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REPORT ON THE ACTUARIAL VALUATION FOR FUNDING PURPOSES AS AT DECEMBER 31, 2013

THE CANADIAN BLOOD SERVICES DEFINED BENEFIT PENSION PLAN

SEPTEMBER 2014

Financial Services Commission of Ontario Registration Number: 1048800
Canada Revenue Agency Registration Number: 1048800

MARSH & McLENNAN COMPANIES

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To prepare the results in this report, actuarial assumptions are used to model a single scenario from a range of possibilities for each valuation basis. The results based on that single scenario are included in this report. However, the future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material. Different assumptions or scenarios within the range of possibilities may also be reasonable, and results based on those assumptions would be different. Furthermore, actuarial assumptions may be changed from one valuation to the next because of changes in regulatory and professional requirements, developments in case law, plan experience, changes in expectations about the future, and other factors.

The valuation results shown in this report also illustrate the sensitivity to one of the key actuarial assumptions, the discount rate. We note that the results presented herein rely on many assumptions, all of which are subject to uncertainty, with a broad range of possible outcomes, and the results are sensitive to all the assumptions used in the valuation.

Should the plan be wound up, the going concern funded status and solvency financial position, if different from the wind-up financial position, become irrelevant. The hypothetical wind-up financial position estimates the financial position of the plan assuming it is wound up on the valuation date. Emerging experience will affect the wind-up financial position of the plan assuming it is wound up in the future. In fact, even if the plan were wound up on the valuation date, the financial position would continue to fluctuate until the benefits are fully settled.

Decisions about benefit changes, granting new benefits, investment policy, funding policy, benefit security, and/or benefit-related issues should not be made solely on the basis of this valuation, but only after careful consideration of alternative economic, financial, demographic, and societal factors, including financial scenarios that assume future sustained investment losses.

Funding calculations reflect our understanding of the requirements of the Pension Benefits Act (Ontario), the Income Tax Act, and related regulations that are effective as of the valuation date. Mercer is not a law firm, and the analysis presented in this report is not intended to be a legal opinion. You should consider securing the advice of legal counsel with respect to any legal matters related to this report.

CONTENTS

1

Summary of Results

	2013-12-31	2010-12-31
Going Concern Financial Status		
Smoothed value of assets	$247,074,000	$168,564,000
Going concern funding target	$252,695,000	$186,703,000
Funding excess (shortfall)	($5,621,000)	($18,139,000)
Hypothetical Wind-up Financial Position		
Wind-up assets	$261,989,000	$179,764,000
Wind-up liability	$301,774,000	$203,514,000
Wind-up excess (shortfall)	($39,785,000)	($23,750,000)
Funding Requirements[1]	**2014**	**2011/2012**
Member contribution rate as percentage of Pensionable earnings	5.9%	5.15%/5.90%
Employer's contribution rate as percentage of Pensionable earnings	7.9%	7.15%/7.90%
Total contribution rate	13.8%	12.30%/13.80%
Next required valuation date	December 31, 2016	December 31, 2013

[1] Provided for reference purposes only. Contributions must be remitted to the Plan in accordance with the Minimum Funding Requirements and Maximum Eligible Contributions sections of this report.

2

Introduction

To the Canadian Blood Services Defined Benefit Pension Plan Board of Trustees (the "Trustees")

At your request, we have conducted an actuarial valuation of the Canadian Blood Services Defined Benefit Pension Plan (the "Plan"), jointly sponsored by Canadian Blood Services and participating unions, as at the valuation date, December 31, 2013. We are pleased to present the results of the valuation.

Purpose

The purpose of this valuation is to determine:

- The funded status of the plan as at December 31, 2013 on going concern and hypothetical wind-up bases, and solvency basis;

- The minimum required funding contributions from 2014, in accordance with the *Pension Benefits Act (Ontario)*; and

- The maximum permissible funding contributions from 2014, in accordance with the *Income Tax Act*.

The information contained in this report was prepared for the internal use of the Canadian Blood Services Defined Benefit Pension Plan Board of Trustees and for filing with the Financial Services Commission of Ontario ("FSCO") and with the Canada Revenue Agency, in connection with our actuarial valuation of the Plan. This report will be filed with FSCO and with the Canada Revenue Agency. This report is not intended or suitable for any other purpose.

In accordance with pension benefits legislation, the next actuarial valuation of the Plan will be required as at a date not later than December 31, 2016, or as at the date of an earlier amendment to the Plan.

Terms of Engagement

In accordance with our terms of engagement with the Trustees, our actuarial valuation of the Plan is based on the following material terms:

- It has been prepared in accordance with applicable pension legislation and actuarial standards of practice in Canada.
- As instructed by the Trustees, we have reflected a margin for adverse deviations in our going concern valuation by reducing the going concern discount rate by 0.70% per year.

- We have reflected the Trustee's decisions for determining the solvency funding requirements, summarized as follows:
  - The same Plan wind-up scenario was hypothesized for both hypothetical wind-up and solvency valuations;
  - No benefits were excluded from the solvency liabilities;
  - The solvency financial position was determined on a market value basis;
  - The solvency deficiency, as defined in the Regulations to the Pension Benefits Act (Ontario), has been specified to be zero in accordance with Section 1.3.1(3) of the Regulations.

See the Valuation Results – Solvency section of the report for more information.

Events since the Last Valuation at December 31, 2010

Pension Plan

There have been no special events since the last valuation date.

This valuation reflects the provisions of the Plan as at December 31, 2013. Effective July 1, 2012, the Pension Benefits Act (Ontario) and the Regulations to the Act were amended to require plans to provide immediate vesting to all Ontario plan members and to provide grow-in benefits to certain Ontario members whose employment is terminated at the initiation of their employer. The Plan has been amended to reflect these requirements. This had no impact on the cost of the plan. We are not aware of any pending definitive or virtually definitive amendments coming into effect during the period covered by this report. The Plan provisions are summarized in Appendix F.

Assumptions

We have used the same going concern discount rate and interest on employees contributions assumptions and methods as were used for the previous valuation. All other assumptions have been updated as following:

	Current valuation	**Previous valuation**
Administrative expenses:	0.60% of pay	0.57% of pay
Inflation rate:	2.25%	2.50%
ITA limit / YMPE increases:	3.25%	3.75%
Pensionable earnings increases:	Updated service related table	Service related table
Post-retirement pension increases:	0.55%	0.75%
Retirement rates:	Updated age-related table	Age-related table
Termination rates:	Updated age-related table	Age-related table
Mortality rates:	2014 Combined (Private and Public) Canadian Pensioners Mortality Table (CPM 2014)	1994 Uninsured Pensioner Mortality Table
Mortality improvements:	Fully generational using improvement scale (CPM-B)	Fully generational using Scale AA
Commuted value election:	70% below age 55	0%

	Current valuation	Previous valuation
Commuted value basis:	3.0% per year for 10 years and 4.6% per year thereafter with UP94 fully generational using Scale AA	n/a

The hypothetical wind-up assumptions have been updated to reflect market conditions at the valuation date.

A summary of the going concern methods and assumptions is provided in Appendix C. A summary of the hypothetical wind-up method and assumptions is provided in Appendix D.

Regulatory Environment and Actuarial Standards

There have been a number of changes to the *Ontario Pension Benefits Act* (the "Act") and Regulations which impact the funding of the Plan.

The Regulations to the Pension Benefits Act (Ontario) were amended in 2011 to, among other things, allow that the solvency deficiency of a jointly sponsored pension plan such as the Plan be set to any amount, but not less than zero. Accordingly, as indicated previously, the solvency deficiency was set to zero.

The Government of Ontario has announced its intentions to make changes to the funding requirements for pension plans registered in Ontario. Since then, Bill 120 received Royal assent. However, the intended changes to the funding requirements which impact the funding of single-employer pension plans will be contained in regulations which have not yet been adopted.

