MERCER

TALENT • HEALTH • RETIREMENT • INVESTMENTS

# SPECIAL FORCES PENSION PLAN
REPORT ON THE ACTUARIAL VALUATION FOR FUNDING PURPOSES AS AT DECEMBER 31, 2013

August 2014

Canada Revenue Agency Registration Number:  0584375

MARSH & McLENNAN COMPANIES

**Note to reader regarding actuarial valuations:**
This valuation report may not be relied upon for any purpose other than those explicitly noted in the Introduction, nor may it be relied upon by any party other than the parties noted in the Introduction. Mercer is not responsible for the consequences of any other use. A valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict a pension plan's future financial condition or its ability to pay benefits in the future. If maintained indefinitely, a plan's total cost will depend on a number of factors, including the amount of benefits the plan pays, the number of people paid benefits, the amount of plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the valuation date. The content of the report may not be modified, incorporated into or used in other material, sold or otherwise provided, in whole or in part, to any other person or entity, without Mercer's permission. All parts of this report, including any documents incorporated by reference, are integral to understanding and explaining its contents; no part may be taken out of context, used, or relied upon without reference to the report as a whole.
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.

The solvency 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 Public Sector Pension Plans Act, the Income Tax Act and related regulations, and the Employment Pension Plans 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
**($000,000's)**

| **Going-Concern Financial Position, Minimum Indexing for Post-2000 Service** | **31.12.2013** | **31.12.2011** |
|---|---|---|
| Actuarial value of assets | $1,902.4 | $1,566.1 |
| Actuarial liability | $2,367.0 | $2,057.4 |
| Funding excess (unfunded liability) | ($464.6) | ($491.3) |
| Funded ratio | 80.4% | 76.1% |
| **Gong-Concern Financial Position, Indexing at 30% of CPI for Post-2000 Service** | **31.12.2013** | **31.12.2011** |
| Actuarial value of assets | $1,902.4 | $1,566.1 |
| Actuarial liability | $2,388.3 | $2,079.0 |
| Funding excess (unfunded liability) | ($485.9) | ($512.9) |
| Funded ratio | 79.7% | 75.3% |
| **Solvency Financial Position[1]** | **31.12.2013** | **31.12.2011** |
| Solvency assets | $2,025.3 | $1,547.9 |
| Solvency liability | $3,013.3 | $2,709.0 |
| Solvency excess (deficiency) | ($988.0) | ($1,161.1) |
| Solvency ratio | 67.2% | 57.1% |

[1] Note that in respect of pre-1992 service, the Government of Alberta has an obligation to fund a portion of the unfunded liability. Their share is being funded by contributions of 1.25% of payroll each year. The present value of these future contributions has not been included as an asset in this financial summary.

# Summary of Results (cont'd.)
**($000,000's)**

| Funding Requirements, Based on COLA for Post-2000 Service at 30% of CPI | 2014 | 2012 |
|---|---|---|
| Current service cost expressed as a percentage of pensionable earnings in following year | | |
| Basic Current Service Cost plus expenses | 19.42% | 18.04% |
| COLA | 1.50% | 1.50% |
| Total | 20.92% | 19.54% |
| Pre-1992 Unfunded Liability Contributions | 2.75% | 2.75% |
| Post-1991 Unfunded Liability Contributions | 5.58% | 6.96% |
| Total Contributions | 29.25% | 29.25% |

# 2

# Introduction

## To the Special Forces Pension Board

At your request, we have conducted an actuarial valuation of the Special Forces Pension Plan (the “SFPP” or the “Plan”) as at 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, solvency and wind-up bases; and
- The range of permissible funding contributions pursuant to the *Public Sector Pension Plans Act* for years 2014 and on.

The information contained in this report was prepared for the Special Forces Pension Board and Alberta Treasury Board & Finance for their internal use and for filing with the Canada Revenue Agency, in connection with our actuarial valuation of the plan. This report is not intended or necessarily suitable for other purposes.

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, in accordance with the minimum requirements of the *Public Sector Pension Plans Act*.

## Terms of Engagement

In accordance with our terms of engagement with the Board of 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; and
- As instructed by the Board of Trustees, we have reflected a margin for adverse deviations in our going-concern valuation by reducing the going-concern discount rate by 0.90% per year.

## Events since the Last Valuation at December 31, 2011

### *Pension Plan*

We are not aware of any changes to the plan since the previous valuation at December 31, 2011 that have a material effect on the plan’s funding.

This valuation reflects the provisions of the plan as at December 31, 2013. A summary of the plan provisions is provided in Appendix D.

## *Assumptions*

We have used the same going-concern valuation assumptions and methods as were used for the previous valuation, except for the following:

| | **Current Valuation** | **Previous Valuation** |
|---|---|---|
| Discount Rate | 6.1% | 6.3% |
| Mortality Rates | 120% of the rates of the 2014 Canadian Pensioners Mortality Table (CPM2014) | 100% of the rates of the 1994 Uninsured Pensioner Mortality Table |
| Mortality Improvements | Fully generational using CPM Improvement Scale B | Fully generational using Scale AA |
| Interest credited on employee contributions | 3.50% | 5.00% |
| Explicit expenses | $2.6 million | $2.2 million |

The solvency assumptions have been updated to reflect market conditions at the valuation date.

A summary of the going-concern and solvency methods and assumptions are provided in Appendix B.

## *Regulatory Environment and Actuarial Standards*

The Alberta government enacted legislation exempting certain public sector pension plans from funding solvency deficiencies effective January 1, 2003. The funding requirements of the Plan incorporated in this valuation report reflect this legislation.

We are not aware of any other changes to the *Public Sector Pension Plans Act* which impact the funding of the Plan.

## Subsequent Events

After checking with representatives of the Company, 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.

# 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.

Within the Plan, cost-of-living adjustments ("COLA" or "indexing") are made on a contractual basis at 60% of Alberta CPI for pre-2001 service. Indexing for service after 2000 is set based on Board policy and financial affordability.

Members and employers currently contribute 1.5% of covered pay (0.75% of covered pay each) towards indexing for post-2000 service. These contributions, together with accumulated capital appreciation (depreciation) and other investment income, are deposited in the Indexing Fund of the Plan and ultimately used to provide indexing in respect of benefits for post-2000 service.

Since the value of the Indexing Fund must ultimately be used to provide indexing under the Plan terms, the Board holds a minimum COLA liability on the Plan's balance sheet for post-2000 service equal to the value of the Indexing Fund.

The Income Tax Act and associated Regulations prescribe the maximum level of indexing that the Board may grant for post-2000 service. Currently, this maximum is set at 100% of CPI. The Board, therefore, may not establish balance sheet liabilities or contribution rates that include indexing at a level higher than 100% of Alberta CPI.

Within these boundaries (the minimum and maximum indexing as outlined in the preceding two paragraphs), the Board may establish the rate of indexing for post-2000 service, provided that the Plan continues to meet the minimum funding requirements of the Alberta *Employment Pension Plans Act*.

In this report, the financial position of the Plan has been illustrated under the following three scenarios:

1. Minimum indexing based on the value of the Indexing Fund and current service contributions towards COLA;

2. Maximum indexing based on the limits imposed under the Income Tax Act; and

3. Indexing based on 30% of Alberta CPI, which is the historical level of indexing provided. The cost of providing indexing of 30% of Alberta CPI is approximately 1.6% of pay, higher than the 1.5% current service contribution towards COLA (ignoring any unfunded liabilities relating to indexing for post-2000 service). The difference of 0.1% of pay is made up by additional current service cost contributions.

