each member upon wind-up be not less than the cost to purchase an annuity for that member. Accordingly, we have followed the Canadian Institute of Actuaries' recommendations for the estimated cost of annuity purchases as at December 31, 2017. If the commuted value rates in accordance with the Canadian Institute of Actuaries' Standard of Practice Section 3500 – Pension Commuted Values produced a higher liability for members not eligible to retire, these rates were used. We adjusted the above rates with the fixed rate of indexing of 2.0% per year under the Former CUPE Plan in order to obtain a net rate for valuation.

The main actuarial assumptions employed for the hypothetical wind-up actuarial valuation are summarized in the following table. All rates and percentages are annualized unless otherwise noted. The rates in brackets represent the net rate after taking into account the escalation of pension of 2.0% per year provided by the Former CUPE Plan.

Table 4.3 – Hypothetical Wind-Up Actuarial Assumptions

	December 31, 2017	December 31, 2016
Interest rate		
• Interest rate for active members and deferred vested members under 55	3.12% (1.10% net) per annum; or 2.6% (0.59% net) per annum for 10 years, 3.4% (1.37% net) per annum thereafter	3.21% (1.19% net) per annum; or 2.2% (0.20% net) per annum for 10 years, 3.5% (1.47% net) per annum thereafter
• Interest rate for all other members	3.12% (1.10% net) per annum	3.21% (1.19% net) per annum
Salary increases	None	None
Mortality	CPM2014 Composite table projected with Scale CPM-B	CPM2014 Composite table projected with Scale CPM-B
Termination (membership)	None	None
Provision for wind-up expenses	$1,500,000	$1,500,000
Retirement	Age that maximizes the value of the pension	Age that maximizes the value of the pension

Allowance has been made for administrative, actuarial and legal costs which would be incurred if the Plan were to be wound up in full or in part. No allowance has been made for costs which may be incurred in respect of resolving surplus or deficit issues on Plan wind up or the costs in respect of assets which cannot be readily realized.

The Canadian Institute of Actuaries (CIA) collects data annually from insurance companies and annually determines interest rates suitable for estimating the cost of single premium group annuities in hypothetical wind-up valuations. For pensioners and for active members and deferred vested members eligible for immediate retirement at the valuation date, the interest rate used in the present hypothetical wind-up valuation is an estimate of the rate that would be used by insurance companies in pricing single premium group annuities for annuitants already retired, based on the suggested rates for such annuitants published by the CIA.

The discount rate used for active members and deferred vested members not eligible for immediate retirement is the rate suggested by the CIA as an appropriate estimate of the cost of deferred annuities based on their survey data from insurance companies.

Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future hypothetical wind-up actuarial valuations.

Termination Scenario

The termination scenario used in the hypothetical wind-up valuation includes the following assumptions:

- Plan wind-up would not result from employer insolvency.
- All assets could be realized at their reported market value.
- CUPE SRP Plan conversion would be void and the pension plan would be wound-up under Part 1 of the PBA.

- Indexed annuities would be purchased for all plan members.

Margin for Adverse Deviations

As specified by the Standards of Practice of the Canadian Institute of Actuaries, the hypothetical wind-up assumptions do not include a margin for adverse deviations.

Provision for Fees

Allowance has been made for administrative, actuarial and legal costs which would be incurred if the Plan were to be wound up, based on sufficient and reliable data. It is assumed that the wind-up date, the calculation date and the settlement date are coincident, and as such, expenses related to investment policy reviews, investment and custodial fees are not included. Expenses related to the resolution of surplus and deficit issues are not taken into account. The amount of expenses is only an approximation and may differ significantly from real expenses incurred on plan wind-up, for example, in case of litigation or bankruptcy.

Hypothetical Wind-up Incremental Cost

The incremental cost on the hypothetical wind-up basis is based on the actuarial method and assumptions described below.

The method used to calculate the incremental cost may be described as follows:

1. Present value of expected benefit payments between December 31, 2017 and December 31, 2018, discounted to December 31, 2017;

   Plus

2. Projected hypothetical wind-up liabilities as at December 31, 2018, discounted to December 31, 2017;

   Less

3. Hypothetical wind-up liabilities as at December 31, 2017.

The projected liabilities as at December 31, 2018 take into account:

- accrual of service to December 31, 2018;
- expected changes in benefits to December 31, 2018; and
- projection of pensionable earnings to December 31, 2018.

The actuarial assumptions used to calculate the incremental cost may be described as follows:

- The assumptions used to calculate the expected benefit payments in item 1. above and service accruals, projected changes in benefits and projected changes in the pensionable earnings in item 2. above correspond to those used in the going-concern valuation as at December 31, 2017.
- The assumptions used to calculate the projected solvency liabilities as at December 31, 2018 in item 2. above correspond to those used for the solvency valuation as at December 31, 2017, taking into account the method of settlement applicable to each member as at December 31, 2017.