The Regulations to the Pension Benefits Act were amended in November 2012 to reflect previously announced changes. The measures introduced are as follows:

On a permanent basis, the regulations were amended to:
- Permit solvency and going concern special payments to be amortized beginning up to one year after the valuation date;
- Permit the use of irrevocable letters of credit from financial institutions to cover solvency deficiencies up to 15% of a plan's solvency liabilities, in lieu of special payments to eliminate the deficiency over the prescribed period.

The first option already applies to the Plan, given its status as a Jointly-Sponsored Pension Plan. Therefore, the revised contribution rates, determined in this report will be in effect on January 1, 2015.

Certain changes to the Canadian Institute of Actuaries Standard of Practice for determining pension commuted values ("CIA CV Standard") became effective on February 1, 2011. The changes affect the mortality assumptions used to value the solvency and wind-up liabilities for benefits assumed to be settled through a lump sum transfer. The financial impact of the change in the CIA CV Standard has been reflected in this actuarial valuation.

Subsequent Events

After checking with representatives of the Trustees, to the best of our knowledge there have been no events subsequent to the valuation date which, in our opinion, would have a material impact on the results of the valuation. Our valuation reflects the financial position of the Plan as of the valuation date and does not take into account any experience after the valuation date.

Impact of Case Law

This report has been prepared on the assumption that all of the assets in the pension fund are available to meet all of the claims on the Plan. We are not in a position to assess the impact that the Ontario Court of Appeal's decision in *Aegon Canada Inc. and Transamerica Life Canada versus ING Canada Inc.* or similar decisions in other jurisdictions might have on the validity of this assumption.

We are not aware of any partial plan wind-up having been declared in respect of the Plan where the Monsanto decision may apply. In preparing this actuarial valuation, we have therefore assumed that all Plan assets are available to cover the Plan liabilities presented in this report. The subsequent declaration of a partial wind-up of the Plan where *Monsanto* may apply in respect of a past event, or disclosure of an existing past partial wind-up, could cause an additional claim on Plan assets, the consequences of which would be addressed in a subsequent report. We note the discretionary nature of the power of the regulatory authorities to declare partial wind-ups and the lack of clarity with respect to the retroactive scope of that power. We are making no representation as to whether the regulatory authorities might declare a partial wind-up in respect of other events in the Plan's history.

3

Valuation Results – Going Concern

Financial Status

A going concern valuation compares the relationship between the value of Plan assets and the present value of expected future benefit cash flows in respect of accrued service, assuming the Plan will be maintained indefinitely.

The results of the current valuation, compared with those from the previous valuation, are summarized as follows:

	2013-12-31	2010-12-31
Assets		
Market value of assets	$262,689,000	$180,464,000
Asset smoothing adjustment	($15,615,000)	($11,900,000)
Smoothed value of assets	$247,074,000	$168,564,000
Going concern funding target		
• Active members	$172,050,000	$140,475,000
• Money purchase feature	$3,090,000	$3,659,000
• Pensioners and survivors	$66,403,000	$37,000,000
• Deferred pensioners	$11,152,000	$5,569,000
Total	$252,695,000	$186,703,000
Funding excess (shortfall)	($5,621,000)	($18,139,000)

The going concern funding target includes a provision for adverse deviations.

Reconciliation of Financial Status

Funding excess (shortfall) as at previous valuation		($18,139,000)
Interest on funding excess (shortfall) at 6.00% per year		($3,465,000)
Employer and employees, special payments, with interest		4,053,000
Expected funding excess (shortfall)		($17,551,000)
Net experience gains (losses)		
• Investment return	$12,465,000	
• Increases in pensionable earnings	$4,964,000	
• Increase in maximum pension	$51,000	
• Indexation	$419,000	
• Mortality	($1,444,000)	
• Retirement	($2,540,000)	
• Termination	($2,396,000)	
• Expenses	($324,000)	
• Interest on employee contributions	$989,000	
Total experience gains (losses)		$12,184,000
Impact of changes in assumptions		
• Economic assumptions	$7,013,000	
• Demographic assumptions	($5,335,000)	
Total assumption changes impact		$1,678,000
Program refinements		($1,985,000)
Net impact of other elements of gains and losses		$53,000
Funding excess (shortfall) as at current valuation		($5,621,000)

Impact of changes in assumptions

The impact of changes in assumptions from the previous valuation is summarized as follows:

Assumption	**Impact**	
Economic assumptions		
• Change in pensionable earnings increase	$660,000	
• Change in inflation, ITA increase and post-retirement indexation	$6,353,000	
Total economic assumption changes impact		$7,013,000
Demographic assumptions		
• Change in mortality table	($11,709,000)	
• Change in termination scale	($1,514,000)	
• Change in retirement scale	$7,888,000	
Total demographic assumption changes impact		($5,335,000)
Total assumption changes impact		$1,678,000

Surplus Accounts

In accordance with Section 3.6 of the Plan, a notional Member Surplus Account and a notional Employer Surplus Account are established and retained in the Trust Fund. These Accounts are adjusted at a rate equal to the net rate of return on the actuarial value of Fund assets. These rates are calculated annually, net of all plan expenses.

The Member Surplus Account evolved over time until it was entirely depleted effective March 1, 2003 when plan improvements were made. Since then, the Member Surplus Account has remained $0 and still is $0 as at December 31, 2013. Also, as per plan rules, and based on valuation results, no amount has yet been allocated to the Employer Surplus Account, which also remains $0 as at December 31, 2013.

Surplus is defined in the Plan as the excess of the actuarial value of Plan assets, excluding Member Surplus and Employer Surplus, over 102% of the Plan's actuarial liabilities on a going-concern basis. Surplus as defined in the Plan is therefore $0 at the valuation date.

Current Service Cost

The current service cost is an estimate of the present value of the additional expected future benefit cash flows in respect of pensionable service that will accrue after the valuation date, assuming the Plan will be maintained indefinitely.

The current service cost during the year following the valuation date, compared with the corresponding value determined in the previous valuation, is as follows:

	2014	**2011**
Total current service cost, including administration expenses	$20,236,000	$17,178,000
Estimated members' share	$8,594,000	$7,212,000
Estimated employer's current service cost	$11,642,000	$9,966,000
Estimated members' pensionable earnings	$150,508,000	$137,888,000
Current service cost expressed as a percentage of members' pensionable earnings		
▪ Employer current service cost	7.7%	7.2%
▪ Member current service cost	5.7%	5.2%
Total current service cost	13.4%	12.4%

The total current service cost rate of 13.4% includes an allowance of 0.60% to cover administrative expenses paid from the fund.

The key factors that have caused a change in the total current service cost since the previous valuation are summarized in the following table:

Employer's current service cost as at previous valuation	12.4%
Demographic changes	0.3%
Changes in assumptions	(0.3%)
Program refinements	1.0%
Total current service cost as at current valuation	13.4%

Discount Rate Sensitivity

The following table summarizes the effect on the going concern funding target shown in this report of using a discount rate which is 1.00% lower than that used in the valuation:

Scenario	**Valuation Basis**	**Reduce Discount Rate by 1%**
Going concern funding target	$252,695,000	$294,918,000
Current service cost		
• Total current service cost, including administrative expenses	$20,236,000	$24,724,000
• Estimated members' share	$8,594,000	$10,852,000
• Estimated employer's current service cost	$11,642,000	$13,872,000
Current service cost expressed as a percentage of pensionable earnings		
• Employer current service cost	7.7%	9.2%
• Member current service cost	5.7%	7.2%
• Total current service cost	13.4%	16.4%

4

Valuation Results – Hypothetical Wind-up

Financial Position

When conducting a hypothetical wind-up valuation, we determine the relationship between the respective values of the Plan’s assets and its liabilities assuming the Plan is wound up and settled on the valuation date, assuming benefits are settled in accordance with the Act and under circumstances producing the maximum wind-up liabilities on the valuation date. The actuary is permitted to disregard benefits which are not contingent on a factor other than the hypothesized scenario, plan member earnings after the valuation date or as required by law.