## *Financial Position – Minimum Indexing*

The results of the valuation as at December 31, 2013, in comparison with those of the previous valuation as at December 31, 2011, are summarized as follows:

**Financial Position – Going-Concern Basis ($000,000's)**
**Minimum Indexing for Post-2000 Service Based on Value of Indexing Fund**

| | 31.12.2013 | 31.12.2011 |
|---|---|---|
| **Actuarial value of assets** | | |
| Adjusted market value – Main Fund | $1,970.1 | $1,513.9 |
| Smoothing adjustment | ($123.7) | $17.4 |
| Total actuarial value of assets – Main Fund | $1,846.4 | $1,531.3 |
| Market value – Indexing Fund | $56.0 | $34.8 |
| Total actuarial value of assets | $1,902.4 | $1,566.1 |
| | | |
| **Actuarial liability** | | |
| Present value of accrued benefits for: | | |
| • Active members | $1,066.7 | $947.2 |
| • Pensioners and survivors | $1,231.6 | $1,066.7 |
| • Deferred pensioners and hold-on-deposits | $12.7 | $8.7 |
| • Indexing for post-2000 service | $56.0 | $34.8 |
| Total liability | $2,367.0 | $2,057.4 |
| **Funding excess (unfunded liability)** | ($464.7) | ($491.3) |
| **Funded ratio** | 80.4% | 76.1% |

Due to the nature of the financing arrangement for the unfunded liability in respect of pre-1992 service, it is necessary to track the financial status of the plan for service before and after January 1, 1992. The following table summarizes this split.

**Minimum Indexing for Post-2000 Service Based on Value of Indexing Fund**

| | As at December 31, 2013 ($000,000's) | | |
|---|---|---|---|
| | **Pre-1992** | **Post-1991** | **Total** |
| **Actuarial value of assets** | | | |
| Adjusted market value – Main Fund | $598.2 | $1,371.9 | $1,970.1 |
| Smoothing adjustment | ($39.7) | ($84.0) | ($123.7) |
| Total actuarial value of assets – Main Fund | $558.5 | $1,287.9 | $1,846.4 |
| Market value – Indexing Fund | $0.0 | $56.0 | $56.0 |
| Total actuarial value of assets | $558.5 | $1,343.9 | $1,902.4 |
| **Actuarial liability** | | | |
| Present value of accrued benefits for: | | | |
| • Active members | $96.5 | $970.2 | $1,066.7 |
| • Pensioners and survivors | $747.7 | $483.9 | $1,231.6 |
| • Deferred pensioners and hold-on-deposits | $1.8 | $10.9 | $12.7 |
| • Indexing for post-2000 service | $0.0 | $56.0 | $56.0 |
| Total liability | $846.0 | $1,521.0 | $2,367.0 |
| **Funding excess (unfunded liability)** | ($287.5) | ($177.1) | ($464.6) |
| **Funded ratio** | 66.0% | 88.4% | 80.4% |
| Government share of unfunded liability | $186.1 | $0.0 | $186.1 |
| Employer and member share of unfunded liability | $101.4 | $177.1 | $278.5 |

## *Financial Position – Maximum Indexing*

The financial position of the Plan reflecting the maximum level of indexing for post-2000 service that is permitted under the Income Tax Act is as follows. A comparison with the results of the valuation as at December 31, 2011 is also provided:

**Financial Position – Going-Concern Basis ($000,000's)**
**Maximum Indexing for Post-2000 Service Based on 100% of Alberta CPI**

| | 31.12.2013 | 31.12.2011 |
|---|---|---|
| **Actuarial value of assets** | | |
| Adjusted market value – Main Fund | $1,970.1 | $1,513.9 |
| Smoothing adjustment | ($123.7) | $17.4 |
| Total actuarial value of assets – Main Fund | $1,846.4 | $1,531.3 |
| Market value – Indexing Fund | $56.0 | $34.8 |
| Total actuarial value of assets | $1,902.4 | $1,566.1 |
| **Actuarial liability** | | |
| Present value of accrued benefits for: | | |
| • Active members | $1,315.7 | $1,134.0 |
| • Pensioners and survivors | $1,285.8 | $1,100.3 |
| • Deferred pensioners and hold-on-deposits | $16.7 | $11.2 |
| Total liability | $2,618.2 | $2,245.5 |
| **Funding excess (unfunded liability)** | ($715.8) | ($679.4) |
| **Funded ratio** | 72.7% | 69.7% |

Due to the nature of the financing arrangement for the unfunded liability in respect of pre-1992 service, it is necessary to track the financial status of the plan for service before and after January 1, 1992. The following table summarizes this split.

**Maximum Indexing For Post-2000 Service Based on 100% of Alberta CPI**

| | As at December 31, 2013 ($000,000's) | | |
|---|---|---|---|
| | **Pre-1992** | **Post-1991** | **Total** |
| **Actuarial value of assets** | | | |
| Adjusted market value – Main Fund | $598.2 | $1,371.9 | $1,970.1 |
| Smoothing adjustment | ($39.7) | ($84.0) | ($123.7) |
| Total actuarial value of assets – Main Fund | $558.5 | $1,287.9 | $1,846.4 |
| Market value – Indexing Fund | $0.0 | $56.0 | $56.0 |
| Total actuarial value of assets | $558.5 | $1,343.9 | $1,902.4 |
| **Actuarial liability** | | | |
| Present value of accrued benefits for: | | | |
| • Active members | $96.5 | $1,219.2 | $1,315.7 |
| • Pensioners and survivors | $747.7 | $538.1 | $1,285.8 |
| • Deferred pensioners and hold-on-deposits | $1.8 | $14.9 | $16.7 |
| Total liability, inclusive of COLA | $846.0 | $1,772.2 | $2,618.2 |
| **Funding excess (unfunded liability)** | ($287.5) | ($428.3) | ($715.8) |

## *Financial Position – Indexing at 30% of CPI*

The financial position of the Plan reflecting indexing for post-2000 service at 30% of Alberta CPI is as follows. A comparison with the results of the valuation as at December 31, 2011 is also provided:

**Financial Position – Going-Concern Basis ($000,000's)**
**Indexing for Post-2000 Service Based on 30% of Alberta CPI**

| | 31.12.2013 | 31.12.2011 |
|---|---|---|
| **Actuarial value of assets** | | |
| Adjusted market value – Main Fund | $1,970.1 | $1,513.9 |
| Smoothing adjustment | ($123.7) | $17.4 |
| Total actuarial value of assets – Main Fund | $1,846.4 | $1,531.3 |
| Market value – Indexing Fund | $56.0 | $34.8 |
| Total actuarial value of assets | $1,902.4 | $1,566.1 |
| **Actuarial liability** | | |
| Present value of accrued benefits for: | | |
| • Active members | $1,129.2 | $994.5 |
| • Pensioners and survivors | $1,245.4 | $1,075.3 |
| • Deferred pensioners and hold-on-deposits | $13.7 | $9.2 |
| Total liability | $2,388.3 | $2,079.0 |
| **Funding excess (unfunded liability)** | ($485.9) | ($512.9) |
| **Funded ratio** | 79.7% | 75.3% |

Due to the nature of the financing arrangement for the unfunded liability in respect of pre-1992 service, it is necessary to track the financial status of the plan for service before and after January 1, 1992. The following table summarizes this split.