However, we assume that the discount rates remain at the levels applicable as at December 31, 2017 and that the select period is reset as at December 31, 2018 for discount rate assumptions that are select and ultimate.

We also assume that the standards of practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect as at December 31, 2017 remain in effect as at December 31, 2018

- The rates used to discount items 1. and 2. above from December 31, 2017 to December 31, 2018 correspond to those used for the solvency valuation as at December 31, 2017. However, these rates are adjusted to take into account the applicable method of settlement applicable to each member as at December 31, 2018.

Note that no new entrants were considered between December 31, 2017 and December 31, 2018 as the impact on the incremental cost is not material.

Opinion on Hypothetical Wind-up Valuation

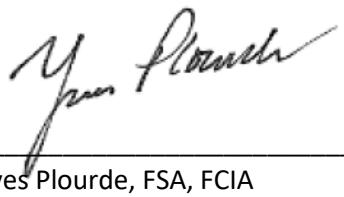
In my opinion, for the purposes of the hypothetical wind-up valuation section of the report:

- The membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This hypothetical wind-up valuation report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the hypothetical wind-up valuation of this report were reasonable at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 28, 2018
Date

Appendix A – Assets

Description of Plan Assets

The assets of the plan are held in a trust fund, and RBC Investor & Treasury Services is the custodian for the assets of the pension fund.

Statement of Market Value

The following table shows the asset mix as at December 31, 2017, and for comparison, the mix as at December 31, 2016 extracted from the Plan's prior actuarial valuation:

Table A.1 – Assets at Market Value

	December 31, 2017	December 31, 2016
Invested assets		
• Canadian Equities	$90,636,954	$95,829,464
• Foreign Equities	135,854,446	140,134,510
• Fixed Income	447,830,722	395,297,773
• Real Estate	83,248,890	78,595,461
• Infrastructure	92,559,988	60,703,700
• Derivatives	1,438,321	(1,276,041)
• Short Term	12,442,630	13,270,059
• Net amount receivable	8,832,298	9,559,223
Total assets	$872,844,249	$792,114,149

Changes to Plan Assets

The following table shows changes to the Plan assets held by RBC Investor & Treasury Services (the custodian) during the inter-valuation period, based on market values. The reconciliation from January 1, 2017 to December 31, 2017 is based on the unaudited financial statements issued by Vestcor for the full calendar year 2017.

Table A.2 – Reconciliation

	2017
Assets at beginning of year	$792,114,149
Receipts	
• Contributions and transfers	61,329,141
• Investment income plus realized and unrealized capital appreciation and depreciation	69,642,946
Total receipts	130,972,087
Disbursements	
• Pensions paid and refunds	45,927,889
• Expenses (fees)	4,314,098
Total disbursements	50,241,987
Assets at end of year	$872,844,249

Return on Assets

The CUPE SRP Plan assets earned the following rates of return, net of investment related expenses charged to the fund, based on our calculations which assume cash flow occurred in the middle of the period:

Table A.3 – Investment Return (net of investment related expenses)

Year	Rate of Return
2017	8.45%
2016	7.88%
2015	2.81%
2014	9.44%

Actuarial Value of Assets

We have used the market value of assets (including receivables / payables) without adjustment. The actuarial value of assets as at December 31, 2017 was $872,844,000.

Target Asset Mix under Shared Risk Plan

The statement of investment policy and goals for the CUPE SRP Plan provides for the long term target asset mix shown in the table below. The target asset mix below includes recent changes approved by the Board of Trustees and reflected in the most recent SIP&G dated February 2018:

Table A.4 – Target Asset Mix

	Target
Asset classes	
• Fixed Income – Domestic Treasury Bills (DTB)	0.5%
• Fixed Income – Domestic Universe Bonds (DUB)	9.0%
• Fixed Income – Domestic Long-term Bonds (DLB)	25.5%
• Fixed Income – US High Yield Bonds (USHY)	7.5%
• Fixed Income – Global Government Bonds (GGB)	7.5%
• Canadian Equities (DE)	10.0%
• Foreign Equities (FE)	15.0%
• Canadian Real Estate (CRE)	10.0%
• Global Real Estate (GRE)	5.0%
• Infrastructure (I)	10.0%
Total	100.0%

This target asset mix was used to determine the discount rate assumption under the plan, and to conduct the stochastic analysis required under the PBA to assess the various risk management goals.

Appendix B – Membership Data

Description of Membership Data

Data on Plan membership was obtained from the PIBA pension system maintained by Vestcor. The data was provided as at December 31, 2017.

The data was matched and reconciled with the data provided for the previous valuation as at December 31, 2016. Basic data checks were performed to ensure that age, salary, service and accrued pensions data were reasonable for the purposes of the valuation and to ensure that the data was accurate, complete and consistent with previous data.

