MORNEAU SHEPELL

Public Service Shared Risk Plan

Actuarial Valuation Report as at January 1, 2016

Registration number: Canada Revenue Agency: #0305839
NB Superintendent of Pensions: #0305839

Report prepared July 2016

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Introduction

The Public Service Superannuation Act ("Former PSSA") was converted to the Public Service Shared Risk Plan ("PSSRP") effective January 1, 2014.

This report, conducted as at January 1, 2016, was prepared for the Public Service Shared Risk Plan Board of Trustees ("Trustees") and the Superintendent of Pensions ("Superintendent") 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; and
- To document the results of a hypothetical wind-up valuation of the PSSRP 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 Regulations:

- 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 paragraph 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 paragraph 15(3) of Regulation 2012-75.

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

The last actuarial valuation report prepared for the PSSRP was performed as at January 1, 2015.

The next actuarial valuation report for the PSSRP 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).

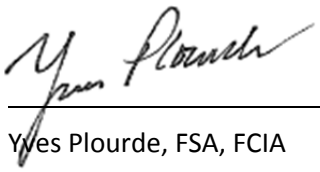
We understand that there are a number of legal actions against the Province of New Brunswick related to the conversion of the former Public Service Superannuation Act to the PSSRP. The outcome of those various legal actions are not yet known and they may or may not ultimately impact the results of the calculations found in this report. At this time, no special provision is made in this report with respect to any potential outcome related to these legal actions. 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 PSSRP 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, 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 are available to provide supplementary information and explanation as appropriate, concerning this report.

Respectfully submitted,



Yves Plourde, FSA, FCIA

July 29, 2016

Date

This report was peer reviewed by Conrad Ferguson, FSA, FCIA

Section 1 – Funding Policy Valuation

A funding policy valuation is 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. The results of the funding policy valuation of the PSSRP as at January 1, 2016, 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, 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 PSSRP 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 PSSRP as at January 1, 2016, along with the results in the previous valuation as at January 1, 2015, are found below:

Table 1.1 – Funding Policy Valuation Funded Status

	January 1, 2016	January 1, 2015
	$M	$M
Fair market value of assets (including receivables / payables)	$6,926.7	$6,567.3
Funding Policy Actuarial Liabilities		
Active members	$2,287.3	$2,286.3
Retirees and survivors	3,962.4	3,784.6
Deferred vested and suspended members	225.9	204.5
Outstanding refunds	1.5	1.9
Total funding policy valuation actuarial liabilities	$6,477.1	$6,277.3
Funding policy valuation excess (unfunded liability)	$449.6	$290.0
Termination value funded ratio [calculated in accordance with Reg. 14(6)(e)]	106.9%	104.6%

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 PSSRP 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 PSSRP in excess of the funding policy valuation normal cost. Results for the year following January 1, 2016 are presented below, along with the results found in the previous actuarial valuation as at January 1, 2015.

Table 1.2 – Funding Policy Valuation Normal Cost and Excess Contributions

	Year Following January 1, 2016		Year Following January 1, 2015	
	$M	% of payroll	$M	% of payroll
A. Funding policy valuation normal cost	$138.9	12.19%	$137.5	12.10%
B. Contributions:				
Members	$94.0	8.25%	$93.7	8.25%
Employers' initial contributions	128.2	11.25%	127.8	11.25%
Employers' temporary schedule 1 (for 5 yrs after 1.1.2014)	5.7	0.50%	5.7	0.50%
Employers' temporary schedule 2 (for 10 yrs after 1.1.2014)	8.5	0.75%	8.5	0.75%
Total	$236.4	20.75%	$235.7	20.75%
C. Excess contributions (B. – A.)	$97.5	8.56%	$98.2	8.65%
Estimated payroll for following year	$1,139.6		$1,136.0	

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 under 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:

Table 1.3 – 15-Year Open Group Funded Ratio

	January 1, 2016	January 1, 2015
	$M	$M
A. Market value of assets (including receivables / payables)	$6,926.7	$6,567.3
B. Present value of excess contributions over next 15 years [calculated in accordance with Reg. 14(6)(c)]	$1,197.6	$1,198.0
C. Funding policy valuation actuarial liabilities	$6,477.1	$6,277.3
D. 15-Year Open Group Funded Ratio [(A. + B.) / C.]	125.4%	123.7%

Reconciliation of Funding Policy Valuation Funded Status with Previous Valuation

The table below describes the change in the PSSRP's funded status between the last funding policy valuation as at January 1, 2015 and this funding policy valuation as at January 1, 2016:

Table 1.4 – Reconciliation of Funded Status

	$M	$M
Funding policy valuation excess (unfunded liability) as at January 1, 2015		290.0
Expected changes in funded status		
Interest on funding excess (unfunded liability)	13.8	
Total Contributions in excess of normal cost (shortfall)	99.9	
Impact of indexing for retirees and survivors as at January 1, 2016	(54.7)	
Impact of indexing for actives members, deferred vested and suspended members as at January 1, 2016	(38.2)	
Total		20.8
Expected funding policy valuation excess (unfunded liability) as at January 1, 2016		310.8
Experience gains (losses) due to the following factors		
Investment return on actuarial value of assets	159.3	
Incidence of mortality	(3.2)	
Incidence of retirements	(6.4)	
Incidence of terminations of employment	0.8	
Membership adjustments	(2.2)	
Impact of refinement in valuation methodology	(6.8)	
Other miscellaneous factors	(2.7)	
Total		138.8
Funding policy valuation excess (unfunded liability) as at January 1, 2016		449.6

Reconciliation of Total Normal Cost

The factors contributing to the change in the total normal cost from the last funding policy valuation as at January 1, 2015 to this funding policy valuation as at January 1, 2016 are shown below:

Table 1.5 – Reconciliation of Total Normal Cost

	% of payroll
Total normal cost as at January 1, 2015:	12.10%
Impact of changes in demographics:	0.09%
Total normal cost as at January 1, 2016:	12.19%

Sensitivity Analysis on the Funding Policy Basis

The Standards of Practice of the Canadian Institute of Actuaries require actuarial 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 Basis

	January 1, 2016	Discount rate 1% lower
	$M	$M
Actuarial liabilities		
Active members	2,287.3	2,750.6
Retirees and survivors	3,962.4	4,355.1
Deferred vested and suspended members	225.9	270.6
Outstanding refunds	1.5	1.5
Total	6,477.1	7,377.8
Increase in actuarial liabilities		900.7

Sensitivity Analysis on the Funding Policy 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 for this valuation, were maintained.

Table 1.7 – Sensitivity of Funding Policy Total Normal Cost

	As at January 1, 2016		Discount Rate 1% lower	
	$M	% of payroll	$M	% of payroll
Total normal cost	138.9	12.19	171.7	15.07
Increase in total normal cost			32.8	2.88

Funding Policy 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 normal cost were calculated using the accrued benefit (or unit credit) actuarial cost method in accordance with the requirements 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 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 members and employers 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 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 Actuarial Valuation Assumptions

									January 1, 2016
Discount rate									4.75% per annum
Salary increase for the year following valuation (normal cost purposes only)									2.75% per annum plus merit and promotion
YMPE increase for the year following valuation (normal cost purposes only)									2.75% per annum
Mortality									Males: 105% of CPM2014_PUBL with generational improvement using projection scale CPM-B
									Females: 110% of CPM2014_PUBL with generational improvement using projection scale CPM-B
Termination (membership)									None
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%	0%	0%
56	0%	0%	0%	0%	0%	0%	0%	2.5%	5%
57	0%	0%	0%	0%	0%	2.5%	5%	5%	5%
58	0%	0%	0%	2.5%	5%	5%	5%	5%	5%
59	0%	0%	5%	5%	5%	5%	5%	12.5%	20%
60	2.5%	5%	5%	5%	5%	12.5%	20%	20%	20%
61	5%	5%	5%	12.5%	20%	20%	20%	20%	20%
62	5%	5%	20%	20%	20%	20%	20%	13.1%	6.25%
63	12.5%	20%	20%	20%	20%	13.1%	6.25%	6.25%	6.25%
64	20%	20%	20%	13.1%	6.25%	6.25%	6.25%	6.25%	6.25%
65	55%	45%	25%	21.9%	18.75%	15.65%	12.5%	9.4%	6.25%
Investment and administrative expenses assumed by the fund									Implicit in the discount rate
Proportion of members married at retirement or death • Males • Females									 80% 70%
Spousal age difference									Males 3 years older than females

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 PSSRP.

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

	January 1, 2016			
New entrants	Each active member is replaced at death or retirement by a new entrant, subject to a net decrease in active membership of 1.25% per year for two years, and stable active membership thereafter			
Distribution of new entrants and salary at entry:	Age	Distribution	Average Salary at Entry	Work Percentage
	30	25.0%	$59,595	95%
	35	25.0%	$59,595	95%
	40	50.0%	$59,595	95%
Inflation	2.25%			
Salary increases	2.75% plus merit and promotion			
YMPE increases	2.75%			

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 rate of inflation should be between 2.00% and 2.50%.

Consistent with this range, we have used 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)	5.93
Assumed margin for adverse deviation (originally set to achieve a high probability of exceeding the discount rate over the next 20 years)	(0.98)
Expected investment and administration expenses paid from the fund	(0.20)
Discount rate	4.75

The expected long-term nominal return by asset class is provided in Appendix C. The target asset mix reflects changes that are being implemented as a result of the adoption of the shared risk plan model. It should be noted that the return assumptions for bonds have been determined mainly on current market conditions while the return assumptions for equities and alternative investments are based more on long-term expectations.

Furthermore, the funding policy mandates the discount rate to be used for funding policy actuarial valuations up to and including January 1, 2016. A change in discount rate can only be considered for the January 1, 2017 actuarial valuation.

Expenses

The allowance for investment management and administrative expenses paid from the fund built into the discount rate is 0.20% of assets based on recent plan history and our expectation for future expenses.

Rate of Salary Increase

We use a salary increase assumption of 2.75% per annum based on a difference of 0.5% per annum above inflation.

In addition to regular salary increases, we include a promotional scale to reflect the various steps in pay scales and promotions during the career of a member. The recommended promotional salary scale varies by age and is greater at the younger ages in order to reflect the seniority increases typically granted early in an individual's career. The recommended scale is the same one used in the previous valuation and is equivalent to an additional cumulative increase of approximately 1.0% per annum over the age range 20 to 64, 0.66% per annum over the age range 30 to 64, 0.4% per annum over the age range 40 to 64 and 0.2% per annum over the age range 50 to 64. Thus, the aggregate provision for salary increases range from about 3.75% per annum for a member aged 20 and 2.95% per annum for a member aged 50.