**Indexing For Post-2000 Service Based on 30% of Alberta CPI**

| | As at December 31, 2013 ($000,000's) | | |
|---|---|---|---|
| | **Pre-1992** | **Post-1991** | **Total** |
| **Actuarial value of assets** | | | |
| Adjusted market value – Main Fund | $598.2 | $1,371.9 | $1,970.1 |
| Smoothing adjustment | ($39.7) | ($84.0) | ($123.7)8 |
| Total actuarial value of assets – Main Fund | $558.5 | $1,287.9 | $1,846.4 |
| Market value – Indexing Fund | $0.0 | $56.0 | $56.0 |
| Total actuarial value of assets | $558.5 | $1,343.9 | $1,902.4 |
| **Actuarial liability** | | | |
| Present value of accrued benefits for: | | | |
| • Active members | $96.5 | $1,032.7 | $1,129.2 |
| • Pensioners and survivors | $747.7 | $497.7 | $1,245.4 |
| • Deferred pensioners and hold-on-deposits | $1.8 | $11.9 | $13.7 |
| Total liability, inclusive of COLA | $846.0 | $1,542.3 | $2,388.3 |
| **Funding excess (unfunded liability)** | ($287.5) | ($198.4) | ($485.9) |
| **Funded ratio** | 66.0% | 87.1% | 79.7% |
| **Government share of unfunded liability** | $186.1 | $0.0 | $186.1 |
| **Employer and member share of unfunded liability** | $101.4 | $198.4 | $299.8 |

## *Reconciliation of Financial Status*

The plan's financial position as at December 31, 2013, an unfunded liability of $485.9 million on a 30% indexing basis, is reconciled with its previous position, an unfunded liability of $512.9 million as at December 31, 2011, as follows:

| | | |
|---|---|---|
| Funding excess (shortfall) as at previous valuation | | ($512.9) |
| Interest on funding excess (shortfall) at 6.30% per year | | ($66.7) |
| Special payments, with interest | | $78.2 |
| Expected funding excess (shortfall) | | ($501.4) |
| Net experience gains (losses) | | |
| • Investment return | $95.7 | |
| • Increases in pensionable earnings and YMPE | ($7.7) | |
| • Indexation | $5.9 | |
| • Retirement | $3.1 | |
| • Mortality | ($2.0) | |
| • Termination | ($3.0) | |
| Total experience gains (losses) | | $92.0 |
| Impact of changes in assumptions | | |
| • Discount rate | ($69.1) | |
| • Rate of interest on employee contributions | $3.2 | |
| • Mortality | ($40.2) | |
| Total assumption changes impact | | ($106.1) |
| Contributions less than the cost of benefits | | ($4.5) |
| Data corrections | | $33.6 |
| Net impact of other elements of gains and losses | | $0.5 |
| Funding excess (shortfall) as at current valuation | | ($485.9) |

## *Commentary*

- Member, employer and government special payments to eliminate the existing unfunded liability produced a gain of $78.2 million.

- The investment return net of expenses of 9.0% over 2012 and 2013 on the actuarial value of assets was higher than the valuation assumption of 6.3% per annum. This higher investment return produced a gain of approximately $95.7 million. Note that the rate of return on the market value of assets over this period was 13.3%. The smoothing methodology defers recognition of a portion of the 2012 gains/losses to the 2014 calendar year, and a portion of 2013 gains/losses to the 2014 and 2015 calendar years.

- The actual weighted average increase in pensionable earnings over 2012-2013 was 4.6%/year. The expected weighted average increase in pensionable earnings over this same period was 4.0%/year. In combination with the actual YMPE increases being slightly lower than expected and a lower than expected increase in the maximum pension, the greater than assumed earnings growth produced a loss of $7.7 million.

- The valuation at December 31, 2011 assumed a cost-of-living increase of 1.38%/year on pre-2001 service. The actual cost-of-living increase was an average of 0.84% over the inter-valuation period (0.96% at January 1, 2013 and 0.72% at January 1, 2014). The lower than expected cost-of-living increase produced a gain of approximately $5.9 million.

- Retirement experience was more favourable than assumed, producing a net experience gain of approximately $3.1 million.

- Termination and mortality experience were less favourable than assumed, producing net experience losses of approximately $2.0 million and $3.0 million, respectively.

- The valuation reflects changes to the discount rate, mortality rate assumptions and the expected interest on member contributions, detailed in Appendix B. The impact of these changes is an increase in the liabilities of the Plan of $106.1 million.

- Changes in the demographics of the active membership resulted in total contributions over the two year period based on the estimated service cost formula being less than the cost of benefits accrued. This resulted in a loss of approximately $4.5 million.

- When reviewing the valuation data, we observed several changes to the data relative to the previous valuation. Differences in salary amounts, contribution balances, and pension amounts were observed. In our discussions with Alberta Pensions Services Corporation regarding the data, we learned that substantial data remediation had taken place since the previous valuation, as a result of system upgrades. In addition, the December 31, 2011 actuarial valuation made an assumption regarding the impact of salary negotiations on 2010 and 2011 pensionable salaries not yet reflected in the data at that time. The December 31, 2013 reflected the actual salary increases post negotiation. In total these data corrections resulted in an improvement to the plan's financial position of approximately $33.6 million.

The above commentary outlines the major components of the gain and loss analysis. All other experience items such as timing of events are combined into the "Net impact of other elements of gains and losses" item.

## Current Service Cost

The current service cost is an estimate of the present value of the additional 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:

**Current Service Cost ($000,000's)**

| | 2014 | 2012 |
|---|---|---|
| Basic Current Service Cost | $77.1 | $67.3 |
| Cost of Living Adjustments (30% of CPI) | $6.6 | $5.7 |
| Estimated Administrative Expenses | $2.6 | $2.2 |
| Total Member and Employer Current Service Cost | $86.3 | $75.2 |
| Pensionable earnings in following year | $412.3 | $385.7 |
| Current service cost expressed as a percentage of pensionable earnings in following year | | |
| Basic Current Service Cost plus expenses | 19.42% | 18.04% |
| COLA[2] | 1.50% | 1.50% |
| Total | 20.92% | 19.54% |

Pensionable earnings only include covered earnings for members who have less than 35 years of service and who are accruing pensionable service under the plan.

An analysis of the changes in the basic current service cost follows:

**Changes in Basic Current Service Cost**

| | |
|---|---|
| Basic Current Service Cost as at 31.12.2011 | 18.04% |
| Changes in assumptions | 0.87% |
| Demographic changes | 0.51% |
| Basic Current Service Cost as at 31.12.2013 | 19.42% |

[2] The actual cost of COLA at 30% of Alberta CPI is 1.60% of pensionable earnings. However, legislated COLA contributions are 1.50% of pensionable earnings. The additional 0.10% of pensionable earnings is included as part of the current service contribution.

## Discount Rate Sensitivity

The following table summarises the effect on the going concern actuarial liability, reflecting indexing for post-2000 service at 30% of Alberta CPI, shown in this report of using a discount rate which is 1.00% lower than that used in the valuation:

**Sensitivity Results ($000,000's)**

| Scenario | Valuation Basis | Reduce Discount Rate by 1% |
|---|---|---|
| **Going Concern Actuarial Liability** | $2,388.3 | $2,794.0 |
| **Current Service Cost** | | |
| Basic Current Service Cost | $77.1 | $98.4 |
| Cost of Living Adjustments (30% of CPI) | $6.6 | $8.4 |
| Estimated Administrative Expenses | $2.6 | $2.6 |
| Total Member and Employer Current Service Cost | $86.3 | $109.4 |
| Pensionable Earnings in Following Year | $412.3 | $412.3 |
| Current Service Cost as a Percentage of Pensionable Earnings in Following Year | 20.92% | 26.53% |

# 4

## Valuation Results – Solvency Basis

In accordance with the *Public Sector Pension Plans Act,* the Special Forces Pension Plan is not subject to the solvency funding requirements outlined in Alberta's *Employment Pension Plans Act*. The Plan is required to disclose the solvency excess or deficiency, but no solvency special payments are required to fund any solvency deficiency that may arise.

When conducting a solvency valuation, we determine the relationship between the respective values of the plan's assets and its liabilities on a solvency basis, determined in accordance with the Alberta *Employment Pension Plans Act*. The values of the plan's assets and liabilities on a solvency basis are related to the corresponding values calculated as though the plan were wound up and settled on the valuation date.