The accrued pension data for terminated and suspended members did not include the applicable indexing from the date of termination to the date of conversion. The correct accrued pensions for pre-conversion service for valuation purposes was calculated for those groups using the accrued pension data provided and pre-retirement indexing using a date field provided by Vestcor.

Summary of Membership Data

The following tables were prepared using data provided by Vestcor regarding its active members, retirees and former members. Accrued pensions, in payment or not, for all members reflect all cost-of-living and benefit improvement adjustments granted by the Board of Trustees effective January 1, 2018.

These tables show the following:

- B.1 Summary of Membership Data
- B.2 Changes in Plan Membership
- B.3 Age/Service Distribution for Active Members as at December 31, 2017
- B.4 Distribution of Retired Members and Beneficiaries by Age Groups as at December 31, 2017
- B.5 Distribution of Terminated and Suspended Members by Age Groups as at December 31, 2017

Table B.1 - Summary of Membership Data

	December 31, 2017	December 31, 2016
Active members[1]		
• Number	7,967	8,065
• Total covered payroll[2]	$328,700,000	$326,325,000
• Average salary	$41,258	$40,462
• Average age	44.8 years	44.9 years
• Average accrued lifetime pension	$5,254	$5,093
• Average accrued bridge benefit	$1,990	$1,939
• Average credited service	8.6 years	8.5 years
Terminated and suspended members		
• Number	2,313	2,022
• Average annual lifetime pension	$3,229	$3,151
• Average annual bridge benefit[3]	$1,243	$1,194
• Average age	44.7 years	44.8 years
Retired members and beneficiaries		
• Number	3,892	3,675
• Average annual lifetime pension	$10,170	$10,035
• Average annual bridge benefit[3]	$5,002	$4,979
• Average age	69.8 years	69.9 years

[1] Includes all actively contributing members at the valuation date. Any non-contributing members, such as on a leave of absence, members who have signed an intra-provincial agreement, or suspended, are grouped under Terminated and Suspended members.

[2] Estimated total payroll for actively contributing employees, taking into account work percentage by individual for part-time employees.

[3] Average for those entitled to or receiving a bridging benefit.

There were also 50 other inactive members with outstanding payments as at December 31, 2017, for a total amount owed of $1,124,000.

Table B.2 – Changes in Plan Membership

	Active Members	Terminated and Suspended members	Retired Members and Beneficiaries	Total
Members at December 31, 2016	8,065	2,022	3,675	13,762
New members	643	-	-	643
Retirements	(215)	(74)	289	-
Returned to active status	387	(385)	(2)	-
Reclassified as suspended	(806)	806	-	-
Terminations:				
• deferred vested	(1)	1	-	-
• paid out	(67)	(39)	-	(106)
• outstanding refunds owing	(36)	(14)	-	(50)
Deaths:				
• with no continuing benefits	(3)	(4)	(75)	(82)
• with survivors	-	-	(17)	(17)
New survivor pensions	-	-	26	26
Guarantee period expired	-	-	(4)	(4)
Data Adjustments	-	-	-	-
Members at December 31, 2017	7,967	2,313	3,892	14,172

Table B.3 – Age/Service Distribution for Active Members as at December 31, 2017

Years of Service		Under 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 and Over	Total
0 - 4	Num.	330	556	445	403	358	371	337	224	130	3,154
	Avg. Sal.	$39,656	$40,378	$38,533	$37,804	$36,652	$35,612	$36,292	$33,788	$32,193	$37,488
	Avg. Pen.	$650	$1,331	$1,538	$1,748	$1,683	$1,720	$1,680	$1,678	$1,684	$1,506
5 - 9	Num.		125	301	380	377	363	336	264	140	2,286
	Avg. Sal.		$46,024	$45,247	$44,492	$43,699	$42,923	$41,752	$40,839	$39,705	$43,177
	Avg. Pen.		$3,826	$4,429	$4,547	$4,539	$4,356	$4,311	$4,289	$4,222	$4,376
10 - 14	Num.		1	51	185	213	205	242	211	129	1,237
	Avg. Sal.		*	$47,206	$45,296	$45,534	$44,274	$43,361	$43,071	$43,358	$44,284
	Avg. Pen.		*	$6,762	$7,292	$7,361	$7,274	$7,073	$7,158	$7,283	$7,212
15 - 19	Num.				13	71	112	148	182	79	605
	Avg. Sal.				$46,226	$46,132	$44,450	$43,597	$43,398	$42,757	$43,939
	Avg. Pen.				$9,771	$10,318	$10,076	$10,078	$10,232	$10,007	$10,136
20 - 24	Num.					4	40	59	53	29	185
	Avg. Sal.					$45,629	$44,943	$45,305	$43,530	$43,304	$44,412
	Avg. Pen.					$13,136	$13,829	$13,975	$13,425	$13,157	$13,640
25 - 29	Num.						18	136	115	24	293
	Avg. Sal.						$44,447	$44,202	$43,684	$44,683	$44,053
	Avg. Pen.						$16,661	$17,191	$17,143	$17,884	$17,196
30 and over	Num.							35	126	46	207
	Avg. Sal.							$44,029	$44,620	$45,911	$44,807
	Avg. Pen.							$20,451	$21,272	$23,809	$21,697
Total number		**330**	**682**	**797**	**981**	**1,023**	**1,109**	**1,293**	**1,175**	**577**	**7,967**
Average of salaries		**$39,656**	**$41,415**	**$41,624**	**$41,919**	**$41,791**	**$40,979**	**$41,323**	**$41,097**	**$40,130**	**$41,258**
Average of accrued lifetime pension		**$650**	**$1,796**	**$2,970**	**$3,984**	**$4,562**	**$5,133**	**$7,035**	**$8,718**	**$7,706**	**$5,254**

