British Columbia Public Service Pension Plan

Actuarial Valuation
as at March 31, 2014

Vancouver, B. C.

December 18, 2014

Contents

Actuarial Report Highlights

An actuarial valuation of the Public Service Pension Plan was completed as at March 31, 2014. Its purpose was to determine the financial position of the Plan as at March 31, 2014 and to report on the adequacy of the member and employer contribution rates.

Scope of the Valuation

The main valuation focuses on the Basic Account and the funding of the Basic, non-indexed benefits. It excludes liabilities for:

- Future indexing funded via fixed contributions to the Inflation Adjustment Account (IAA); and
- Post-retirement group benefits provided on a pay-as-you-go basis via carve outs from the IAA contributions.

Furthermore, it ignores the limits imposed by the *Income Tax Act* ("*ITA*") on benefits provided from registered pension plans - such excess benefits are paid on a current cash basis through the Supplemental Benefits Account, which is maintained at a zero balance.

We have, however, performed supplementary valuations as follows:

- For basic and indexed benefits, on the assumption that indexed benefits are to be fully funded, in advance, as for basic benefits; and
- Limiting benefits to those permitted under the *ITA*; this is done both for basic benefits only, and for basic plus indexed benefits.

Key Changes Included in the Valuation

Effective April 1, 2012, member and employer contributions to the Basic Account were increased by 0.40%.

There were no benefit changes that had a material financial impact on the plan.

Actuarial Methods and Assumptions

The actuarial liabilities include the value of benefits accrued by members as at March 31, 2014 as well as future benefits expected to be earned by existing members. Asset values are based on smoothed market values (limited to not more than 108%, nor less than 92%, of market value), plus projected future contributions based on entry-age normal contribution rates and, where relevant, the existing amortization rates.

The contribution rates are tested on the entry-age contribution method. Under this method, a long-term, entry-age rate, which would fully fund benefits for future new entrants to the Plan, is calculated. The surplus

(unfunded liability) is then amortized according to the requirements of the Board's Funding Policy. This method is designed to maintain costs at a level percentage of payroll over an extended period. The resulting contribution rate is then tested against the going-concern requirements of the BC *Pension Benefits Standards Act ("PBSA")* as required by the Joint Trust Agreement.

Key long-term assumptions used include:

- Annual Investment Return — 6.50% (unchanged from the previous valuation)
- Annual Salary Increase — 3.75% plus seniority (unchanged from the previous valuation)
- Annual Indexing — 0% for basic costs, 3.00% for indexed costs (unchanged from the previous valuation)

Actuarial Position

The valuation shows an improvement in the actuarial position for the Basic Account on the entry-age normal contribution basis. A surplus of $392 million has emerged since the March 31, 2011 valuation:

Basic Benefits Only ($000's)	2014	2011
Assets without previously scheduled amortization	20,471,582	17,814,281
Liabilities	20,277,884	18,040,744
Surplus (Unfunded Liability) without previously established amortization	193,698	(226,463)
Present value of previously established amortization	197,973	226,463
Surplus (Unfunded Liability) with previously established amortization	391,671	0

The supplementary valuation results are:

Basic and Indexed Benefits ($000's)	2014	2011
Assets without previously scheduled amortization	26,958,991	23,463,158
Liabilities	27,553,771	24,583,375
Surplus (Unfunded Liability) without previously established amortization	(594,780)	(1,120,217)
Present value of previously established amortization	197,973	226,463
Surplus (Unfunded Liability) with previously established amortization	(396,807)	(893,754)

When the *ITA* maximums are recognized, the above surpluses (unfunded liabilities) with previously established amortizations change marginally, to:

Benefits Limited to *ITA* Maximums ($000's)		**2014**	**2011**
Surplus (Unfunded Liability) with previously established amortization amounts	Basic Benefits only	546,885	46,988[1]
	Basic and Indexed Benefits	(184,345)	(830,623)[1]

Main Reasons for Change in Actuarial Position

The main reasons for the improvement in the actuarial position are:

- Investment returns higher than assumed; and
- Actual salary increases lower than the long-term assumption;

Offset by

- Changes in the demographic assumptions.

Member and Employer Contribution Rates – Basic Non-Indexed Benefits

Members currently contribute 8.18% of salaries, less 1.5% of salaries up to the Year's Maximum Pensionable Earnings ("YMPE"), for basic non-indexed benefits; employers contribute a matching amount for a total contribution rate of 16.36%. The long-term cost rate for future service (i.e. the entry-age, normal actuarial cost) is 16.33% of salaries, or 0.03% of salaries lower than the current combined member and employer contributions.

The Joint Trust Agreement ("JTA") requires that the contribution rates comply with the going-concern requirements of the *PBSA*. The funded position of the plan on the entry-age rate basis has improved to a surplus of $392 million, including the present value of the 0.6% of pay until 2026 amortization requirement established at the March 31, 2011 valuation. Without this amortization requirement, the plan still has a surplus of $194 million. However, as the *PBSA* only allows amortization of surplus in excess of 5% of the net liabilities, or $828 million in this case, no amortization of the $194 million surplus is permissible and so contributions at the entry-age normal cost rate of 16.33% of salaries are required.

The JTA sets out four alternatives available to the Board when the plan has surplus in the Basic Account:

- Reducing the contribution rate;
- Improving benefits;

[1] Including $226,463,000 amortization requirement established at the 2011 valuation.

- Making a transfer to the Inflation Adjustment Account;
- Setting aside a rate stabilization reserve.

If the contribution rate is reduced, the JTA requires that the decrease be shared equally between the members and the employers. Accordingly, the total contribution rate may decrease by 0.02% of salaries (after rounding) (0.01% of salaries each for members and employers) for a minimum permissible Basic contribution rate of 16.34%, or the basic benefits may be increased such that the required contribution rate becomes equal to the current contribution of 16.36%, or the contribution rate can remain at 16.36% of pay and the surplus can be retained in the Basic Account as a rate stabilisation reserve, or transferred to the IAA. Variations that combine some, or all, of the alternatives are allowed by the JTA. We would be happy to discuss alternatives with the Board.

Combined Minimum Permissible Basic plus IAA Contribution Rates

When the minimum permissible Basic contributions are combined with the IAA rates, the revised totals, net of the amounts assumed allocated to fund post-retirement group benefits, become:

Minimum Permissible Contribution Rates

	Member	Employer	Total
Current Basic Account	8.18%[1]	8.18%[1]	16.36%[1]
Minus maximum permissible Basic Account reduction	(0.01%)	(0.01%)	(0.02%)
Total Minimum Permissible Basic Rate	**8.17%**[1]	**8.17%**[1]	**16.34%**[1]
Current IAA	1.25%	1.75%[2]	3.00%[2]
Total Minimum Permissible Contribution Rate	**9.42%**[1,2]	**9.92%**[1,2]	**19.34%**[1,2]

These minimum permissible contribution rates comply with the requirements of the *PBSA*.

The *ITA* requires that individual member contributions not exceed the lesser of 9% of salaries or $1,000 plus 70% of the pension credit, though this condition may be waived by the Minister provided members do not contribute more than half the cost of benefits. Both the current member contributions and the minimum permissible member contributions will exceed this limit for some of the high earning members of the plan, so regardless of the decision by the Board with respect to contribution rates, it will be necessary to apply to the Minister for a waiver. The net employer contributions currently exceed the member contributions by 0.5% of salaries. As IAA contribution rates are fixed and any future Basic contribution rate changes must be shared

[1] Integrated, i.e. less 1.5% of salaries up to the YMPE.

[2] Net of 1% assumed to be allocated to post-retirement group benefits after March 31, 2012.

equally in terms of the JTA, the requirement that the member contributions will not exceed half of the amount required to fund the aggregate benefits is met.

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I. Scope of the valuation

In accordance with section 10 of the Joint Trust Agreement and on the instructions of The Public Service Pension Board of Trustees (the “Board of Trustees”), we have completed an actuarial valuation of the Basic Account of the Public Service Pension Plan (the "Plan") as at March 31, 2014 and are pleased to submit this report thereon. The primary purpose of this valuation is to determine the financial or actuarial position of the Basic Account as at March 31, 2014 and to report on the adequacy of the member and employer contribution rates.

The main valuation focuses on the Basic Account and the funding of the Basic, non-indexed benefits. It excludes liabilities for:

- Future indexing funded via fixed contributions to the Inflation Adjustment Account (“IAA”); and
- Post-retirement group benefits provided on a pay-as-you-go basis via carve outs from the IAA.

Furthermore, it ignores the limits imposed by the *Income Tax Act* ("*ITA*") on benefits provided from registered pension plans - such excess benefits are paid on a current cash basis through the Supplemental Benefits Account, which is maintained at a zero balance.

We have, however, performed supplementary valuations as follows:

- For basic and indexed benefits, on the presumption that indexed benefits are to be fully funded, in advance, as for basic benefits; and
- Limiting benefits to those permitted under the *ITA*; this is done both for basic benefits only, and for basic plus indexed benefits.

The intended users of this report are The Board of Trustees, the Financial Institutions Commission of British Columbia ("FICOM") and Canada Revenue Agency (“CRA”). This report is not intended or necessarily suitable for other purposes than those listed above.

II. Changes in plan

The last valuation of the Plan, prepared as at March 31, 2011 and included in our report dated December 6, 2011, determined the financial position of the Plan as amended to April 1, 2011. Since then, a number of changes have been made to the Plan rules. The only change affecting its financing is:

- Effective April 1, 2012, member and employer contributions to the Basic Account were increased by 0.40%.

There were no benefit changes that had a material financial impact on the plan.

The changes, and the main provisions of the Plan, are described in Appendix A.

III. Actuarial methods and assumptions

1. Financing Method and Adequacy of Contribution Rates

(a) Funding Criteria

In any pension system, the rates of member and employer contribution should be such that

- the present value of all future such contributions at those rates
- **equals** the present value of all future benefits
- **minus** the funds on hand.

There are numerous financing methods that will satisfy this equation. At one end is the pay-as-you-go or current disbursement method; under this method, contributions are limited to those necessary to finance current benefit disbursements, so that no assets are accumulated. At the other end is the achievement of full funding within a reasonable period; this results in the accumulation of substantial assets.

The general criteria we use in establishing the appropriate level of contributions to a pension plan include the following:

(i) **benefit security** – the probability of fulfilling the present benefit promises provided in the Plan depends on a mixture of political, economic and financial factors; but, whatever the probability, it is clear that benefit security would be enhanced with a larger accumulation of assets.

(ii) **stability of contributions** – the financing system should result in contribution rates that are relatively stable over an extended period of time.

(iii) **allocation of costs** – as far as is practicable, pension costs should be allocated to the generation that incurs them; there is no assurance that future generations will assume the burdens transferred to them by prior generations.

Effective March 9, 2006, the Board adopted a formal funding policy in which it identified benefit security as its primary objective and stability of contributions as an important secondary objective. We have taken this into account in carrying out this valuation.

(b) Indexing Treatment

The current financing provisions are described in Appendix A. Member and employer contributions are at rates set out in the Plan rules. A larger part of these contributions is allocated to the Basic Account, and a smaller portion to the IAA. The future indexing of pensions is based on funds available in the IAA, which derives its

funds primarily from these allocated contributions, from excess investment earnings on pensioner liabilities in the Basic Account, and from investment earnings within the IAA itself.

In a sense, the IAA operates akin to a defined contribution or money-purchase account in that the value of indexing benefits is limited to the assets in the IAA. Future cost-of-living adjustments are not guaranteed, but are granted at the discretion of the Board, subject to the availability of funds in the IAA. Where there are sufficient monies in the IAA, full indexing in line with the Canada Consumer Price Index ("CPI") is provided; alternatively, if the monies in the IAA cannot provide full CPI indexing, then the amount of indexing is limited to the monies available. In either case, the mechanics are such that the capitalized value of the indexing granted is transferred from the IAA to Basic each time indexing is granted. Thus, the system will limit indexing, if necessary, so that the granting of such supplements should not create (or increase) an unfunded liability, or reduce an actuarial surplus. Accordingly, we did not consider any future indexing in determining the financial status of the Basic Account.

However, we also show supplementary results on the assumption that the assets of, and future contributions to, the Basic Account and the IAA are combined, with benefits to be fully indexed and funded in advance, as for basic benefits.

(c) Basic Account Valuation - Current Financing

We determined the financial status of the Plan for the Basic Account only (i.e. ignoring the indexing granted after March 31, 2014). The methods used are described in Appendix B.

(d) Funding Requirements

The approach taken in this valuation (set out in the following sections) has taken into account the requirements of the Board's funding policy, as well as the requirements of the Joint Trust Agreement.

(e) Normal Cost and Amortization of Surplus or Unfunded Liability

An entry-age funding approach is used. As a first step, contributions are calculated as the level, long term, percentage rate required to finance the benefits of new entrants to the Plan over their working lifetimes, so that their projected benefits are fully secured by equivalent assets by the time they retire (the "normal cost rate" or the "entry-age rate"). Thus, to the extent actuarial assumptions are realized, the addition of new entrants to the Plan should not generate unfunded liabilities.

Next, the funded position of the plan at the valuation date is considered. The liability takes into account benefits earned to the valuation date as well as benefits expected to be earned for future service by existing members. Asset values are taken at smoothed market values for existing assets, plus projected future contributions in respect of the existing members at the entry-age normal rates. The resulting net financial position may be either an actuarial surplus or an unfunded actuarial liability. This surplus, or unfunded liability, is amortized over a

specified period as outlined in the funding policy, e.g. 25 or 15 years. Contributions, expressed as a percentage of salaries, revert to the normal cost rate after the unfunded liability or surplus has been amortized.