The hypothetical wind-up financial position as of the valuation date, compared with that at the previous valuation, is as follows:

	2013-12-31	2010-12-31
Assets		
Market value of assets	$262,689,000	$180,464,000
Termination expense provision	($700,000)	($700,000)
Wind-up assets	$261,989,000	$179,764,000
Present value of accrued benefits for:		
• Active members	$205,168,000	$150,711,000
• Money purchase feature	$3,090,000	$3,659,000
• Pensioners and survivors	$77,929,000	$41,589,000
• Deferred pensioners	$15,587,000	$7,555,000
Total wind-up liability	$301,774,000	$203,514,000
Wind-up excess (shortfall)	($39,785,000)	($23,750,000)

Wind-up Incremental Cost to December 31, 2016

The wind-up incremental cost is an estimate of the present value of the projected change in the hypothetical wind-up liabilities from the valuation date until the next scheduled valuation date, adjusted for the benefit payments expected to be made in that period.

The hypothetical wind-up incremental cost determined in this valuation, compared with the corresponding value determined in the previous valuation, is as follows:

	2013-12-31
Number of years covered by report	3 years
Total hypothetical wind-up liabilities at the valuation date (A)	$301,774,000
Present value of projected hypothetical wind-up liability at the next required valuation (including expected new entrants) plus benefit payments until the next required valuation (B)	$381,038,000
Hypothetical wind-up incremental cost (B – A)	$79,264,000

The incremental cost is <u>not</u> an appropriate measure of the contributions that would be required to maintain the financial position of the Plan on a hypothetical wind-up basis unchanged from the valuation date to the next required valuation date, if actual experience is exactly in accordance with the going concern valuation assumptions. This is because it does not reflect the fact that the expected return on plan assets (based on the going concern assumptions) is greater than the discount rate used to determine the hypothetical wind-up liabilities.

Discount Rate Sensitivity

The following table summarizes the effect on the hypothetical wind-up liabilities shown in this report of using a discount rate which is 1% lower than that used in the valuation:

Scenario	**Valuation Basis**	**Reduce Discount Rate by 1%**
Total hypothetical wind-up liability	$301,774,000	$353,321,000

5

Valuation Results – Solvency

Overview

The Act also requires the financial position of the Plan to be determined on a solvency basis. The financial position on a solvency basis is determined in a similar manner to the Hypothetical Wind-up Basis, except for the following:

Exceptions	Reflected in valuation based on the terms of engagement
The circumstance under which the Plan is assumed to be wound up could differ for the solvency and hypothetical wind-up valuations.	The same circumstances were assumed for the solvency valuation as were assumed for the hypothetical wind-up valuation.
Certain benefits can be excluded from the solvency financial position. These include: (a) any escalated adjustment (e.g. indexing), (b) certain plant closure benefits, (c) certain permanent layoff benefits, (d) special allowances other than funded special allowances, (e) consent benefits other than funded consent benefits, (f) prospective benefit increases, (g) potential early retirement window benefit values, and (h) pension benefits and ancillary benefits payable under a qualifying annuity contract.	No benefits were excluded for purposes of the solvency liabilities in this valuation.
The financial position on the solvency basis needs to be adjusted for any Prior Year Credit Balance.	Not applicable.
The solvency financial position can be determined by smoothing assets and the solvency discount rate over a period of up to 5 years.	Smoothing was not used.
The benefit rate increases coming into effect after the valuation date can be reflected in the solvency valuation.	Not applicable.
The Regulations state a valuation report prepared on certain pension plans, including the Plan, with an effective date on or after December 31, 2010 may specify the solvency deficiency to be a stated amount (not to be less than zero).	The solvency deficiency has been specified to be zero.

Financial Position

The financial position on a solvency basis, compared with the corresponding figures from the previous valuation, is as follows:

	2013-12-31	2010-12-31
Assets		
Market value of assets	$262,689,000	$180,464,000
Termination expense provision	($700,000)	($700,000)
Net assets	$261,989,000	$179,764,000
Liabilities		
Total hypothetical wind-up liabilities	$301,774,000	$203,514,000
Value of excluded benefits	$0	($11,063,000)
Liabilities on a solvency basis	$301,774,000	$192,451,000
Surplus (shortfall) on a solvency basis	($39,785,000)	($12,687,000)
Transfer ratio	0.868	0.883

As permitted under Section 1.3.1(3) of the regulations to the *Pension Benefits Act (Ontario)*, the solvency deficiency can be specified to be a stated amount, not to be less than zero. Consequently, **the solvency deficiency as at December 31, 2013 has been specified to be zero.**

6

Minimum Funding Requirements

The Act prescribes the minimum contributions that Canadian Blood Services must make to the Plan. The minimum contributions in respect of a defined benefit component of a pension plan are comprised of going concern current service cost and special payments to fund any going concern or solvency shortfalls. Because the Plan is a jointly-sponsored pension plan, and in accordance with the Plan rules, special payments are shared equally between Canadian Blood Services and Plan members.

In our previous valuation of the Plan for funding purposes, as at December 31, 2010, the contribution rates were set as follows for the period from 2011 through 2013:

Contribution Rate as a Percentage of Pensionable Earnings, 2011-2013

	Members	Employer	Total
2011	5.15%	7.15%	12.30%
2012 – 2013	5.90%	7.90%	13.80%

As at December 31, 2013, the total current service cost is 13.4%, and special payments are required to amortize the going concern deficit. Since the solvency deficiency has been specified to be zero, no special payments are required for solvency purposes. The special payments represent an additional 0.4% of pensionable earnings, bringing the total contribution rate to 13.8%. This results in no change to the total contribution rate for the Plan from the previous valuation.

As per the plan rules, we recommend that Canadian Blood Services and plan members make monthly contributions to the plan from January 1, 2014 to December 31, 2016 based on the following:

Contribution Rate as a Percentage of Pensionable Earnings, 2014-2016

	Members	Employer	Total
2014 – 2016			
• Current service cost	5.7%	7.7%	13.4%
• Provision for amortization of funding shortfall	0.2%	0.2%	0.4%
• Total contribution rate	5.9%	7.9%	13.8%

On the basis of the members' estimated pensionable earnings, we have estimated the members' and employer contributions for the three-year period from January 1, 2014 to December 31, 2016 to be as follows:

Estimated Contributions until December 31, 2016

Year Ending	Member contributions	Employer contributions	Total contributions
December 31, 2014	$8,880,000	$11,890,000	$20,770,000
December 31, 2015	$9,234,000	$12,364,000	$21,598,000
December 31, 2016	$9,592,000	$12,844,000	$22,436,000

The estimated contribution amounts above are based on projected members' pensionable earnings. Therefore, the actual employer's current service cost will be different from the above estimates and, as such, the contribution requirements should be monitored closely to ensure contributions are made in accordance with the Act.

The development of the minimum special payments is summarized in Appendix A.

Other Considerations

Differences Between Valuation Bases

There is no provision in the minimum funding requirements to fund the difference between the hypothetical wind-up and solvency shortfalls, if any.

In addition, although minimum funding requirements do include a requirement to fund the going concern current service cost, there is no requirement to fund the expected growth in the hypothetical wind-up or solvency liability after the valuation date, which could be greater than the going concern current service cost.

Timing of Contributions

Funding contributions are due on a monthly basis. Contributions for current service cost including the expense allowance must be made within 30 days following the month to which they apply. Special payment contributions must be made in the month to which they apply.

Payment of Benefits

The Act imposes certain restrictions on the payment of lump sums from the Plan when the transfer ratio revealed in an actuarial valuation is less than one. If the transfer ratio shown in this report is less than one, the plan administrator should ensure that the monthly special payments are sufficient to meet the requirements of the Act to allow for the full payment of benefits, and otherwise should take the prescribed actions.