We have included the value of all benefits that may be contingent upon the circumstances of the postulated plan wind-up. Indexing for post-2000 service is based solely on the level of indexing that could be provided by the market value of the Indexing Fund on the assumed date of wind-up.

As at December 31, 2013, the solvency ratio of the plan, being the ratio of solvency assets to solvency liabilities, is 67.2%. The plan's solvency position as at December 31, 2013, in comparison with that of the previous valuation as at December 31, 2011, is determined as follows:

**Financial Position – Solvency Basis ($000,000's)**

| | **31.12.2013** | **31.12.2011** |
|---|---|---|
| **Assets** | | |
| **Actuarial value of assets** | | |
| Adjusted market value – Main Fund | $1,970.1 | $1,513.9 |
| Wind-up expenses | ($0.8) | ($0.8) |
| Market value – Indexing Fund | $56.0 | $34.8 |
| Total actuarial value of assets | $2,025.3 | $1,547.9 |
| **Liabilities** | | |
| Actives | $1,252.8 | $1,193.7 |
| Pensioners and survivors | $1,685.8 | $1,465.6 |
| Deferred pensioners and hold-on-deposits | $18.8 | $14.9 |
| Indexing for post-2000 service | $56.0 | $34.8 |
| Total liability | $3,013.3 | $2,709.0 |
| **Solvency surplus (deficiency)** | ($988.0) | ($1,161.1) |
| **Solvency ratio** | 67.2% | 57.1% |

## Solvency Incremental Cost to December 31, 2016

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

The solvency incremental cost determined in this valuation is as follows:

| | December 31, 2013 |
|---|---|
| Number of years covered by report | 3 years |
| Total solvency liabilities at the valuation date (A) | $3,013.3 |
| Present value of projected solvency liability at the next required valuation plus benefit payments until the next required valuation (B) | $3,517.3 |
| Solvency incremental cost (B – A) | $504.0 |

The solvency incremental cost includes indexing for post-2000 service based solely on the level of indexing that could be provided by the market value of the Indexing Fund. It also considers the effect of employee and employer contributions totalling 1.50% of pay to be remitted to the indexing fund over the next 3 years.

The incremental cost is not an appropriate measure of the contributions that would be required to maintain the financial position of the Plan on a solvency basis unchanged from the valuation date and 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 solvency liabilities.

## Discount Rate Sensitivity

The following table summarises the effect on the solvency liabilities 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% |
|---|---|---|
| **Total solvency liability** | $3,013.3 | $3,511.2 |

The financial position as at December 31, 2013 on a solvency basis split for service pre and post January 1, 1992 is as follows:

**Financial Position – Solvency Basis ($000,000's)**

| | December 31, 2013 | | |
|---|---|---|---|
| | **Pre-1992** | **Post-1991** | **Total** |
| **Assets** | | | |
| Adjusted market value – Main Fund | $598.2 | $1,371.9 | $1,970.1 |
| Wind-up expenses | ($0.4) | ($0.4) | ($0.8) |
| Market value – Indexing Fund | $0.0 | $56.0 | $56.0 |
| Actuarial value of assets | $597.8 | $1,427.5 | $2,025.3 |
| **Liabilities** | | | |
| Actives | $149.8 | $1,103.0 | $1,252.8 |
| Pensioners and survivors | $1,020.6 | $665.2 | $1,685.8 |
| Deferred pensioners and hold-on-deposits | $2.5 | $16.2 | $18.7 |
| Indexing fund for post-2000 service | $0.0 | $56.0 | $56.0 |
| Total | $1,172.9 | $1,840.4 | $3,013.3 |
| **Solvency surplus (deficiency)** | ($575.1) | ($412.9) | ($988.0) |
| **Solvency ratio** | 51.0% | 77.6% | 67.2% |

## *Impact of Plan Wind Up*

In our opinion, the value of the plan's assets would be less than its actuarial liabilities if the plan were to be wound up on the valuation date.

Specifically, actuarial liabilities would exceed the market value of plan assets by $988.0 million. This calculation includes a provision of $0.8 million for termination expenses that might be payable from the pension fund if the plan were wound up.

Part of this deficiency would be shared by the Government of Alberta in respect of pre-1992 service.

# 5

# Funding Requirements

## Contribution Requirements

Contributions into the Special Forces Pension Plan are governed by two different Acts: the *Public Sector Pension Plans Act* which establishes minimum funding standards and the Federal *Income Tax Act* which establishes maximum funding standards. Under the *Public Sector Pension Plans Act*, minimum funding for post-1991 service must be made in accordance with the Alberta *Employment Pension Plans Act* with respect to current service as well as post-1991 past service unfunded liabilities.

- Payments to eliminate the pre-1992 unfunded liability are scheduled in the *Public Sector Pension Plans Act* with the Government of Alberta contributing 1.25% of covered pay and contributing members and employers contributing 0.75% of pay each until December 31, 2036.

- Subject to Sections 4 and 5 of Schedule 4 of the *Public Sector Pension Plans Act,* the Board has authority to set contribution rates for current service and unfunded liability payments for post-1991 service, as well as to determine cost-of-living adjustment ("COLA") benefits and contributions for post-1991 service.

- Pursuant to Section 5 of Schedule 4 of the *Public Sector Pension Plans Act,* current service contributions are established in respect of pension benefits that will accrue in calendar years after the valuation (2014 forward). They are jointly funded by contributing members and employers, with employers contributing 1.1% of pay higher than members.

- Pursuant to Section 5 of Schedule 4 of the *Public Sector Pension Plans Act,* and also pursuant to the *Employment Pension Plans Act,* unfunded liabilities with respect to post-1991 service must be eliminated by special payments over a period of no more than 15 years. Post-1991 special payments are shared equally between contributing members and employers.

- Pursuant to Section 4 of Schedule 5 of the *Public Sector Pension Plans Act,* the level of COLA benefits for post-1991 service and the corresponding contributions for that COLA are determined by the Board. The *Income Tax Act* limits the level of COLA to 100% of CPI for post-1991 service. COLA contributions are shared equally between contributing members and employers.

## Current Service Cost

The estimated value of the benefits that will accrue on behalf of the active members during 2014, in comparison with the corresponding value determined in the previous valuation as at December 31, 2011, is summarized below:

**Current Service Cost ($000,000's)**

| | 2014 | 2012 |
|---|---|---|
| Basic Current Service Cost | $77.1 | $67.3 |
| Cost of Living Adjustments (30% of CPI) | $6.6 | $5.7 |
| Estimated administrative expenses | $2.6 | $2.2 |
| Total member and employer Current Service Cost | $86.3 | $75.2 |
| Pensionable earnings in following year | $412.3 | $385.7 |
| Current service cost expressed as a percentage of pensionable earnings in following year | 20.92% | 19.54% |

Pensionable earnings only include covered earnings for members who have less than 35 years of service and who are accruing pensionable service under the plan.