(f) PBSA Requirements

The *PBSA* imposes certain minimum funding requirements on pension plans registered in British Columbia. These include the determination of a plan's financial position on a solvency basis in addition to the going-concern basis, the amortization of unfunded actuarial liabilities over a maximum of 15 years, and special rules regarding the treatment of surplus. While the Public Service Pension Plan is one of a number of British Columbia public sector plans that are exempt from these provisions, the current joint trusteeship arrangement requires that the Plan's financing comply with the *PBSA* requirements for a going-concern valuation. This report therefore complies with the going concern valuation requirements of the *PBSA*.

(g) Test Contribution Adequacy

Under the *PBSA* going-concern requirements, the employers and the members must contribute the full normal actuarial cost (e.g. the "entry-age rate" described in (e) above). In addition, unfunded liabilities must be amortized over not more than 15 years from when they are established. For this purpose the unfunded liability that needs to be amortized from the valuation date is the unfunded liability described above, reduced by the present value of any previously established amortization amounts.

Surpluses may be applied to reduce the contribution requirements but, with respect to the employer share of the requirements, only after a surplus margin of 5% of liabilities has been set aside, with the remaining surplus to be amortized over not less than 5 years.

Section 11.5(b) of the JTA requires the Board to use a 25 year period for the amortization of a surplus when considering its application towards benefit improvements without the prior approval of the Plan's partners, in order to provide a measure of contribution rate stability. The Board set out its policy with regard to amortization of surplus in its March 2006 funding policy. Accordingly, we have calculated theoretical minimum contribution requirements in accordance with the funding policy as follows:

- Calculate the "normal cost rate" (i.e., the "entry-age rate") and the resulting surplus (or unfunded liability) using this rate.
- If there is an unfunded liability after allowing for the value of any previously established amortization amounts, amortize it over 15 years.
- If there is a surplus, calculate the contribution rate with a 15-year amortization period and the contribution with a 25-year amortization period. The contribution rate with a 15-year amortization of surplus will be lower than the rate with a 25-year amortization of surplus.

- If the current contribution is between the 15 and 25-year rates, then the rate should remain unchanged. Effectively, the surplus is applied as a rate stabilization reserve.
- If the current contribution rate is greater than the 25-year contribution rate, then there is "excess surplus" and the Board may decide how to apply this excess surplus. Alternatives, as set out in the JTA include:
    - Reducing the contribution rate;
    - Improving benefits;
    - Making a transfer to the Inflation Adjustment Account;
    - Setting aside a rate stabilization reserve.
- If the current contribution rate is lower than the 15-year contribution rate, then the rate should be increased to be equal to the 15-year contribution rate.
- The resulting contribution rate must also comply with the *PBSA* minimum requirement.

The JTA rules require any contribution rate changes, up or down, to be shared equally by the Plan members and the employers (the employers will continue to pay the excess costs for certain smaller groups of members who have more advantageous benefits). Thus, we express the future cost requirements as a combined member-plus-employer amount.

2. Actuarial Assumptions

The rates of investment return, salary increase, indexing, mortality, withdrawal, disability and retirement experienced by members of the fund were examined for the three year period ending on the valuation date, together with corresponding experience for earlier periods and with other assumptions affecting the valuation results. We discussed the implications of the economic assumptions, and possible changes to them, with the Board.

Following these discussions with the Board, we left the economic assumptions unchanged. We made some adjustments to the demographic and other assumptions. The assumptions are described in Appendix B; the key economic assumptions are summarized below.

- Annual Investment Return — 6.50% (unchanged from the previous valuation)
- Annual Salary Increase — 3.75% plus seniority (unchanged from the previous valuation)
- Annual Indexing — 0% for basic costs, 3.00% for indexed costs (unchanged from the previous valuation)

Emerging experience differing from the assumptions will result in gains or losses which will be revealed in future valuations.

3. Membership Data

Data as of March 31, 2014 were prepared by the Pension Corporation. The data are described in detail in Appendix B and numerically summarized in Appendices C, D and E.

4. Benefits Excluded

The treatment of post-retirement group benefits does not affect the Basic Account valuation results. With respect to the indexed valuation results, we have reduced the employer contributions to the IAA by 1% of salaries effective April 1, 2012, being the maximum potential amounts that could be allocated to the post-retirement group benefits. We have not otherwise considered the liabilities and the financing for these benefits.

IV. Results of actuarial investigations

The presentation format of the results has been amended since the March 31, 2011 valuation report. The change in presentation does not alter the approach to setting the contribution rates, or the funded position on which the contribution rate recommendation is based. See Appendix H for further details.

1. Basic Account – Actuarial Position

Schedule 1 shows a statement of the actuarial position of the Plan as at March 31, 2014. This statement ignores liabilities for future indexed supplemental pensions granted after the valuation date, and their financing, and assumes that member and employer contribution rates for basic pensions will be made at the entry-age normal cost rate i.e. 16.33% of payroll. In addition, the value of the previously established amortization amounts totaling 0.6% of payroll currently scheduled to expire in 2026 is taken into account.

Schedule 1 – Statement of Actuarial Position as at March 31, 2014

Basic Account – Non-Indexed Benefits – Entry-age Normal Cost

	($000's)	
Assets	**2014**	**2011**
Market Value of Basic Account	18,213,614	14,362,006
Asset Smoothing Adjustment	(1,457,089)	(37,439)
Smoothed Value of Basic Account	**16,756,525**	**14,324,567**
Actuarial present values of future contributions at entry-age rates	3,715,057	3,489,714
Total Assets (without previously scheduled amortization)	**20,471,582**	**17,814,281**
Liabilities		
Actuarial present values for		
- pensions being paid	8,386,957	6,915,269
- inactive members	996,443	887,025
- active members	10,774,508	10,147,613
- future expenses	119,798	90,540
Voluntary contribution balance	178	297
Total Liabilities	**20,277,884**	**18,040,744**
Surplus (Unfunded Liability) – without previously scheduled amortization	**193,698**	**(226,463)**
Funded Ratio: Total Assets ÷ Total Liabilities	**101.0%**	**98.7%**
Surplus (Unfunded Liability) – without previously scheduled amortization	193,698	(226,463)
- Present value of existing amortization (0.6% to 2026)	197,973	226,463
Surplus (Unfunded Liability) – with previously scheduled amortization	**391,671**	**0**
Funded Ratio: Total Assets (with amortization) ÷ Total Liabilities	**101.9%**	**100.0%**

2. Change in Actuarial Position

The statement of actuarial position included in Schedule 1 indicates that a surplus of $392 million has emerged since March 31, 2011. The $392 million surplus is the net result of a number of items, the most significant being higher than assumed investment returns, lower than assumed salary increases, offset by changes in the valuation assumptions.

Schedule 2 – Change in Actuarial Position

	Approximate effect on surplus ($ millions)
(1) Surplus (Unfunded Liability) at March 31, 2011	0
(2) Actual income from investments higher than 6.5% assumed rate (on smoothed values)	289
(3) Actual salary increases to March 31, 2014 lower than previously assumed	471
(4) Actual contributions lower than previously assumed[1]	(35)
(5) Changes in valuation assumptions	(316)
(6) Other factors (a net gain) including changes in plan membership and other differences between actuarial assumptions and actual experience during the inter-valuation period	(17)
(7) Surplus (Unfunded Liability) at March 31, 2014	392

The $316 million loss due to changes in actuarial assumptions (shown in item (5)) is the net result of the following (the assumption changes are described in Appendix B):

Change in Actuarial Position Arising From Change in Actuarial Assumptions

Assumption changes	Approximate effect ($ millions)
Pre-retirement mortality	3
Disability incidence rate	4
Disability recovery rate	(7)
Withdrawal rates	27
Retirement rates	46
Post-retirement mortality	(327)
Post-retirement mortality for disabled pensioners	(60)
Percentage of part time members	(2)
Total loss due to assumption changes	**(316)**

[1] This arises for two reasons. Firstly, the contribution rate increase calculated in the 2011 valuation is assumed to occur at the valuation date, while in fact it occurs 12 months after the valuation. Secondly, the amortization payments received since the last valuation are lower than expected due to the payroll increases being lower than assumed.

3. Adequacy of Contribution Rates

As discussed in Section III, the required contribution rate consists of the normal cost plus an adjustment to amortize any surplus or unfunded liability. These components of the required contributions are discussed in more detail below.

(a) Change in Normal Cost Rate

The total current service contribution required to finance the basic pensions of new entrants (i.e. the normal cost) has increased from 15.75% of salaries as at March 31, 2011 to 16.33% of salaries as at March 31, 2014. The 0.58% of salaries increase in normal cost rate is developed in Appendix F and is the net result of a number of items, the most significant being:

- the change in the mortality assumption (cost increase of 0.54%);
- the change in the administration expense assumption (cost increase of 0.10%); offset by
- the change in the new entrant demographic profiles (cost decrease of 0.04%); and
- the change in the termination assumption (cost decrease of 0.09%).

(b) PBSA Required Rate – Minimum Permissible Rate

The valuation shows a surplus of $391,671,000 including the present value of the existing amortization requirement established at the 2011 valuation of $197,973,000. As there is a surplus of $193,698,000 excluding the existing amortization requirement, the *PBSA* allows this amortization requirement to be eliminated entirely.

The minimum *PBSA* required contribution rate is then equal to the normal cost less the 5 year amortization of any surplus in excess of 5% of the net liabilities. Five percent of the net liabilities is $828,141,000[1], which exceeds the 2014 surplus of $193,698,000. Thus no surplus may be amortized under the *PBSA* requirements. The *PBSA* minimum required contribution rate is therefore 16.33% of salaries (integrated).

The current contribution rates, the contribution rates for current service (on an entry-age basis, i.e. the normal actuarial cost) and the minimum permissible (*PBSA* required) contribution rates are summarized in Schedule 3. It is not necessary for the current contribution to be reduced to the minimum permissible contribution rate, but any decrease in contribution rates must be shared equally between members and employers.

[1] Any surplus less than this can be considered to be a compulsory rate stabilization reserve.

Schedule 3 – Current and Minimum Permissible Basic Account Contribution Rates

	Based on valuation results as at March 31	
Current Basic Account contribution rates	**2014 (%)**	**2011 (%)**
Member[1]	8.18	7.78
Employer[1]	8.18	7.78
Combined member/employer[1]	**16.36**	**15.56**
Minimum Basic Account contribution rates[2]		
Entry age normal cost rate	**16.33**	**15.75**
Amortization of unfunded liability (surplus)		
▪ 25-year amortization	(0.33)	0.40
▪ 15-year amortization	(0.49)	0.60
▪ ***PBSA* amortization**	-	**0.60**
Total minimum Basic Account contribution rate[1]		
▪ 25-year amortization	16.00	16.15
▪ 15-year amortization	15.84	16.35
▪ ***PBSA* minimum rate[1]**	**16.33**	**16.35**

The above results indicate a *PBSA* minimum rate of 16.33% of salaries compared to the current rate of 16.36% of salaries, i.e. the current rate is 0.03% higher than the minimum required.

[1] Less 1.5% of salary up to the YMPE (for each of the members and the employers) and exclusive of contributions required for indexed supplementary pensions.

[2] Total member plus employer, to be shared equally.

4. Revised Contribution Rates

Section 10.3 of the JTA requires that the Plan's financing comply with the *PBSA* requirements for a going-concern valuation. It also indicates that any changes in the Basic Account contribution rate must be shared equally between members and employers.

As a result, current rates may be decreased by 0.02% of salaries (after rounding). Sharing this equally would result in a decrease of 0.01% of salaries each for the members and the employers.

When this is combined with the current IAA contribution rates, the revised minimum permissible rates become:

Schedule 4 – Current and Minimum Permissible Total Contribution Rates

	Member	Employer	Total
Current Basic Account	8.18%[1]	8.18%[1]	16.36%[1]
Minus maximum permissible Basic Account reduction	(0.01%)	(0.01%)	(0.02%)
Total Basic Rate	**8.17%[1]**	**8. 17%[1]**	**16.34%[1]**
Current IAA	1.25%	1.75%[2]	3.00%[2]
Total Minimum Permissible Contribution Rate	**9.42%[1]**	**9.92%[1,2]**	**19.34%[1]**

Under the *ITA*, there is a requirement that individual member contributions may not exceed the lesser of:

(a) 9% of salary, or

(b) $1,000 plus 70% of the member's pension credit

although these conditions may be waived by the Minister of Finance provided that the contributions are "determined in a manner acceptable to the Minister and it is reasonable to expect that, on a long-term basis, the aggregate of the regular current service contributions made under the provision by all members will not exceed 1/2 of the amount that is required to fund the aggregate benefits in respect of which those contributions are made."

The current member contributions exceed 9% of salaries for members earning more than $183,140 annually (312 active members had salaries above this at the 2014 valuation), while the minimum permissible member contribution rate exceeds 9% of salaries for members earning more than $187,500 annually, so regardless of the decision by the Board with respect to contribution rates, it will be necessary to apply to the Minister for a waiver. In either circumstance (rate remaining as they are, or rates being reduced to the minimum permissible)

[1] Integrated, i.e. less 1.5% of salaries up to the YMPE.

[2] Net of 1% assumed to be allocated to post-retirement group benefits.

the employer contributions will exceed the member contributions by 0.5% of salaries. Therefore, given that future Basic contribution rate changes are shared equally and IAA contributions are fixed at their current level, the requirement that the member contributions will not exceed ½ of the amount required to fund the aggregate benefits is met. A similar exemption was required, and obtained, following the 2011 valuation.

5. Other Plan Changes

As the valuation shows a surplus, in addition to reducing the Basic contribution rate to the minimum permissible rate previously discussed, the Board can, subject to the funding policy, also consider:

- Improving benefits;
- Making a transfer to the Inflation Adjustment Account;
- Setting aside a rate stabilization reserve;
- Or any combination of these four alternatives.

The Basic contribution rate after implementing any decisions may not exceed the current contribution rate of 16.36% and the cost of any benefit improvements have to be funded over no less than 25 years. We would be happy to discuss alternatives with the Board at its convenience.