Mortality

In order to take into account the improvements in life expectancy recently substantiated by the Canadian Institute of Actuaries in its report on Canadian Pensioners Mortality (published on February 13, 2014), we used the CPM-2014Publ Mortality Table, and the CPM-B Improvement Scale, which varies by gender, age and calendar year for the funding policy valuation as of January 1, 2015. A mortality study had been undertaken using plan experience from 2004 to 2012. This study revealed mortality rates that are higher than that produced by the mortality table and projection scale. As a result, we had used adjustment factors of 105% for males and 110% for females. The same adjustments were used for all participants before and after retirement. The same mortality assumption is being used for this 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	2016	2021	2026	2031	2036
55	33.4	33.7	33.9	34.2	34.4
60	28.5	28.8	29.1	29.3	29.5
65	23.9	24.1	24.4	24.6	24.8
70	19.4	19.6	19.8	20.0	20.3
75	15.1	15.3	15.5	15.7	15.9
80	11.2	11.4	11.5	11.7	11.9
Males					**Life expectancy by Age in Year**
Age	2016	2021	2026	2031	2036
55	31.6	31.9	32.2	32.5	32.7
60	26.9	27.2	27.5	27.7	28.0
65	22.3	22.6	22.9	23.1	23.4
70	17.9	18.2	18.4	18.7	18.9
75	13.7	14.0	14.2	14.4	14.6
80	9.9	10.2	10.3	10.5	10.7

For existing disability pensioners, the mortality table adopted is the 1971 GAM Table. This table is the same as for the previous valuation for disabled pensioners and remains appropriate for this group of pensioners.

Rate of Increase in YMPE

We have continued to assume in this valuation that the YMPE will increase at the same rate as salary (before merit and promotional increase). As a result, we have used a rate of 2.75% per annum. 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 as well as 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 is the same assumption as the one used for the last valuation. We will continue to monitor this assumption for reasonableness.

Opinion on Funding Policy Valuation

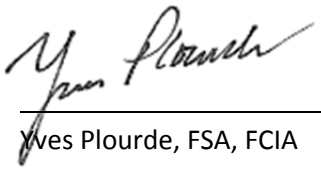
In our opinion, for the purposes of the funding policy valuation section of the report:

- 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 funding policy valuation report has been prepared, and our 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 PSSRP at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

July 29, 2016

Date

Section 2 – Risk Management Goals and Procedures

Meeting Risk Management Goals

The PSSRP 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 PSSRP. These goals and procedures are described separately below, along with the relevant results of the stochastic analysis required under the PBA as at January 1, 2016.

Risk Management Goals

The primary risk management goal under the PBA is to achieve a 97.5% probability that past base benefits at the end of each year 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 IV and V of the Funding Policy, respectively.

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

- On average be expected to provide contingent indexing on base benefits (all members) in excess of 75% of the indexation provided under the Former PSSA 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 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 the plan is to strive to protect in accordance with Regulation 2012-75. 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 PSSRP 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 four steps identified in the funding deficit recovery plan under Section IV of the Funding Policy is implemented in sequence until such time as the open group funded ratio of the PSSRP reaches 100% or higher. A "benefit reduction trial" is recorded (for purposes of the primary risk management goal calculation) when step 4 of the funding deficit recovery plan found in Section IV 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. 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 (the "Superintendent"). These assumptions are found in Appendix C.

- For purposes of this report, the PSSRP's contributing member population is assumed to reduce by 1.25% per year for a period of 2 years following January 1, 2016, and remain stable thereafter in each subsequent year of the projection period. As such, departures from the plan, for any reason, are assumed to be replaced by the number of new entrants required to respect the said goals that the overall contributing member population reduces by 1.25% per year for a period of 2 years following January 1, 2016, 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 January 1, 2016, 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 are required to take, or can consider, under the terms of the Funding Policy.

The primary risk management goal must be achieved or exceeded:

- At January 1, 2014 (i.e. the Conversion 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.

The secondary risk management goals must be achieved or exceeded:

- At January 1, 2014 (i.e. the Conversion 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 January 1, 2016

The stochastic analysis undertaken as at January 1, 2016, took into account the main following items:

- Membership Data as at January 1, 2016 summarized in Appendix B;
- Economic and demographic assumptions as at January 1, 2016 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;
- PSSRP provisions, summarized in Appendix D;
- Funding deficit recovery plan found under Section IV of the PSSRP’s Funding Policy (except for reduction in past or future base benefits);
- Funding excess utilization plan found under Section V of the PSSRP’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 January 1, 2016 are as follows:

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

Risk Management Goal	Goal under PBA	Results for PSSRP as at January 1, 2016
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	97.5%	**98.55%** **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. Full CPI subject to a maximum increase of 5.0% or 6.0% per year depending on the date of retirement.)	75.0% of the assumed increase in CPI	**83.2%** 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	75.0% of the value of ancillary benefits will be provided	Above **97.7%** of the value of ancillary benefits is expected to be provided (See Note below) **PASSED**

Note: The Funding Policy provides for the reduction of one type of ancillary benefit under the Funding Deficit Recovery Plan at actions 1 and 2. This is the replacement of early retirement reductions for post conversion service under action 1, and for pre-conversion service at action 2, by a full actuarial reduction for members not yet eligible to receive an immediate pension. We expect these two ancillary benefits would be reduced in about 2.3% of our 2,000 20-yr scenarios. If those were the only two ancillary benefits reduced, and they were eliminated completely, then we can expect that 97.7% of the value of ancillary benefits will be provided over the 20-year period. Given that there are other ancillary benefits under the plan that will not be touched (because they are not mentioned as a benefit that can be reduced under the Funding Policy), the percentage for this test is expected to be higher than 97.7%, which is well above minimum required under the PBA of 75%.

Section 3 – 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.

Section 16(3) of Regulations 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.

It is important to note that the Former PSSA was not subject to the PBA and the procedures to be followed if a wind-up occurred were not defined within the Former PSSA. As a result, the procedures for payments at wind-up were not defined. In conducting the hypothetical wind-up valuation as at January 1, 2016, we therefore made the assumption that the conversion to a shared risk plan would be void, and that the PSSRP would be wound-up as at January 1, 2016 in accordance with rules found under Part 1 of the PBA. This assumption has been made solely on the basis that Section 16(3) would apply, 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 fully indexed annuity purchases as at January 1, 2016.