Average age: 44.8 years

Average number of years of service: 8.6 years

Notes:

Age groups are based on exact age.

Years of service means the number of years credited for pension plan purposes, fractional parts being rounded to the nearest integer.

The salary used is the estimated salary rate as of January 1, 2018.

Membership for active members is composed of 2,033 males and 5,934 females.

Table B.4 – Distribution of Retired Members and Beneficiaries by Age Groups as at December 31, 2017

Age Group	Number	Total Annual Payments	
		Lifetime	Bridge
Under 60	318	3,323,946	1,507,530
60-64	893	10,416,687	4,454,342
65-69	970	10,129,878	-
70-74	722	7,372,697	-
75-79	432	4,240,036	-
80-84	263	2,060,072	-
85-89	147	1,069,659	-
90 and over	111	685,257	-
Total	**3,856**	**39,298,232**	**5,961,872**

Average age: 69.8

Notes:

Age groups are based on exact age.

The pension used is the pension payable as at January 1, 2018

Membership for retired members and beneficiaries is composed of 838 males and 3,018 females.

In addition, there are payments continuing to be made to 36 beneficiaries under remaining guarantees after pensioners' deaths for a total of $282,254 annually.

Table B.5 – Distribution of Terminated and Suspended Members by Age Groups as at December 31, 2017

Age Group	Number	Total Accrued Pensions	
		Lifetime	Bridge
Under 25	51	32,990	14,407
25 - 29	241	331,157	126,415
30 - 34	321	686,604	261,636
35 - 39	270	669,150	259,377
40 - 44	285	808,070	317,251
45 - 49	270	878,526	343,187
50 - 54	356	1,549,906	604,014
55 - 59	289	1,507,130	559,950
60 and over	230	1,005,027	380,617
Total	**2,313**	**7,468,760**	**2,866,854**

Average age: 44.7 years

Notes:

Age groups are based on exact age.

The pension used is the pension payable as at January 1, 2018.

Membership for terminated and suspended members is composed of 597 males and 1,716 females.

Appendix C – Stochastic Projection Assumptions

Our assumptions for stochastic analysis are built each year using Conference Board of Canada (CBoC) forecasts, internal research, inflation expectations and by surveying the asset manager universe. This ensures we are not using inputs that are out of touch with broader expectations. We strive for a moderate level of conservatism in our assumptions, as high expectations can lead to biased results, understating the true risk level of plans.

Stochastic projection assumptions are updated annually by Morneau Shepell Asset and Risk Management with an anchor date of December 31st and a time horizon of up to 25 years. A multi-stage process is used to set the economic assumptions. First, a long term inflation rate assumption is selected based primarily on the current Bank of Canada Monetary Policy. Volatility for inflation is based on historical data since the early 1990's when the current monetary policy was introduced. Market implied inflation is used as an indicator of the market expectation for long term trends for inflation. Secondly, historical and current bond data is used to determine the long term interest rates for key bond indices. It is assumed that current yields will revert to the projected long term rates over a projected period of 10 years. Volatility assumptions are based on historical data modified to reflect current low yield rates. Expected return levels and standard deviations for Canadian bond indices are generated in a stochastic simulation approach.

The next stage is to determine nominal equity return assumptions. The process uses multiple sources including our inflation assumptions, historical data, GDP and other economic data, growth forecasts and dividend information. Standard deviations and correlations of equity returns are mainly derived from historical data. Historical data is used to measure the return and volatility spreads between small-cap and large-cap equities. Alternative asset classes are primarily based on historical data but adjusted by factors specific for each asset class.

