

New Brunswick Municipal Employees Pension Plan

Actuarial Valuation as at December 31, 2018 for Funding Purposes

Report prepared September 2019

Registration number:
New Brunswick and Canada Revenue Agency #0418723

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Introduction

This report presents the results of the actuarial valuation as at December 31, 2018 of the New Brunswick Municipal Employees Pension Plan (“Plan”). The Pension Board for the Plan retained the services of Morneau Shepell Ltd. (“Morneau Shepell”) to perform this actuarial valuation. The last complete valuation that was filed with the New Brunswick Office of the Superintendent of Pensions and the Canada Revenue Agency was performed as at December 31, 2017.

This report was prepared for the Pension Board, the New Brunswick Office of the Superintendent of Pensions and the Canada Revenue Agency (“CRA”) for the following purposes:

- to determine the funded status of the Plan on the going-concern basis;
- to determine the funded status of the Plan on both solvency and hypothetical wind-up bases;
- to estimate the employer contributions required under the Plan during the period from this valuation date up to the next valuation in accordance with the New Brunswick Pension Benefits Act; and
- to provide the information and the actuarial opinion required by the New Brunswick Pension Benefits Act and the Income Tax Act (Canada).

The solvency and hypothetical wind-up bases have been updated to reflect market conditions as at the valuation date. In addition, no changes were made to the actuarial assumptions on the going-concern basis.

Restriction on use of this report

This report was prepared for the Pension Board for the Plan. It will also be filed with the New Brunswick Office of the Superintendent of Pensions and the CRA. This report and any of its content may not be distributed, published, made available or relied upon by any other person, without the express written permission of Morneau Shepell, unless and only to the extent otherwise provided by applicable law.

Section 1 – Actuarial Opinion

This opinion is given with respect to the New Brunswick Municipal Employees Pension Plan, registration number 0418723 (New Brunswick). We performed a valuation of the Plan as at December 31, 2018, based on the Plan provisions and data as at that date. The Pension Board has confirmed that, after December 31, 2018, no subsequent events, modifications or extraordinary changes to the membership or the Plan that would materially affect the results of this actuarial valuation have occurred, except as indicated in this report.

I hereby certify that, in my opinion, as at December 31, 2018:

- The Plan is not fully funded on the going-concern basis. The actuarial liabilities exceeds the assets by \$7,538,000.
- The Plan is not fully funded on the solvency basis. The actuarial liabilities exceed the value of assets on a solvency basis by \$47,955,400.
- The Plan assets would have been less than the actuarial liabilities by \$52,753,600 if the Plan had been wound up on the valuation date.
- The solvency ratio of the Plan, as defined under the New Brunswick *Pension Benefits Act*, is equal to 0.714.
- The transfer ratio of the Plan, as defined under the New Brunswick *Pension Benefits Act*, is equal to 0.685.
- The transfer ratio of the Plan is less than 100% and the New Brunswick *Pension Benefits Act* restricts the amount that may be paid out of the Plan in respect of a terminating member. Specifically, since the Plan's transfer ratio is 68.5%, an amount equal to 31.5% of a terminating member's entitlement (the "transfer deficiency") is required to remain in the Plan for a 5-year period from his or her termination from the Plan.
- The residual normal cost (i.e. the normal cost less employee required contributions) is equal to 4.85% of payroll.
- The minimum employer contribution is equal to 4.85% of payroll plus amortization payments equal to a level percentage of payroll of 2.55% for a total contribution of 7.40%. However, the Plan terms require that employer contributions be at least equal to employee required contributions, which are currently equal to approximately 8.00% of payroll. Higher employer contributions are acceptable under the ITA but they cannot exceed the residual normal cost plus \$52,753,600 plus interest in aggregate. The Plan actuary should be consulted if employer contributions in any year are greater than the minimum requirement to match employee required contributions.

These contributions conform to the eligibility requirements of the *Income Tax Act* (Canada) if contributed within the fiscal year or remitted within 120 days after the end of the fiscal year. They also conform to the New Brunswick *Pension Benefits Act*. This Act requires that the current service employer contributions and the employee contributions be remitted to the fund monthly, within 30 days of the month to which they pertain. It also requires that amortization payments be made at least monthly.

In my opinion, for the purposes of this 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 report has been prepared, and my opinion given, in accordance with accepted actuarial practice in Canada.

The assumptions that form the going-concern basis used in this report were reasonable at the time this actuarial valuation report was prepared and contributions were determined.

This actuarial valuation was performed in accordance with the going-concern and solvency standards prescribed under the New Brunswick *Pension Benefits Act*.

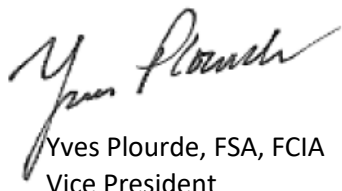
The calculations in the actuarial valuation report have been prepared in accordance with subsection 147.2(2) of the *Income Tax Act* (Canada).

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 Plan administrator, the participating employers or the members 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 may result in gains or losses, which may affect future contribution levels. These gains or losses will be revealed in future actuarial valuations.

The next actuarial valuation will have to be performed not later than as at December 31, 2019.

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



Yves Plourde, FSA, FCIA
Vice President

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September 2019

This valuation report has been peer reviewed by Don Charlton, FCIA

Section 2 – Going-Concern Funded Status

Going-Concern Funded Status

The funded status of the 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.