Additional restrictions are imposed when:

- The transfer ratio revealed in the most recently filed actuarial valuation is less than one and the administrator knows or ‘ought to know’ that the transfer ratio of the Plan has declined by 10% or more since the date the last valuation was filed.

- The transfer ratio revealed in the most recently filed actuarial valuation is greater than or equal to one and the administrator knows or ‘ought to know’ that the transfer ratio of the Plan has declined to less than 0.9 since the date the last valuation was filed.

As such, the administrator should monitor the transfer ratio of the Plan and, if necessary, take the prescribed actions.

7

Maximum Eligible Contributions

The *Income Tax Act* (the "ITA") limits the amount of employer contributions that can be remitted to the defined benefit component of a registered pension plan. However, notwithstanding the limit imposed by the ITA, for plans which are not 'Designated' as defined in the ITA, in general, the minimum required contributions under the Act can be remitted.

In accordance with Section 147.2 of the ITA and *Income Tax Regulation* 8516, for a plan which is underfunded on either a going concern or on a hypothetical wind-up basis, the maximum permitted contributions are equal to the employer's current service cost, including the explicit expense allowance if applicable, plus the greater of the going concern funding shortfall and hypothetical wind-up shortfall.

For a plan which is fully funded on both going concern and hypothetical wind-up bases, the employer can remit a contribution equal to the employer's current service cost, including the explicit expense allowance if applicable, as long as the surplus in the plan does not exceed a prescribed threshold. Specifically, in accordance with Section 147.2 of the ITA, for a plan which is fully funded on both going concern and hypothetical wind-up bases, the plan may not retain its registered status if the employer makes a contribution while the going concern funding excess exceeds 25% of the going concern funding target.

Schedule of Maximum Contributions

Canadian Blood Services is permitted to fully fund the greater of the going concern and hypothetical wind-up shortfalls, $39,785,000, as well as make current service cost contributions. The portion of this contribution representing the payment of the hypothetical wind-up shortfall can be increased with interest at 3.53% per year from the valuation date to the date the payment is made, and must be reduced by the amount of any deficit funding made from the valuation date to the date the payment is made.

Assuming Canadian Blood Services contributes the greater of the going concern and hypothetical wind-up shortfall of $39,785,000 as of the valuation date, the rule for determining the estimated maximum eligible annual contributions, as well as an estimate of the maximum eligible contributions until the next valuation, are as follows:

	Contribution Rule			Estimated contributions		
Year Ending	**Employer's Monthly current service cost**[2]	**Employees' Monthly current service cost**[2]	**Deficit Funding**	**Employer's current service cost**	**Employees' current service cost**	**Total current service cost**
Dec. 31, 2014	7.7%	5.7%	n/a	$11,604,000	$8,594,000	$20,198,000
Dec. 31, 2015	7.7%	5.7%	n/a	$12,067,000	$8,936,000	$21,003,000
Dec. 31, 2016	7.7%	5.7%	n/a	$12,535,000	$9,283,000	$21,818,000

The employer's current service cost in the above table was estimated based on projected members' pensionable earnings. The actual employer's current service cost will be different from these estimates and, as such, the contribution requirements should be monitored closely to ensure compliance with the ITA.

[2] Expressed as a percentage of members' pensionable earnings.

8

Actuarial Opinion

In our opinion, for the purposes of the valuations:

- the membership data on which the valuation is based are sufficient and reliable,
- the assumptions are appropriate, and,
- the methods employed in the valuation are appropriate.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. It has also been prepared in accordance with the funding and solvency standards set by the *Pension Benefits Act (Ontario)*.

Pascal Berger
Fellow of the Canadian Institute of Actuaries
Fellow of the Society of Actuaries

September 26, 2014
Date

Liza Musni
Fellow of the Canadian Institute of Actuaries
Fellow of the Society of Actuaries

September 26, 2014
Date

APPENDIX A

Prescribed Disclosure

Definitions

The Act defines a number of terms as follows:

Defined Term	Description	Result
Transfer Ratio	The ratio of: (a) solvency assets minus the lesser of the Prior Year Credit Balance and the minimum required employer contributions until the next required valuation; to (b) the sum of the solvency liabilities and liabilities for benefits, other than benefits payable under qualifying annuity contracts that were excluded in calculating the solvency liabilities.	0.868
Prior Year Credit Balance	Accumulated excess of contributions made to the pension plan in excess of the minimum required contributions (note: only applies if the Company chooses to treat the excess contributions as a Prior Year Credit Balance).	$0
Solvency Assets	Market value of assets including accrued or receivable income and excluding the value of any qualifying annuity contracts.	$261,989,000
Solvency Asset Adjustment	The sum of:	
	(a) the difference between smoothed value of assets and the market value of assets;	$0
	(b) the present value of going concern special payments (including those identified in this report) within 6 years following the valuation date;	$3,343,000
	(c) the present value of any previously scheduled solvency special payments (excluding those identified in this report).	$0
		$3,343,000
Solvency Liabilities	Liabilities determined as if the plan had been wound up on the valuation date, including liabilities for plant closure benefits or permanent layoff benefits that would be immediately payable if the employer's business were discontinued on the valuation date of the report, but, if elected by the plan sponsor, excluding liabilities for, (a) any escalated adjustment, (b) excluded plant closure benefits, (c) excluded permanent layoff benefits, (d) special allowances other than funded special allowances, (e) consent benefits other than funded consent benefits, (f) prospective benefit increases, (g) potential early retirement window benefit values, and (h) pension benefits and ancillary benefits payable under a qualifying annuity contract.	$301,774,000

Defined Term	Description		Result
Solvency Liability Adjustment	The amount by which solvency liabilities are adjusted as a result of using a solvency valuation interest rate that is the average of market interest rates calculated over the period of time used in the determination of the smoothed value of assets.		$0
Solvency Deficiency	The amount by which the sum of:		
	(a)	the solvency liabilities	$301,774,000
	(b)	the solvency liability adjustment	$0
	(c)	the prior year credit balance	$0
			$301,774,000
	Exceeds the sum of:		
	(d)	the solvency assets net of estimated termination expenses[3]	$261,989,000
	(e)	the solvency asset adjustment	$3,343,000
			$265,332,000
	(f)	Solvency deficiency before application of Section 1.3.1 of the Regulations:	$36,442,000
	Notwithstanding the above, in accordance with Section 1.3.1(3) of the Regulations, the solvency deficiency can be specified to be an amount less than (f) above, not to be less than zero. The solvency deficiency has been specified to be $0.		$0

Timing of Next Required Valuation

In accordance with the Act the next valuation of the Plan would be required at an effective date within one year of the current valuation date if:

- The ratio of solvency assets to solvency liabilities is less than 85%.
- The employer elected to exclude plant closure or permanent lay-off benefits under Section 5(18) of the regulations, and has not rescinded that election.

Otherwise, the next valuation of the Plan would be required at an effective date no later than three years after the current valuation date.

Accordingly, the next valuation of the Plan will be required as of December 31, 2016.

Special Payments

Based on the results of this valuation, the Plan is not fully funded. In accordance with the Act, any going concern deficits must be amortized over a period not exceeding 15 years, beginning on a date not later than 12 months after the valuation date, and any solvency deficits must be amortized over a period not exceeding 5 years, also beginning on a date not later than 12 months after valuation date. However, since the solvency deficiency has been specified to be zero, no solvency payments are required.