Hypothetical Wind-Up Funded Status

The hypothetical wind-up funded status under the scenario postulated above, including the results of the last hypothetical wind-up valuation, is as follows:

Table 3.1 – Hypothetical Wind-Up Funded Status

	January 1, 2016	January 1, 2015
	$M	$M
Assets		
Market value of assets	6,926.7	6,567.3
Provision for expenses	(3.0)	(3.0)
Total	6,923.7	6,564.3
Hypothetical wind-up liabilities[1]		
Active members	7,378.2	7,674.7
Retirees and survivors	6,793.9	6,414.1
Deferred vested and suspended members	669.4	649.6
Outstanding refunds	1.5	1.9
Total	14,843.0	14,740.3
Assets less liabilities on the hypothetical wind-up basis	(7,919.3)	(8,176.0)

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 PSSRP while it is not in a wind-up state.

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

	January 1, 2016	Discount rates 1% lower
	$M	$M
Actuarial liabilities		
Active members	7,378.2	9,443.7
Retirees and survivors	6,793.9	7,796.6
Deferred vested and suspended members	669.4	859.5
Outstanding refunds	1.5	1.5
Total	14,843.0	18,101.3
Increase in actuarial liabilities		3,258.3

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 January 1, 2016 to January 1, 2017, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is estimated to be $397.6M as at January 1, 2016.

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 PSSRP 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 PSSA was not subject to the PBA before it was converted to the PSSRP, in the absence of specific direction to the contrary in the Former PSSA, we have valued the hypothetical wind-up liability using discount rates consistent with the requirements of the PBA if the PSSRP 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 fully indexed annuity purchases as at January 1, 2016.

The primary actuarial assumptions employed for the 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 estimated annuity purchase rates for fully indexed annuities.

Table 3.3 – Hypothetical Wind-Up Actuarial Assumptions

	January 1, 2016	January 1, 2015
Interest rate		
Interest rate for active members and deferred vested members under 55	3.11% per annum (-0.05% net)	2.82% per annum (-0.58% net)
Interest rate for retired members and those 55 and over	3.11% per annum (-0.05% net)	2.82% per annum (-0.58% net)
Salary increases	None	None
Mortality	CPM14 generational using Scale CPM-B	UP-94 generational using Scale AA
Termination (membership)	None	None
Wind-up expenses	$3,000,000	$3,000,000
Retirement	Age which maximizes the value of the pension	Age which maximizes the value of the pension

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 used for pensioners without adjustment, as 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.
- PSSRP conversion would be void and the plan would be wound-up under Part 1 of the PBA.
- Fully 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 PSSRP 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, bankruptcy and eventual replacement by a third-party administrator.

Hypothetical Wind-up Incremental Cost

The method used to calculate the hypothetical wind-up incremental cost may be described as follows:

1. Present value of expected benefit payments between January 1, 2016 and January 1, 2017, discounted to January 1, 2016;

   Plus

2. Projected hypothetical wind-up liabilities as at January 1, 2017, discounted to January 1, 2016;

   Less

3. Hypothetical wind-up liabilities as at January 1, 2016.

Opinion on Hypothetical Wind-up Valuation

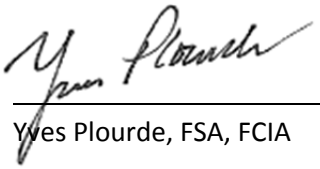
In our opinion, for the purposes of the hypothetical wind-up valuation section of the report:

- 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 our 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

July 29, 2016

Date

Appendix A – Assets

Description of Plan Assets

The assets of the PSSRP are held in trust and are being managed by the New Brunswick Investment Management Corporation ("NBIMC"). The information on fund assets as at December 31, 2015 was taken from unaudited financial statements prepared by NBIMC for the Board of Trustees.

Statement of Market Value

The following table shows the asset mix as at December 31, 2015:

Table A.1 – Assets at Market Value

	December 31, 2015
Invested assets	$M
Canadian Equities	1,072.3
Foreign Equities	1,548.4
Fixed Income	2,524.1
Inflation Linked Assets	902.6
Alternatives	856.3
Other investments and net amount receivable	23.0
Total assets	6,926.7

Changes to Plan Assets

The following table shows changes to the PSSRP's assets during the inter-valuation period, based on market values. The reconciliation from January 1, 2015 to December 31, 2015 is based on the unaudited financial statements prepared by NBIMC for the Board of Trustees

Table A.2 – Reconciliation

	2015 $M
Assets at beginning of period	$6,567.3
Receipts	
Member contributions	$96.8
Employer contributions	$141.0
Investment income plus realized and unrealized capital appreciation and depreciation	$481.2
Total receipts	$719.0
Disbursements	
Pensions paid and refunds	$346.0
Expenses (fees)	$13.6
Total disbursements	$359.6
Assets at end of period	$6,926.7

Return on Assets

The plan assets earned the following rates of return, net of investment management fees and other expenses charged to the Fund, based on our calculations which assume cash flow occurred in the middle of the period:

Table A.3 – Net Investment Return

Year	Rate of Return
	%
2015	7.2

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, 2015 was $6,926.7M.

Target Asset Mix under Shared Risk Plan

The Statement of Investment Policies for the PSSRP, as adopted by the Board of Trustees, provides for the following long term target asset mix.