The table below provides the Plan's going-concern funded status as at December 31, 2018 and December 31, 2017:

Table 2.1 – Going-Concern Funded Status

	December 31, 2018	December 31, 2017
	\$	\$
Actuarial value of assets		
Market value (including payables and receivables)	115,252,400	116,938,600
Actuarial liabilities		
Active members	67,058,700	67,948,900
Terminated vested members	5,491,500	2,955,100
Retired members and beneficiaries	48,580,600	45,111,000
Members with transfer deficiencies payable	922,100	855,800
Members with outstanding payments	737,500	24,700
Total	122,790,400	116,895,500
Actuarial surplus (unfunded liability)	(7,538,000)	43,100
Funding ratio	93.9%	100.0%

Reconciliation of Going-Concern Funded Status

The table below describes the change in the Plan's going-concern funded status since the last valuation:

Table 2.2 – Reconciliation of Going-Concern Funded Status

	\$	\$
Actuarial surplus (unfunded liability) as at December 31, 2017		43,100
Expected changes in funded status		
Interest on surplus (unfunded liability)	2,500	
Employer contributions in excess (short) of residual normal cost	1,268,400	
Total		1,270,900
Expected surplus (unfunded liability) as at December 31, 2018		1,314,000
Actuarial gains (losses) due to the following factors		
Investment return on actuarial value of assets	(9,044,000)	
Terminations	(294,400)	
Retirements	(105,500)	
Salary, YMPE and pension limit increases	(137,700)	
Mortality	479,300	
Data adjustment	421,700	
Other factors	(171,400)	
Total		(8,852,000)
Changes in actuarial assumptions		-
Actuarial surplus (unfunded liability) as at December 31, 2018		(7,538,000)

Sensitivity Analysis on the Going-Concern Basis

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 2.3 – Sensitivity of Actuarial Liabilities on the Going-Concern Basis

	December 31, 2018	Discount rate 1% lower
	\$	\$
Actuarial liabilities		
Active members	67,058,700	79,623,200
Terminated vested members	5,491,500	6,277,800
Retired members and beneficiaries	48,580,600	53,078,400
Members with transfer deficiencies payable	922,100	943,600
Members with outstanding payments	737,500	737,500
Total	122,790,400	140,660,500
Increase in actuarial liabilities		17,870,100

Section 3 – Solvency and Hypothetical Wind-up Funded Status

Solvency Funded Status

A solvency valuation is a hypothetical valuation prescribed by the New Brunswick *Pension Benefits Act*. It imposes a floor on required contributions and a ceiling on what may be transferred out of the pension fund upon termination of membership.

Table 3.1 – Solvency Funded Status

	December 31, 2018	December 31, 2017
	\$	\$
Solvency assets		
Market value of assets	115,252,400	116,938,600
Provision for expenses	(400,000)	(400,000)
Total wind-up assets	114,852,400	116,538,600
Solvency asset adjustment	4,798,200	3,305,700
Total solvency assets	119,650,600	119,844,300
Solvency liabilities		
Active members	93,582,700	97,071,800
Terminated vested members	8,239,100	5,078,100
Retired members and beneficiaries	64,064,500	60,355,000
Members with transfer deficiencies payable	982,200	909,500
Members with outstanding payments	737,500	24,700
Total	167,606,000	163,439,100
Assets less liabilities on the solvency basis	(47,955,400)	(43,594,800)
Solvency ratio	0.714	0.733
Wind-up surplus (deficiency)	(52,753,600)	(46,900,500)
Transfer ratio	0.685	0.713

The Plan has been granted an exemption from the solvency deficiency funding requirements of the New Brunswick *Pension Benefits Act* effective December 31, 2006.

Solvency Asset Adjustment

As defined under the New Brunswick *Pension Benefits Act*, the solvency asset adjustment represents the present value of amortization payments established at the preceding valuation, adjusted to take into account the current going-concern valuation, and due to be paid during the prescribed period following the valuation date.

The solvency asset adjustment as at December 31, 2018 is determined as follows:

Table 3.2 – Solvency Asset Adjustment

Nature of liability or deficiency	Start date	End date	Annual amortization payment	Solvency asset adjustment ¹
	mm-dd-yyyy	mm-dd-yyyy	\$	\$
Going-concern unfunded liability	12-31-2006	12-31-2021	258,600	762,000
Going-concern unfunded liability	12-31-2009	12-31-2024	474,900	2,326,500
Going-concern unfunded liability	12-31-2018	12-31-2033	349,000	1,709,700
Total			1,082,500	4,798,200

¹ Value of amortization payments over at most 5 years following December 31, 2018 discounted as at December 31, 2018 (at a discount rate of 3.23% per year)

Hypothetical Wind-up Funded Status

Since all benefits have been valued, if the Plan had been liquidated as at December 31, 2018 and assuming that the asset liquidation value had been equal to the market value, the hypothetical wind-up funded status would have been similar to the solvency funded status shown in table 3.1 if the solvency asset adjustment was excluded from the solvency status.

Solvency Ratio

The solvency ratio is equal to the ratio of the solvency assets to the solvency liabilities as indicated in table 3.1.

Transfer Ratio

The transfer ratio is equal to the ratio of the wind-up assets to the solvency liabilities as indicated in table 3.1.

Sensitivity Analysis on the Solvency Basis

The table below illustrates the effect on the actuarial liabilities of using discount rates 1% lower than those used for the solvency valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 3.3 – Sensitivity of Actuarial Liabilities on the Solvency Basis

	December 31, 2018	Discount rate 1% lower
	\$	\$
Actuarial liabilities		
Active members	93,582,700	111,012,700
Terminated vested members	8,239,100	9,741,600
Retired members and beneficiaries	64,064,500	71,436,100
Members with transfer deficiencies payable	982,200	1,006,400
Members with outstanding payments	737,500	737,500
Total	167,606,000	193,934,300
Increase in actuarial liabilities		26,328,300

Incremental Cost on the Solvency Basis

The incremental cost on the solvency basis represents the present value of the expected aggregate change in the solvency liabilities from December 31, 2018 to December 31, 2019, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is \$7,958,100 as at December 31, 2018.

Section 4 – Normal Cost and Amortization Payments

Normal Cost

The table below summarizes the estimated going-concern cost of pension benefits being earned in the twelve-month period after the valuation date (the normal cost).

Table 4.1 – Normal Cost

	As at December 31, 2018		As at December 31, 2017	
	\$	% of payroll	\$	% of payroll
Normal cost	5,450,300	12.85	5,409,900	12.94
Less employee contributions	3,393,800	8.00	3,347,100	8.00
Residual normal cost	2,056,500	4.85	2,062,800	4.94
Residual normal cost as a % of employee contributions	60.6%		61.6%	

The total estimated covered payroll for 2019 is \$42,399,600. The total estimate covered payroll for 2018 was \$41,822,500.

The normal actuarial cost includes a 9.0% loading to cover expected non-investment, non-custodial administration expenses which are paid out of the Plan's assets. The expense loading makes appropriate provision for these expenses.