[3] In accordance with accepted actuarial practice, for purposes of determining the financial position, the market value of plan assets was reduced by a provision for estimated termination expenses payable from the Plan's assets that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

As such, special payments must be made as follows:

Type of payment	Start date	End date	Monthly Special Payment	Present Value: Going Concern Basis[4]	Present Value: Solvency Basis[5]
Going concern	**Jan. 1, 2012**	**Dec.31, 2026**	**$51,512**	**$5,621,000**	**$3,343,000**

The present value of going-concern special payments scheduled in the previous valuation exceeded the going concern shortfall. In accordance with the Act, the excess can be used to reduce the amount or the period of any going concern special payment schedule. Therefore, we have reduced the amount of going concern special payment previously determined at the prior valuation from $160,602 per month to $51,512 per month.

However, given the structure of the Plan and its cost sharing arrangement, the above monthly special payment is expressed as a percentage of the members' pensionable earnings. Based on the valuation data, the monthly special payment of $51,512 represents 0.4% of pensionable earnings, which will be shared equally between the plan members and Canadian Blood Services.

Pension Benefit Guarantee Fund (PBGF) Assessment

Under the regulations to the *Pension Benefit Act*, the Plan is exempt from the annual assessment to the Pension Benefits Guarantee Fund.

[4] Based on a going concern discount rate.

[5] Based on the average solvency discount rate.

APPENDIX B

Plan Assets

The pension fund is held by RBC Investment Services. In preparing this report, we have relied upon the pension fund statements prepared by RBC Investment Services and on the audited pension plan statements, without further audit. Customarily, this information would not be verified by a plan's actuary. We have reviewed the information for internal consistency and we have no reason to doubt its substantial accuracy.

Reconciliation of Market Value of Plan Assets

The pension fund transactions since the last valuation are summarized in the following table:

	2011	2012	2013
January 1	$181,011,462	$196,207,816	$223,164,938
PLUS			
Members' contributions	$6,976,674	$7,932,611	$8,455,404
CBS contributions	$9,854,755	$11,068,928	$11,856,799
Investment income	$8,253,870	$10,322,720	$9,812,146
Transfers from other plans	$46,720	$0	$0
Net capital gains (losses)	($3,278,024)	$8,608,291	$19,119,092
	$21,853,995	$37,932,550	$49,243,441
LESS			
Pensions paid	$3,335,405	$4,207,852	$5,009,951
Lump-sums paid	$1,937,355	$5,189,771	$2,435,745
Administration fees	$962,132	$1,133,786	$774,692
Investment fees	$422,749	$444,019	$668,568
	$6,657,641	$10,975,428	$8,888,956
December 31	$196,207,816	$223,164,938	$263,519,423
Gross rate of return[6]	2.67%	9.46%	12.64%
Rate of return net of investment expenses[6]	2.44%	9.22%	12.33%
Rate of return net of all expenses[6]	1.92%	8.63%	11.97%

[6] Assuming mid-period cash flows.

The market value of assets shown in the above table is adjusted to reflect in-transit amounts as follows:

	Current Valuation	Previous Valuation
Market value of invested assets	$263,519,423	$181,011,462
In-transit amounts		
• Members' contributions	$374,947	$248,152
• CBS contributions	$528,937	$353,711
• Expenses	($420,743)	($459,302)
• Benefit payments	($1,313,308)	($690,511)
Market value of assets adjusted for in-transit amounts	$262,689,256	$180,463,512

We have tested the pensions paid, the lump-sums paid, and the contributions for consistency with the membership data for the Plan members who have received benefits or made contributions. The results of these tests were satisfactory.

Investment Policy

The plan administrator has adopted a statement of investment policy and procedures. This policy is intended to provide guidelines for the manager(s) as to the level of risk that is consistent with the Plan's investment objectives. A significant component of this investment policy is the asset mix.

The plan administrator is solely responsible for selecting the Plan's investment policies, asset allocations, and individual investments.

The constraints on the asset mix and the actual asset mix at the valuation date are provided for information purposes:

	Investment Policy			Actual Asset Mix as at December 31, 2013
	Minimum	Target	Maximum	
Canadian Equities	25%	35%	45%	33.0%
Foreign equity				
▪ U.S.	12%	15%	18%	17.0%
▪ Non-North American	8%	10%	12%	11.0%
Fixed income	30%	40%	50%	38.0%
Short term	0%	0%	12%	1.0%
		100%		100%

APPENDIX C

Methods and Assumptions – Going Concern

Valuation of Assets

For this valuation, we have used an adjusted market value method to determine the smoothed value of assets. Under this method, realized and unrealized capital gains (losses) arising during a given year are spread on a straight-line basis over three years in accordance with the schedule shown in the following table:

Year	Percentage of Gains (Losses) Recognized
2013	33 1/3%
2012	66 2/3%
before 2012:	100%

The smoothed value is constrained to a minimum value of 90% of the market value, and a maximum value of 105% of the market value.

The asset values produced by this method are related to the market value of the assets, with the advantage that, over time, the market-related asset values will tend to be more stable than market values. To the extent that more capital gains than losses will arise over the long term, the smoothed value will tend to be lower than the market value.

The smoothed value of the assets at December 31, 2013 was derived as follows:

Market value of assets		$263,519,423
LESS		
Unrecognized capital gains	2013: $19,119,092 x 2/3 =	$12,746,062
(losses) realized or unrealized	2012: $8,608,291 x 1/3 =	$2,869,430
		$15,615,492
Smoothed value of assets		$247,903,931

The smoothed value of assets shown in the above table is adjusted to reflect in-transit amounts as follows:

	Current Valuation	Previous Valuation
Smoothed value of assets	$247,903,931	$169,111,849
In-transit amounts		
• Members' contributions	$374,947	$248,152
• Company's contributions	$528,937	$353,711
• Expenses	($420,743)	($459,302)
• Benefit payments	($1,313,308)	($690,511)
Smoothed value of assets, adjusted for in-transit amounts	$247,073,764	$168,563,899

Going Concern Funding Target

Over time, the real cost to the employer of a pension plan is the excess of benefits and expenses over member contributions and investment earnings. The actuarial cost method allocates this cost to annual time periods.

For purposes of the going concern valuation, we have continued to use the projected unit credit actuarial cost method. Under this method, we determine the present value of benefit cash flows expected to be paid in respect of service accrued prior to the valuation date, based on projected final average earnings. This is referred to as the funding target.

The funding excess or funding shortfall, as the case may be, is the difference between the market or smoothed value of assets and the funding target. A funding excess on a market value basis indicates that the current market value of assets and expected investment earnings are expected to be sufficient to meet the cash flows in respect of benefits accrued to the valuation date as well as expected expenses – assuming the plan is maintained indefinitely. A funding shortfall on a market value basis indicates the opposite – that the current market value of the assets is not expected to be sufficient to meet the plan's cash flow requirements in respect of accrued benefits, absent additional contributions.

As required under the Act, a funding shortfall will be amortized over no more than 15 years through special payments. A funding excess may, from an actuarial standpoint, be applied immediately to reduce required employer current service contributions unless precluded by the terms of the plan or by legislation.

The actuarial cost method used for the purposes of this valuation produces a reasonable matching of contributions with accruing benefits. Because benefits are recognized as they accrue, the actuarial cost method provides an effective funding target for a plan that is maintained indefinitely.

Current Service Cost

The current service cost is the present value of projected benefits to be paid under the plan with respect to service expected to accrue during the period until the next valuation.

The employer's current service cost is the total current service cost reduced by the members' required contributions.

The members' and employer's current service cost have been expressed as a percentage of the members' pensionable earnings to provide an automatic adjustment in the event of fluctuations in membership and/or pensionable earnings.

Under the projected unit credit actuarial cost method, the current service cost for an individual member will increase each year as the member approaches retirement. However, the current service cost of the entire group, expressed as a percentage of the members' pensionable earnings, can be expected to remain stable as long as the average age of the group remains constant.

Actuarial Assumptions – Going Concern Basis

The present value of future benefit payment cash flows is based on economic and demographic assumptions. At each valuation we determine whether, in our opinion, the actuarial assumptions are still appropriate for the purposes of the valuation, and we revise them, if necessary. Emerging experience will result in gains or losses that will be revealed and considered in future actuarial valuations.