## Additional Contributions Related to Pre-1992 Service

The plan's unfunded liability for service prior to January 1, 1992 is targeted to be eliminated on or before December 31, 2036 through the payment of additional contributions by members, employers, and the Government of Alberta. The additional contributions are split between the three parties, as follows:

| | Percent of Pensionable Earnings |
|---|---|
| Government | 1.25% of pensionable earnings |
| Members | 0.75% of pensionable earnings |
| Employers | 0.75% of pensionable earnings |
| Total | 2.75% of pensionable earnings |

As at December 31, 2013, the pre-1992 unfunded liability is $287.5 million. The legislated contributions in respect of the pre-1992 unfunded liability have an actuarial present value as at December 31, 2013 as follows:

**Additional Annual Contributions ($000,000's)**

| | Percentage of Pensionable Earnings | Annual Dollar Amount | Present Value of Future Additional Contributions | Last Payment |
|---|---|---|---|---|
| Government contributions | 1.25% | $5.2 | $84.4 | Dec. 31, 2036 |
| Member contributions | 0.75% | $3.1 | $50.7 | Dec. 31, 2036 |
| Employer contributions | 0.75% | $3.1 | $50.7 | Dec. 31, 2036 |
| Total contributions | 2.75% | $11.4 | $185.8 | |

The total present value of future additional contributions of $185.8 million is less than the pre-1992 unfunded liability of $287.5 million as at December 31, 2013. As a result, current contribution levels are insufficient to eliminate the pre-1992 unfunded liability by December 31, 2036.

## Unfunded Liability Special Payments Related to Post-1991 Service

The *Public Sector Pensions Plan Act of Alberta* prescribes the minimum special payments related to post-1991 service that must be made to the Plan.

At the last actuarial valuation as at December 31, 2011 the employers and employees elected to make post-1991 special payments in 2012, 2013 and 2014 in accordance with the following schedule:

**Prior Post-1991 Annual Special Payment Schedule**

| | Date Established | Percentage of Pensionable Earnings | 2014 Dollar amount | Present Value of 2014 special payment | Last Payment |
|---|---|---|---|---|---|
| Member | Dec 31, 2011 | 3.48% | $14.3 | $13.9 | Dec 31, 2023 |
| Employer | Dec 31, 2011 | 3.48% | $14.3 | $13.9 | Dec 31, 2023 |
| Total special payments | | 6.96% | $28.6 | $27.8 | |

The above post-1991 special payment contribution schedule will remain until the end of 2014 at which time the employers and employees will adopt a new schedule in accordance with this December 31, 2013 report. The present value at December 31, 2013 of the 2014 special payments in accordance with the prior scheduled special payment is $27.8 million.

Before adjusting for changes in assumptions, there have been gains in the plan on a going-concern basis. As such the annual special payment amounts in the prior schedule have been adjusted effective January 1, 2015 to reflect those gains. The new liability that has arisen as a result of changes in assumptions has been amortized over 15 years.

The following table outlines the minimum special payments to eliminate the post-1991 unfunded liability as at December 31, 2013 after adjusting for the present value ($27.8 million) of the previously scheduled 2014 post-1991 special payments as per the prior valuation report, taking into consideration minimum cost-of-living adjustments that are equivalent to the value of the Indexing Fund.

**Minimum Post-1991 Annual Special Payments – Effective January 1, 2015 ($000,000's)**

| | Date Established[3] | Payment Start Date | Percentage of Pensionable Earnings | Annual Dollar Amount | Present Value of Future Special Payments | Last Payment |
|---|---|---|---|---|---|---|
| Member | Dec 31, 2011 | Jan 1, 2015 | 1.57% | $6.5 | $48.8 | Dec 31, 2023 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.58% | $2.4 | $25.9 | Dec 31, 2028 |
| Employer | Dec 31, 2011 | Jan 1, 2015 | 1.57% | $6.5 | $48.8 | Dec 31, 2023 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.58% | $2.4 | $25.9 | Dec 31, 2028 |
| Total special payments | | | 4.30% | $17.8 | $149.4 | |

Under the *Income Tax Act*, the total contribution must be no more than (i) the current service cost[4], plus (ii) where an unfunded actuarial liability exists, the amount of the unfunded actuarial liability, less (iii) where there is a funding excess, the amount of the funding excess which exceeds a prescribed level. The following table outlines the maximum permissible contribution rate, including cost-of-living adjustments in respect of post-2000 service at 100% of CPI after adjusting for the present value ($27.8 million) of the previously scheduled 2014 post-1991 special payments as per the prior valuation report

**Maximum Post-1991 Annual Special Payments – Effective January 1, 2015 ($000,000's)**

| | Date Established[3] | Payment Start Date | Percentage of Pensionable Earnings | Annual Dollar Amount | Present Value of Future Special Payments | Last Payment |
|---|---|---|---|---|---|---|
| Member | Dec 31, 2013 | Jan 1, 2015 | 26.22% | $108.1 | $200.3 | Dec 31, 2016 |
| Employer | Dec 31, 2013 | Jan 1, 2015 | 26.22% | $108.1 | $200.3 | Dec 31, 2016 |
| Total special payments | | | 52.44% | $216.2 | $400.6 | |

The Board intends to grant cost-of-living-adjustments in respect of post-2000 service at a level that is 30% of CPI. The inclusion of 30% of CPI COLA in respect of service earned between January 1, 2001 and December 31, 2013 increases the unfunded liability for post-1991 service. The Board has adopted unfunded liability contribution rates that are scheduled to eliminate the unfunded liability for post-1991 service inclusive of COLA at 30% of CPI.

In addition, the board has elected to maintain a total contribution rate for members and employers of 28.00% of covered pay. As a result, the board has established special payments which will eliminate the post-1991 unfunded liability as at December 31, 2013 as follows:

---

[3] The first payment in accordance with this table will begin January 1, 2015

[4] Including COLA contributions.

**Post- 1991 Annual Special Payments ($000,000's)**

| | Date Established | Payment Start Date | Percentage of Pensionable Earnings | Annual Dollar Amount | Present Value of Future Special Payments | Last Payment |
|---|---|---|---|---|---|---|
| Member | Dec 31, 2011 | Jan 1, 2014 | 3.48% | $14.3 | $13.9 | Dec 31, 2014 |
| | Dec 31, 2011 | Jan 1, 2015 | 1.98% | $8.2 | $48.8 | Nov 30, 2021 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.81% | $3.3 | $36.5 | Dec 31, 2028 |
| Employer | Dec 31, 2011 | Jan 1, 2014 | 3.48% | $14.3 | $13.9 | Dec 31, 2014 |
| | Dec 31, 2011 | Jan 1, 2015 | 1.98% | $8.2 | $48.8 | Nov 30, 2021 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.81% | $3.3 | $36.5 | Dec 31, 2028 |
| Total special payments in calendar year 2014 | | | 6.96% | $28.6 | $27.8 | |
| Total special payments in calendar year 2015 and onwards | | | 5.58% | $23.0 | $170.6 | |

The percentage of pensionable earnings is calculated as a level percentage of pay through to the last payment date, assuming pensionable earnings grow at 3.00% per year (the assumed base earnings increase excluding merit and promotion).

## *Solvency Contributions*

In accordance with the *Public Sector Pension Plans Act*, the Plan is not subject to the solvency funding of the Alberta *Employment Pension Plans Act*.

## *Total Contributions*

The following table outlines the range of funding contributions that would be permitted under the *Income Tax Act*, and the *Public Sector Pension Plans Act* based on the valuation at December 31, 2013 for the period to December 31, 2016:

| | Minimum Required Under the ***Public Sector Pension Plans Act*** | Maximum Permitted Under the ***Income Tax Act*** |
|---|---|---|
| **Current service cost** | 20.92% | 25.70% |
| **Pre-1992 unfunded liability (including government contributions)** | 2.75% | 2.75% |
| **Post-1991 unfunded liability** | 4.30% | 52.44% |
| **Total contributions** | 27.97% | 80.89% |

The minimum contributions reflect the currently legislated COLA contributions of 1.5% of pay for service after December 31, 2013. Should the Board amend the plan to reduce the current service COLA contribution below 1.5% of pay, the minimum required contribution would correspondingly decrease. The maximum contributions pursuant to the *Income Tax Act* reflect the maximum level of indexing that is permitted in respect of post-2000 service (100% of CPI).