Table A.4 – Target Asset Mix

Asset classes	Target Allocation (%)
Fixed Income:	
Short term assets	1.00%
Domestic government bonds	17.80%
Corporate bonds	17.70%
Inflation Linked:	
Real return bonds	5.00%
Real estate	4.00%
Infrastructure	4.00%
Public Equity (Market Capitalization):	
Canadian equities	10.50%
US equities	5.00%
International equities	5.00%
Public Equity (Low Volatility):	
Canadian equities	5.00%
US equities	5.00%
International equities	5.00%
Emerging markets equities	3.00%
Private Equity	4.00%
Absolute return strategy	8.00%
Total	100%

This target asset mix was used to determine the discount rate assumption under the PSSRP, 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 the Pension and Employee Benefits Division of the Office of Human Resources. The data was provided as at January 1, 2016.

We have taken the following additional steps to review data for accuracy, completeness and consistency purposes:

- A reconciliation of data was performed in order to follow the changes concerning some of the active members, retirees and vested members.
- Basic data checks were performed to ensure that age, salary, service and pension accrual data were reasonable for the purposes of the valuation.

Summary of Membership Data

The following tables were prepared using data provided by the Pension and Employee Benefits Division regarding its active members, retirees and former members. Accrued pensions, in payment or not, for all members reflect the cost-of-living adjustment granted by the Board of Trustees effective January 1, 2016.

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 January 1, 2016
- B.4 Distribution of Retirees and Survivors by Age Groups as at January 1, 2016
- B.5 Distribution of Deferred Vested and Suspended Members by Age Groups as at January 1, 2016

Table B.1 – Summary of Membership Data

		January 1, 2016	January 1, 2015
Active members	Number	17,484	17,742
	Average salary	$66,324	$64,076
	Average age	46.9 years	46.9 years
	Average accrued life benefit	$12,675	$12,426
	Average accrued bridge benefit	$4,294	$4,263
	Average credited service	13.1 years	13.1 years
Deferred vested and suspended members	Number	3,444	2,986
	Average age	47.8 years	47.8 years
	Average annual lifetime benefit	$6,168	$6,403
	Average annual bridge benefit[1]	$2,165	$2,192
Retirees and survivors	Number	15,229	14,788
	Average annual total pension	$22,811	$22,267
	Average age	70.9 years	70.7 years

[1] *Average for those entitled to receive a bridge benefit.*

Table B.2 – Changes in Plan Membership

	Active Members	Deferred Vested and Suspended Members	Retirees and Survivors	Total
Members at January 1, 2015	17,742	2,986	14,788	35,516
New members	1,209	--	--	1,209
Retirements	(590)	(107)	697	--
Members who returned to active	315	(315)	--	--
Terminations				
Deferred vested	(3)	3	--	--
Paid lump sum	(165)	(65)	--	(230)
Outstanding	(46)	(15)	--	(61)
Deaths or cessation of pension	(16)	(5)	(428)	(449)
New survivor pensions	--	--	157	157
Became suspended members	(962)	962	--	--
Data adjustments	--	--	15	15
Members at January 1, 2016	17,484	3,444	15,229	36,157

Table B.3 – Age/Service Distribution for Active Members as at January 1, 2016

		Age										
Years of Service		Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 and Over	Total
0 - 4	Number	208	810	851	716	710	572	529	414	202	49	5,061
	Tot. Sal.	10,048,320	43,641,591	48,174,045	43,562,832	44,123,396	34,901,676	31,353,263	24,019,191	10,213,547	2,580,934	292,618,795
	Avg. Sal.	48,309	53,879	56,609	60,842	62,146	61,017	59,269	58,017	50,562	52,672	57,818
5 - 9	Number		126	540	696	621	520	415	273	135	16	3,342
	Tot. Sal.		7,987,160	34,752,683	46,101,282	42,019,154	34,956,550	27,952,848	18,887,696	8,458,934	1,213,280	222,329,588
	Avg. Sal.		63,390	64,357	66,237	67,664	67,224	67,356	69,186	62,659	75,830	66,526
10 - 14	Number			109	506	565	538	461	352	155	30	2,716
	Tot. Sal.			7,831,367	35,643,619	39,828,774	38,329,443	32,127,489	22,654,880	10,543,211	2,125,387	189,084,170
	Avg. Sal.			71,847	70,442	70,493	71,244	69,691	64,360	68,021	70,846	69,619
15 - 19	Number				81	349	434	419	317	122	33	1,755
	Tot. Sal.				5,530,857	25,603,096	32,177,393	28,997,966	21,362,272	7,847,943	2,536,073	124,055,601
	Avg. Sal.				68,282	73,361	74,141	69,208	67,389	64,327	76,851	70,687
20 - 24	Number					72	477	498	299	114	25	1,485
	Tot. Sal.					4,963,449	35,089,895	34,554,683	20,530,880	7,785,492	1,847,284	104,771,682
	Avg. Sal.					68,937	73,564	69,387	68,665	68,294	73,891	70,553
25 - 29	Number					1	312	762	487	145	24	1,731
	Tot. Sal.					***	25,005,373	55,573,765	33,834,287	9,864,237	1,553,857	125,873,844
	Avg. Sal.					***	80,145	72,931	69,475	68,029	64,744	72,717
30 - 34	Number						5	314	455	106	21	901
	Tot. Sal.						354,734	23,305,851	33,125,639	8,062,739	1,509,514	66,358,477
	Avg. Sal.						70,947	74,222	72,804	76,064	71,882	73,650
35 and over	Number							28	315	122	28	493
	Tot. Sal.							1,979,959	22,005,436	8,503,785	2,023,185	34,512,365
	Avg. Sal.							70,713	69,859	69,703	72,257	70,005
Total number		208	936	1,500	1,999	2,318	2,858	3,426	2,912	1,101	226	17,484
Total salaries		10,048,320	51,628,752	90,758,094	130,838,590	156,580,193	200,815,063	235,845,825	196,420,281	71,279,889	15,389,514	1,159,604,521
Average of salaries		48,309	55,159	60,505	65,452	67,550	70,264	68,840	67,452	64,741	68,095	66,324

Average attained age: 46.9 years

Average number of years of service: 13.1 years

Notes:

The age is computed at the nearest birthday.