6. Accrued Benefits – Funded Ratio

The funded ratio is calculated by dividing the Basic Account assets by the total liability for benefits accrued in respect of service to the valuation date. The asset/liability comparison is analogous to that in Schedule 1, except that contributions and benefits in respect of future service to be worked by existing members are excluded from the comparison. The results are shown below.

Schedule 5 – Accrued Benefits – Funded Ratio at March 31, 2014[1]

Basic Account – Non-Indexed Benefits

	($000's)	
	2014	**2011**
Fund (Basic Account):		
▪ **Smoothed Value of Fund**	**16,756,525**	**14,324,567**
Accrued Liabilities:		
▪ for pensions being paid	8,386,957	6,915,269
▪ for inactive members	996,443	887,025
▪ for active members	6,568,753	6,216,958
▪ for voluntary contributions	178	297
Total Accrued Liabilities	**15,952,331**	**14,019,549**
Surplus (Unfunded Actuarial Liability):		
▪ for accrued service only	804,194	305,018
Funded Ratio:		
Fund ÷ Total accrued liabilities	105%	102%

The above schedule indicates that the funded ratio for accrued benefits has improved from about 102% to 105%. This is largely for reasons similar to the items in the analysis in Schedule 2, but excluding those items related to future contribution rates.

7. Sensitivity Analysis

Sensitivity Analysis under Standards of Practice

The Canadian Institute of Actuaries Practice-Specific Standards for Pension Plans require reporting of the effect of using a discount rate (investment return) 1.0% lower than that used for the valuation on:

(a) the actuarial present value, at the calculation date, of projected benefits allocated to periods up to the calculation date, and

(b) the service cost or the rule for calculating the service cost between the calculation date and the next calculation date.

[1] The 2011 valuation report referred to this schedule as “Schedule 4”.

The tables below show the impact on the accrued liability as required by (a) and the entry age normal cost as required by (b) as at March 31, 2014 of a one percentage point drop in the discount rate assumption. All other assumptions were kept unchanged.

Sensitivity – Impact of 1% drop in investment return on Accrued Benefits and Normal Cost

Impact on liabilities of 1% drop in discount rates	Going Concern 6.5% ($,000's)	Going Concern 5.5% ($,000's)	Increase ($,000's)
Active members	6,568,753	7,689,973	1,121,220
Disabled members	481,308	551,603	70,295
Terminated members	515,135	602,222	87,087
Pensioners and beneficiaries	8,386,957	9,135,951	748,994
Total increase in liabilities			**2,027,596**

Impact on normal cost rate of 1% drop in discount rates	Going Concern 6.5%	Going Concern 5.5%	Increase
Current service cost rate	16.33%	19.64%	3.31%

Sensitivity Analysis for Plan Funding

Given that the plan is funded on the entry age basis, we have also considered the impact of a one percentage point drop in the investment return assumption on the Basic Account non-indexed benefits consistent with Schedule 1. These figures are summarized in the table below:

Sensitivity – Impact of 1% drop in investment return on Plan Funding

	($000's)		
	6.5%	**5.5%**	**Increase**
Smoothed Value of Fund	16,756,525	16,756,525	0
Actuarial present values of:			
▪ Future contributions at entry-age rates	3,715,057	4,893,585	1,178,528
▪ Present value of existing amortization	197,973	208,996	11,023
Total Assets	**20,669,555**	**21,859,106**	**1,189,551**
Total Liabilities	**20,277,884**	**23,479,564**	**3,201,680**
Surplus/(Unfunded liability) on entry-age basis	391,671	(1,620,458)	2,012,129
Entry Age Normal Cost	16.33%	19.64%	3.31%
PBSA Amortization	0.00%	4.41%	4.41%
***PBSA* Minimum rate – Schedule 3**	**16.33%**	**24.05%**	**7.72%**

8. Supplementary Valuations

Results analogous to those in Schedules 1, 3 and 5 are shown in Appendix G, on the following bases:

- for basic and indexed benefits combined, on the assumption that indexed benefits are to be fully funded, in advance, as for basic benefits;
- for basic only, and basic plus indexed benefits, including only benefits accrued to the valuation date, and;
- limiting benefits to those permitted under the *Income Tax Act*; this is done both for:
    - basic benefits only; and for
    - basic plus indexed benefits.

The adjustments to the assumptions are discussed in Appendix B. In the indexing calculations, we reduced the employer contributions to the IAA from 2.75% to 1.75% on the assumption that a maximum of 1% will be allocated to the post-retirement group benefits.

The key results are summarized below:

Schedule 6 – Indexed Benefits (without tax limits)

	Basic Only	Basic + Indexed
	($000's)	**($000's)**
Smoothed Value of Fund	16,756,525	21,795,233
Actuarial present values of:		
▪ Future contributions at entry-age rates	3,715,057	5,163,758
▪ Present value of existing amortization requirements (0.6% to 2026)	197,973	197,973
Total Assets	20,669,555	27,156,964
Total Liabilities	20,277,884	27,553,771
Surplus (Unfunded Liability) including existing amortization	**391,671**	**(396,807)**
Present value of existing amortization	(197,973)	(197,973)
Surplus (Unfunded Liability) to be amortized over 15 years	**193,698**	**(594,780)**
Contribution Rates (Integrated)	**%**	**%**
Member – as shown in Schedule 4	8.18	9.43
Employer – as shown in Schedule 4	8.18	9.93
Total – revised, as shown in Schedule 4	**16.36**	**19.36**
Entry-age normal cost	16.33	21.80
Amortization[1]	0.00	1.50
Total – entry-age	**16.33**	**23.30**

[1] Basic amortization is as required by the *PBSA*; Basic + Indexed amortization is over 15 years.

If assets and liabilities are restricted to accrued service only, i.e., analogous to Schedule 5 earlier, the 2014 surplus (unfunded liability) figures change as follows:

Schedule 7 – Indexed Accrued Benefits (with tax limits) – Funded Ratio at March 31, 2014

	($000's)	
	Basic Only	**Basic + Indexed**
Smoothed Value of Fund	16,756,525	21,795,233
Total Accrued Liabilities	15,952,331	21,639,733
Surplus (Unfunded Liability)	804,194	155,500
Funded Ratio	105%	101%

Benefits Limited to ITA Maximums

When the income tax limits on benefits are recognized, the above 2014 surpluses (unfunded liabilities) and normal cost rates change marginally. The Key results are summarized below:

Schedule 8 – Benefits Limited to ITA Maximums – Basic Account Only

Basic Account Only	**Without Tax Limit**	**With Tax Limit**
Surplus (Unfunded Liability)	**$000's**	**$000's**
Entry Age Basis (including scheduled amortization)	391,671	546,885
Accrued Service Only (no scheduled amortization)	804,194	977,146
Contribution Rate	**%**	**%**
Entry-age normal cost	16.33	16.21
PSBA Amortization	0.00	0.00
Total	**16.33**	**16.21**

Schedule 9 – Benefits Limited to ITA Maximums – Indexed Benefits

Basic and Indexed Benefits	**Without Tax Limit**	**With Tax Limit**
Surplus (Unfunded Liability)	**($000's)**	**($000's)**
Entry Age Basis (including scheduled amortization)	(396,807)	(184,345)
Entry Age Basis (excluding scheduled amortization)	(594,780)	(382,318)
Accrued Service Only (no scheduled amortization)	155,500	388,571
Contribution Rate	**%**	**%**
Entry Age Normal Cost	21.80	21.65
15 year Amortization	1.50	0.96
Total	**23.30**	**22.61**

9. Test Maximum Surplus and Contributions for Tax Purposes

Section 147.2(2) of the Income Tax Act limits employer contributions that may be made to a plan if there is a surplus and it exceeds a certain amount – the plan become revocable if contributions are made when such a surplus exists. The tax rules also require that employer contributions not exceed the normal cost rate plus amounts necessary to amortize an unfunded liability. Since the Plan has a surplus in the Basic Account it may appear as if this restriction might apply. However, subsection (c) of Section 147.2(2) of the *Income Tax Act* also provides that the benefits taken into account for the purposes of a contribution recommendation "may include anticipated cost-of-living and similar adjustments where the terms of a pension plan do not require that those adjustments be made but it is reasonable to expect that they will be made".

Indexing at full CPI has been provided since January 1, 1982 under the current Plan terms, and for many years before that under earlier Plan provisions. As discussed earlier, indexing is currently financed on a mixture of a pay-as-you-go basis (from a combined 1.25%/2.75% member/employer contribution for active members effective April 1, 2012, less employer contributions allocated to post-retirement group benefits), an excess investment return basis (investment return in excess of the valuation assumption is transferred each year from Basic to IAA in respect of pensioner liabilities), and a "terminally-funded" basis (each year the full capitalized cost of any indexing granted is transferred from IAA to Basic). Thus, it may be considered appropriate for purposes of testing the *ITA* 147.2(2) limits to recognize, in advance, the future indexing of pensions for the current Plan membership. On this basis, the valuation results on the fully indexed basis, recognizing the income tax limits on benefits, would apply.

Thus, on the premise that it is appropriate for the Plan to recognize future indexing for the purposes of testing the *ITA* contribution limits, there is an unfunded liability, and furthermore, the required contribution rates are lower than the fully indexed normal cost rate. In other words, without even considering any amortization of the unfunded liability, the required rates are acceptable under the *ITA* and contributions may remain at the current level of 19.36%.

V. Subsequent Events

To the best of our knowledge, there are no material subsequent events that would affect the results and recommendations of this valuation. Any investment experience occurring between the valuation date and the report date, which differs from the assumption made, is not reported on in this valuation report and will be reported on in future valuations.

VI. Actuarial opinion

In our opinion,

(a) the membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation,

(b) the assumptions are appropriate for the purposes of the valuation, and

(c) the methods employed in the valuation are appropriate for the purposes of the valuation.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. Pursuant to the JTA and regulatory requirements, the next valuation should be completed no later than as of March 31, 2017.

VII. Acknowledgement

We gratefully acknowledge the generous assistance of the staff of the Pension Corporation in the preparation of the data and other items required for this report.

Respectfully submitted,

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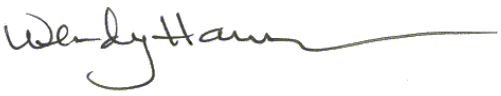
Fellow of the Canadian Institute of Actuaries[1]
Fellow of the Institute and Faculty of Actuaries



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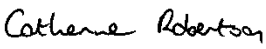

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December 18, 2014

[1] Canadian Institute of Actuaries is the Primary Regulator.

Appendix A: Summary of Plan and Amendments as at April 1, 2014

Changes to the Plan

The previous valuation was based on the provisions of the Plan as at March 31, 2011. Since then, the Plan has been amended a number of times. The main changes to March 31, 2014 are summarized below.

- Effective March 29, 2011, the plan rules were amended to clarify that termination of employment means the cessation of employment with the employer with whom the period of non-contributory services occurred.
- Effective July 1, 2011, the plan rules were amended to clarify that purchases of service under section 25 apply only to service performed with a plan employer.
- Effective July 1, 2011, a new subsection was added to the plan rules to allow members to purchase, on an actuarial basis, past service with a plan employer accrued prior to the employer joining the plan.
- Effective July 1, 2011, a new subsection was added to the plan rules to allow existing employees of new employers a one-time option to waive enrolment upon the new employer beginning to participate in the plan.
- Effective April 1, 2012, member and employer contributions to the Basic Account were increased by 0.40%.
- Effective January 1, 2013, the plan rules were amended to remove the requirement of an employer to provide written confirmation that an employer/employee relationship existed for non-contributory purchases.
- Effective December 10, 2013, a new section was added to the plan rules to ensure members who are involuntarily transferred between plan employers due to workforce restructuring do not lose pension rights and to make sure the plan continues to receive contributions at appropriate levels.
- Effective December 10, 2013, the plan rules were amended to replace references to the *Family Relations Act* with the *Family Law Act*.
- Effective March 31, 2014, the plan rules were amended to comply with the enactment of the *Wills, Estate and Succession Act* (WESA) and implement all nomination of beneficiary changes required under WESA.

The main provisions of the Plan are summarized below. Except as otherwise noted, the section references are to the Public Service Pension Plan Rules as at April 1, 2014. The valuation is based on these provisions.

The summary herein (and the valuation itself) ignores the additional contributions and enhanced benefits that are provided for certain groups, e.g. judges, MLAs, deputy ministers, BC Ambulance paramedics. Their additional numbers are not material in the context of the overall valuation results. Adjustments to their contribution rates will be discussed separately with the Board.

Employer and Employee Eligibility

The Plan applies to public sector employers, including the government and other employers where application of the Plan is authorized by another enactment, and to any other body designated as an employer, on terms and conditions of eligibility specified by the Board. [Section 2]

Participation is compulsory for all "regular employees" (continuous full time and continuous part time) of government or other Plan employers, or employees who earn at least 50% of the Year's Maximum Pensionable Earnings (YMPE) in one calendar year. Enrolment is optional for regular employees appointed by the Lieutenant Governor in Council, deputy ministers and eligible part-time staff who earn less than 50% of the YMPE in a calendar year and have completed at least two years of continuous employment. [Section 3]

Member Contributions

Section 5 defines the following contributions, which are deducted from a member's salary during a calendar year:

a) 6.68% of that part of the member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);

b) 8.18% of the member's cumulative salary which is in excess of the YMPE (paid into the Basic Account); and

c) 1.25% of the member's entire salary (paid into the Inflation Adjustment Account).

Member contributions cease after 35 years of pensionable service have been accrued.

Employer Contributions

Section 6 requires every employer to contribute the following amounts during a calendar year:

a) 6.68% of that part of the member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);

b) 8.18% of the member's cumulative salary which is in excess of the YMPE (paid into the Basic Account); and

c) 2.75% of the member's salary (paid into the Inflation Adjustment Account, less amounts allocated to non-pension benefits).