Based on the results of the valuation, the Board has elected to maintain a total contribution rate for members and employers of 28.00%. The contribution rates for members and employers effective January 1, 2015 are shown in the following table.

| | **Member** | **Employer** | **Total** |
|---|---|---|---|
| Current service contributions | | | |
| Basic Benefit | 9.16% | 10.26% | 19.42% |
| COLA at 30% of CPI | 0.75% | 0.75% | 1.50% |
| Pre-1992 unfunded liability additional contributions | 0.75% | 0.75% | 1.50% |
| Post-1991 unfunded liability special payments | 2.79% | 2.79% | 5.58% |
| Total contributions | 13.45% | 14.55% | 28.00% |

In addition, the Government will contribute 1.25% of pay towards the pre-1992 unfunded liability.

# 6

# Actuarial Opinion

## With Respect to the Actuarial Valuation as at December 31, 2013 of the Special Forces Pension Plan Canada Revenue Agency Number: 0584375

The most recent valuation of the Special Forces Pension Plan was conducted as at December 31, 2013 for the purpose of providing the Special Forces Pension Board with information necessary for the funding of the pension obligations of the plan.

This actuarial valuation of the plan was conducted using membership data and financial information supplied by the Special Forces Pension Board and Alberta Pensions Services Corporation. Various tests were performed on the data to ensure validity and reasonableness of results as well as to perform a reconciliation of results since the previous valuation as at December 31, 2011. In our opinion, the data are sufficient and reliable for the purposes of the actuarial valuation.

The actuarial cost method utilized in the valuation was the Projected Unit Credit Actuarial Cost Method. The asset valuation method is based on the market value of assets with a smoothing adjustment intended to smooth out market volatility at the valuation date. Under this method, investment income different from the valuation discount rate (the assumed future rate of return on plan assets, net of margin) is recognized over a three year period. The resulting asset value is then constrained to lie between 90% and 110% of the market value of assets.

The market values and audited financial statements were provided by the Special Forces Pension Board. We have relied on this information in determining the actuarial value of assets at the valuation date.

In our opinion, the methods employed are appropriate for the purpose of the valuation.

The following table briefly summarizes the assumptions employed in the actuarial valuation for funding purposes:

| Description | As at December 31, 2013 |
|---|---|
| Discount rate | 6.10% |
| CPI | 2.30% |
| Salary escalation | 3.00% per year plus merit and promotion scale |
| YMPE escalation | 2.50% per year |
| Increase in *Income Tax Act* maximum pension limits (used to limit pensionable earnings) | 2.50% per year |
| Interest credited on member contributions | 3.50% per year |
| Merit and promotion (sample rates) | |
| Age 20 | 4.30% |
| Age 30 | 2.80% |
| Age 40 | 1.20% |
| Age 50 | 0.60% |
| Age 60 | 0.00% |
| Retirement rates | |
| Years Since Eligible to Retire* | Percentage Assumed to Retire |
| 0 | 40% |
| 1 | 25% |
| 2+ | 15% |
| * A rate of 100% is assumed at age 60, in lieu of the above. | |
| Mortality | 120% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table with generational mortality improvements in line with the CPM –B scale |
| Termination rates (sample rates) | |
| Age 20 | 0.83% |
| Age 30 | 0.83% |
| Age 40 | 0.50% |
| Age 50 | 0.00% |
| Percent electing deferred pension | 100% |
| Disability incidence | None |
| Proportion married at retirement or death before retirement | 90% |
| Spousal age difference | Male member: spouse 4 years younger<br>Female member: spouse 4 years older |

| Description | As at December 31, 2013 |
|---|---|
| Cost-of-living increases | 60% of CPI for service up to and including December 31, 2000;<br>Based on Board policy for service after December 31, 2000 |
| Actuarial cost method | Projected Unit Credit |
| Asset valuation method | Smoothed value, constrained to be between 90% and 110% of the market value of assets |

In our opinion, these assumptions are, in aggregate, appropriate for the purpose of the valuation. Nonetheless, emerging experience may differ from the assumptions, and the resulting gains or losses will be revealed in future valuations.

The results of the actuarial valuation, inclusive of COLA at 30% of CPI for post 2000 service, are summarized below:

| | | ($000,000's) | |
|---|---|---|---|
| | **Pre-1992** | **Post-1991** | **Total** |
| Actuarial value of assets | $558.5 | $1,343.9 | $1,902.4 |
| Actuarial liabilities | $846.0 | $1,542.3 | $2,388.3 |
| Funding excess (unfunded liability) | ($287.5) | ($198.4) | ($485.9) |

The normal cost of benefits expected to accrue in the year following the valuation date is $86.3 million or 20.92% of expected 2014 pensionable earnings

In our opinion:

- The data upon which this valuation is based are sufficient and reliable for the purposes of the valuation;
- The assumptions are, in aggregate, appropriate for the purpose of establishing the financial position of the plan;
- All assumptions made for the purposes of the valuation were independently reasonable at the time the valuation was prepared;
- The methods employed are appropriate for the purpose of establishing the financial position of the plan and the funding contribution requirements pursuant to the *Public Sector Pension Plans Act*;
- In respect of pre-1992 service, the plan would be fully funded on a going-concern basis if its assets were augmented by $287.5 million. The legislated contributions are set forth below:

**Pre-1992 Legislated Annual Contributions ($000,000's)**

| | Percentage of Pensionable Earnings | Annual Dollar Amount (2014) | Present Value of Future Additional Contributions | Last Payment |
|---|---|---|---|---|
| Government contributions | 1.25% | $5.2 | $84.4 | Dec. 31, 2036 |
| Member contributions | 0.75% | $3.1 | $50.7 | Dec. 31, 2036 |
| Employer contributions | 0.75% | $3.1 | $50.7 | Dec. 31, 2036 |
| Total contributions | 2.75% | $11.4 | $185.8 | |

These contributions are insufficient to eliminate the pre-1992 unfunded liability by December 31, 2036;

- In respect of post-1991 service, the plan would be fully funded on a going-concern basis if its assets were augmented by $198.4 million. In order to comply with the provisions of the *Public Sector Pension Plans Act* and the *Income Tax Act*, the Board has elected to liquidate the unfunded liability by contributing special payments at the amounts indicated and for the periods set forth below:

**Post- 1991 Annual Special Payments ($000,000's)**

| | Date Established | Payment Start Date | Percentage of Pensionable Earnings | Annual Dollar Amount | Present Value of Future Special Payments | Last Payment |
|---|---|---|---|---|---|---|
| Member | Dec 31, 2011 | Jan 1, 2014 | 3.48% | $14.3 | $13.9 | Dec 31, 2014 |
| | Dec 31, 2011 | Jan 1, 2015 | 1.98% | $8.2 | $48.8 | Nov 30, 2021 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.81% | $3.3 | $36.5 | Dec 31, 2028 |
| Employer | Dec 31, 2011 | Jan 1, 2014 | 3.48% | $14.3 | $13.9 | Dec 31, 2014 |
| | Dec 31, 2011 | Jan 1, 2015 | 1.98% | $8.2 | $48.8 | Nov 30, 2021 |
| | Dec 31, 2013 | Jan 1, 2015 | 0.81% | $3.3 | $36.5 | Dec 31, 2028 |
| Total special payments in calendar year 2014 | | | 6.96% | $28.6 | $27.8 | |
| Total special payments in calendar year 2015 and onwards | | | 5.58% | $23.0 | $170.6 | |

- The solvency ratio of the plan is 67.2%;

- The plan would be fully funded on a solvency basis if its assets were augmented by $988.0 million. Part of this deficiency is shared with the Government of Alberta in respect of pre-1992 service.

This report has been prepared and the opinions contained herein are given in accordance with accepted actuarial practice in Canada.