The following expected return and volatility by asset class was used as at December 31, 2017:

Table C.1 – Expected Return over 20 Years and Volatility (standard deviation) by Asset Class

	Expected Annualized Return over 20 years	Volatility of Annual Return (standard deviation)
Inflation	2.25%	1.2%
Asset classes		
• Fixed Income – Domestic Treasury Bills (DTB)	2.00%	1.3%
• Fixed Income – Domestic Universe Bonds (DUB)	3.10%	6.9%
• Fixed Income – Domestic Long-term Bonds (DLB)	3.35%	10.4%
• Fixed Income – US High Yield Bonds (USHY)	5.40%	12.2%
• Fixed Income – Global Government Bonds (GAC/JPG)*	2.45%	5.5%
• Canadian Equities (DE)	6.65%	16.5%
• Foreign Equities (FE)	6.85%	15.3%
• Canadian Real Estate (CRE)	6.25%	10.2%
• Global Real Estate (RE)**	6.40%	12.9%
• Infrastructure (I)	6.65%	13.3%

** Two asset classes were used as a proxy for Global Government Bonds: Global Aggregate Credit (GAC) and JP Morgan Non-US Government Bond Index (JPG)*

*** Two asset classes were used as a proxy for Global Real Estate: Canadian Real Estate and FTSE Developed Markets*

For every year in the 20-year projection, expenses of 10 basis points to reflect the cost of passive management is deducted from the expected return (the additional cost of active management is expected to be achieved in addition to the expected returns shown above and therefore are not included in the analysis). For the payment of non-investment related expenses, the normal cost has been increased by 5.0% (representing about 0.5% of payroll), and that amount is used for non-investment expenses in our stochastic analysis.

The following correlation among the various asset classes identified in Table C.1 was also used as at December 31, 2017:

Table C.2 – Correlation Among Asset Classes

	DTB	DUB	DLB	USHY	GAC	JPG	DE	FE	CRE	GRE	I
DTB	1.00	-0.07	-0.08	-0.18	-0.33	-0.21	0.00	-0.03	0.29	-0.01	0.04
DUB		1.00	0.90	-0.18	-0.10	0.54	0.00	-0.02	-0.04	0.20	0.19
DLB			1.00	0.04	0.04	0.51	0.03	0.01	0.12	0.25	0.25
USHY				1.00	0.51	-0.30	0.40	0.50	0.39	0.32	-0.02
GAC					1.00	0.04	0.33	0.26	-0.12	0.32	0.10
JPG						1.00	-0.39	-0.33	-0.20	-0.13	0.10
DE							1.00	0.52	0.09	0.53	0.15
FE								1.00	0.10	0.47	-0.07
CRE									1.00	0.21	0.01
GRE										1.00	0.20
I											1.00

Using a Monte Carlo simulation technique, the expected returns, volatility and correlation of the various asset classes shown above are used to model 2,000 series of alternative economic scenarios over 20-year periods. This provides at least 40,000 observations from which to measure whether the risk management goals have been achieved.

This exceeds the minimum requirements under the PBA of 1,000 series of economic scenarios.

For each of these scenarios and for each year, the financial position of the CUPE SRP Plan is measured on a funding policy basis. For the purpose of the stochastic analysis, the margin for adverse deviation in the discount rate is modified in each future period in the projection such that the resulting discount rate remains fixed at 4.5% per year throughout the projection period. The discount rate of 4.5% per year is used to project the funding policy liability and determine the present value of excess contributions throughout the projection period. The projection of the liability and future cash flows under the stochastic analysis uses the same demographic assumptions as used for the calculation of the funding policy liability, as required under paragraph 15(2)(c) of Regulation 2012-75.

The risk management procedures are described in Section 2 of this report.

Appendix D – Summary of Plan Provisions

The following is a brief summary of the main provisions of the CUPE SRP Plan effective December 31, 2017. For an authoritative statement of the precise provisions of the CUPE SRP Plan, reference must be made to the official CUPE SRP Plan documents.

Introduction

The Pension Plan for CUPE Employees of New Brunswick Hospitals ("Former CUPE Plan") became effective on January 1, 1975. The Former CUPE Plan was amended at various times throughout its history.

Effective July 1, 2012, the Former CUPE Plan was converted to the CUPE SRP Plan. The administration of the CUPE SRP Plan continues to be the responsibility of an independent Board of Trustees.

Eligibility and Participation

Each Member of the Former CUPE Plan joins the CUPE SRP Plan on July 1, 2012. Active members of the Pension Plan for Part-Time and Seasonal Employees of the Province of New Brunswick who are eligible to join the CUPE SRP Plan ceased active membership in the said plan and were required to join the CUPE SRP Plan as of July 1, 2012.

Each employee who commences full-time employment on or after July 1, 2012 is required to join the Plan from the first day of the month coincident with or next following the date of employment.

Required Contributions

Effective July 1, 2012, each member is required to contribute 9.0% of earnings. Participating employers contribute at least 10.1% of earnings from the same date.

Contribution rates are subject to change in accordance with triggers found under the Funding Policy for the CUPE SRP Plan.

Normal Retirement

The normal retirement date is the first day of the month coincident with or next following the sixty-fifth birthday.