The table below shows the various assumptions used in the current valuation in comparison with those used in the previous valuation.

Assumption	Current valuation	Previous valuation
Discount rate:	6.00%	6.00%
Administration expenses:	0.60% of pay	0.57% of pay
Inflation:	2.25%	2.50 %
ITA limit / YMPE increases:	3.25%	3.75%
Pensionable earnings increases:	Updated service related table	Service related table
Post-retirement pension increases:	0.55%	0.75%
Interest on employee contributions:	3.00%	3.00%
Retirement rates:	Updated age related table	Age related table
Termination rates:	Updated age related table	Age related table
Mortality rates:	Combined (Private and Public) CPM 2014 Table	1994 Uninsured Pensioner Mortality Table
Mortality improvements:	Fully generational using improvement scale CPM-B	Fully generational using Scale AA
Commuted value election:	70% below age 55	0%
Commuted value basis:	3.0% for 10 years and 4.6% thereafter with UP94 - generational table	n/a
Disability rates:	None	None

With exception of the discount rate, the assumptions are best estimates and do not include a margin for adverse deviations.

Age or Service Related Tables

Sample rates from the age or service related tables are summarized in the following table:

	Termination		Retirement	
Age	**Current Valuation**	**Previous Valuation**	**Current Valuation**	**Previous Valuation**
20	12.22%	13.37%	0.00%	0.00%
25	10.27%	11.42%	0.00%	0.00%
30	8.71%	9.75%	0.00%	0.00%
35	7.29%	8.33%	0.00%	0.00%
40	6.03%	7.11%	0.00%	0.00%
45	4.91%	6.07%	0.00%	0.00%
50	3.95%	5.19%	0.00%	0.00%
55	0.00%	4.57%	4.00%	2.41%
56	0.00%	0.00%	4.00%	3.24%
57	0.00%	0.00%	4.00%	4.36%
58	0.00%	0.00%	4.00%	5.86%
59	0.00%	0.00%	4.00%	7.88%
60	0.00%	0.00%	8.00%	10.65%
61	0.00%	0.00%	8.00%	14.27%
62	0.00%	0.00%	8.00%	19.19%
63	0.00%	0.00%	8.00%	25.82%
64	0.00%	0.00%	25.00%	34.74%
65	0.00%	0.00%	25.00%	100.00%
66	0.00%	0.00%	25.00%	100.00%
67	0.00%	0.00%	25.00%	100.00%
68	0.00%	0.00%	25.00%	100.00%
69	0.00%	0.00%	25.00%	100.00%
70	0.00%	0.00%	100.00%	100.00%

	Rate of Salary Increase	
Service*	**Current valuation**	**Previous valuation**
0	5.50%	6.14%
5	4.31%	4.84%
10	3.81%	4.28%
15	3.60%	3.95%
20	3.46%	3.72%
25	3.35%	3.54%
30	3.27%	3.40%
35	3.20%	3.27%

*Completed years at the valuation date.

Pensionable Earnings

The benefits ultimately paid will depend on each member's final average earnings. To calculate the pension benefits payable upon retirement, death or termination of employment, we have taken the annualized pensionable earnings during 2013 and assumed that such pensionable earnings will increase at the assumed rates shown above.

Rationale for Assumptions

A rationale for each of the assumptions used in the current valuation is provided below.

Discount Rate

We have discounted the expected benefit payment cash flows using the expected investment return on the market value of the fund. Other bases for discounting the expected benefit payment cash flows may be appropriate, particularly for purposes other than those specifically identified in this valuation report.

The discount rate is comprised of the following:

- Estimated returns for each major asset class consistent with market conditions on the valuation date and the target asset mix specified in the Plan's investment policy.
- Implicit provision for investment expenses determined as the hypothetical fees that would be incurred for passive management of all assets.
- A margin for adverse deviations of 0.70% is included.

The discount rate was developed as follows:

Assumed investment return	6.80%
Investment expense provision	(0.10%)
Margin for adverse deviation	(0.70%)
Net discount rate	6.00%

Expenses

The assumed investment return reflects an implicit provision for investment expenses. We have also included an allowance of 0.6% of pensionable earnings in the current service cost to meet administrative expenses charged to the fund. This is established to provide approximately $900,000 of administration expenses for 2014 and increase with the pension fund thereafter. This amount is in accordance with the budget for expenses prepared by the Trustees in 2014.

Inflation

The inflation assumption is based on market expectations of long-term inflation implied by the yields on nominal and real return bonds at the valuation date of 2.25%.

Income Tax Act Pension Limit and Year's Maximum Pensionable Earnings

The assumption is based on historical real economic growth and the underlying inflation assumption.

Post-retirement pension increases

The assumption is based on the Plan formula and inflation assumption above. Pensions in payment are assumed to increase annually at a rate of 0.55%. This assumption reflects the Plan's indexation formula, as well as expected fluctuations in inflation around the assumed mean of 2.25% per year.

Pensionable Earnings

The assumption is based on an experience study that was conducted in 2014, considering actual increases over the years 2008 to 2013, inclusive.

Retirement Rates

The assumption is based on experience over the years 2008 to 2013, inclusive.

Termination Rates

The assumption is based on experience over the years 2008 to 2013, inclusive.

Mortality Rates

The assumption for the mortality rates is based on The Canadian Pensioner's Mortality (CPM) study published by the Canadian Institute of Actuaries in February 2014.

Due to the size of the Plan, specific data on plan mortality experience is insufficient to determine the mortality rates. After considering plan-specific characteristics, such as the type of employment, the industry experience, pension and employment income for the plan members, and data in the CPM study, it was determined to use the CPM (Combined – Private and Public) mortality rates without adjustment.

There is broad consensus among actuaries and other longevity experts that mortality improvement will continue in the future, but the degree of future mortality improvement is uncertain. The mortality improvement scale published in the CPM study represents one reasonable outlook for future improvement. We have used the CPM-B mortality improvement scale without adjustment.

Based on the assumption used, the life expectancy of a member age 65 at the valuation date is 22.2 years for males and 24.5 years for females.

Interest on Employee Contributions

The assumption is based on Plan terms, market expectations of returns on Federal long-term bonds and historical spreads.

Disability Rates

Use of a different assumption would not have a material impact on the valuation.

APPENDIX D

Methods and Assumptions – Hypothetical Wind-up and Solvency

Hypothetical Wind-up Basis

The Canadian Institute of Actuaries requires actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit. For the purposes of the hypothetical wind-up valuation, the plan wind-up is assumed to occur in circumstances that maximize the actuarial liability.

To determine the actuarial liability on the hypothetical wind-up basis, we have valued those benefits that would have been paid had the Plan been wound up on the valuation date, including benefits that would be immediately payable if the employer's business were discontinued on the valuation date, with all members fully vested in their accrued benefits.

Upon plan wind-up, members are given options for the method of settling their benefit entitlements. The options vary by eligibility and by province of employment, but in general, involve either a lump sum transfer or an immediate or deferred pension.

The value of benefits assumed to be settled through a lump sum transfer is based on the assumptions described in Section 3500 – *Pension Commuted Values* of the Canadian Institute of Actuaries Standards of Practice applicable for December 31, 2013.

Benefits provided as an immediate or deferred pension are assumed to be settled through the purchase of annuities based on an estimate of the cost of purchasing annuities.

However, there is limited data available to provide credible guidance on the cost of a purchase of indexed annuities in Canada. We have estimated the cost of settlement through purchase of annuities in accordance with the *Canadian Institute of Actuaries Educational Note: Assumptions for Hypothetical Wind-up and Solvency Valuations with Effective Dates Between December 31, 2013 and December 30, 2014.*

We have not included a provision for adverse deviation in the solvency and hypothetical wind-up valuations.