Respectfully submitted,

Brenda Prysko

Brenda Prysko
FSA, FCIA

Sept 17, 2014

Date

Joe De Dominicis
FSA, FCIA

Sept 17, 2014

Date

# APPENDIX A

## Plan Assets

The pension fund is held in trust by Alberta Investment Management Corporation (on behalf of the Special Forces Pension Board and the Minister of Finance) and is invested in accordance with the Board's written statement of investment policies and goals. We have relied upon the audited financial statements as reported by the Special Forces Pension Board for the period January 1, 2012 to December 31, 2013 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 Plan Assets

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

**Reconciliation of Market Value of Assets ($000,000's)[5]**

| | 2012 | 2013 |
|---|---|---|
| January 1 | $1,549.7 | $1,749.4 |
| PLUS: | | |
| Member current service contributions[6] | $35.4 | $36.1 |
| Employer current service contributions | $40.1 | $41.3 |
| Employer special payments | $35.7 | $37.9 |
| Investment income | $190.0 | $269.0 |
| | $301.2 | $384.3 |
| LESS: | | |
| Pensions paid | $85.0 | $89.3 |
| Refunds and transfer payments | $7.2 | $6.2 |
| Expenses | $9.3 | $12.1 |
| | $101.5 | $107.6 |
| December 31 | $1,749.4 | $2,026.1 |
| Gross rate of return[7] | 12.23% | 15.34% |
| Rate of return net of expenses[8] | 11.59% | 14.60% |

[5] Including the balance of the indexing fund used to provide COLA benefits. The indexing fund balance was $56.0 million as at December 31, 2013 and was $34.8 million as at December 31, 2011.

[6] Current service contributions include optional service contributions.

[7] Assuming mid-period cash flows.

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's assets are invested primarily in pooled funds, as shown below:

| | **($000,000's)** |
|---|---|
| Fixed-income securities | |
| Cash and short-term securities | $21.5 |
| Bonds and mortgages | $480.9 |
| Total fixed-income securities | $502.4 |
| Equities | |
| Canadian | $363.3 |
| Global developed | $678.9 |
| Private | $75.2 |
| Emerging markets | $99.9 |
| Total equities | $1,217.3 |
| Inflation sensitive | |
| Real estate | $136.0 |
| Infrastructure and private debt and loans | $91.6 |
| Real return bonds | $35.3 |
| Timberland | $37.4 |
| Total inflation sensitive | $300.3 |
| **Total investments** | **$2,020.0** |
| Accounts receivable | $6.5 |
| Accounts payable | ($0.4) |
| **Net assets available for benefits** | **$2,026.1** |

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

The Board annually reviews the funding requirements of the plan and after taking into account the expected risk and return associated with the various asset classes, has established the following long-term benchmark portfolio and allowable range of weights for asset classes within the portfolio.

| Asset Class | Long-term Policy Asset Mix | Actual Asset Mix |
|---|---|---|
| Money market | 1.0% | 1.1% |
| Fixed income | 26.0% | 23.8% |
| Equities | 57.0% | 60.2% |
| Inflation-sensitive | 16.0% | 14.9% |
| Total | **100.0%** | **100.0%** |

# APPENDIX B

## Actuarial Methods and Assumptions

### Valuation of Assets

Commencing January 1, 2010, the Board adopted a new smoothing method to determine the actuarial value of assets. Under this method, investment income different from the valuation discount rate (the assumed future rate of return on plan assets, net of margin) is recognized over a three year period. The resulting asset value (excluding the unsmoothed value of the indexing fund) is then constrained to lie between 90% and 110% of the market value of assets. This constrained asset value plus the value of the assets in the indexing fund is equal to the actuarial value of assets. The smoothing adjustment is the difference between the actuarial value of assets and the market value of assets.

At the end of 2013, the smoothing reserve resulted in an actuarial value of assets less than the market value of assets, by $123.7 million. Generally speaking, consecutive years of net capital losses (both realized and unrealized) will result in an actuarial value of assets exceeding the market value, since losses are deferred. Similarly, consecutive years of net capital gains (both realized and unrealized) will result in the market value of assets exceeding the actuarial value of assets, since gains are deferred.

The actuarial value of the assets, determined as at December 31, 2013 under the smoothing method is $1,902.4 million.

This value was derived as follows:

**Actuarial Value of Assets as at December 31, 2013 ($000,000's)**

| | | December 31, 2013 | | |
|---|---|---|---|---|
| | | **Pre-1992** | **Post-1991** | **Total** |
| **A** | Adjusted market value at December 31, 2013 (excluding indexing fund) | $598.2 | $1,371.9 | $1,970.1 |
| | 2012 investment gains (losses) different from 6.3% | $28.5 | $54.0 | $82.5 |
| | 2013 investment gains (losses) different from 6.3% | $45.3 | $99.0 | $144.3 |
| | ⅓ of 2012 excess unrealized gains (losses) | ($9.5) | ($18.0) | ($27.5) |
| | ⅔ of 2013 excess unrealized gains (losses) | ($30.2) | ($66.0) | ($96.2) |
| **B** | Smoothing offset | ($39.7) | ($84.0) | ($123.7) |
| **C** | Smoothed asset value before constraints **(A – B)** | $558.5 | $1,287.9 | $1,846.4 |
| | 90% of market value at December 31, 2013 | $502.7 | $1,159.1 | $1,661.8 |
| | 110% of market value at December 31, 2013 | $614.4 | $1,416.7 | $2,031.0 |
| **D** | Constrained asset value | $558.5 | $1,287.9 | $1,846.4 |
| **E** | Indexing fund balance | $0.0 | $56.0 | $56.0 |
| Actuarial value of assets at December 31, 2013 **(D + E)** | | $558.5 | $1,343.9 | $1,902.4 |

On an actuarial value basis, the average net rate of return (net of all expenses) for the fund in 2012 and 2013 was 9.0% and on a market value basis, the average net rate of return (net of all expenses) for the fund in 2012 and 2013 was 13.3%.

## *Valuation of Actuarial Liabilities*

Over time, the real cost 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*, as was used in the previous valuation. Under this method, we determine the actuarial present value of benefits accrued in respect of service prior to the valuation date, including ancillary benefits, based on projected final average earnings. This is referred to as the *actuarial liability*. For each individual plan member, accumulated contributions with interest are established as a minimum actuarial liability.

Indexing for post-2000 service is based on Board policy and financial affordability. The minimum actuarial liability includes COLA for post-2000 service based on the value of the Indexing Fund.

The *funding excess* or *unfunded liability*, as the case may be, is the difference between the actuarial value of assets and the actuarial liability. For post-1991 service, an unfunded liability will be amortized over no more than 15 years through special payments as required under the *Public Sector Pension Plans Act,* via reference to the *Employment Pension Plans Act.* Contributions to eliminate the unfunded liability for pre-1992 service are legislated in the *Public Sector Pension Plans Act.* A funding excess may, from an actuarial standpoint, be applied immediately to reduce required current service contributions unless precluded by the terms of the plan or by legislation.

Because benefits are recognized as they accrue, the actuarial funding method aims at keeping the plan fully funded at all times. This promotes benefit security, once any unfunded liabilities and solvency deficiencies have been funded.

## *Current Service Cost*

The *current service cost* is the actuarial present value of projected benefits to be paid under the plan with respect to service during the year following the valuation date. The current service cost has been expressed as a percentage of the members' covered pay 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' covered pay, can be expected to remain stable as long as the average age of the group remains constant.

## *Contributions*

Accordingly, the contributions for this purpose, with respect to post-1991 service, are determined as follows:

**Contributions**

| With a funding excess | With an unfunded liability |
|---|---|
| Current service cost | Current service cost |
| MINUS | PLUS |
| Any funding excess applied to cover the current service cost | Payments to amortize any unfunded liability |

As detailed in the *Public Sector Pension Plans Act*, the Plan's unfunded liability for service prior to January 1, 1992 is targeted to be eliminated on or before December 31, 2036 through the payment of additional contributions.