Reconciliation of Normal Cost

The factors contributing to the change in the normal cost are shown below:

Table 4.2 – Reconciliation of Normal Cost

	% of payroll
Normal cost as at December 31, 2017	12.94
Demographic changes	(0.09)
Normal cost as at December 31, 2018	12.85

Sensitivity Analysis of the Normal Cost on the Going-Concern Basis

The table below illustrates the effect on the 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 4.3 – Sensitivity of Normal Cost on the Going-Concern Basis

	As at December 31, 2018		Discount rate 1% lower	
	\$	% of payroll	\$	% of payroll
Normal cost	5,450,300	12.85	6,651,000	15.69
Increase in normal cost			1,200,700	2.84

Amortization Payments

The amortization schedule as determined in the previous actuarial report is as follows:

Table 4.4 – Amortization Payments – Previous Valuations

Nature of liability or deficiency	Start date	End date	Annual amortization payment	Balance solvency ¹	Balance going-concern ²
	mm-dd-yyyy	mm-dd-yyyy	\$	\$	\$
Going-concern unfunded liability	12-31-2006	12-31-2021	255,100	1,003,600	951,600
Going-concern unfunded liability	12-31-2009	12-31-2024	468,400	2,302,100	2,936,100
Total			723,500	3,305,700	3,887,700

¹ Value of amortization payments over at most 5 years from December 31, 2017 discounted as at December 31, 2017 (at a discount rate of 3.10% per year)

² Value of amortization payments discounted as at December 31, 2017 (at a discount rate of 5.90% per year)

Based on the funded status of the Plan shown in Sections 2 and 3, the previous amortization schedule must continue as per the New Brunswick *Pension Benefits Act*.

The employer minimum required contributions to finance deficiencies as of this valuation date are thus as follows:

Table 4.5 – Amortization Payments – Current Valuation

Nature of liability or deficiency	Start date	End date	Annual amortization payment	Balance solvency ¹	Balance going-concern ²
	mm-dd-yyyy	mm-dd-yyyy	\$	\$	\$
Going-concern unfunded liability	12-31-2006	12-31-2021	258,600	762,000	733,500
Going-concern unfunded liability	12-31-2009	12-31-2024	474,900	2,326,500	2,586,000
Going-concern unfunded liability	12-31-2018	12-31-2033	349,000	1,709,700	4,218,500
Total			1,082,500	4,798,200	7,538,000

¹ Value of amortization payments over at most 5 years from December 31, 2018 discounted as at December 31, 2018 (at a discount rate of 3.23% per year)

² Value of amortization payments discounted as at December 31, 2018 (at a discount rate of 5.90% per year)

The Plan is not fully funded on the going concern basis. Therefore a new amortization schedule as at December 31, 2018 is required as shown in Table 4.5.

The annual amortization payments above are calculated as level % of pay and these are the resulting dollar amounts in the upcoming year. These amortization payments are in addition to amounts required to cover the residual normal cost. Higher amortization payments are acceptable but they cannot exceed the greater of the excess of the actuarial liabilities over the assets on the going-concern basis and the excess of the actuarial liabilities over the assets on a hypothetical wind-up basis, plus interest in aggregate.

Contributions

The table below summarizes the total minimum annual contributions necessary to meet the funding requirements of the New Brunswick *Pension Benefits Act* taking into account that the Plan is exempt from the solvency deficiency funding requirements. The minimum special payments to amortize past going-concern unfunded liabilities have been calculated as a level percentage of payroll and the estimated annual payments are all in 2019 dollars based on the estimated 2019 payroll data used in this valuation.

The employer minimum required contributions to finance deficiencies as of this valuation date are thus as follows:

Table 4.6 – Minimum Annual Funding Requirements Table

	Level % of Payroll	Amount in 2019 Dollars
Total annual normal actuarial cost	12.85	5,450,300
Plus amortization payments to December 31, 2021	0.61	258,600
Plus amortization payments to December 31, 2024	1.12	474,900
Plus amortization payments to December 31, 2033	0.82	349,000
Minimum total amount contributions	15.40	6,532,800
Less employee contributions	(8.00)	(3,393,000)
Balance of contributions needed to cover minimum required	7.40	3,139,000
Less employer contributions	(8.00)	(3,393,800)
2019 contributions in shortfall (excess) of required contributions	(0.60)	(254,800)

Appendix A – Going-Concern Actuarial Basis

Asset Valuation Method

The actuarial value of the assets used to determine the going-concern funded status is equal to the market value. This method is the same as the one used in the last valuation.

Actuarial Cost Method

The actuarial liabilities and the normal cost on the going-concern basis were calculated using the projected accrued benefit (or projected unit credit) actuarial cost method.

The 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 assumptions as indicated hereafter.

The normal cost is equal to the actuarial present value of benefits expected to be earned by members in the year following the valuation date. The residual normal cost is the excess of the normal cost over employees' required contributions.

The valuation method for determining the actuarial liabilities and the normal cost is the same as the one used in the last valuation.

Members who have reached the retirement age assumption and are still in service are presumed to accumulate pension credits for the following year for normal cost calculation purposes (up to the maximum pensionable service). For normal cost calculation purposes, we included the actuarial present value of the benefits that accrue in the year following the valuation date. This method is the same as the one used in the last valuation.

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 members remain stable. All other things being equal, an increase in the average age of the active 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. This method is the same as the one used in the last valuation.

Actuarial Assumptions

The main actuarial assumptions used in the going-concern valuation are summarized in the following table. Some assumptions used in this valuation are different from those used in the previous valuation. For comparison purposes, the assumptions used in the last valuation are also included in the table. All rates and percentages are annualized unless otherwise noted.