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

Membership for active members is composed of 8,497 males and 8,987 females.

Table B.4 – Distribution of Retirees and Survivors by Age Groups as at January 1, 2016

Age Group	Number	Total Annual Payments	
		Lifetime	Bridge
Under 60	1,220	$24,277,283	$7,794,460
60-64	3,467	82,709,676	27,863,037
65-69	3,596	77,899,975	---
70-74	2,502	49,319,760	---
75-79	1,704	32,500,447	---
80-84	1,290	22,604,945	---
85-89	847	13,617,231	---
90 and over	603	8,785,347	---
Total	15,229	311,714,664	35,657,497

Average age: 70.9 years

Notes: Age groups are based on exact age. The pension used is the pension payable as at January 1, 2016. Membership for retirees and survivors is composed of 7,783 males and 7,446 females.

Table B.5 – Distribution of Deferred Vested and Suspended Members by Age Groups as at January 1, 2016

Age Group	Number	Total Annual Payments	
		Lifetime	Bridge
Under 25	14	7,425	3,410
25-29	151	178,326	82,225
30-34	323	765,089	325,601
35-39	391	1,390,144	542,196
40-45	464	2,291,239	861,046
45-49	521	3,541,204	1,244,025
50-54	698	5,718,249	2,082,762
55-59	497	4,361,153	1,501,382
60-64	264	2,005,732	551,776
65 and over	121	984,817	---
Total	3,444	21,243,378	7,194,423

Average age: 47.8 years

Note: Age groups are based on exact age. Membership for deferred vested and suspended members is composed of 1,498 males and 1,946 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. 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. Purchasing power parity is assumed in setting foreign equity return assumptions. 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 January 1, 2016:

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

	Expected Return	Volatility (standard deviation)
Inflation	2.25%	1.20%
Asset Classes		
Fixed Income:		
Short term assets (ST)	1.85%	1.60%
Domestic government bonds (GOV)	2.70%	7.20%
Corporate bonds (CORP)	3.65%	5.80%
Inflation Linked:		
Real return bonds (RR)	2.45%	12.50%
Real Estate (RE)	6.25%	10.40%
Infrastructure (INF)	6.85%	14.10%
Public Equity (Market Capitalization):		
Canadian equities (Can Eq)	7.55%	16.50%
US equities (US Eq)	6.80%	17.50%
International equities (EAFE Eq)	7.20%	16.20%
Public Equity (Low Volatility)[1]:		
Canadian equities (Can Eq LV)	7.05%	13.20%
US equities (US Eq LV)	6.30%	14.00%
International equities (EAFE Eq LV)	6.70%	13.00%
Emerging markets equities (Em Eq LV)	9.90%	19.90%
Private Equity (PE)	10.55%	25.10%
Absolute return strategy (AR)	5.80%	10.60%

[1] *For purposes of our stochastic analysis at January 1, 2016, specific assumptions were made for the public equities (low volatility) strategies. The methodology for deriving assumptions for such strategies was approved by the Superintendent of Pensions in a letter dated August 18, 2015. The conditions ultimately imposed by the Superintendent of Pensions for such strategies are as follows:*

- *Expected long term rate of return of 0.25% to 0.5% lower than regular market capitalization index.*
- *Volatility of 80% of the regular market capitalization index*
- *Correlation of 30% lower than regular market capitalization index*
- *Maximum of 25% of the funds in such strategies for modeling purposes, with any excess modeled using the regular market capitalization index assumptions*

For every year in the 20-year projection, expenses of 8 basis points to reflect the cost of passive management and another 5 basis points for the cost of non-investment expenses is deducted from the expected return to account for the payment of expenses from the Fund (the additional cost of any active management activities is expected to be offset by additional returns over the expected returns shown above and therefore are not included in the analysis).

The following correlation among the various asset classes identified in Table C.1 was also used as at January 1, 2016:

Table C.2 – Correlation Among Asset Classes

Asset Classes	Short Term	Gov.	Corp.	Real Return	Real Estate	Infra.	Cad Equity	US Equity	EAFE Equity	Cad Low Vol	US Low Vol	EAFE Low Vol	Emerging Low Vol	Private Equity	Absolute Return
Short Term Assets	1.00	0.09	0.02	-0.21	0.22	-0.03	0.02	0.03	-0.01	0.01	0.07	-0.01	0.03	0.04	0.08
Government Bonds		1.00	0.86	0.39	-0.03	0.2	-0.04	0.06	-0.09	-0.03	0.03	-0.06	-0.09	0.00	-0.06
Corporate Bonds			1.00	0.40	-0.20	0.17	0.27	0.17	0.11	0.18	0.12	0.08	0.11	0.19	0.19
Real Return Bonds				1.00	0.02	0.54	0.20	-0.22	-0.14	0.14	-0.15	-0.08	0.05	-0.05	0.12
Real Estate					1.00	0.00	0.17	0.06	0.20	0.12	0.03	0.15	0.07	0.09	0.18
Infrastructure						1.00	0.15	-0.09	-0.04	0.11	-0.06	-0.03	0.06	0.00	0.11
Canadian Equities							1.00	0.36	0.60	0.70	0.26	0.43	0.51	0.52	0.76
US Equities								1.00	0.64	0.25	0.70	0.48	0.08	0.62	0.43
EAFE Equities									1.00	0.43	0.47	0.69	0.40	0.50	0.39
Canadian Low Vol										1.00	0.18	0.30	0.36	0.36	0.56
US Low Vol											1.00	0.34	0.06	0.44	0.32
EAFE Low Vol												1.00	0.28	0.37	0.28
Emerging Market Low Vol													1.00	0.19	0.40
Private Equity														1.00	0.54
Absolute Return															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 20 years.