A member's annual normal retirement pension is equal to the sum of:

(A) In respect of service before January 1, 1997, the product of:

i. the number of years of the member's pensionable service before January 1, 1997, and

ii. 1.75% of the annual average of the best five (5) consecutive years of earnings at July 1, 2012, up to the annual average YMPE for the same five (5) years, plus 2% of the excess of the annual average of the best five (5) consecutive years of earnings at July 1, 2012 over the annual average YMPE for the same five (5) years;

and

(B) In respect of service from January 1, 1997 to July 1, 2012, the product of:

i. the number of years of the member's pensionable service during that period, and

ii. 1.4% of the annual average of the best five (5) consecutive years of earnings at July 1, 2012, up to the annual average YMPE for the same five (5) years, plus 2% of the excess of the annual average of the best five (5) consecutive years of earnings at July 1, 2012 over the annual average YMPE for the same five (5) years;

and

(C) In respect of service from July 1, 2012, the sum of (i) and (ii) for each calendar year (or portion thereof):

i. 1.4% of the Member’s annualized earnings for the calendar year, up to the YMPE for the calendar year; and

ii. 2.0% of the portion of the Member’s annualized earnings for the calendar year that are in excess of the YMPE for the calendar year.

Pensions accrued above are subject to cost-of-living adjustments, before and after retirement, every January 1st following July 1, 2012, subject to approval by the Board of Trustees, and in accordance with the trigger requirements found under the Funding Policy for the CUPE SRP Plan. The following cost-of-living adjustments have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms of the Funding Policy.

Table D.1 – Cost of Living Adjustments

Effective Date	Cost of Living Adjustment
January 1, 2013	2.00% (pro-rated by 50% for active members)
January 1, 2014	0.96% for current year, plus 0.4% for prior year
January 1, 2015	1.43%
January 1, 2016	1.49%
January 1, 2017	1.40%
January 1, 2018	1.47%

Further increases to accrued pensions for active members may be awarded under the terms of the Funding Policy once cost-of-living adjustments have been awarded and the results of the actuarial valuation preceding the effective date of the adjustments allow the Board of Trustees to spend additional funds on pension increases.

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 2, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.2 – Step 2 Pension Adjustments

Effective Date	Step 2 Pension Increase (active members only)
January 1, 2013	n/a
January 1, 2014	n/a
January 1, 2015	95% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2013
January 1, 2016	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2014
January 1, 2017	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2015
January 1, 2018	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2016

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 3, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.3 – Step 3 Pension Adjustments

Effective Date	Step 3 Pension Increase (pensioners only)
January 1, 2016	100% of additional increase necessary to provide all members receiving a pension at December 31, 2014 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement
January 1, 2017	100% of additional increase necessary to provide all members receiving a pension at December 31, 2015 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2015 are affected.
January 1, 2018	100% of additional increase necessary to provide all members receiving a pension at December 31, 2016 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2016 are affected

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 4, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.4 – Step 4 Pension Adjustments

Effective Date	Step 4 Pension Increase (pensioners only)
January 1, 2016	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2014 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date.
January 1, 2017	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2015 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2015 are affected.
January 1, 2018	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2016 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2016 are affected.

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 5, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.5 – Step 5 Pension Adjustments

Effective Date	Step 5 Pension Increase (active members only)
January 1, 2016	100% of additional increase necessary to provide all active members a lifetime accrued benefit escalated at the Average Industrial Wage rather than the Consumer Price Index at December 31, 2014.
January 1, 2017	As the Average Industrial Wage index over the year in question (Dec 31, 2014 to Dec 31, 2015) was less than the CPI granted in Step 1, Step 5 did not provide any increases.
January 1, 2018	As the Average Industrial Wage index over the year in question (Dec 31, 2015 to Dec 31, 2016) was less than the CPI granted in Step 1, Step 5 did not provide any increases.

Normal, Automatic and Optional Forms of Pension

The normal form of pension is a pension payable in equal monthly installments commencing on the member's pension commencement date and continuing thereafter during the lifetime of the member or for sixty months, whichever is the longer. For a member with a spouse or common-law partner, the automatic form of pension is a joint and survivor pension which is payable in equal monthly installments for the life of the member and payable to the member's spouse or common-law partner after the member's death at 60% of the amount paid to the member. Such automatic form of pension is actuarially equivalent to the normal form of pension.

Optional forms of pension are also available on an actuarially equivalent basis.

Early Retirement and Bridge Benefit

Early retirement is permitted on or after age 55 if the member has at least 5 years of employment or 2 years of plan membership.

On early retirement, a bridge benefit of $18.00 per month per year of pensionable service is payable in addition to the lifetime pension found under "Normal Retirement". The bridge benefit is payable to age 65 or to the death of the member, if earlier, and is not reduced for early retirement.

The portion of the lifetime pension accrued for service before July 1, 2012 is unreduced if the pension commences to be paid at age 60 or later. If such lifetime pension commences to be paid before age 60, it is reduced by 1/4% per month (3% per year) that the lifetime pension commencement date precedes age 60.