The assumptions are as follows:

Form of Benefit Settlement Elected by Member	
Lump sum	70% of active members under age 55, and 50% of active members over age 55, elect to receive their benefit entitlement in a lump sum.
Annuity purchase	All remaining members are assumed to elect to receive their benefit entitlement in the form of a deferred or immediate pension. These benefits are assumed to be settled through the purchase of deferred or immediate annuities from a life insurance company.
Basis for Benefits Assumed to be Settled through a Lump Sum	
Mortality rates:	UP94 generational with projection scale AA
Interest rate:	3.00% per year for 10 years, 4.60% per year thereafter
Pension increase:	0.26% per year for 10 years, 0.54% per year thereafter
Basis for Benefits Assumed to be Settled through the Purchase of an Annuity	
Mortality rates:	UP94 generational with projection scale AA
Interest rate:	3.93% per year
Pension increase:	0.81% per year
Retirement Age	
Maximum value:	Members are assumed to retire at the age which maximizes the value of their entitlement from the Plan, based on the eligibility requirements which have been met at the valuation date.
Grow-in:	The benefit entitlement and assumed retirement age of Ontario and Nova Scotia members whose age plus service equals at least 55 at the valuation date reflect their entitlement to grow into early retirement subsidies.
Other Assumptions	
Special payments	Discounted at the average interest rate of 3.53% per year
Final average earnings:	Based on actual pensionable earnings over the averaging period
Family composition:	Same as for going concern valuation
Maximum pension limit:	$2,770.00 increasing at 2.30% per year for 10 years, 3.20% per year thereafter
Termination expenses:	$700,000

To determine the hypothetical wind-up position of the Plan, a provision has been made for estimated termination expenses payable from the Plan's assets in respect of actuarial and administration expenses that may reasonably be expected to be incurred in terminating the Plan and to be charged to the Plan.

Because the settlement of all benefits on wind-up is assumed to occur on the valuation date and is assumed to be uncontested, the provision for termination expenses does not include custodial, investment management, auditing, consulting, and legal expenses that would be incurred between the wind-up date and the settlement date or due to the terms of a wind-up being contested.

Expenses associated with the distribution of any surplus assets that might arise on an actual wind-up are also not included in the estimated termination expense provisions.

In determining the provision for termination expenses payable from the Plan's assets, we have assumed that the plan sponsor would be solvent on the wind-up date. We have also assumed, without analysis, that the Plan's terms as well as applicable legislation and court decisions would permit the relevant expenses to be paid from the Plan.

Actual fees incurred on an actual plan wind-up may differ materially from the estimates disclosed in this report.

Incremental Cost

In order to determine the incremental cost, we estimate the hypothetical wind-up liabilities at the next valuation date. We have assumed that the cost of settling benefits by way of a lump sum or purchasing annuities remains consistent with the assumptions described above. Since the projected hypothetical wind-up liabilities will depend on the membership in the Plan at the next valuation date, we must make assumptions about how the Plan membership will evolve over the period until the next valuation.

We have assumed that the Plan membership will evolve in a manner consistent with the going concern assumptions as follows:

- Members terminate, retire, and die consistent with the termination, retirement, and mortality rates used for the going concern valuation.
- Pensionable earnings, the *Income Tax Act* pension limit, and the Year's Maximum Pensionable Earnings increase in accordance with the related going concern assumptions.
- Active members accrue pensionable service in accordance with the terms of the Plan.
- To accommodate for new entrants to the Plan, we have added to the projected liability an amount equal to the liability of new entrants that have joined the Plan since the previous valuation, increased to reflect 3 years of inflation and productivity.
- Cost of living adjustments are consistent with the inflation assumption used for the going concern valuation.

Solvency Basis

In determining the financial position of the Plan on the solvency basis, we have excluded the future indexation of benefits. As such the post-retirement indexation rate was assumed to be 0%. All other methods and assumptions are the same as the ones used for determining the wind-up position of the Plan.

The solvency position is determined in accordance with the requirements of the Act.

APPENDIX E

Membership Data

Analysis of Membership Data

The actuarial valuation is based on membership data as at December 31, 2013, provided by Morneau Shepell Inc., the plan's third-party administrator.

We have applied tests for internal consistency, as well as for consistency with the data used for the previous valuation. These tests were applied to membership reconciliation, basic information (date of birth, date of hire, date of membership, gender, etc.), pensionable earnings, credited service, contributions accumulated with interest, and pensions to retirees and other members entitled to a deferred pension. Contributions, lump sum payments, and pensions to retirees were compared with corresponding amounts reported in financial statements. The results of these tests were satisfactory.

If the data supplied are not sufficient and reliable for its intended purpose, the results of our calculation may differ from the results that would be obtained with such data. Although Mercer has reviewed the suitability of the data for its intended use in accordance with accepted actuarial practice in Canada, Mercer has not verified or audited any of the data or information provided.

Plan membership data are summarized below. For comparison, we have also summarized corresponding data from the previous valuation.

	2013-12-31	2010-12-31
Active Members		
Number	2,855	2,875
Total pensionable earnings for the following year	$150,507,900	$137,888,000
Average pensionable earnings for the following year	$52,700	$48,000
Average annualized pensionable earnings for the following year	$61,000	$58,200
Average years of pensionable service	7.10	6.10
Average age	48.0	47.2
Average part-time ratio	85%	82%
Proportion of females	79%	81%
Accumulated contributions with interest	$61,984,000	$50,137,000
Money Purchase Feature contribution balance	$3,090,000	$3,659,000
Deferred Pensioners		
Number	321	192
Total annual pension	$1,530,600[7]	$886,200
Average annual pension	$4,937	$4,620
Average age	48.8	48.1
Pensioners and Survivors		
Number	491	279
Total annual lifetime pension	$5,279,500	$3,040.600
Average annual lifetime pension	$10,753	$10,900
Average age	66.9	66.4
Terminated members with benefits not settled[8]		
Number	174	130
Average estimated transfer value	$7,550	$5,300

[7] Excludes 11 outstanding members.

[8] Treated as benefit payments in transit in the accrued value of assets.

The membership movement for all categories of membership since the previous actuarial valuation is as follows:

	Actives	Deferred Vested	Pensioners and Beneficiaries	Total
Total at 2010-12-31	2,875	192	279	3,346
New entrants	811	-	-	811
Terminations:	(631)	132	-	(499)
Deaths	(13)	-	(3)	(16)
Retirements	(195)	(15)	210	-
Survivors	-	-	8	8
Data adjustments	8	12	(3)	17
Total at 2013-12-31	2,855	321	491	3,667

The distribution of the active members by age and their 2013 annualized pensionable earnings by age and pensionable service as at December 31, 2013 is summarized as follows:

	Years of Pensionable Service								
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30 – 34**	**35+**	**Total**
Under 25	29								29
	41,071								41,071
25 to 29	120	7							127
	49,568	48,123							49,489
30 to 34	179	47	3						229
	51,663	48,250	42,873						50,548
35 to 39	183	81	36						300
	54,334	61,292	60,287						56,927
40 to 44	169	119	73	6	2				369
	56,866	62,845	66,932	66,876	*				*
45 to 49	190	147	82	23	15	4			461
	57,359	61,058	65,696	63,784	56,327	53,594			60,276
50 to 54	202	154	97	26	27	11	4		521
	55,863	62,723	67,716	65,715	57,064	60,254	51,822		60,713
55 to 59	149	137	86	19	24	20	6	1	442
	56,784	62,650	63,122	58,113	76,500	53,899	57,299	*	*
60 to 64	97	106	56	9	11	11	7	4	301
	55,208	60,976	61,741	86,987	68,133	63,358	44,217	41,531	59,738
65 +	15	35	16	3	3	2	2		76
	55,389	69,021	61,220	43,847	51,238	*	*		62,905
Total	1,333	833	449	86	82	48	19	5	2,855
	54,591	61,399	64,601	65,063	*	*	*	*	58,753

* Not shown for confidentiality reasons

The distribution of the inactive members by age as at the valuation date is summarized as follows:

	Deferred Pensioners		Pensioners and Survivors	
Age	**Number**	**Average Pension**	**Number**	**Average Pension**
< 35	33	$1,562		
35 – 39	32	$3,164		
40 – 44	47	$4,672		
45 – 49	51	$4,570		
50 – 54	42	$4,605	1	$3,428
55 – 59	52	$7,475	50	$7,472
60 – 64	40	$7,074	124	$8,730
65 – 69	9	$4,843	183	$11,834
70 – 74	4	$4,110	96	$12,081
75 – 79			32	$14,000
80 +			5	$9,307
Total	310[9]	$4,937	491	$10,753

[9] Excludes 11 outstanding members.