Table A.1 – Going-Concern Actuarial Assumptions

	December 31, 2018	December 31, 2017
Discount rate	5.90% per annum	Same
Inflation	2.25% per annum	Same
Indexation	0.0% per annum	Same
Salary increases (productivity)	3.00% per annum	Same
Increases in maximum pensionable earnings	3.00% per annum	Same
Increases in maximum pension	At January 1, 2019, the annual defined benefit limit is \$3,025.56 and is assumed to increase by 3.0% per annum starting on January 1, 2020	At January 1, 2018, the annual defined benefit limit is \$2,944.44 and is assumed to increase by 3.0% per annum starting on January 1, 2019
Interest credited on employee contributions	5.90% per annum	Same
Mortality	CPM2014 with full generational mortality improvement, using Scale CPM-B, adjusted by 115% in males and 110% in females	Same
Termination (membership)	No allowance	Same
Disability	No allowance	Same
Retirement		
Regular employees	5% retire at ages 55 to 59, 9% retire at ages 60 to 64 and 30% retire at age 65; those already meeting the calculated retirement age are assumed to retire one year after the valuation date	Same
Police and Fire	5% retire at ages 50 to 54, 9% retire at ages 55 to 59 and 30% retire at age 60; those already meeting the calculated retirement age are assumed to retire one year after the valuation date	Same
Members on long-term disability	Retire at earliest unreduced age; those already meeting the calculated retirement age are assumed to retire one year after the valuation date	Same

Table A.1 – Going-Concern Actuarial Assumptions (continued)

	December 31, 2018	December 31, 2017
Provision for expenses	A 9% loading is added to the total annual normal actuarial cost to cover the expenses of operating the plan, other than expenses which are implicitly recognized in the discount rate.	Same
Actuarial cost method	Projected Unit Credit prorated on service	Same

Choice of Assumptions

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

Inflation rates

As stated in its monetary policy, the Bank of Canada aims to keep inflation at the 2% target, i.e. the midpoint of the 1% to 3% inflation-control target range. Given historical increases in consumer prices in Canada, the rates expected by the market, portfolio managers' expectations and the Bank of Canada policy, an expected rate of inflation of 2.25% has been retained.

Discount rate

The elements considered in the development of the discount rate assumption for going-concern purposes are summarized in the table below:

Table A.2 – Discount Rate

	%
Expected inflation	2.25
Expected real return	3.40
Value added for rebalancing and diversification effect	0.50
Value added for active management	0.45
Expected investment and custodial expenses	(0.70)
Discount rate	5.90

The following table shows the expected real return by asset class for a passive management, before adjustment for portfolio rebalancing and diversification. It should be noted that the return assumptions for bonds has been determined mainly (but not totally) on current market conditions while the return assumptions for equities are based more on long term expectations.

Table A.3 – Expected Real Return by Asset Class (Passive Management)

Asset classes	Target asset mix	Expected real return
	%	%
Bonds (Universe)	9.0	0.70
Bonds (Long-Term)	13.5	1.05
Bonds (Corporate)	9.0	1.40
Bonds (Long-Term Corporate)	13.5	2.00
Global high yield	10.0	4.05
Canadian equity	16.0	4.85
World equity	19.0	4.45
Emerging markets equity	10.0	7.70
Expected average real return		3.40

Portfolio rebalancing will affect the portfolio's expected long-term return. In other words, realigning portfolio's weightings to the target determined in the investment policy from time to time will have an impact on the long-term return. The impact of portfolio rebalancing depends on its frequency, the weightings between asset classes, the level of diversification in the portfolio and the investment horizon. The expected return is also influenced by the level of diversification of the portfolio (this is independent of rebalancing). The expected impact of rebalancing and diversification on the portfolio's return (weighted average of returns of asset classes) was estimated on the basis of stochastic projections and estimated at 0.50%.

A provision has been considered in the discount rate to take into account the added value associated with active management. Note that this provision has been limited to the estimated fees corresponding to active management.

Increases in maximum pensionable earnings

The assumption for the increase in maximum pensionable earnings reflects an assumed rate of inflation of 2.25% per annum, plus an allowance of 0.75% per annum for the effect of real economic growth and productivity gains in the Canadian economy, which is consistent with historical real economic growth.

Salary increases (productivity)

The assumption for the salary increase reflects an assumed rate of inflation of 2.25% per annum, plus an allowance of 0.75% in the long-term for the effect of real economic growth and productivity gains in the economy.

Mortality

The mortality assumption adopted for this valuation is the CPM-2014 Table projected with improvement scale CPM-B with adjustment factors of 115% for males and 110% for females as at December 31, 2018. The mortality assumption remains unchanged from the December 31, 2017 valuation. There is not sufficient experience data to conduct a credible mortality experience study given the size of the Plan.

Termination (membership)

No allowance has been made for termination of employment prior to retirement on the basis that the impact of including such an assumption would not have a material impact on the valuation results. The Plan has experienced limited gains and losses on termination experience over the last three valuations suggesting that this assumption remains reasonable.

Retirement

The retirement rates have been determined based on our expectation of the best-estimate retirement rates pursuant to Plan provisions and the experience of other similar plans. The Plan has not experienced significant gains or losses on retirement experience suggesting that this assumption remains reasonable.

Provision for expenses

Explicit provision has been made in the normal cost for the non-investment and non-custodial related expenses expected to be paid from the pension fund. The 9% loading added to the total annual normal actuarial cost for this purpose has been maintained in the current valuation.

Custodial and investment expenses

We have reviewed investment related expenses for the recent past and determined the total custodial and investment expenses of 0.70% is a reasonable estimate of such future expenses.

Appendix B – Solvency and Hypothetical Wind-Up Actuarial Basis

Asset Valuation Method

The actuarial value of the assets used to determine the solvency and hypothetical wind-up funded status is equal to the market value of assets, adjusted for amounts payable and receivable. This valuation method is the same as the one used in the last valuation.

Actuarial Cost Method

The solvency liabilities are determined using the accrued benefit (or unit credit) actuarial cost method. The solvency 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, the age used is the age on the date of the nearest birthday. However, to determine eligibility for benefits, the exact age was used. These methods are the same as those used in the last valuation.

Actuarial Assumptions

The main actuarial assumptions used in the solvency and hypothetical wind-up valuations correspond to those prescribed by the applicable legislation.

These assumptions are summarized in the following table. For comparison purposes, the assumptions used in the last valuation are also included. All rates and percentages are annualized unless otherwise noted.