The portion of the lifetime pension accrued for service on and after July 1, 2012 is reduced by 5/12% per month (5% per year) that the lifetime pension commencement date precedes age 65.

Benefits on Termination of Employment

If a member terminates employment prior to completing five years of continuous employment and prior to completing two years of plan membership, the member is entitled to a refund of the total amount of his/her contributions to the plan, with interest.

If a member terminates employment before age 55 but after completing at least five years of continuous employment or two years of plan membership, the member may elect to receive:

(i) a deferred lifetime pension payable from normal retirement date equal to the accrued pension to which the member is entitled as at his/her date of termination in accordance with the formula specified above for the normal retirement pension; or

(ii) to transfer the termination value of the deferred lifetime pension calculated in accordance with the PBA, to a registered retirement savings arrangement as allowed under the PBA.

Members electing a deferred lifetime pension will also be entitled to retire early in accordance with the "Early Retirement" section, and will also be eligible for a bridge benefit.

Death Benefits

If a member dies prior to completing five years of continuous employment and prior to completing two years of plan membership, the benefit payable is a refund of the member's own contributions to the plan, with interest.

If the member dies after completing at least five years of continuous employment or two years of plan membership, but before pension commencement, the death benefit payable is the termination value of the deferred pension determined in accordance with the PBA.

In the event of death after pension commencement, the benefit payable is determined in accordance with the form of pension selected by the member at retirement.

Appendix E – Summary of Funding Policy

The following is a brief summary of the main provisions of the Funding Policy for the CUPE SRP Plan effective December 31, 2017. For an authoritative statement of the precise provisions of the Funding Policy, reference must be made to the official document.

Purpose of Plan and Funding Policy

The purpose of the CUPE SRP Plan is to provide secure pension benefits to members and former members without an absolute guarantee, but with a risk focused management approach delivering a high degree of certainty that base benefits can be met in the vast majority of potential future economic scenarios.

The primary focus is to provide a highly secure lifetime pension at normal retirement age. However, the intention is that additional benefits may be provided depending on the financial performance of the Plan.

The Funding Policy is the tool used by the Board of Trustees to manage the risks inherent in a shared risk plan. The Funding Policy provides guidance and rules regarding decisions that must, or can, be made by the Board of Trustees around funding levels, contributions and benefits.

Benefit Objectives

The primary benefit objective for the Plan is to deliver benefits that closely replicate, to the extent possible, the benefits provided under the Plan prior to the conversion, including inflation protection.

Furthermore, benefit accruals under the Plan after the conversion are based on a normal retirement age of 65 with a 5% per year reduction for early retirement. This change reflects anticipated continued increases in life expectancy. The overall plan design objective with respect to retirement age is to provide each cohort of plan members with about the same expected number of years of pension payments for a similar amount of pension in current dollars at retirement. None of the above are guarantees.

Risk Management

In accordance with legislation on shared risk plans, the primary risk management goal is to achieve a 97.5% probability that base benefits will not be reduced over the following 20 years.

In addition, secondary risk management goals are to provide, on average, contingent indexing on base benefits (for all members) in excess of 75% of CPI over the next 20 years, and to achieve at least a 75% probability that the ancillary benefits described in the Plan text at conversion can be provided over the next 20 years.

Contributions

The initial total contribution rate is equal to 19.1% of earnings (members at 9.0% of earnings and employer at 10.1% of earnings).

Contribution adjustments may be made by the Board of Trustees. A total contribution increase of up to 1% of earnings is to be triggered by the Board of Trustees if the open group funded ratio of the Plan, as defined by the PBA, falls below 100% for two successive year ends until such time as the open group funded ratio reaches 105% without considering the effect of the contribution increase and the primary risk management goal is met.

A reduction in contributions of up to a total of 2% of earnings can be triggered by the Board of Trustees if the conditions set forth in the funding excess utilization plan are met.

Funding Deficit Recovery Plan

The funding deficit recovery plan must be implemented by the Board of Trustees if the open group funded ratio of the Plan falls below 100% for two successive plan year ends.

The funding deficit recovery plan consists of the following actions in the order of priority as listed below:

1. Increase contributions by up to a total of 1.0% of earnings.
2. Change early retirement rules for post-conversion service for members who are not yet eligible to retire and receive an immediate pension under the terms of the Plan to a full actuarial reduction for retirement before age 65;
3. Change early retirement rules for pre-conversion service for members who are not yet eligible to retire and receive an immediate pension under the terms of the Plan to a full actuarial reduction for retirement before age 60;
4. Reduce base benefit accrual rates for future service after the date of implementation of the deficit recovery plan by not more than 5%;
5. In addition to the reduction in step 4 above, reduce base benefits on a proportionate basis for all members regardless of membership status for both past and future service in equal proportions.

The above actions shall be taken one by one and when the primary risk management goal is met, no further actions are required at that time.