APPENDIX F

Summary of Plan Provisions

Mercer has used and relied on the plan documents, including amendments and interpretations of plan provisions, supplied by the Canadian Blood Services. If any plan provisions supplied are not accurate and complete, the results of any calculation may differ significantly from the results that would be obtained with accurate and complete information. Moreover, plan documents may be susceptible to different interpretations, each of which could be reasonable, and the results of estimates under each of the different interpretations could vary.

This valuation is based on the plan provisions in effect on December 31, 2013. Since the previous valuation, the Plan has been amended to consider changes in the Pension Benefits Act (Ontario) and the Regulations to the Act with respect to vesting and grow-in benefits.

The following is a summary of the main provisions of the Plan in effect on December 31, 2013. This summary is not intended as a complete description of the Plan.

Background	The Canadian Blood Services Defined Benefit Pension Plan became effective September 28, 1998 further to the transfer of responsibilities with respect to the collection and delivery of blood supplies in Canada, outside the province of Quebec, from the Canadian Red Cross Society to Canadian Blood Services. The Plan is a jointly-sponsored pension plan, as defined by the *Pension Benefits Act* (Ontario), and as certified upon filing the report on the actuarial valuation for funding purposes as at December 31, 2010.
Eligibility for membership	Members of the Canadian Red Cross Pension Plan (defined benefit part) were automatically enrolled in the Plan as of the effective date. New regular full-time employees who are members of a Participating Union may join after 3 months of continuous service and must join after 2 years. Other regular full-time employees may join after 3 months continuous service and must join either this plan or the Canadian Blood Services Defined Contribution Pension Plan after 2 years. Employees who are not regular full-time employees may join the Plan, or the Canadian Blood Services Defined Contribution Pension Plan if they are not members of a Participating Union, after 3 months of continuous service.

Employee Contributions	If the total contribution rate, as determined by the funding actuarial valuation, falls between 9.5% and 11.5% of pensionable earnings, members pay 4.75% and the employer pays the balance of the cost. If the total contribution rate, as determined by the funding actuarial valuation, falls outside the range of 9.5% to 11.5%, the reduction or additional cost will be shared equally between the employer and plan members. Grandfathered additional optional contributions (the money purchase feature) were permitted under the Plan until November 30, 2004. These contributions accumulate on a money purchase basis with the fund rate of return, minus applicable expenses, until payment upon retirement, death or termination of employment.
Retirement Dates	Normal Retirement Date ▪ The normal retirement date is the first day of the month coincident with or next following the member's 65th birthday. Early Retirement Date ▪ The member may choose to retire as early as age 55. Postponed Retirement Date ▪ Retirement may be postponed beyond the normal retirement date. The pension must commence by the end of the year in which the member reaches age 71.
Normal Retirement Pension	If a member retires on the Normal Retirement Date, the member will be entitled to a pension equal to: ▪ 2.0% times the average of the member's best five consecutive years of annualized earnings times years of credited service prior to November 1, 1997; plus ▪ 1.6% times the average of the member's best five consecutive years of annualized earnings times years of credited service after October 31, 1997.
Pensionable earnings	Base pay
Early Retirement Pension	If a member retires early, the member will be entitled to a pension that is calculated the same way as for a normal retirement. The basic pension payable, however, will be reduced by a given percentage for each month before the normal retirement date, as follows: ▪ For the first 60 months: 0.3% per month ▪ For the next 60 months: 0.4% per month
Postponed Retirement Pension	Benefits will continue to accrue as normal.
Maximum Pension	The total annual pension payable from the Plan upon retirement, death or termination of employment cannot exceed the lesser of: ▪ 2% of the average of the best three consecutive years of total compensation paid to the member by Canadian Blood Services, multiplied by total credited service; and ▪ $2,770 in 2014 or such other maximum subsequently permitted under the *Income Tax Act*, multiplied by the member's total credited service. The maximum pension is determined at the date of pension commencement.

Death benefits	Pre-retirement: • If a member dies before the normal retirement date and before any pension payments have begun, the member's spouse, or beneficiary if there is no spouse, will receive a lump sum settlement equal to the value of the benefits to which the member would have been entitled had employment terminated on the date of death (or had the member retired, if he is age 55 or more), including the 50% rule, plus the value of optional contributions, including employer matching contributions. Post retirement: • The normal form of payment is a lifetime pension guaranteed for ten years. However, the member may elect to receive an optional form of pension on an actuarial equivalent basis. If a member has an eligible spouse, the member must choose a two-thirds or 100% joint & survivor pension, paid on an actuarially equivalent basis, unless waived by the member and spouse.
Termination Benefits	Upon termination of employment, a member is entitled to a deferred pension. The member may also transfer the commuted value of that pension into another retirement vehicle in accordance with the applicable Federal and provincial legislation. Deferred pensions are payable commencing at age 65. However, a member may elect to receive an actuarially reduced early retirement pension as early as age 55. If the member has 1 or more years of credited service, he is entitled to the greater of commuted value of pension including the 50% rule or the return of member contributions times a factor (locked-in). The factor equals 110% for those with 1 year credited service increasing by 10% for each year to reach 200% for those with 10 or more years credited service. This report reflects the election made by the Plan sponsors to exclude the Plan from the operation of Section 74 of the Pension Benefits Act (Ontario).
Disability Benefits	If a member becomes totally disabled, the employer will pay the member's required contributions during the period of disability. The member's earnings rate in effect at the onset of disability is used to determine contributions and benefits during the disability period.
Indexation during retirement	Pensions in pay are indexed annually to 75% of the increase in CPI in excess of 2%, subject to a maximum annual increase of 5.5%. From time to time, at their discretion, the Trustees may increase pensions in pay further on an ad hoc basis. The most recent ad hoc increase was granted effective January 1, 2008.

APPENDIX G

Employer and Trustees Certification

With respect to the Report on the Actuarial Valuation for Funding Purposes as at December 31, 2013 of the Canadian Blood Services Defined Benefit Pension Plan, I hereby certify that, to the best of my knowledge and belief:

- The valuation reflects the terms of the Canadian Blood Services Defined Benefit Pension Plan Board of Trustees engagement with the actuary described in section 2 of this report, particularly the requirement to include a margin of 0.7% in the discount rate used to perform the going concern valuation.
- The valuation reflects the Trustees decisions in regard to determining solvency funding requirements.
- A copy of the official plan documents and of all amendments made up to December 31, 2013 was provided to the actuary and is reflected appropriately in the summary of plan provisions contained herein.
- The asset information summarized in Appendix B is reflective of the Plan's assets.
- The membership data provided to the actuary included a complete and accurate description of every person who is entitled to benefits under the terms of the Plan for service up to December 31, 2013.
- All events subsequent to December 31, 2013 that may have an impact on the Plan have been communicated to the actuary.

2014-09-25	2014-09-25
Date	Date
[signature]	[signature]
Signed	Signed
Pauline Port	BRENDAN DICK
Name	Name
Trustee - Co-Chair	Trustee - Co-Chair
Title	Title

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