Table B.1 – Solvency and Hypothetical Wind-Up Actuarial Assumptions

	December 31, 2018	December 31, 2017
Discount rates (settlement by transfer of values)	3.23% per annum, or, 3.20% per annum for 10 years, 3.40% per annum thereafter, if this provides a higher liability	3.10% per annum, or, 2.60% per annum for 10 years, 3.40% per annum thereafter, if this provides a higher liability
Discount rates (settlement by purchase of annuities)	3.23% per annum	3.10% per annum
Indexation	0.00% per annum	Same
Mortality	CPM-2014 with full generational mortality improvement, using Scale CPM-B (gender distinct)	Same
Retirement	Age that maximizes the value of the pension	Same
Provision for expenses	\$400,000	Same

Termination scenario

The termination scenario used in the solvency and hypothetical wind-up valuations includes the following assumptions:

- Plan wind-up would not result from employer insolvency.
- All assets could be realized at their reported market value.

This approach is the same as the one used in the last valuation.

Discounted value of payments

The rates used to discount the amortization payments for the purposes of calculating the solvency asset adjustment and the solvency balance correspond to the discount rates chosen for the valuation of the members' benefits settled by the purchase of non-indexed annuities with an insurance company.

Margin for adverse deviations

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

Choice of Assumptions

Settlement of benefits

The assumptions used to value the members' benefits settled by a lump sum transfer are in accordance with the Plan provisions, the applicable legislation as well as the Canadian Institute of Actuaries' standards of practice for pension commuted values.

The assumptions used to value the benefits of members and beneficiaries settled by the purchase of annuities with an insurance company are in conformity with the educational note dated March 18, 2019 prepared by the Canadian Institute of Actuaries. These assumptions are based on an estimate of the premium that would be required by an insurer to guarantee payment of the pensions. The duration of the liabilities expected to be settled through the purchase of non-indexed annuities is equal to 12.86 years.

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. 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.

Incremental Cost

The incremental cost on the solvency 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, 2018 and December 31, 2019, discounted to December 31, 2018;

Plus

2. Projected solvency liabilities as at December 31, 2019, discounted to December 31, 2018;

Less

3. Solvency liabilities as at 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 correspond to those used in the going-concern valuation as at December 31, 2018.
- The assumptions used to calculate the projected solvency liabilities as at December 31, 2019 in item 2. above correspond to those used for the solvency valuation as at December 31, 2018, taking into account the method of settlement applicable to each member as at December 31, 2019.

However, we assume that the discount rates remain at the levels applicable as at December 31, 2018 and that the select period is reset as at December 31, 2019 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, 2018 remain in effect as at December 31, 2019.

- The projected solvency liabilities as at December 31, 2019 in item 2. above is calculated using the same postulated scenario as is used for the solvency valuation as at December 31, 2018.
- The rates used to discount items 1. and 2. above from December 31, 2019 to December 31, 2018 correspond to those used for the solvency valuation as at December 31, 2018. However, these rates are adjusted to take into account the applicable method of settlement applicable to each member as at December 31, 2019.
- No new entrants were considered between December 31, 2018 and December 31, 2019 as the impact on the incremental cost is not material.

Appendix C – Assets

Source of Information

All information pertaining to the assets has been extracted from the financial statements prepared by CIBC Mellon.

Tests have been performed to ensure that contributions, benefits payments and investment earnings were reasonable.

Statement of Net Assets (Market Value)

The following table shows the asset allocation as at December 31, 2018. For comparison purposes, the asset allocation as at December 31, 2017 is also shown.

Table C.1 – Net Assets (Market Value)

	December 31, 2018	December 31, 2017
	\$	\$
Assets		
Invested assets		
• Cash	3,551,908	1,143,468
• Bonds, debentures and mortgages	58,416,171	54,436,171
• Canadian equity	18,819,636	22,039,233
• Foreign equity	33,651,224	39,077,881
Total	114,438,939	116,696,753
Net assets in the financial statements	114,438,939	116,696,753
Adjustments		
Other assets		
• Contributions receivable	590,846	526,637
• Investment sales receivable	350,250	—
• Accounts payable	(127,587)	(241,755)
Benefits payable	—	(42,990)
Total	813,509	241,892
Net assets (after adjustments)	115,252,448	116,938,645

Changes in Net Assets

The following table shows changes affecting the assets during the inter-valuation period, based on market values.

Table C.2 – Reconciliation

	2018
	\$
Net assets – beginning of period	116,938,645
Adjustment to market value	42,991
Increase in assets	
Contributions	
• Employee (current service)	3,269,115
• Employer (current service)	3,263,418
• Transfer in	—
• Total	6,532,533
Investment income	(1,528,718)
Total	5,003,815
Decrease in assets	
Benefits paid	
• Pensions in payment	3,963,085
• Transfer and refunds	1,539,429
• Total	5,502,514
Expenses	
• Investment fees	531,216
• Custodial fees	114,523
• Administration fees	584,750
• Total	1,230,489
Total	6,733,003
Net assets – end of period	115,252,448

The employers match the regular, ongoing contributions of plan members. However, members who purchase past service pay the full actuarial cost of that service and this may result in total employee contributions being higher than employer contributions by varying amounts, depending on the level of past service purchases in each year.

Return on Assets

The annual rates of return achieved on assets, after investment management fees and custodial fees charged to the fund, are as follows:

Table C.3 – Return on Assets after expenses

Year	Market Value Basis
	%
2018	(1.86)
2017	7.26
2016	8.64

Appendix D – Membership Data

Description of Membership Data

The data as at December 31, 2018 was taken from the files which we maintain on an ongoing basis as day-to-day administrators of the Plan and which are based on data supplied to us by the various participating employers in the Plan. We have taken the following steps to review the data to ensure sufficiency and reliability:

- the records of each member were reconciled with the data of the previous valuation;
- individual benefit statements were distributed to the members, who were instructed to report any errors;
- the contributions and pensions paid since the last valuation shown in the financial statements were compared with the equivalent values drawn from the data;
- a reconciliation was performed in order to follow the changes in the number of active members, retirees and vested members; and
- basic data checks were performed to ensure that age, salary and service data were reasonable for the purposes of the valuation.

Summary of Membership Data

The following tables were prepared using data provided by the participating employers regarding their active members, retirees and former members.