For each of these scenarios and for each year, the financial position of the PSSRP 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 4.75% per year throughout the projection period. The discount rate of 4.75% 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 Public Service Shared Risk Plan ("PSSRP") effective January 1, 2016. For an authoritative statement of the precise provisions of the PSSRP, reference must be made to the official PSSRP documents.

Introduction

Various unions, the Province of New Brunswick and the Minister of Finance, in his capacity as plan governor and administrator of the Former PSSA entered into a Memorandum of Understanding pursuant to which they agreed to convert the Former PSSA to the PSSRP effective on January 1, 2014. As of that date, the Public Service Superannuation Act ("Former PSSA") was repealed by An Act Respecting Pensions Under the Public Service Superannuation Act (New Brunswick) which provided that the Former PSSA be converted to a shared risk plan in accordance with Part 2 of the PBA.

Effective January 1, 2014, the PSSRP is administered by an independent Board of Trustees.

Eligibility and Participation

Each Member of the Former PSSA joins the PSSRP on January 1, 2014. Active members of the Pension Plan for Part-Time and Seasonal Employees of the Province of New Brunswick who are eligible to join the PSSRP cease active membership in the said plan and are required to join the PSSRP as of January 1, 2014.

Each employee who commences full-time or part-time employment on or after January 1, 2014 is required to join the PSSRP upon employment. Most of the other categories of employees must join when they become eligible in accordance with the minimum requirements of the PBA.

Members of the Legislative Assembly on September 23, 2014 and after are required to join the PSSRP.

Required Contributions

Each member is required to contribute 7.5% of earnings up to the YMPE, plus 10.7% of earnings in excess of the YMPE.

The participating employers are required to contribute 11.25% of earnings. In addition, the employers make temporary contributions of 0.5% of earnings for a 5-year period starting January 1, 2014, and 0.75% of earnings for a 10-year period starting January 1, 2014.

The YMPE is the Year's Maximum Pensionable Earnings under the Canada Pension Plan, and is equal to $54,900 in 2016.

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

Normal Retirement

The normal retirement date is the first day of the month following the member's sixty-fifth birthday.

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

A. In respect of service before January 1, 2014, the product of:

   i. The number of years of the member's pensionable service before January 1, 2014, and

   ii. 1.3% of the annual average of the best five (5) consecutive years of earnings at January 1, 2014, up to the annual average YMPE for the 3 years prior to January 1, 2014, plus 2.0% of the excess of the annual average of the best five (5) consecutive years of earnings at January 1, 2014 over the annual average YMPE for the 3 years prior to January 1, 2014;

and

B. In respect of service from January 1, 2014, the sum of (i) and (ii) for each calendar year (or pro-rated for a 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 January 1, 2014, subject to approval by the Board of Trustees, and in accordance with the trigger requirements found under the Funding Policy for the PSSRP.

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 adjustment and the terms of the funding policy.

Table D.1 – Cost of Living Adjustments

Effective Date	Cost of Living Adjustment
January 1, 2015	1.43%
January 1, 2016	1.49%

Normal 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. For a member with a spouse or common-law partner at the time of the member's death, 50% of the member's pension (before application of reductions for early retirement) continues to such spouse or common-law partner in equal monthly installments for the life of the spouse or common-law partner. Should the member have dependent children at the time of his/her death, such dependent children may be entitled to a pension if there is no spouse or common-law partner or after the death of such spouse or common-law partner. A minimum amount of pension equal to the member's own contribution with interest to retirement will be payable in total.

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, an annual bridge benefit is payable in addition to the lifetime pension found under "Normal Retirement". The annual bridge benefit is payable to age 65 or to the death of the member, if earlier, and is equal to the sum of:

A. In respect of service before January 1, 2014, the product of:

   i. The number of years of the member's pensionable service before January 1, 2014, and

   ii. 0.7% of the annual average of the best five (5) consecutive years of earnings at January 1, 2014 up to the annual average YMPE for the 3 years prior to January 1, 2014;

and

B. In respect of service from January 1, 2014, for each calendar year (or pro-rated for a portion thereof), 0.6% of the Member's annualized earnings for the calendar year up to the YMPE for the calendar year.

The portions of the lifetime pension and bridge benefit accrued for service before January 1, 2014 are unreduced if the pension and bridge commence to be paid at age 60 or later. If such pension and bridge commence to be paid before age 60, they are each reduced by 1/4% per month (3% per year) that the pension and bridge commencement date precedes the first day of the month following age 60.

The portions of the lifetime pension and bridge benefit accrued for service on and after January 1, 2014 are reduced by 5/12% per month (5% per year) that the pension and bridge commencement date precedes the first day of the month following 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 PSSRP and Former PSSA, if any, 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. 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 PSSRP and Former PSSA, if any, 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 is as follows:

i. If there is a spouse or common-law partner:

- The Termination Value, as defined under the PBA; or
- Pension of 50% of the accrued lifetime pension;

ii. If there is no spouse or common-law partner, but there are dependent children designated as beneficiaries:

- Pension of 50% of the accrued lifetime pension split equally among dependent children until they no longer qualify as dependent;

iii. If there is no spouse or common-law partner and no dependent children designated as beneficiaries:

- The Termination Value, as defined under the PBA, payable to the designated beneficiary(ies) or estate.