Employer contributions cease in respect of a member's salary after the member has accrued 35 years of pensionable service.

Retirement Benefits: Eligibility Conditions for Pension

The normal retirement age is 65 for all members except for correctional centre employees, who have a normal retirement age of 60. In the following summary of the various eligibility conditions and plan provisions, the age and/or service conditions are first shown for the groups with normal retirement age equal to 65; the age and/or service conditions, if different for those with normal retirement age equal to 60, are shown in parentheses, following the normal age 65 conditions. In addition, certain ambulance paramedics have different provisions which are not included below, as the impact on the Plan as a whole is not material.

Section 50 provides that an active member who terminates employment on or after April 1, 2000, is entitled, upon application, to an unreduced pension calculated under section 54, if the member has:

a) attained age 55 (50) and the sum of the member's age plus years of contributory service is 85 or more; or

b) attained age 60 (55) with at least 2 years of contributory service; or

c) attained age 65 (60).

Section 51(a) provides for a reduced pension calculated under section 55(1) if the terminating member has attained age 55 (50) and completed at least 2 years of contributory service.

Section 51(b) provides for a reduced pension calculated under section 55(2) if the terminating member has attained age 60 (55) but has not completed 2 years of contributory service.

Calculation of Unreduced Pension

Section 54 provides that the unreduced lifetime monthly pension payable to a member terminating employment on or after March 1, 2002, in the form of a single life annuity guaranteed for 10 years, is calculated as the sum of the following:

a) 2% of the member's highest average salary multiplied by the number of years of pensionable service accrued before January 1, 1966,

b) 1.35% of the lesser of

    1) the member's highest average salary, and

    2) 1/12 of the YMPE for the calendar year immediately before the effective date of the pension

    multiplied by the number of years of pensionable service accrued on and after January 1, 1966 not exceeding 35 years, and

c) 2% of the excess of the member's highest average salary over the amount determined under paragraph (b) (ii), multiplied by the number of years of pensionable service accrued on and after January 1, 1966 not exceeding 35 years.

In addition, the member is entitled to a pension payable until the earlier of the death of the member or the member reaching age 65; that is:

a) 0.65% of the lesser of

    1) the member's highest average salary, and

    2) 1/12 of the YMPE for the calendar year immediately before the effective date of the pension multiplied by

b) the number of years of pensionable service on and after January 1, 1966 not exceeding 35 years.

Highest average salary means one-twelfth of the average annual salary earned by a member during the 5 years of pensionable service (not necessarily consecutive) in which the salaries were highest (or, if the member has accrued less than 5 years of pensionable service, the total number of years and partial years of pensionable service).

The calculation of the pension payable to a deferred member who terminated employment prior to March 1, 2002 and who is entitled to an unreduced pension is the same as for a member terminating employment on or after March 1, 2002 except that the pension is payable in the form of a single life annuity (no guarantee), the 1.35% referred to in the calculation of the lifetime benefit is 1.3%, and the 0.65% referred to in the calculation of the temporary pension payable until the earlier of age 65 or the death of the member is 0.7%.

A member who has made voluntary additional contributions in the past - these are no longer accepted - will be granted an additional pension or may take a refund at any time prior to termination or retirement.

Calculation of Reduced Pension

Where a reduced pension is payable under section 51 to members aged between 55 (50) and 60 (55) who have 2 or more years of contributory service, section 55 provides that the lifetime and temporary pensions, described above, are each reduced by a percentage equal to 3% for each year by which the member's age is less than the earlier of age 60 (55) or the age at which the member's age plus years of contributory service total 85 (subsection 55(1)), whichever is less, and the reduction is prorated for fractions of a year.

If the member terminates employment under age 50 (45), or with less than 10 years of contributory service, the 3% (per year) early retirement reduction factor referred to above is increased to 5% (per year).

Where a reduced pension is payable under section 51 to members aged 60 (55) or over who do not have 2 years of contributory service, section 55 provides that the lifetime and temporary pensions, described above, are each reduced by a percentage equal to 5% for each year by which the member's age is less than 65 (60) years of age (subsection 55(2)), prorated for fractions of a year.

Alternative Types of Pensions

Section 56 provides that a pension may be granted on the single life plan with a guaranteed period of 10 years (normal form), single life plan with a guaranteed period (5 or 15 years), joint life and last survivor plan, temporary life plan in connection with one of the above, or a combination of these plans with the approval of the plan administrative agent. The amount of any pension granted on a form other than the normal form is calculated on an actuarially equivalent basis.

Where a member has a spouse at retirement, the member is required to elect a 60% joint life and last survivor option, unless the spouse waives this requirement in writing or there is a written agreement or court order made under Part 5 or 6 of the *Family Law Act* that is filed with the plan administrative agent. This option provides for a reduced amount payable to the member, continuing to the spouse on death of the member at 60% of the initial reduced amount. The provision in section 56(3) is worded slightly differently, though we understand it is implemented as described above, as is required under the *PBSA*. A spouse is as defined in the *PBSA*, and includes a common-law or same-sex spouse.

Long-Term Disability

Sections 12(5) and 99(2) provide that if a member is receiving a monthly income benefit from an approved group disability plan, the member and employer do not make contributions and the member is not entitled to a pension under the Plan, but the period for which the member receives such group disability income benefit is considered pensionable service, with the final pension based on the highest average salary at disablement increased to retirement in accordance with changes in the consumer price index.

Disability Pensions

Section 60 provides that a member is entitled upon application to a disability pension if the member, before reaching age 60 (55), has terminated employment, is totally and permanently disabled, has completed 2 years of contributory service and is not eligible for a monthly income benefit from a group disability plan. A member who has received a lump sum payment instead of a monthly income benefit under a group disability plan is not eligible to receive a disability pension Section 63 provides that where a disability pension is payable, the pension earned to date is increased as permitted under the *Income Tax Act*. Subject to certain limits, this permits the immediate recognition of projected future service in the calculation of the pension.

Pre-retirement Death Benefits

The pre-retirement death benefits for active and inactive plan members are covered in section 69, and are as follows:

a) on death before age 60 (55) with less than 2 years of contributory service, the death benefit is a payment of the member's contributions with interest;

b) on death before age 55 (50) with 2 or more years of contributory service, the benefit is the full commuted value of the regular pension earned to the date of death (but not less than the value of member contributions with interest). If there is a surviving spouse, then the spouse may choose either the foregoing value or an immediate pension actuarially equivalent to the commuted value;

c) on death after age 55 (50) with 2 or more years of contributory service (or after age 60 (55) with less than 2 years of contributory service), without a surviving spouse, the benefit is also equal to the full commuted value of the regular pension earned to the date of death (but not less than the value of member contributions with interest). If there is a surviving spouse, then the benefit is an immediate pension to the spouse, which is actuarially equivalent to the commuted value.

Refunds, Vesting and Portability

Sections 42(1)(a) and 44 provide for the payment of the member contributions plus interest should the member terminate membership under age 60 (55) with less than 2 years of contributory service. In accordance with section 96, interest credits for periods on or after January 1, 2004 are based on the average yields of 5-year personal fixed term chartered bank deposit rates, published in the Bank of Canada Review as CANSIM Series V122515.

Under sections 42(1)(b) and 45, a terminating member is entitled to a deferred pension equal to the full normal pension accrued to the date of termination; this may be paid on a reduced basis at an early retirement date depending on the service to termination (see above "Eligibility conditions for pension" section). Sections 42(1)(c) and 46 provide for the payment of a lump sum commuted value in lieu of the deferred pension, if the member is below age 55 (50), subject to the commuted value being payable on a locked-in basis. Under certain limited conditions (small pensions, or small commuted values) the *PBSA* permits the election of a lump-sum payout, regardless of age, and on a non-locked-in basis.

Section 100 provides that the deferred vested pension of a terminating member is based on the highest average salary at termination, increased to retirement or to December 31, 1980 if earlier, based on the percentage increase granted to pensions each January 1 under section 73. Subsequent to 1980, the highest average salary is increased to retirement by the percentage increase granted to pensions for the period between the month of termination and the month the pension becomes effective.

Section 75(3)(i) provides that the cost of the deferred indexing described above is funded from the Inflation Adjustment Account.

Cost of Living Benefits (Indexing)

Section 73 sets out how cost of living benefits are to be administered. It provides for increases to retired members on January 1 of each year, with the benefits funded from the Inflation Adjustment Account. The increase is based on the total amount of pension being received, including previous cost of living increases, less any portion of the pension that is a result of voluntary contributions (which are no longer permitted). (The bridge pension to age 65, payable as part of the regular pension formula, and a temporary life annuity arising as a result of converting some or all of the regular pension to one of the optional forms are subject to indexing increases.) The maximum increase is equal to the percentage increase in the annual change in the 12-month average Consumer Price Index for the period November to October.

Section 73 sets out additional requirements with regards to the cost of living benefit, including:

a) the same uniform percentage increase will be granted in respect of all pensions eligible for adjustment;

b) the increase is prorated if the pension has not been in payment for at least 12 months;

c) the total capitalized value of all cost of living benefits granted on January 1 must not exceed the amount in the Inflation Adjustment Account on the preceding September 30;

d) the capitalized value of all cost of living benefits granted annually is transferred from the Inflation Adjustment Account to the Basic Account; and

e) if in calculating the cost of living there is a decrease in the CPI (deflation), pensions will not be reduced and the reduction in the cost of living will be carried forward into subsequent years until it has been recovered.

The Fund

Section 75 provides that the Pension Fund is divided into the following three accounts:

a) the Basic Account, consisting of all the assets in the fund other than assets in the Inflation Adjustment Account and the Supplemental Benefits Account;

b) the Inflation Adjustment Account, consisting of:

    1) the 1.25% contribution by each of the members under section 5(1)(c);

    2) the 2.75% employer contributions under section 6(1)(c), less amounts allocated for the payment of premiums for prescribed non-pension (i.e., group) benefit entitlements;

    3) the net investment income earned on the Inflation Adjustment Account; and

4) the income, as determined by the plan administrative agent, that is earned on fund assets held in the Basic Account in respect of pensions being paid and that is in excess of the investment return anticipated in the most recent actuarial valuation;

less:

5) amounts transferred to the Basic Account in respect of capitalized cost of living benefits granted under sections 73 and 88;

6) refunds to plan members in respect of contributions made to this account under sections 5(1)(c), or amounts otherwise transferred out of this account in respect of member and employer contributions allocated to this account;

7) amounts determined by the plan administrative agent in respect of the portions of commuted value payments, or other transfers out of the Plan, that are attributable to cost of living adjustments;

8) amounts transferred to the Basic Account that are equal to the capitalized value of increases in deferred pensions resulting from increases in highest average salaries under section 100; and

9) amounts transferred to the Supplemental Benefits Account to cover inflation protection on benefits in excess of those registrable under the *Income Tax Act*; and

(Section 10.3 of the Joint Trust Agreement also permits the Board to transfer portions of any actuarial surplus in the Basic Account to the IAA.)

c) the Supplemental Benefits Account, consisting of assets required for the administration and payment of benefits that are non-registrable under the *Income Tax Act*.

Income Tax Act Limits

The *Income Tax Act* imposes certain limits on the contributions that may be made to, and the benefits that may be paid from, a registered pension plan. However, in total, the contribution requirements from, and the benefit promises to, Plan members have not been altered under the Public Service Pension Plan. To this end, a Supplemental Benefits Account has been created to cover the financing and payment of benefits in excess of those registrable under the *Income Tax Act*. The excess benefits are paid on a current cash basis, by allocating from the regular employer contributions, the amounts necessary to maintain the Supplemental Benefits Account at a zero balance. Effectively, from a Plan member's perspective, it is expected that these procedures will be invisible - the total contribution and benefit obligations remain unchanged. We have ignored the implications of all such internal restructuring in completing the primary, Basic Account valuation. In the Plan summary herein, and elsewhere in this valuation report, our references to contributions/benefits to/from the Basic/Inflation Adjustment Accounts are inclusive of the allocations to/from the Supplemental Benefits Account; in general, the allocations to/from the Supplemental Benefits Account have not been referenced.

We have also completed supplementary valuations recognizing the income tax limits on pensions. We understand that these limits are applied only in respect of service after 1991. The maximum annual pension currently permitted (before application of any early retirement reductions, where applicable) is the lesser of:

a) $2,770 in 2014 (2015 onward limit is based on 1/9 the money purchase limit) multiplied by the years of service; and

b) 2% multiplied by the years of service further multiplied by the average of the best 3 years of remuneration paid to the member.

The Plan also imposes a 35-year cap on accruals at the above maximum rate.

Other Items

1. The Post Retirement Group Benefit Rules set out the non-pension (i.e., group) benefits that are provided to retired members. These include the partial subsidy of premiums for extended-health and group-life benefits. The subsidized costs are allocated entirely from employer contributions to the IAA. Non-pension benefits were previously contained in sections 91 through 95 of the Plan rules (repealed effective January 1, 2004). Dental benefits, which were previously subsidized, are now offered through a voluntary member-funded dental plan.

2. Section 3.2 of the Joint Trust Agreement provides that all expenses incurred in the administration of the Plan are to be paid from the fund.

3. Section 57 enables an employer to request the plan administrative agent to adopt a Special Retirement Incentive Plan (SRIP), whereby the age and service conditions, or the early retirement percentage reductions, or both, may be adjusted. Where the plan administrative agent agrees, the plan administrative agent must also determine the members eligible for the SRIP, the period it remains open, the conditions applicable to the incentives, the additional costs to the employer, and the timing of these payments to fund the SRIP.