Table D.1 – Summary of Membership Data

	December 31, 2018	December 31, 2017
Active members		
Number	699	707
Total payroll for following year (excluding members on long-term disability)	\$42,399,575	\$41,822,481
Average payroll for following year (excluding members on long-term disability)	\$60,744	\$59,239
Average contributions with interest (excluding members on long-term disability)	\$64,808	\$66,841
Average age in years	47.0	47.3
Average pensionable service in years	11.0	11.1
Deferred vested members		
Number	83	73
Total annual pensions at normal retirement age	\$596,548	\$413,147
Average annual pension at normal retirement age	\$7,187	\$5,660
Average age in years	52.0	49.6
Pensioners		
Number	258	244
Total annual pensions	\$4,148,957	\$3,863,524
Average annual pension	\$16,081	\$15,834
Average age in years	70.9	71.1

Table D.2 – Changes in Plan Membership

	Active members	Deferred vested members	Pensioners	Total
Members as at December 31, 2017	707	73	244	1,024
New members	56	—	—	56
Return to active from deferred	—	—	—	—
Terminations:				
Deferred pensions	(14)	14	—	—
Non-vested or lump-sum transfers	(28)	(2)	—	(30)
Deaths:				
With no further payment	(1)	—	(9)	(10)
With continuing pension	—	—	(3)	(3)
Survivor pension	(1)	—	4	3
Retirements	(20)	(2)	22	—
Data Adjustments	—	—	—	—
Members as at December 31, 2018	699	83	258	1,040

In addition to the above membership counts, there are 19 terminated members with outstanding refunds at December 31, 2018 and 60 terminated employees for whom a portion of their lump sum commuted value remains in the Plan to be paid at a later date in accordance with the Plan's policy to withhold a portion of all commuted value payments for a period up to 5 years as required by the New Brunswick *Pension Benefits Act*.

Table D.3 – Summary of Active Members as At December 31, 2018 (Excluding Members on Long-Term Disability)

Age Group (age nearest)	Number	Total Salary	Average Salary	Average Pensionable Service in Years
Under 25	11	\$558,774	\$50,798	1.2
25 - 29	34	\$1,834,251	\$53,949	2.7
30 - 34	57	\$3,246,923	\$56,964	4.5
35 - 39	80	\$4,903,992	\$61,300	6.8
40 - 44	110	\$6,533,290	\$59,394	8.5
45 - 49	107	\$6,755,320	\$63,134	10.6
50 - 54	128	\$8,362,601	\$65,333	14.3
55 - 59	104	\$6,293,016	\$60,510	17.0
60 and over	67	\$3,911,408	\$58,379	16.7
Total	698	\$42,399,575	\$60,744	11.0

Of the total, 506 are male and 192 are female, plus there is another 1 male on LTD with no salary from their employer.

Table D.4 – Summary of Deferred Vested Former Employees at December 31, 2018

Age Group (age nearest)	Number	Total Annual Pension at NRD	Average Annual Pension at NRD
Under 35	4	\$8,363	\$2,091
35 - 39	7	\$19,135	\$2,734
40 - 44	11	\$36,686	\$3,335
45 - 49	9	\$32,484	\$3,609
50 - 54	16	\$100,334	\$6,271
55 - 59	15	\$118,056	\$7,870
60 and over	21	\$281,491	\$13,404
Total	83	\$596,548	\$7,187

Of the total, 50 are male and 33 are female.

Table D.5 – Summary of Pensioners as at December 31, 2018

Age Group (age nearest)	Number	Total Annual Pension	Average Annual Pension
55 - 59	4	\$34,109	\$8,527
60 - 64	45	\$911,000	\$20,244
65 - 69	76	\$1,405,531	\$18,494
70 - 74	67	\$1,162,626	\$17,353
75 - 79	39	\$460,981	\$11,820
80 - 84	20	\$139,327	\$6,966
85 and over	7	\$35,384	\$5,055
Total	258	\$4,148,957	\$16,081

Of the total, 169 are male and 89 are female.

Table D.6 – Summary of Terminated Members with Outstanding Refunds as at December 31, 2018

Number	Total Refund	Average Refund
19	\$737,501	\$38,816

Table D.7 – Summary of Terminated Members with Amounts Withheld as at December 31, 2018

Number	Total Amount Withheld	Average Amount Withheld	Average Years Remaining until Payment
60	\$1,047,863	\$17,464	2.6

Appendix E – Summary of Plan Provisions

The Plan was established effective March 1, 1979 to make available to municipalities in New Brunswick a uniform contributory pension plan for their permanent employees and to provide certain retirement and related benefits for and on behalf of all eligible Employees who become Members of the Plan.

In 2007, the *Municipalities Act* was amended to allow the detailed provisions of the Plan to be removed from Regulation 81-34 and put in a separate document which the Pension Board has full authority to change. Accordingly, the Pension Board was formally given authority to administer and revise the Plan as granted by the New Brunswick Regulation 2010-23 of the *Municipalities Act* as filed on March 15, 2010.

The Plan provisions upon which the present valuation was done are summarized below.

The Plan is registered in New Brunswick (registration number NB.0418723) and with the Canada Revenue Agency (registration number 0418723).

Effective Date

March 1, 1979.

Eligibility and Participation

Regular, full-time employees are eligible on the first of the month coincident with or next following the date they become a permanent employee or, if later, the date their employer adopts the Plan. The New Brunswick *Pensions Benefits Act* requires that part-time employees become eligible if they have completed 24 months of employment and earned at least 35% of the Year's Maximum Pensionable Earnings (YMPE) under the Canada Pension Plan in each of two consecutive calendar years.

Member Contributions

Effective January 1, 2013, the contribution rates for regular employees are equal to 7.41% of earnings up to the YMPE and 9.88% of earnings in excess of the YMPE, while the corresponding contribution rates for police and firefighters equal to 8.20% and 10.92%, respectively.

Employer Contributions

Each participating employer must contribute such amounts as are, in the opinion of the actuary, necessary, in addition to member contributions and accumulated assets, to provide the benefits defined in the Plan. In practice, each participating employer has always matched the required member contributions since the inception of the Plan and continues to do so.

Normal Retirement

The normal retirement date of a member is the first of the month coincident with or next following his or her sixty-fifth birthday for regular employees and the sixtieth birthday for police and firefighters.