Any amount by which the Termination Value, as defined under the PBA, exceeds the aggregate of all pension payments made above, shall be paid to the designated beneficiary(ies) or estate.

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.

Primary Purpose, Benefit Security and Cost-of-living Adjustments

The primary purpose of the PSSRP is to provide pensions to eligible employees after retirement and until death in respect of their service as employees. A further purpose of this PSSRP is to provide secure pension benefits to members without an absolute guarantee but with a risk-focused management approach delivering a high degree of certainty that full base benefits will be payable in the vast majority of potential future economic scenarios. As a shared risk plan, all future cost-of-living adjustments and other ancillary benefits under the PSSRP shall be provided only to the extent that funds are available for such benefits, as determined by the Board of Trustees in accordance with applicable laws and the Funding Policy.

Appendix E – Summary of Funding Policy

The following is a brief summary of the main provisions of the Funding Policy for the PSSRP effective January 1, 2016. For an authoritative statement of the precise provisions of the Funding Policy, reference must be made to the official document.

Purpose of the Plan and Funding Policy

The purpose of the PSSRP 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 base lifetime pension at normal retirement age. However, the intention is that additional benefits may be provided depending on the financial performance of the PSSRP.

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 may be made by the Board of Trustees around funding levels, contributions and benefits.

Risk Management

In accordance with legislation on shared risk plans, the primary risk management goal is to achieve a 97.5% probability that past base benefits at the end of each year will not be reduced over a 20-year period.

In addition, secondary risk management goals are to provide, on average, contingent indexing on base benefits for service rendered on or before the conversion date in excess of 75% of the indexation provided under the pre-conversion plan over a 20-year period, as well as to provide, on average over a 20-year period, other ancillary benefits that exceed 75% of the value of the ancillary benefits described in the plan text at conversion.

Contributions

The initial employee contribution rate is equal to 7.5% of earnings up to the YMPE and 10.7% of earnings above the YMPE while the initial employer contribution rate is set at 11.25% of earnings. During the first 5 years after conversion, employers shall make temporary additional contributions at the rate of 0.5% of earnings as well as a further 0.75% of earnings for the first 10 years following conversion. These temporary contributions are to stop if the PSSRP achieves an open group funded ratio of 140%.

The above mentioned initial contribution rates may be adjusted by the Board of Trustees. A total contribution increase of up to 3% of earnings (1.5% each for employee and employer contributions) is to be triggered by the Board of Trustees if the open group funded ratio of the PSSRP, as defined by the PBA, falls below 100% for two successive year ends until such time as the open group funded ratio reaches 110% without considering the effect of the contribution increase and the funding goal under regulation is met.

A reduction in contributions of up to 0.5% of earnings for employees and 3.5% of earnings for the employers can be triggered by the Board of Trustees (subject to employers never contributing less than employees) if the conditions set forth in the funding excess utilization plan are met, and the open group funded ratio is at least 140%.

If, at any time, there is an increase or a decrease in employees employed by the employer of more than 5% in a given year, the initial contribution rates shall be re-calculated.

Finally, effective as of the date 15 years after the conversion, the employee and employer contributions shall be set such that the total initial contributions remitted are shared equally between the employees and employers.

Funding Deficit Recovery Plan

The funding deficit recovery plan must be implemented by the Board of Trustees if the open group funded ratio falls below 100% for two successive plan year ends and after implementing the 3% maximum total increase in contribution discussed above.

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

1. Change retirement rules for service on or after the conversion date for non-vested members to a full actuarial reduction for retirement before age 65;
2. Change retirement rules for service prior to the conversion date for non-vested members to a full actuarial reduction for retirement before age 60;
3. Reduce base benefit accrual rates for future service after the date of implementation of the funding deficit recovery plan by not more than 5%;
4. 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 funding goal under regulation is met, no further actions are required at that time.

The base benefit reduction in point 4, if required, shall be such that the funding goals under the Regulations for such purposes are achieved.

Changes set out under points 1 through 3 shall take effect no later than 12 months following the date of the funding policy valuation report that triggered the need for the changes. Base benefit reductions described in point 4 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%.

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 any.

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:

1. Provide indexing of base benefits up to the full CPI since the last date where full CPI was achieved.
2. Apply total contribution reduction adjustment of up to 4% of earnings, provided the open group funded ratio is over 140%.
3. Establish a reserve to cover the next 10 years of potential contingent indexing.
4. If steps 1 through 3 have been taken, the Board of Trustees can propose other benefit changes provided such benefit changes meet the criteria outlined in the funding excess utilization plan.

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 4.75% per year and shall remain in effect for the first two actuarial valuation reports filed following the conversion report hence until the January 1, 2017 actuarial valuation. The Board of Trustees may consider a change in the discount rate for subsequent funding policy actuarial valuations.

Other assumptions may be changed by the Board of Trustees as experience evolves.

Appendix F – Plan Administrator Confirmation Certificate

With respect to the Actuarial Valuation Report of the Public Service Shared Risk Plan as at January 1, 2016, I hereby confirm that to the best of my knowledge:

- the data regarding Plan members and beneficiaries provided to Morneau Shepell as at January 1, 2016 constitutes a complete and accurate description of the information contained in the files;
- copies of the official plan text, funding policy and statement of investment policies of the PSSRP and all amendments to date were provided to Morneau Shepell; and
- there are no subsequent events or any extraordinary changes to the plan membership as at January 1, 2016, which would materially affect the results.

The PSSRP Board of Trustees

Signature: Marilyn Quinn

Name: Marilyn Quinn

Title: Chairperson

Date: 29-07-2016

MORNEAU SHEPELL

MENTAL HEALTH PARTNER

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