4. The benefit provisions are different in a number of respects for certain groups of participants, e.g. judges, MLAs, deputy ministers, ambulance paramedics, etc. These groups are relatively small and should not have a material effect on the results of our valuation and hence we have ignored these differences in our calculations. We have also ignored the normal-retirement-age-60 classification and have treated all active members as if they are subject to normal retirement age 65.

5. The plan has in place transfer agreements with other public sector pension plans in Canada, including the three other main BC public sector pension plans. Under these agreements members may elect to transfer their service from one plan to another. Transfers under the agreement take into account the benefits under the transferring plans and pro-rate service if the importing plan's reserve requirements are higher than those

available from the exporting plan. Members may pay for any shortfall, subject to CRA approval, within certain deadlines.

Appendix B: Actuarial Methods and Assumptions

The significant actuarial assumptions are summarized below.

Investment Return	6.50% per annum (unchanged from the previous valuation)
General ("across-the-board") Salary Increases	3.75% per annum (unchanged from the previous valuation)
Seniority Salary Increases	Annual percentages varying by age and sex
CPI Increases	3.00% (unchanged from the previous valuation)
Pension Indexing	▪ Future indexing of pensions and deferred pensions ignored, as will be covered by Inflation Adjustment Account ▪ Future indexing (by inflation) of wage base for disability accruals assumed to be a charge to the Basic Account and to be 3.00% per annum (unchanged from the previous valuation) ▪ Indexing to date is capitalized and forms part of pension liability
Asset Values	▪ Assets carried at smoothed market values ▪ Smoothed value restricted to a range of 92% to 108% of the market value
Costing Method	Contributions are based on an entry-age funding approach

More detail with respect to the above, detail with respect to other assumptions, and comparisons with assumptions and approaches in the previous valuation follow.

1. Actuarial Methods

The plan has been valued on a going-concern basis, which assumes that the plan will continue to operate indefinitely. The basis is used to estimate the funded position of the Plan, and to estimate the contributions required to be made to the Plan's fund.

The methodology used to calculate the valuation liabilities shown in the statement of actuarial position was as follows:

The liability for current pensioners and active members was calculated by projecting the benefit payments to be made to those persons and to their eligible spouses using the actuarial assumptions described below and then discounting those projected payments to the valuation date at the investment return assumption.

The liability for members currently receiving benefits from a long-term disability plan was calculated partly as if they would continue to earn service credits and ultimately receive a pension from the Plan and partly as if they would again become contributing members of the Plan.

The liability for the inactive group (including those entitled to deferred vested pensions) was calculated on the assumption that a proportion (based on current working status, contribution balance, length of credited service and date of last contribution) would again become contributing members of the Plan and a further proportion (based on similar, but different, criteria) would collect deferred vested pensions.

The liability for the remaining inactive members was generally set equal to their accumulated refund values (in some cases, depending on the member's status, we held twice the refund value).

The valuation assets consist of:

(i) The Basic Account; and

(ii) The present value of future member and employer contributions at the entry-age normal cost rates, for the closed active group, for the basic non-indexed benefits.

We calculated the required member/employer contribution rate for current service in accordance with the entry-age actuarial cost method, based on the data for those members who joined the plan in the last three years prior to the valuation date and the actuarial assumptions described below. This method produces the level rate of the member/employer contributions sufficient to provide the benefits for the average future new entrants to the plan. The cost so determined is also referred to as the normal actuarial cost and is calculated on an aggregate basis for all entrants as a level percentage of salaries.

The funded position, including the present value of any previously established unfunded liability amortization requirements, is then considered. If the assets exceed the liabilities, then the difference between them gives rise to an actuarial surplus. If the liabilities exceed the assets then there is an unfunded liability. Adjustments to the normal cost, sufficient to amortize the surplus or unfunded liability were then determined, as a percentage of salaries, as follows:

(1) If the result is an unfunded liability, amortize it over the 15 year period commencing April 1, 2014; and

(2) If the result is a surplus (the result of a gain since the last valuation), apply the gain to amortize or reduce the previously identified unfunded liabilities, starting with the oldest established. If, after removing all previously established unfunded liability amortization amounts there is still a surplus, amortize this surplus over both 15 years and 25 years.

The required contributions are the sum of the normal actuarial cost and the amounts required to amortize the unfunded actuarial liability or surplus. If there is a surplus, the funding policy requires that the contribution rate

should fall within the range defined by the rate amortizing the surplus over 25 years (25 year rate) and the rate amortizing the surplus over 15 years (15 year rate). If the current rate is less than the 15 year rate, the current rate must be increased, if the current rate is more than the 25 year rate, the contribution rate may be reduced to the 25 year rate, or benefits increased such that the required contribution rate equals the 25 year rate.

The contribution rates have to comply with the going-concern funding requirements of the *PBSA*. This means that if there is an unfunded liability, it must be amortized over 15 years from the date it is established as described above. If there is a surplus, the employer rate may not be less than the employer normal cost, reduced by the rate that amortizes the surplus in excess of 5% of net liabilities over not less than 5 years. As the member rates and employer rates are required to be equal under the JTA, we also apply this requirement to the member rates as well. In other words if there is a surplus, the *PBSA* minimum rate is the total normal cost reduced by the rate that amortizes the surplus in excess of 5% of the net liabilities over 5 years.

The actuarial procedures followed are substantially the same as those in the previous valuation.

2. Treatment of Member and Pensioner Data

Data as of March 31, 2014 were prepared by the Pension Corporation for 53,622 active members, 41,831 pensioners, 2,522 members receiving benefits from a long-term disability plan, 9,524 terminated members eligible for a vested pension, 6,647 other inactive members (including 13 on leave of absence) plus a further 220 non-retired individuals with very limited data, 11,975 active member terminations and 3,056 pensioner terminations during the period April 1, 2011 to March 31, 2014. In addition, Pension Corporation also provided separate data for 84 active MLA members (including 1 on long-term disability who we treated as active members), 35 deferred vested MLA members and 4 other inactive MLA members. The Pension Corporation advised us that the data supplied are generally proper, complete and in accordance with specifications, unless otherwise noted.

Where possible, we compared totals with corresponding details in the Plan's audited Annual Reports. We also subjected the data to a number of tests of reasonableness and consistency, including the following:

- a member's (and partner's as applicable) age is within a reasonable range;
- a member's gender or date of birth did not change;
- a member joined the plan or commenced pension at a reasonable age;
- accrued service increased by a reasonable amount (e.g. no more than 3 years since the last valuation and no more than 1 year in the valuation year);
- accrued service was within the 35 years cap;
- the salary level and the salary increase from the previous valuation was within a reasonable range;

- pensions in pay increased by a reasonable amount (e.g. in line with the indexation since the last valuation); and
- we examined the additions to and deletions from each of the data files (i.e., the files for active employees, pensioners and terminated members) since the previous valuation to determine whether all Plan members were accounted for in this valuation, to check for duplicate records and to confirm pension amounts.

There were a number of discrepancies recorded during our examination of the data and we sought clarification of these from the Pension Corporation. Where necessary, we modified the data, our assumptions, or both, to compensate for these discrepancies.

The active member data includes a number of individuals who work less than full time. For the purposes of calculating liabilities and normal actuarial costs, we treated all members as if they were full-time employees after the valuation date; however, in calculating the amortization costs as a percentage of total future payrolls, we reduced the total payroll base by 4% to reflect the part-time employment (a 3% adjustment was applied at the previous valuation).

There were also 1,918 active members coded as having maximum-retirement-age equal to age 60. We ignored this classification and treated all active members as having maximum-retirement-age equal to 65. In addition, certain members, e.g. judges and MLAs, have enhanced benefits. We ignore these enhanced benefits in this valuation. The additional contributions required for members with enhanced benefits will be reported on separately to the Board of Trustees.

The active member data included 1,714 persons who had no salary or service reported for the year ending March 31, 2014, or with a last-contribution-date prior to March 2014. We excluded them from the active member base, and have included them with the inactive data.

Salary details were inappropriate (missing, very low, or very high) for a further 23 active members. We assumed that these members had the same average earnings as for other actives in the same age-sex category.

The liability for the 2,431 members on long-term disability was calculated in two steps. We first calculated a liability as if these individuals would ultimately collect deferred vested pensions starting at age 61 where their deferred pensions were calculated on the basis of service projected to retirement date (maximum 35 years) and the actual salaries indexed to the valuation date (where the actual salary detail shown for those members was inappropriate, we used the average salaries for active members in the same age-sex category). We also calculated a liability as if these members would again become contributing members of the plan. In order to allow for the possibility of recoveries from disability we set the liability equal to 80% of the former figure plus

20% of the latter figure. A similar approach was used in the previous valuation but using a 70/30 disabled/recovered blend.

We also excluded 91 members on long-term disability from the regular valuation process because of missing, invalid or inconsistent detail. Liabilities of twice their accumulated accounts were held for these members.

We divided the 9,559 (including 35 MLAs) terminated members entitled to a vested pension into two classes:

(i) those with missing, invalid or inconsistent detail, and

(ii) all other inactive members.

The liability for the first group was held as twice their accumulated accounts. For the second group, we calculated liabilities on the assumption that 100% of these members would receive vested pensions. This approach is unchanged from the previous valuation.

We divided the 8,361 other inactive members (i.e., including the 1,714 persons reassigned from the active group) into three classes:

(i) those with an accumulated account of at least $1,500, and who are on leave of absence or who have returned to work after the valuation date;

(ii) those with missing, invalid or inconsistent detail, or whose accumulated accounts were less than $1,500, or who had less than 3 complete years of service, or who did not contribute in 2012/13 or 2013/14, or who were known to have taken a refund after the valuation date; and

(iii) all other inactive members.

We calculated liabilities on the assumption that the first and third groups would be reactivated on April 1, 2014, with assumed average salaries equal to the average salaries for active members in the same age-group category, and that the second group would take immediate refunds. For those in the second group with an accumulated account of at least $1,500 and 2 or more years of service, but who were not eligible (under our criteria) to be reactivated, we held a liability equal to twice the accumulated account. For the remaining members in the second group (i.e. those with an accumulated account of less than $1,500 or less than 2 years of service), we held the accumulated account. This is unchanged from the previous valuation.

We held a liability equal to the accumulated account for the 4 MLA inactive members (as they all had less than the 6 years of contributory service required to be vested).

We excluded 877 remaining vested members from the regular valuation process because of missing, invalid or inconsistent detail. Liabilities of twice their account balances were held for these members.

With respect to the 220 remaining non-retired members with limited data, we held a liability equal to twice their accumulated accounts.

The data from the Pension Corporation and our treatment of this data is summarised below. Further details on the active member data, the new entrant groups on which our entry age costs are based, the inactive member data and the pensioner data are summarized in Appendices C, D and E.

			Valuation Treatment							
	Pension Corp. Data	**MLA Data**	**Pensioners**	**Pensioners with zero liability**	**Actives**	**LTD**	**Vested**	**Re-activate**	**Refund CWI[1]**	**Refund 2 x CWI**
Pensioners	41,831		41,711	120						
Active Members	53,622	84			51,992			812	583	319
Long Term Disability	2,522					2,431				91
Terminated Vested	9,524	35					8,682			877
Inactive members	6,647	4						15	6,378	258
Limited data	220									220
Total membership	**114,366**	**123**	**41,711**	**120**	**51,992**	**2,431**	**8,682**	**827**	**6,961**	**1,765**

3. Actuarial Assumptions

Investment return and general salary increase rates

Our actuarial costing method involves projecting future benefit disbursements and contribution and investment income. In such projections, the most significant assumptions are those that are made for the future rates of return to be earned by the fund and future general salary increases (which are across-the-board increases applying to employees regardless of service, rank or position).

(a) Relationship to excess investment return threshold

The investment return assumption is also significant for another reason. Since 1980, the provisions of the plan relating to the indexing of pensions provide that the income to be credited to the Inflation Adjustment Account in respect of pensions being paid is determined by reference to the amount in excess of the investment return anticipated in the most recent actuarial valuation. An increase in the investment return assumption without a corresponding change in the related valuation economic assumptions (such as general salary increases and post-retirement indexing) would have at least two effects:

[1] CWI = contributions with interest.

(i) It would reduce the amount of excess investment return allocated to the IAA, and hence reduce the potential for future indexing; and

(ii) It would reduce the costs of the basic non-indexed plan, provided benefit levels are not changed.

A reduction in the investment return assumption would have the opposite effects. In this context consistency in the assumptions, from one valuation to the next, takes on added significance.

The previous valuation used a long-term investment return assumption of 6.50% per annum. As noted earlier, this also becomes the threshold rate used to determine excess investment return transfers to the IAA during the post-retirement period; effectively, this is the same as saying that the Basic Account will earn at most a rate of 6.50% per annum during the post-retirement period.

(b) Actual returns and asset mix

We have calculated market value returns on the total fund (i.e., Basic plus IAA), including non-invested assets (i.e., receivables, net of payables), net of investment-related expenses, and assuming that all cash flows occur at mid-year, as 5.9% for 2012, 9.5% for 2013 and 14.9% for 2014. At March 31, 2014, approximately 65% of the total portfolio was invested in equities (including private placements, infrastructure and renewable resources), a further 15% in real estate, and the balance of 20% in fixed income.

(c) Expected returns

After examining the net average investment return earned by the fund's investments, the yield on investments made in recent years, the likely future trend of investment returns in general, the investment practices, and the provisions of this Plan - e.g. the allocation of excess investment income to the Inflation Adjustment Account - we have concluded that a reasonable best estimate of the long term investment return on the plan's assets is 6.75%. We also concluded that a reasonable best estimate of the real return on the assets, i.e., the investment return in excess of inflation, is 4%.

In setting the valuation assumptions it is necessary to reduce these expected returns by a margin, so that the resulting liabilities have a suitable provision for adverse deviations. Following discussions with the Board regarding the appropriate adjustments to the best estimate assumptions and taking into account the requirements of the Board's funding policy, for the purposes of this valuation we continued with our previous valuation assumption for the long-term investment return of 6.5% per annum, as well as our previous valuation assumption for the real return of 3.5%. In other words there is a margin of 0.25% on the investment return assumption, and a margin of 0.5% on the real return assumption.