For retirements and terminations on or after January 1, 1998, the annual amount of a member's normal retirement pension is equal to:

1. the product of:
 - a) the number of years of the member's pre-1998 pensionable service, and
 - b) 1.8% of the annual average earnings up to the average YMPE plus 2% of the annual average earnings in excess of the average YMPE,
- plus
2. the product of:
 - a) the number of years of the member's post-1997 pensionable service, and
 - b) 1.5% of the annual average earnings up to the average YMPE plus 2% of the annual average earnings in excess of the average YMPE.

The average annual earnings are calculated as the average during any five years in the last ten years prior to retirement or termination which produces the highest average. The average YMPE is calculated over the final three years, including the year of retirement or termination.

The pension is subject to the maximum pension rules established from time to time by the *Income Tax Act* (Canada).

Ad hoc increases to pensions may be granted in the future, up to 2% per annum, depending on the financial position of the Plan and at the full discretion of the Pension Board.

Forms of Pension Payment

The normal form of payment is a single life annuity with a minimum of 120 monthly payments guaranteed. Optional forms are available on an actuarial equivalent basis. Under the New Brunswick *Pension Benefits Act*, pensioners who have a spouse or common-law partner at retirement must elect a reduced joint and last survivor form under which at least 60% continues to the spouse or common-law partner, unless the spouse or common-law partner waives his or her rights to the joint and survivor form.

Early Retirement

A member who has completed five years of employment may retire at any time after attaining age 55 (50 for police officers and firefighters).

For members who were age 55 and over (age 50 for police and firefighters) at January 1, 2010, the reduction factor is calculated as 0.25% times the number of months by which the age at retirement precedes age 65 (age 60 for police and firefighters).

For members who attained age 55 and over (age 50 for police and firefighters) between January 1, 2010 and January 1, 2013, the reduction factor has increased annually on each January 1, starting January 1, 2011, at a rate of 0.025% per year until January 1, 2015 when the reduction factor was set at 0.375% times the number of months by which the age at retirement precedes age 65 (age 60 for police and firefighters).

For members under age 55 (age 50 for police and firefighters) at January 1, 2013, the reduction factor has increased annually on each January 1, starting January 1, 2011, at a rate of 0.025% per year until January 1, 2018

when the reduction factor hit 0.450% times the number of months by which the age at retirement precedes age 65 (age 60 for police and firefighters).

Late Retirement

A member who remains in employment beyond the normal retirement age continues to contribute to the Plan and accrue benefits. Retirement cannot be postponed beyond December 31st of the calendar year in which the member reaches age 71.

Effective January 1, 2014, the late retirement provisions were amended to provide members who retire after age 65 with a late retirement equalization of up to 5.4% per annum (0.45% per month) after age 65, subject to limits under the *Income Tax Act*.

For every month that a member's age at retirement is over age 65, the pension will increase by the percentage indicated:

Retirement Date	Rate
	%
On or Before December 31, 2013	0.000
On or after January 1, 2014 but on or before December 31, 2014	0.350
On or after January 1, 2015 but on or before December 31, 2015	0.375
On or after January 1, 2016 but on or before December 31, 2016	0.400
On or after January 1, 2017 but on or before December 31, 2017	0.425
On or after January 1, 2018	0.450

Benefits on Termination of Employment

A member who terminates employment prior to completing both two years of continuous Plan membership and five years of continuous employment is entitled to a refund of the total amount of his or her own contributions to the Plan, with interest.

If a member terminates employment after completing two or more years of continuous Plan membership or five or more years of continuous employment the member is entitled to his or her accrued normal retirement pension. The pension will be available on an unreduced basis at age 65 or 60, depending on whether the member is a regular employee or a police officer or firefighter.

The locking-in and portability requirements of the New Brunswick *Pension Benefits Act* apply.

In addition, if the accumulated amount of the member's post-1991 contributions exceeds one-half of the lump-sum value of the member's post-1991 benefit, the excess is refundable to the member.

Pre-retirement Death Benefits

In the event of the death of a member prior to retirement and prior to completing both two years of continuous Plan membership and five years of continuous employment, the benefit payable is a refund of the member's own contributions with interest.

On death before retirement but after completing two or more years of continuous Plan membership or five years of continuous employment, the benefit payable to the spouse, common-law partner, or beneficiary, as applicable, is 100% of the lump-sum value of the member's accrued normal retirement pension or, if greater, the member's own contributions with interest.

Disability Benefits

For disabilities occurring after January 1, 2010, a disabled member can continue accumulating pensionable service if he or she elects to continue contributing to the Plan during the period in which the employee is disabled. Employees deemed totally and permanently disabled prior to January 1, 2010 receive pensionable service without having to make contributions to the Plan.

Purchase of Past Service

The purchase of certain periods of past service with municipalities is allowed, with the member paying the full actuarial cost of the additional service on a valuation liability basis.

Appendix F – Employer Certification

With respect to the actuarial valuation report of New Brunswick Municipal Employees Pension Plan as at December 31, 2018, we hereby confirm that to the best of our knowledge:

- the contributions have been paid to the fund in conformity with the previous actuarial report;
- the data regarding Plan members and beneficiaries provided to Morneau Shepell constitutes a complete and accurate description of the information contained in our files;
- the data regarding Plan assets provided to Morneau Shepell are complete and accurate;
- copies of the official text of the Plan and all amendments to date were provided to Morneau Shepell and the summary of Plan provisions contained in this report adequately reflects the Plan provisions for the purposes of this actuarial valuation;
- there are no subsequent events nor any extraordinary changes to the membership other than those listed in this actuarial report on the Plan, which would materially affect the results.