The base benefit reduction in point 5, if required, shall be such that both goals below are achieved:

1. 105% open group funding level; and
2. Primary risk management goal of 97.5% probability that base benefits need not be further reduced over the next 20 years

Contribution increases shall take effect no later than 12 months following the date of the funding policy valuation report that triggered the need for contribution increases, and all other actions shall take effect no later than 18 months following the date of the funding policy valuation report that triggered the need for the action.

Funding Excess Utilization Plan

The funding excess utilization plan describes the actions the Board of Trustees must take or consider when the open group funding levels exceeds 105%. If the open group funding level is at 105% or less, there are no actions that can be taken under the funding excess utilization plan.

The amount available for utilization is as follows:

- 1/6th of the excess funds that make up the difference between the open group funding level at the valuation date to a maximum of 140% and 105%; PLUS
- 100% of the excess above 140%.

If base benefits and/or ancillary benefits have been reduced, all excess available for utilization must first be used to reinstate those reductions. Afterwards, the following actions are to be taken in the following order of priority and no action can be taken until the immediately preceding action in the list below has been fully implemented:

1. Provide indexing of base benefits up to the full CPI since the last date where full CPI was achieved.
2. Provide further increases in base benefits of members not in receipt of a pension such that the base benefits are upgraded to a final five year average.
3. Provide a further increase to retired members such that a final average formula is reasonably replicated for each retired member at their retirement date and indexed to full CPI thereafter.
4. Provide a lump sum payment representing a reasonable estimate of missed past increased payments up to the levels of benefits arising out of steps 2 and 3.
5. Provide a further increase to benefits of members who were not in receipt of a pension at the funding policy valuation date that triggered the action up to the rate of increase in the average wage.
6. Establish a reserve to cover the next 10 years of potential contingent indexing.
7. Apply contribution reduction adjustment of up to 2%.
8. Improve the normal form of pension for all members who are not in receipt of a pension.
9. Improve the bridge pension for all members eligible for a bridge pension whether or not in pay.
10. Improve the early retirement rules for service after June 30, 2012, provided that the Board of Trustees considers life expectancy experience as it develops.

Action 1 can be applied with excess funds available when the open group funded ratio is below 140%, provided the primary risk management test exceeds 95.0% and the asset mix has not been changed in a manner which increases the investment risk in the prior 6-month period. Actions 2 to 5 can be applied with excess funds available when the open group funded ratio is below 140%, provided the primary risk management test exceeds 97.5%. If all improvements from 1 through 5 above have been made and the open group funded ratio is still in excess of 140%, then actions 6 through 10 can be undertaken in sequence. After such actions have been undertaken, the Trustees may consider permanent benefit changes subject to the approval of the Province and Union and subject to most members being able to benefit from the changes.

Except for the timing of contribution reductions, the timing of the above actions shall be the first of the year that is 12 months after the date of the funding policy valuation report that triggered the actions.

Actuarial Assumptions

A funding policy actuarial valuation shall be conducted by the Plan's actuary at December 31st of each year. The discount rate is 4.5% per year and can only be changed with the approval of the Province and the Union. The intention is to keep the discount rate stable over time. Other assumptions may be changed as experience evolves.

Appendix F – Plan Administrator Confirmation Certificate

With respect to the Actuarial Valuation Report of the Shared Risk Plan for CUPE Employees of New Brunswick Hospitals as at December 31, 2017, I hereby confirm that to the best of my knowledge:

- the data regarding Plan members and beneficiaries provided to Morneau Shepell as at December 31, 2017 constitutes a complete and accurate description of the information contained in the files;
- copies of the official plan text and funding policy of the CUPE SRP Plan and all amendments to date were provided to Morneau Shepell; and
- there are no subsequent events or any extraordinary changes to the plan membership from December 31, 2017 to the date of this valuation report, which would materially affect the results.

Board of Trustees
Shared Risk Plan for CUPE Employees of New Brunswick Hospitals

Signature	*Signature*
Name: Luc J Sirois	Name: Brenda Vienneau
Title: Chair	Title: Vice-Chair
Date: October 18, 2018	Date: October 18, 2018

MORNEAU SHEPELL

Morneau Shepell is the only human resources consulting and technology company that takes an integrated approach to employee assistance, health, benefits and retirement needs. The Company is the leading provider of employee and family assistance programs, the largest administrator of retirement and benefits plans and the largest provider of integrated absence management solutions in Canada. As a leader in strategic HR consulting and innovative pension design, the Company helps clients solve complex workforce problems and provides integrated productivity, health and retirement solutions. Established in 1966, Morneau Shepell serves approximately 20,000 clients, ranging from small businesses to some of the largest corporations and associations. With more than 4,000 employees in offices across North America, Morneau Shepell provides services to organizations across Canada, in the United States and around the globe. Morneau Shepell is a publicly-traded company on the Toronto Stock Exchange (TSX: MSI).

MENTAL HEALTH PARTNER