The following table shows the development of the investment return assumption:

	Discount rate
Weighted average return	6.76%
Diversification and rebalancing effect	0.30%
Provision for investment related expenses	(0.25%)
Rounding	(0.06%)
Estimated net investment return before margin	**6.75%**
Margin for adverse deviation	(0.25%)
Discount return assumption (rounded to nearest 0.25%)	**6.50%**

To determine the going concern discount rate, our model determined expected long term capital market returns, standard deviations and correlations for each major asset class by using historic returns, current yields and forecasts. We then stochastically generated projected asset class returns for 1,000 paths over 20 years to create expected returns for each major asset class and applied these to the Plan's target asset mix.

For the purposes of establishing the discount rate used in this report, we have assumed that there will be no added-value returns from employing an active management strategy in excess of the associated additional investment management fees. The investment expense allowance of 0.25% provides for expected future management fees.

(d) Real return and salary relationships - derive salary assumption

The 6.5% investment return assumption used in this valuation was viewed as consisting of a real return component of about 3.5% per annum plus a long-term underlying inflation assumption of about 3.0% per annum. This can also be viewed as a best estimate of future inflation of 2.75% (derived from the best estimate nominal return assumption of 6.75% less the best estimate real return assumption of 4%), plus a margin for adverse deviations of 0.25%.

The general salary increase assumption used in the 2011 valuation was 3.75% per annum. This was viewed as consisting of the underlying inflation assumption of 3.0% per annum, plus a real salary increase component of 0.75% per annum. For this valuation, we continued with the real salary increase assumption of 0.75% and the general salary increase assumption of 3.75%. The real salary increase assumption of 0.75% consists of a best estimate of real salary increases of 0.50%, plus a margin for adverse deviations of 0.25%.

The impact of these assumptions on the valuation result is discussed further below.

(e) Impact of investment return and salary assumptions on the valuation

During the **post-retirement period**, the excess investment return threshold is critical as this is the discount rate for the Basic Account post-retirement liabilities. It also sets the excess investment return threshold which puts a

ceiling on the amounts the Basic Account can effectively earn on the portion of the assets that support post-retirement liabilities. For example, if the threshold is 6.5%, then, provided the long-term returns exceed 6.5% on average, all of the excess will be transferred to the IAA, i.e., the Basic Account will retain only 6.5%.

During the **pre-retirement period**, it is the relationship, i.e., the net difference, between the investment return and general salary increase assumptions that is the key, rather than their absolute levels - projected benefits increase each year by the salary assumption and are then discounted by the investment assumption, i.e., the net result is that the liabilities are effectively being discounted by the net difference between the two assumptions. For example, the long-term assumptions we have used in this valuation (i.e., 6.5% investment return, 3.75% salary, 3.0% underlying inflation) would produce results similar to those using assumptions of 6.75% investment return and 4% salary, with 3.25% underlying inflation; or 6.25% investment return and 3.50% salary, with 2.75% underlying inflation, etc. Thus, the underlying inflation assumption in itself is not material to the results.

(f) Summary of interrelationships

The 2014 and 2011 annual investment return and general salary increase assumptions, and their underlying economic interrelationships, are summarized below.

	2014 and 2011 valuations
1. Investment return = excess investment return threshold	6.50%
2. Real return rate	3.50%
3. Implied underlying inflation = 1 - 2	3.00%
4. Real salary increase	0.75%
5. General salary increase = 3 + 4	3.75%

(g) Actual vs. expected salaries; adjust data salaries

The 2014 valuation data indicates that average annual earnings increased by about 4.3% from mid-fiscal-2011 to mid-fiscal-2014 (i.e., about 1.4% per annum), as compared with an expected increase of about 11.7% (i.e., 3.75% per annum) on the basis of the assumptions used in the 2011 valuation.

The input data salaries provided to us for this valuation were the actual earnings during fiscal 2014. In order to bring these data salaries forward to the valuation date, we took them without further adjustment as being equal to the salary rates on the valuation date (this may slightly understate the actual salary rates at the valuation date). Thereafter, the assumed rates of salary increase are applied continuously during each future year.

(h) YMPE increase

We also assumed that the YMPE would increase at the general salary increase rate of 3.75% per year from its 2014 level of $52,500, both for the regular valuation and for the purposes of computing the entry-age costs. In the previous valuation we assumed that the YMPE would increase at the same rate of 3.75% per year, but from its 2011 level of $48,300, both for the regular valuation and the entry-age costs.

Pension Indexing – Basic Valuation

Indexing supplements on and after January 1, 1982 are provided on an annual basis and are limited to those amounts that can be appropriately financed by the balances available in the Inflation Adjustment Account. Thus we do not need to allow for future indexing in our calculations as the costs of this indexing are currently fixed at 1.25% of salaries to be paid by the members, plus 2.75% paid by the employers, less amounts paid for group benefits for pensioners (currently capped at 1% of pay). With respect to indexed supplements granted through January 1, 2014, the present values have been included in the actuarial liabilities for pensions in the course of payment and thus form part of the determination of the recommended contribution.

As in the previous valuation, we ignored the future pre-retirement escalation that applies to vested pensions, since the cost of this "indexing" is also charged to the Inflation Adjustment Account.

With regard to the vested pensions of members who have terminated employment, the amounts of deferred pensions quoted to us include indexing during the deferred period to date. We understand that transfers to the Basic Account from the Inflation Adjustment Account to finance this indexing do not occur until retirement (theoretically, such transfers should be made on an annual basis as the indexing occurs, so as to reduce the inter-generational transfer of the costs of such indexing). We have therefore adjusted the deferred pension amounts to remove this indexing so that the Basic Account liability is aligned with the allocation of assets between the Basic and IAA accounts. We made the same adjustment in the previous valuation.

The indexing of salaries before retirement in the case of members on long-term disability is, on the other hand, a charge to the Basic Account rather than to the Inflation Adjustment Account. Accordingly, in valuing the deferred pensions for those currently on long-term disability, we have made an allowance for this by applying an escalation assumption (at the full underlying inflation assumption) of 3.0% per annum during the deferral period to retirement.

Asset values

The fund's annual reports record assets on a market value basis. We relied on these annual reports for the asset values used for the years ending March 31, 2012 to March 31, 2014.

As in the previous valuation, we applied a smoothing technique by adjusting the market values over a five year period. We believe a smoothing approach is appropriate as it cushions the actuarial valuation results against

the dramatic swings in market value that can occur. After discussion with the Board, it was agreed that an additional constraint on the smoothed value of assets is appropriate, and that the funding policy be modified to provide that the smoothed value is restricted to a range of 92% to 108% of market value.

To obtain the unconstrained smoothed value, we first determine the actual return on the basis of market values during the year (taking into account the timing of non-investment related cashflows i.e. the net contributions minus benefits and non-investment expenses). We then determine an assumed return for the year at a rate equal to the assumed underlying real return rate plus the year-over-year change in the consumer price index. The difference between the two returns is then spread over a five year period, recognizing one-fifth of it in each of the current and four succeeding years. This approach effectively spreads the difference between (a) the total investment return (including both realized and unrealized capital changes) and (b) a hypothetical return based on a long-term real return rate, over a five year period.

The smoothed value is then restricted to a range of 92% to 108% of market value, if necessary. This constraint applied as of March 31, 2014.

The application of this approach to the total fund yields the following results:

Adjustments to Total Fund

Target return		2012	2013	2014
1.	March-over-March increase in CPI	1.9%	1.0%	1.5%
2.	Base return = (1) + 3.5%	5.4%	4.5%	5.0%
Year-end asset values - $000's				
3.	At market value	19,440,574	20,941,550	23,690,470
4.	At smoothed value	18,962,491	19,512,767	21,795,233
5.	Ratio of (4) ÷ (3)	0.975	0.932	0.920
Annual returns				
6.	At market value	5.9%	9.5%	14.9%
7.	At smoothed value	3.6%	4.7%	13.5%

Using the relationship between the market and adjusted values shown in line 5 above, and applying this relationship to the Basic Account and Inflation Adjustment Account balances, we get:

Year end asset values - $000's

Basic Account		2012	2013	2014
8.	Market value	15,030,361	16,183,498	18,213,614
9.	Smoothed value	14,660,734	15,079,343	16,756,525
10.	Ratio of (9) ÷ (8)	0.975	0.932	0.920
Inflation Adjustment Account				
11.	Market value	4,410,213	4,758,052	5,476,856
12.	Smoothed value	4,301,757	4,433,424	5,038,708
13.	Ratio of (12) ÷ (11)	0.975	0.932	0.920

Timing of Decrements

We updated our valuation system which has resulted in minor changes in assumptions as to the timing of decrements.

Mortality

We examined the 2011-2014 mortality experience and compared this with the experience observed in our previous analyses of the mortality rates and with the rates used in the previous valuation. In general, the actual experience showed fewer deaths than were indicated on the basis of the rates used in the previous valuation. We therefore adjusted the mortality rates to allow for the improvements in mortality of the members. In addition, the Canadian Institute of Actuaries published the results of a study of Canadian specific pension plan mortality

in February 2014. The CIA report included a 2014 Public Sector Mortality Table (CPM2014Publ) and an improvement scale CPM Improvement Scale B (CPM-B). We reviewed the recent mortality experience of the Plan against both the base mortality table and the improvement scale, and found both to be a good fit. Recent female mortality experience has been lower than implied by the CPM2014Publ table. As a result, we made an adjustment to the rates underlying that table as follows:

a) The incidence of mortality both prior to and after retirement (other than employees retired on account of disability) was assumed to be in accordance with 100% for males and 95% for females of the rates in 2014 Public Sector Mortality Table (CPM2014Publ), projected using CPM Improvement Scale B (CPM-B).

   The previous valuation used 65% for males and 75% for females of the respective base rates in the 1994 Group Annuity Mortality Table.

b) For deferred vested pensions, mortality was ignored during the deferral period before retirement. This same assumption was made in the previous valuation.

c) For employees retired on account of disability we assumed 75% for males and females of the mortality rates (applicable in 2012) for similar retirees used for the valuation of the Pension Plan for the Public Service of Canada as at March 31, 2011. The previous valuation used 85% for males and females of the mortality rates (applicable in 1997) for similar retirees used for the valuation of the Pension Plan for the Public Service of Canada (previously referred to as the Canadian Public Service Superannuation Plan) as at March 31, 1996.

Withdrawal

We examined the rates of withdrawal for reasons other than death, retirement or disability over the period April 1, 2011 to March 31, 2014 and compared this with the experience observed and the rates used for previous valuations. Observed withdrawal rates were similar to those used in the previous valuation, with the exception of terminations in the first year of service and termination after 3 years of service, which were higher than assumed. Accordingly, we have made relatively minor changes to the withdrawal rates used for the previous valuation, by adopting the following multiples of those rates.

Multiples applied to 2011 rates

	In the first 3 years of service			After 3 years of service
	1st year	2nd year	3rd year	
Males	105%	100%	100%	105%
Females	105%	100%	100%	105%

Sample withdrawal rates are shown in the following tables.

A Withdrawal Rates Applicable in the First 3 Years of Service (these include terminations from all sources, i.e., including death, disability and retirement)

Age at entry	2014 valuation			2011 valuation		
	1st year	2nd year	3rd year	1st year	2nd year	3rd year
Males						
20	.161	.141	.136	.153	.141	.136
30	.083	.086	.089	.079	.086	.089
40	.076	.075	.062	.072	.075	.062
50	.061	.051	.055	.058	.051	.055
Females						
20	.102	.122	.147	.097	.122	.147
30	.096	.122	.127	.091	.122	.127
40	.067	.074	.053	.064	.074	.053
50	.054	.060	.049	.051	.060	.049

B. Withdrawal Rates Applicable After 3 Years of Service

Attained age	2014 valuation		2011 valuation	
	Males	Females	Males	Females
23	.128	.124	.122	.118
33	.045	.072	.043	.069
43	.022	.030	.021	.029
53	.013	.014	.012	.013

The withdrawal rates we have used do not extend past age 54; they were previously set at a level less than 100% of experience rates to be on a basis consistent with our handling of the inactive member data, where we assume some will be reactivated.

Disability

The Plan provides for either the payment of a disability pension from the Plan or, for members receiving long-term disability benefits, the continued accrual of pension benefits. We examined the combined experience of members going on disability pensions and on long-term disability and concluded that the experience in the inter-valuation period merited a change in the assumed rates. Since most members receive continuing disability service credits rather than an immediate pension, we have continued to value the disability cost for active members as a deferred pension (indexed before retirement) with continued accrual of service, rather than as an

immediate pension. Based on an examination of those now retired who had, prior to retirement, been in receipt of disability service credits, we assumed that the deferred pensions would commence at age 61 (or, immediately, for those older than age 61). The same assumption was made in the 2011 valuation.

Sample disability rates are shown in the following table. No direct allowance is made for the possibility of an individual recovering from disability prior to retirement - the rates used have been reduced from the observed disability incidence to implicitly allow for such recoveries.

Disability Rates

Age	2014 Valuation		2011 Valuation	
	Males	Females	Males	Females
25	.0003	.0001	.0003	.0002
35	.0004	.0011	.0005	.0011
45	.0023	.0036	.0024	.0037
55	.0073	.0098	.0066	.0102

The rates used for the 2014 valuation are 190% for males and 165% for females of the respective rates used for the valuation of the Pension Plan for the Public Service of Canada as at March 31, 2011. The previous valuation used 150% for males and 160% for females of the respective rates used for the valuation of the Pension Plan for the Public Service of Canada (previously referred to as the Canadian Public Service Superannuation Plan) as at March 31, 2005

Retirement

We examined the 2011-2014 retirement experience and compared this with the experience observed in our previous analyses of the retirement rates and with the rates used in the previous valuation. In general, the actual experience show fewer retirements than were indicated on the basis of the rates used in the previous valuation. We gave partial recognition to the observed experience by making modest adjustments to the rates previously used for retirement with an unreduced pensions for males (except at ages 61 and 62), and for females below age 60 and aged 64. We also slightly decreased the rates for reduced early retirement for both males and females with more than 10 years of service.