Signature

NADINE LÉGER

Name (printed)

Chairperson of the Pension Board

Title


Date

Appendix G – Terms of Engagement

August 27, 2019

CONFIDENTIAL

Ms. Nadine Léger
Chairperson, NBMEPP Pension Board

Re: Terms of Engagement for New Brunswick Municipal Employees Pension Plan Actuarial Valuation as at December 31, 2018

Dear Nadine,

As previously discussed, standards from the Canadian Institute of Actuaries (CIA) encourage advance discussion and acknowledgment for the terms of engagement of a particular valuation. Below you will find a summary of our understanding of assumptions and methods to be used for the December 31, 2018 actuarial funding valuation of the New Brunswick Municipal Employees Pension (the "Plan"), which has been requested by the Plan's Pension Board:

1. The valuation is to be conducted in accordance with the *New Brunswick Pension Benefits Act* ("NBPBA") and the *Income Tax Act* ("ITA") and, as such, should include a Going-Concern valuation and a Solvency valuation. In accordance with Standards of Practice for the Canadian Institute of Actuaries ("CIA Standards"), the position of the Plan, was it to be wound up on the valuation date, should also be disclosed. The measurement date for the valuation will be December 31, 2018.
2. Assets should be measured at market value, plus any net amounts in transit for receivables and payables.
3. Data on Plan membership will be extracted from the Plan's administration system maintained by Morneau Shepell Ltd. The data will be extracted at December 31, 2018.
4. Assumptions should not reflect margins for adverse deviations.
5. The going-concern valuation basis used is described in detail in Appendix A. The discount rate used in the going-concern valuation will be 5.90% per annum (unchanged from the actuarial valuation as at December 31, 2017). All other economic and demographic assumptions for the going-concern valuation are consistent with the previous going-concern actuarial valuation as at December 31, 2017 and the CIA Standards to the extent that they remain reasonable and appropriate in the professional opinion of Morneau Shepell Ltd.
6. Economic and demographic assumptions for the solvency and hypothetical wind-up valuations as outlined in Appendix B are consistent with the requirements of the NBPBA and the CIA Standards to the extent that they are reasonable and defensible in the professional opinion of Morneau Shepell Ltd.
7. With respect to the solvency and hypothetical wind-up valuations, pensioners, deferred vested members and active members who are eligible to retire immediately are assumed to have an annuity purchased on


their behalf upon wind-up. For active members not eligible to retire, they are assumed to elect the greater of the commuted value or annuity purchase value.

8. The solvency discount rate with respect to those assumed to purchase an annuity will be 3.23% per annum compared to 3.10% per annum as at the last valuation. The solvency discount rates with respect to those assumed to elect a commuted value will be 3.20% for the first 10 years and 3.40% thereafter, compared to 2.60% for the first 10 years and 3.40% thereafter as at the last valuation.
9. The actuarial cost method to be used for the going-concern valuation is the projected unit credit method pro-rated on service and remains unchanged from December 31, 2017.
10. The valuation report should state the minimum employer contribution requirement as per the NBPBA as well as the maximum allowable employer contribution as per the ITA.
11. If the Transfer Ratio remains below 0.90 as at December 31, 2018, then the next actuarial valuation is to be conducted as at December 31, 2019 as per the NBPBA. If the Transfer Ratio is at or above 0.90 as at December 31, 2018, then the next actuarial valuation is to be conducted no later than December 31, 2021.
12. Any items that require deviation from the decisions contained herein are to be discussed with representatives from New Brunswick Municipal Employees Pension Plan.
13. We are not aware of any subsequent events that will materially impact the results of this actuarial valuation.
14. Please note that some assumptions may be recommended to change after the gain / loss analysis is conducted for this valuation. However, such recommendations on possible changes to assumptions such as retirement, salary, etc. require delay, as appropriate, until the actuarial gain and loss analysis provided in our valuation report has been completed.

Ms. Nadine Léger
August 27, 2019

If you agree with our understanding as summarized above, please sign a copy of this letter and return it to our attention. If you require additional information or wish to discuss further the content of this letter, please do not hesitate to contact us.

Regards,



Yves Plourde, FSA, FCIA
Vice President


This letter has been peer reviewed by Don Charlton, FSA, FCIA.

We, the undersigned, agree that the summary set forth in this letter is an accurate representation of both parties' understanding of the terms of engagement for the December 31, 2018 actuarial valuation of the New Brunswick Municipal Employees Pension Plan.



Nadine Léger
Chairperson
NBMEPP Pension Board

August 27, 2019
Date



Yves Plourde
Morneau Shepell Ltd.

August 27, 2019
Date

Appendix A – Going Concern Actuarial Assumptions

Table A.1 - Going Concern Actuarial Assumptions

Discount rate/ Interest on employee contributions (net of custodial and investment expenses)	5.90% per annum	
Salary increases	3.0% per annum	
YMPE increases	3.0% per annum	
Inflation	2.25% per annum	
Pensioner cost of living increases	0.0% per annum	
Mortality tables	CPM2014 with full generational mortality improvement, using Scale CPM-B, adjusted by 115% in males and 110% in females, on a sex-distinct basis	
Retirement age	Regular employees	5% retire at ages 55 to 59, 9% retire at ages 60 to 64 and 30% retire at age 65; those already meeting the calculated retirement age are assumed to retire one year after the valuation date
	Police and Fire	5% retire at ages 50 to 54, 9% retire at ages 55 to 59 and 30% retire at age 60; those already meeting the calculated retirement age are assumed to retire one year after the valuation date.
	Members on long-term disability	Retire at earliest unreduced age; those already meeting the calculated retirement age are assumed to retire one year after the valuation date
Rates of termination	No allowance	
Disability incidence	No allowance	
Actuarial cost method	Projected Unit Credit prorated on service	
Expenses	A 9% loading is added to the total annual normal actuarial cost to cover the expenses of operating the plan, other than expenses which are implicitly recognized in the discount rate.	
Income Tax Act defined benefit limit	At January 1, 2019, the annual defined benefit limit is \$3,025.56 and is assumed to increase by 3.0% per annum starting on January 1, 2020	

Appendix B – Solvency/Hypothetical Wind-up Actuarial Assumptions

Table B.1 – Solvency/Hypothetical Wind-up Actuarial Assumptions

Discount rate for active and deferred members not eligible for immediate retirement	The scenario which maximizes the individual liabilities, either: 3.23% per annum or (3.20% per annum for the first 10 years, and 3.40% per annum thereafter)
Discount rate for retired members, and active and deferred members eligible for immediate retirement	3.23% per annum
Indexation	0.0% per annum
Salary increases	None
Merit and promotional scale	None
Mortality Tables	CPM2014 with full generational mortality improvement, using Scale CPM-B, on a sex-distinct basis
Termination of employment	None
Disability	None
Retirement	Age that maximizes the value of the pension
Wind-up expenses	\$400,000

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).