The rates used in this and the previous valuation, are as follows:

Retirement Rates

		2014 valuation		2011 valuation	
Age	**Service**	**Males**	**Females**	**Males**	**Females**
For unreduced retirement pensions					
55-59	rule-of-85	.50	.50	.55	.57
60	10	.34	.40	.36	.40
61	10	.22	.22	.22	.22
62	10	.22	.22	.22	.22
63	10	.20	.24	.22	.24
64	10	.25	.25	.28	.30
65	0	1.00	1.00	1.00	1.00
For reduced early retirement					
55-59	at least 10 years, but not rule-of-80	.04	.06	.05	.07
55-59	rule-of-80	.12	.14	.14	.16

Even though pensions (unreduced and reduced) are available with less than 10 years of service, we have continued to apply the retirement rates before age 65 only to those with 10 or more years of service, on the presumption that those with fewer than 10 years would not retire until age 65.

Seniority salary scales

Seniority salary increases are in addition to the general salary increases and are intended to reflect increasing seniority, recognition of merit and promotion. We examined the seniority salary scales based both on the earnings history of the active members during the 3 year period ended March 31, 2014 and on the graduated average salaries of the active members as of March 31, 2014, and compared these with the experience observed and rates used in the previous valuation. Based on these investigations we decided to continue with the previous salary scales.

The annual seniority increases are assumed to reduce with age. Sample seniority increase assumptions at key ages are shown below. The assumptions represent the assumed seniority increase in the next year. Note that these rates are the same as those used for the previous valuation, but that valuation report showed the rates expressed as a proportion of earnings at age 65.

Sample Seniority Salary Rate Increases

Age	2014 and 2011 valuation	
	Males	Females
25	.037	.029
35	.016	.015
45	.007	.009
55	.003	.004
65	.000	.000

Proportion of eligible terminating members electing a vested pension

Locking-in of vested pensions occurs after 2 years of service, in respect of all service credits. We have therefore valued all vested terminations as vested pensions. The same assumption was made in the previous valuation.

The balance of the terminating members (i.e. those not vested) are assumed to elect a refund of contributions with interest.

Proportions of members married at death

For this valuation, we assumed that the surviving spouses of all vested members who die after age 55 would opt to take the commuted value of the pension earned to the date of death. Therefore the proportions of members assumed to be married at death are irrelevant for this valuation. The same assumption was made in the previous valuation.

Growth of active Public Service population

We assumed in all the actuarial projections that there would be no future growth or decline in the Public Service population. The same assumption was made in the previous valuation.

Expenses

Administration expenses are paid out of the Public Service Pension Plan fund. These amounts totalled 0.36%, 0.48% and 0.42% of salaries for the 2012, 2013 and 2014 fiscal years respectively. Projected expenses provided by the Pension Corporation for the next few years anticipate that administration expenses will continue at the higher rates seen in 2013 and 2014. Accordingly, we increased the expense provision from 0.35% of salary used in the previous valuation to 0.45% of salary, as part of the normal actuarial costs in the determination of the required contribution rates under the entry-age funding method. We also included a provision for the present value of expenses in the statement of actuarial position. The same approach was used in the previous valuation.

As before, the investment management fees are excluded from our analysis above and from the expense provision we have made as they are reflected in the long-term investment return assumption.

Refunds

We continued with the interest assumption used for accumulation and refunds of member contributions to be 1.5% less than the valuation interest assumption, i.e., at 5.0% per annum. This allows for the *PBSA*-related practice whereby the refund interest rate is set equal to an average of 5-year bank-term-deposit rates (which are assumed to be 1.5% less than fund earnings).

Plan Termination

The Standards of Practice issued by the Canadian Institute of Actuaries require that a valuation report "disclose the financial position of the plan if it were to be wound up on the calculation date, unless the plan does not define the benefits payable upon wind-up, in which case the actuary should include a statement to that effect".

While the Joint Trust Agreement deals with plan termination in sections 13.4 and 13.5, it is our, and the Board's, opinion that the benefits on wind-up are not defined. Accordingly, we no longer comment on the financial position of the plan if it were to be wound up.

Fully Indexed Valuation – Assumption Changes

We made the following changes to the assumptions when doing the fully indexed valuations:

- We combined the assets in the Basic and Inflation Adjustment Accounts, using a smoothed asset value of $21,795,233,000;
- We applied an indexing assumption equal to the full assumed underlying inflation rate, i.e., 3.0% per annum. This indexing rate was applied to pensions after retirement and, in the case of deferred vested pensions and disability salary accruals, during the pre-retirement period. Indexing is applied annually, in arrears; and
- We combined the contribution rates to Basic and IAA, i.e., we assumed a total member contribution rate of 8.18% + 1.25% = 9.43%, integrated with the CPP (i.e., reduced by 1.5% of salaries below the YMPE). The employer contributions of 2.75% to the IAA were reduced by 1% to account for the carve-out of the non-pension (EHB and Dental) benefits. The 1% carve-out was based on the Board's funding policy that no more than 1% of the employers' IAA contributions would be available to pay for post-retirement group benefits. The total employer rate is assumed to be 8.18% + 1.75% = 9.93%, with a 1.5% integration for CPP. A similar approach was used in the previous valuation.

Maximum pension rule – Assumption Changes

As noted earlier, we have not applied these rules when doing the primary Basic and the fully indexed valuations. We have applied them, as described below, when doing the supplementary valuations with benefits limited to the *ITA* maximums. The maximum annual pension currently permitted under the income tax rules is the lesser of:

a) $2,770 in 2014 multiplied by the years of service; and

b) 2% multiplied by the years of service further multiplied by the average of the best 3 years of remuneration paid to the member.

While the Plan applies the *ITA* limits only in respect of service after 1991, we have, for ease of calculation, assumed that this limit applies on all service; this assumption does not affect the future normal costs, but the accrued liabilities will be slightly understated. The Plan also imposes a 35 year cap on accruals at the above maximum rate, which we have applied. For an individual in this Plan to be currently affected by the $2,770 maximum, the final average salary must be very high; while current salaries are not such as to cause many problems, the salaries projected in the future through application of the assumed salary increase rates outlined above are such that some individuals would be limited. However, under the income tax rules, the flat $2,770 limit is automatically indexed each year after 2014 in accordance with increases in the average wage. Accordingly, we have applied a 3.75% per annum increase to the $2,770 limit after 2014 (at the previous valuation the corresponding dollar limit was $2,552.22, and was scheduled to be automatically indexed each year after 2012 in accordance with increases in the average wage; the same 3.75% increase rate was applied after 2012 to the $2,552.22 limit at the previous valuation).

It should also be noted that, in the tax-limited results, we valued the deferred vested pensions not yet in pay, in full, as provided to us, i.e. we were unable to carve out any "excess" portions. In the previous valuation we also valued the existing pensions in pay in full. Given the changes to the pension administration system, we were able to carve out the pensions in pay in excess of the limits for this valuation.

Appendix C: Active Member Data

	Active members March 31, 2014			New entrants April 1, 2011 to March 31, 2014 and still active March 31, 2014	
Age group[1]	Number	Average annual earnings[2] $	Average service (years)	Number	Average annual earnings $
Males					
Less than 25	260	43,147	1.1	370	45,094
25-29	1,254	50,837	2.6	679	51,850
30-34	2,208	58,716	4.1	654	58,543
35-39	2,633	63,804	5.9	494	59,946
40-44	3,311	66,876	8.6	415	65,060
45-49	4,007	69,442	11.9	383	68,474
50-54	4,751	70,484	15.5	307	73,832
55-59	4,138	73,179	17.7	184	72,501
60 & over	2,890	74,786	17.6	91	78,148
Total	**25,452**	**67,818**	**11.9**	**3,577**	**60,423**
Females					
Less than 25	277	41,410	1.1	461	43,461
25-29	1,559	48,093	2.5	851	48,441
30-34	2,589	55,602	4.2	589	52,524
35-39	2,820	60,377	6.0	469	56,018
40-44	3,632	62,249	9.2	420	56,059
45-49	4,302	63,460	12.4	341	55,291
50-54	4,833	62,613	15.9	238	57,577
55-59	4,165	62,350	17.1	127	63,713
60 & over	2,363	63,097	17.7	46	71,041
Total	**26,540**	**60,706**	**11.6**	**3,542**	**52,493**
Total males and females	**51,992**	**64,188**	**11.7**	**7,119**	**56,478**

[1] Age nearest birthday at March 31, 2014 for actives and at entry for new entrants.

[2] Based on actual earnings in 2013/14 for those employed all year and annualized for others. Zero, very low or very high earnings figures were replaced by the average earnings in the same age-sex group.

A comparison of the March 31, 2014 active membership with the March 31, 2011 membership is as follows:

	March 31, 2011	March 31, 2014	Change 2011 to 2014
Males			
Number	24,777	25,452	+ 2.7%
Proportion of total	48.1%	49.0%	+ 0.9%
Average age (at 3.31)	46.8	47.1	+ 0.3 years
Average service	12.2	11.9	- 0.3 years
Average salary	$65,655	$67,818	+ 3.3%
Females			
Number	26,743	26,540	- 0.8%
Proportion of total	51.9%	51.0%	- 0.9%
Average age (at 3.31)	45.9	46.2	+ 0.3 years
Average service	11.4	11.6	+ 0.2 years
Average salary	$57,749	$60,706	+ 5.1%

The above comparison indicates a slight increase in the covered membership during the 3 year inter-valuation period. The proportion of females to males has decreased slightly. The average ages have increased slightly for males and females. Average service reduced somewhat for males but increased slightly for females. The increase in average salary is higher for females than for males.

A comparison of the new entrant subset used at March 31, 2014 with that used at March 31, 2011 in determining the entry-age normal costs is as follows:

	March 31, 2011	March 31, 2014	Change 2011 to 2014
Males			
Number	3,826	3,577	- 6.5%
Proportion of total	49.8%	50.2%	+ 0.4%
Average age at entry	37.6	37.2	- 0.4 years
Average salary	$57,678	$60,423	+ 4.8%
Females			
Number	3,851	3,542	- 8.0%
Proportion of total	50.2%	49.8%	- 0.4%
Average age (at entry)	36.0	35.4	- 0.6 years
Average salary	$51,554	$52,493	+ 1.8%

The average age of new entrants has slightly decreased for both males and females. The increase in average salary for new entrants is lower than the increase in average salary for the actives as a whole.

Appendix D: Inactive Member Data

1. Inactive Members Assumed Reactivated on Valuation Date

Age group[1]	Males			Females		
	Number	Average annual earnings[2]	Average service (years)	Number	Average annual earnings[2]	Average service (years)
Under 30	15	51,967	3.6	34	48,674	3.2
30-34	41	58,597	4.1	95	55,777	4.8
35-39	49	63,764	5.2	91	59,858	5.6
40-44	53	66,549	6.9	71	62,090	7.0
45-49	50	69,279	9.8	78	63,358	10.9
50-54	54	70,300	12.9	62	62,659	12.2
55-59	35	73,297	14.7	43	61,956	10.5
60 & over	26	74,495	16.8	30	62,528	10.7
Total	**323**	**66,861**	**9.2**	**504**	**59,874**	**7.8**

	Number	Average annual earnings[2]	Average service
Total - males & females	**827**	**62,603**	**8.4 years**

[1] Age nearest birthday at March 31, 2014.

[2] Assumed same earnings as for active members in same age-sex group.

2. Members on Long-Term Disability with Projected Deferred Pensions

Age group[1]	Males		Females	
	Number	Average annual deferred pension[2]	Number	Average annual deferred pensions[2]
Under 30	5	24,476	6	21,700
30-34	15	24,152	36	25,102
35-39	28	24,734	44	23,094
40-44	40	23,956	108	24,826
45-49	95	23,322	184	21,732
50-54	166	22,795	338	20,029
55-59	216	21,042	402	20,306
60 & over	281	21,629	467	16,378
Total	**846**	**22,173**	**1,585**	**19,755**

[1] Age nearest birthday at March 31, 2014.

[2] Basic lifetime portions payable from age 61; additional temporary amounts payable from age 61 to 65.

3. Other Inactive Members Entitled to Vested Pensions and Not Assumed Reactivated

	Males			Females		
	Average annual vested pensions			Average annual vested pensions		
Age group[1]	**Number**	**Initial[2] $**	**Offset at age 65 $**	**Number**	**Initial[2] $**	**Offset at age 65 $**
Under 30	59	2,855	851	83	2,463	788
30-34	169	3,544	994	261	3,186	953
35-39	290	4,557	1,190	453	3,972	1,146
40-44	551	6,096	1,600	865	5,852	1,617
45-49	738	8,103	1,974	1,147	7,111	1,908
50-54	895	11,138	2,537	1,296	9,122	2,387
55-59	558	11,718	2,554	758	8,168	2,088
60 & over	276	10,029	1,810	283	6,025	1,490
Total	**3,536**	**8,683**	**2,006**	**5,146**	**6,951**	**1,850**

4. Remaining Inactive Members

Number	Member contributions with interest
8,726[3]	$24,989,432

[1] Age nearest birthday at March 31, 2014.

[2] These pensions are assumed to commence at the first age at which the member is entitled to an unreduced pension, i.e., at various ages between 55 and 65.

[3] Includes 91 disabled and 877 vested members, with invalid data.

Appendix E: Pensioner Data

1. Former Contributors

		Annual Pensions ($000's)				
Age group[1]	**Number of pensioners[2]**	**Single life**	**Joint life & survivor**	**Joint life & survivor with guarantee**	**Single life with guarantee**	**Temporary life**
Male pensioners						
Less than 55	32	0	230	130	116	247
55-59	1,425	88	17,772	4,668	9,858	14,731
60-64	4,081	6,585	50,195	14,544	24,495	43,004
65-69	4,913	15,338	62,885	13,299	23,468	5,218
70-74	3,493	21,078	40,533	6,306	8,482	0
75-79	2,342	17,834	24,128	686	1,691	0
80-84	1,922	17,097	15,091	0	171	0
85-89	1,115	11,002	7,226	0	0	0
90 & over	542	7,372	3,298	0	0	0
Total	**19,865**	**96,394**	**221,358**	**39,633**	**68,281**	**63,200**
Female pensioners						
Less than 55	45	62	45	16	324	85
55-59	1,653	196	8,045	4,142	16,297	13,418
60-64	3,758	8,386	15,807	8,320	32,495	29,621
65-69	4,132	20,177	14,303	5,026	26,901	3,462
70-74	2,770	22,034	7,731	1,440	7,486	0
75-79	1,732	15,923	2,754	61	756	0
80-84	1,270	10,345	1,163	0	21	0
85-89	772	6,091	303	0	0	0
90 & over	479	4,880	50	0	0	0
Total	**16,611**	**88,094**	**50,201**	**19,005**	**84,280**	**46,586**
Grand Total	**36,476**	**184,488**	**271,559**	**58,638**	**152,561**	**109,786**
Supplemental Pensions (included above)		**864**	**7,285**	**663**	**1,855**	**6**

[1] Age nearest birthday at March 31, 2014.

[2] These numbers include only those who were formerly contributors to the Plan.

2. Beneficiaries

		Annual Pensions ($000's)	
Age group[1]	**Number of beneficiaries**[2]	**Single life**	**Single Life with Guarantee**
Male beneficiaries			
Less than 50	15	122	0
50-54	12	121	0
55-59	47	522	17
60-64	64	809	0
65-69	104	1,339	106
70-74	77	813	17
75-79	63	526	32
80-84	91	645	15
85-89	51	313	14
90 & over	20	154	0
Total	**544**	**5,364**	**201**
Female beneficiaries			
Less than 50	42	406	0
50-54	76	840	67
55-59	127	2,162	113
60-64	271	4,680	220
65-69	405	6,091	279
70-74	524	7,795	24
75-79	634	7,696	0
80-84	820	9,396	0
85-89	872	11,430	0
90 & over	700	11,004	0
Total	**4,471**	**61,500**	**703**
Remaining guarantees	**220**	**0**	**3,516**
Grand Total	**5,235**	**66,864**	**4,420**
Supplemental Pensions (included above)		**675**	

[1] Age nearest birthday at March 31, 2014.

[2] These numbers include spouses (or estates) currently receiving benefits where the former contributor is deceased.

Appendix F: Development of Required Contribution Rates

All of the figures shown herein are on a combined member/employer basis.

The change in the normal actuarial cost from 2011 to 2014 can be traced as follows:

	Combined %
Normal cost at 2011 valuation	**15.75**
Data changes	(0.04)
Assumption changes:	
▪ pre-retirement mortality	(0.01)
▪ disability incident rates	0.06
▪ withdrawal rates	(0.09)
▪ retirement rates	0.01
▪ post-retirement mortality	0.49
▪ post-retirement mortality for disabled pensioners	0.06
▪ change in administration expense assumption	0.10
Total change	**0.58**
Normal cost at 2014 valuation	**16.33**

Calculation of Required Contribution Rate

	2014	2011
A. Normal (entry-age) actuarial cost	16.33%	15.75%
B. Surplus (unfunded) actuarial liability on entry-age basis ($000s)	193,698	(226,463)
C. Present value of existing amortization requirements ($000s)		
(i) 0.6% to 2026	197,973	0
D. Sum of B + C	391,671	(226,463)
E. Balance of unfunded liability to be amortized over 15 years ($000s) (= D, or zero if B and D are greater than zero)	0	(226,463)
	%	**%**
F. 15 year amortization of balance of unfunded actuarial liability	0.00	0.6
G. Total *PBSA* amortization requirement		
(i) to 2026	0.00	0.6
Total	**0.00**	**0.6**
H. Total *PBSA* required contribution rate	**16.33**	**16.35**

The percentages are applied to members' total earnings and are inclusive of approximate Canada Pension Plan member/employer contributions (i.e., 1.5% of each member's salary up to the YMPE for each of the members and the employers, for a 3.0% total reduction).

Appendix G: Comparative Results on Fully Indexed Basis, and with Income Tax Limits

The results herein are analogous to those contained in Schedules 1, 3 and 5 in the body of the report. For ease of comparison, we have repeated the 2014 Basic Account results; selected 2011 comparisons are also shown. The results are included for:

- Basic (i.e., non-indexed) benefits only, no tax limits;
- Basic plus Indexed, no tax limits;
- Basic only, with tax limits; and
- Basic plus Indexed, with tax limits

Schedule G1[1] – Statement of Actuarial Position as at March 31, 2014

Present Plan ($000's)

	Without Tax Limits		With Tax Limits	
	Basic Only	**Basic + Indexed**	**Basic Only**	**Basic + Indexed**
Assets				
Market value of Fund	18,213,614	23,690,470	18,213,614	23,690,470
Asset smoothing adjustment	(1,457,089)	(1,895,237)	(1,457,089)	(1,895,237)
Smoothed value of Fund	**16,756,525**	**21,795,233**	**16,756,525**	**21,795,233**
Actuarial present values of future contributions at entry-age rates	3,715,057	5,163,758	3,683,276	5,124,031
Total Assets without amortization	**20,471,582**	**26,958,991**	**20,439,801**	**26,919,264**
Liabilities				
Actuarial present values for:				
▪ pensions being paid	8,386,957	11,035,385	8,251,815	10,853,958
▪ inactive members	996,443	1,573,997	996,270	1,573,753
▪ active members	10,774,508	14,824,413	10,722,828	14,753,895
▪ future expenses	119,798	119,798	119,798	119,798
Voluntary contribution balance	178	178	178	178
Total Liabilities	**20,277,884**	**27,553,771**	**20,090,889**	**27,301,582**
Surplus (Unfunded Liability) – without existing amortization	**193,698**	**(594,780)**	**348,912**	**(382,318)**
Present value of existing amortization (0.6% to 2026)	197,973	197,973	197,973	197,973
Surplus (Unfunded Liability) – with existing amortization	**391,671**	**(396,807)**	**546,885**	**(184,345)**
Selected 2011 Comparisons				
Total Assets without amortization	17,814,281	23,463,158	17,803,978	23,447,704
Total Liabilities	18,040,744	24,583,375	17,983,453	24,504,790
Surplus (Unfunded Actuarial Liability)	(226,463)	(1,120,217)	(179,475)	(1,057,086)
Present value of existing amortization (0.6% to 2026)	226,463	226,463	226,463	226,463
Surplus (Unfunded Liability) with amortization	0	(893,754)	46,988	(830,623)

[1] This Schedule combines schedules G1 and G2 from the 2011 report.

Schedule G3 – Current and Required Contribution Rates – March 31, 2014

	Without Tax Limits		With Tax Limits	
	Basic only %	Basic + Indexed %	Basic only %	Basic + Indexed %
Current contribution rates				
Member[1]	8.18	9.43	8.18	9.43
Employer[1, 2]	8.18	9.93	8.18	9.93
Combined member/employer[1, 2]	16.36	19.36	16.36	19.36
Required contribution rates[3]				
Entry age normal cost rate[1]	16.33	21.80	16.21	21.65
Amortization of unfunded actuarial liability (surplus)				
▪ 25-year amortization	(0.33)	1.01	(0.59)	0.65
▪ 15-year amortization	(0.49)	1.50	(0.88)	0.96
▪ *PBSA* amortization	0.00	n/a	0.00	n/a
Total contribution rate[1]				
▪ 25-year amortization	16.00	22.81	15.62	22.30
▪ 15-year amortization	15.84	23.30	15.33	22.61
▪ *PBSA* rate	16.33	n/a	16.21	n/a
Total required contribution rate[1]	**16.33**	**n/a**	**16.21**	**n/a**
Selected 2011 Comparisons				
Member rate[1]	7.78	9.03	7.78	9.03
Employer rate[1, 2]	7.78	9.53	7.78	9.53
Combined member/employer	**15.56**	**18.56**	**15.56**	**18.56**
Required contribution rates				
Entry age normal cost rate[1]	**15.75**	**20.99**	**15.71**	**20.93**
Amortization of unfunded actuarial liability (surplus)				
▪ 25 year amortization	0.40	2.00	0.32	1.89
▪ 15 year amortization	0.60	2.96	0.47	2.79
▪ *PBSA* amortization	0.60	n/a	0.47	n/a
Total contribution rate[1]				
▪ 25 year amortization	16.15	22.99	16.03	22.82
▪ 15 year amortization	16.35	23.95	16.18	23.72
▪ *PBSA* amortization	16.35	n/a	16.18	n/a
Total required contribution rate[1]	**16.35**	**n/a**	**16.18**	**n/a**

[1] Less 1.5% of salary up to the YMPE (for each of the members and the employers).

[2] Non-indexed costs ignore IAA contributions; indexed costs include IAA contributions, at 1.25% for members and 1.75% (2.75% gross, 1.75% net of post-retirement group benefits contributions) for employers.

[3] Total member plus employer, to be shared equally.

Schedule G4 – Accrued Liabilities and Funded Ratio

Present Plan – March 31, 2014 ($000's)

	Without Tax Limits		With Tax Limits	
	Basic only	**Basic + Indexed**	**Basic only**	**Basic + Indexed**
Funds				
▪ **Smoothed Value of Fund**	16,756,525	21,795,233	16,756,525	21,795,233
Accrued Liabilities				
▪ for pensions being paid	8,386,957	11,035,385	8,251,815	10,853,958
▪ for inactive members	996,443	1,573,997	996,270	1,573,753
▪ for active members	6,568,753	9,030,173	6,531,116	8,978,773
▪ for voluntary contributions	178	178	178	178
Total Accrued Liabilities	**15,952,331**	**21,639,733**	**15,779,379**	**21,406,662**
Surplus (Unfunded Actuarial Liability)				
▪ for accrued service only	804,194	155,500	977,146	388,571
Funded Ratio				
Fund ÷ Total accrued liabilities	105.0%	100.7%	106.2%	101.8%
Selected 2011 Comparisons				
Assets	14,324,567	18,623,805	14,324,567	18,623,805
Total Liabilities	14,019,549	19,061,801	13,977,399	19,003,981
Surplus (Unfunded Actuarial Liability)	305,018	(437,996)	347,168	(380,176)
Funded Ratio	102.2%	97.7%	102.5%	98.0%

Appendix H: Actuarial Position on Current Contribution Basis as at March 31, 2014

Report disclosure changes

In previous valuation reports, we showed results for the basic benefits in two different ways:

- **Current Contribution Basis**: Firstly, the funded position assuming contributions would continue at the current rate was calculated (this calculation included as an asset the value of future contributions assuming that the current rate would continue indefinitely). This result, which was disclosed in Schedule 1 of our previous reports, provided insight into the financial position of the Basic Account if contributions were to remain unchanged in the future.
- **Entry Age Basis**: Secondly, the funded position was calculated assuming that contributions would be equal in value to the value of contributions at the entry-age rate, plus scheduled future amortization amounts. This result, which was disclosed in Schedule 2 of our previous reports, established the financial position of the plan for the purposes of calculating the required contribution rate.

Prior to Joint Trusteeship in 2001, the Plan was not required to meet the *PBSA* funding requirements and the basis for establishing contribution rates was, by practice, the Current Contribution approach as depicted in the former Schedule 1. This approach assumed the current rates would continue indefinitely into the future.

While the move to Joint Trusteeship continued to exempt the Plan from the *PBSA* funding requirements, the signatories to the Joint Trust Agreement included a requirement to fund the plan according to the "going-concern" requirements of the *PBSA* (Article 10) for each valuation. Effective with the 2002 valuation, the Entry Age approach, depicted in the former Schedule 2 and in Schedule 1 to the current report, has appropriately been the basis on which contribution rate adjustments have been determined. As a result, the Current Contribution Basis is less useful, especially since the various amortization amounts are payable for 15 years or less, rather than indefinitely.

In an effort clarify the basis on which contribution rates are set, Schedule 1 to this report shows only the Entry Age result used to determine required contribution rates. The Current Contribution result is reported for information purposes below. The methods and process for setting the contribution rate has not changed.

The following shows the results of the March 31, 2014 valuation assuming that member and employer contribution rates for the basic pensions continue to be made at the current rates set out in the Plan rules. It replicates Schedule 1 under Part 1 of Section IV of the 2011 report.

Basic Account – Non-Indexed Benefits ($000's)

	2014	2011
Assets		
Market Value of Basic Account	18,213,614	14,362,006
Asset Smoothing Adjustment	(1,457,089)	(37,439)
Smoothed Value of Basic Account	**16,756,525**	**14,324,567**
Actuarial present values of:		
▪ Future member contributions at current rates	1,861,501	1,720,388
▪ Future employer contributions at current rates	1,861,501	1,720,388
Total Assets	**20,479,527**	**17,765,343**
Liabilities		
Actuarial present values for:		
▪ Pensions being paid	8,386,957	6,915,269
▪ Inactive members	996,443	887,025
▪ Active members	10,774,508	10,147,613
▪ Future expenses	119,798	90,540
Voluntary contribution balance	178	297
Total Liabilities	**20,277,884**	**18,040,744**
Surplus (Unfunded Actuarial Liability)	**201,643**	**(275,401)**