## *Actuarial Assumptions — Going-Concern Basis*

The actuarial value of benefits 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.

For this valuation, we have used the following assumptions:

**Actuarial Assumptions – Going-Concern Basis**

| Description | Current Valuation | Previous Valuation |
|---|---|---|
| Discount rate | 6.10% | 6.30% |
| Non-investment expenses | $2.6 million | $2.2 million |
| Alberta CPI | 2.30% | 2.30% |
| Canada CPI | 2.30% | 2.30% |
| Salary escalation | 3.00% per year plus merit and promotion scale | 9.00% for 1 year after the valuation date, 3.00% per year thereafter, plus merit and promotion scale |
| Merit and promotion | Age related table | Age related table |
| Cost-of-living increases | 60% of Alberta CPI for service up to and including December 31, 2000; Based on Board policy for service after December 31, 2000 | 60% of Alberta CPI for service up to and including December 31, 2000; Based on Board policy for service after December 31, 2000 |
| ITA limit / YMPE escalation: | 2.50% | 2.50% |
| Interest credited on member contributions | 3.50% | 5.00% |
| Retirement rates | Scale based on retirement eligibility. | Scale based on retirement eligibility. |
| Mortality rates | 120% of the rates of the 2014 Public Sector Canadian Pensioners Mortality Table | 1994 Uninsured Pensioner (UP94) |
| Mortality improvements | Fully generational using CPM Improvement Scale B (CPM-B) | Fully generational using Scale AA |
| Termination rates | Age related table | Age related table |
| Percent electing deferred pension | 100% | 100% |
| Disability rates | None | None |
| Proportion married at retirement or death before retirement | 90% | 90% |
| Spousal age difference | Male 4 years older | Male 4 years older |

The assumptions are best-estimate with the exception that the discount rate includes a margin for adverse deviations.

## Age and Service Related Tables

### *Termination Rates*

Sample rates are summarized below:

| Age | Sample Termination Rates Males & Females |
|---|---|
| 20 | 0.83% |
| 25 | 0.83% |
| 30 | 0.83% |
| 35 | 0.67% |
| 40 | 0.50% |
| 45+ | 0.00% |

### *Retirement Rates*

For this valuation and the previous valuation, the retirement rates are outlined below.

| Years since Eligible to Retire* | Rate of Retirement |
|---|---|
| 0 | 40% |
| 1 | 25% |
| 2+ | 15% |

* A rate of 100% is assumed at age 60, in lieu of the above.

## 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 2013 earnings and assumed that such pensionable earnings will increase at 3.00% per year plus merit and promotion. This assumption is based on input from the Special Forces Pension Board regarding future salary expectations. Individual salary increases can generally be considered to result from general economic conditions, plus non-economic factors such as merit and promotion.

To the extent that salaries increase by greater than assumed rates, losses will accrue in the plan's funding. Gains will emerge if salaries increase at a lower rate than assumed.

The following rates varying by age were used for this valuation and the previous valuation.

| Age | Merit & Promotion Sample rates |
|---|---|
| 20 | 4.30% |
| 30 | 2.80% |
| 40 | 1.20% |
| 50 | 0.60% |
| 60 | 0.00% |

## Payroll Growth

For purposes of calculating unfunded liability additional contributions as a percentage of payroll, we have assumed total payroll will grow at 3.00% per year.

## Other Methodologies

We have prepared a list of additional assumptions and methods used in the valuation of the plan. This list is intended to assist users of this report in understanding the specific benefits valued. Small differences in methods and assumptions in a plan of this size can sometimes have effects in the millions of dollars.

- It is assumed that indexation of deferred and immediate pensions commences one year after termination or retirement;
- The present value of additional contributions is calculated assuming total payroll grows at the rates indicated in the report and that the total contribution remains at 2.75% of pay for the entire period ending December 31, 2036;
- The pensionable salary for calculating the normal cost percentage is nil for members with more than 35 years of service and nil for members who no longer accrue pensionable service under the plan; and
- For deferred benefits on termination or death (post-1991 service), the pensions were deferred to age 55 in accordance with the plan.

# 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 fund assets. 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;
- Additional returns assumed to be achievable due to active equity management equal to the fees related to active equity management. Such fees were determined by the difference between the provision for total investment expenses and the hypothetical fees that would be incurred for passive management of all assets;
- Implicit provision for investment expenses determined based on historical expenses paid from the fund; and
- A margin for adverse deviations of 0.90%.

The discount rate was developed as follows:

| | |
|---|---|
| Assumed investment return | 7.00% |
| Additional returns for active management | 0.62% |
| Investment expense provision | (0.62%) |
| Margin for adverse deviation | (0.90%) |
| Net discount rate | 6.10% |

The Board recognizes that a portion of this future return is expected to come from equity risk premiums (equity returns above bond yields), and has considered the expected additional risk and volatility when setting the discount rate.

If the fund achieves higher investment returns than assumed, gains will be revealed at subsequent valuations. If the fund achieves lower investment returns, losses will emerge.

**Expenses**

The assumption is based on expected administrative expenses for 2014 provided by representatives of the Special Forces Pension Plan. We have included a provision of $2.6 million in the current service cost to meet all administrative expenses charged to the fund. The assumed Investment Return reflects an implicit provision for investment expenses.

**Inflation**

The level of price inflation directly influences benefits provided by the Plan by the application of the cost-of-living increases. It is also useful in developing a coherent set of economic assumptions by relating several of the individual assumptions to an assumed long term level of underlying price 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. For this valuation, we have assumed that CPI would increase 2.30% per annum.

Pensions in payment and deferred pensions are assumed to increase annually at the rate of 60% of CPI for service up to and including December 31, 2000, and based on Board policy for service after December 31, 2000.

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

The assumption is based on historical real economic growth, Canada Pension Plan economic assumptions, and the underlying Canada CPI assumption. The assumption is based on an assumed inflation rate in Canada of 2.30% per year and an assumed productivity component of 0.20% per year.

To the extent that the YMPE increases by greater than the assumed rate, gains will accrue in the Plan's funding. Losses will emerge if the YMPE increases at a lower rate than assumed.

**Pensionable Salary**

The assumption is based on general wage growth assumptions increased by our best estimate of additional expected salary increases and future merit and promotional increases.

The merit and promotion scale was derived from Plan experience.

To the extent that salaries increase by greater than assumed rates, losses will accrue in the plan's funding. Gains will emerge if salaries increase at a lower rate than assumed.

**Cost-of-Living Increases**

The assumption is based on the Plan formula and inflation assumption above and the board's policy.

**Retirement Rates**

Age at retirement is an important consideration for this plan. The younger the members are at retirement, the greater the cost to the plan of a given member's pension.

The assumption is based on Plan experience. Subsequent experience has been consistent with these rates.

**Termination Rates**

We have made an allowance for projected benefits payable on the termination of employment before retirement for reasons other than death.

The assumption is based on Plan experience.

| Mortality Rates |
|---|
| The assumption for the mortality rates is based on the Canadian Pensioners' Mortality (CPM) study published by the Canadian Institute of Actuaries in February 2014.<br><br>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 120% of the CPM mortality rates.<br><br>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 mortality improvement scale without adjustment.<br><br>Based on this assumption, the life expectancy of a member aged 65 at the valuation date is 21.3 years for males and 23.2 years for females. |

| Interest on Employee Contributions |
|---|
| The assumption is based on Plan terms and the underlying investment return assumption. |

| Disability Rates |
|---|
| Based on the number of members in approved LTD plans and the small number of disability claims experienced by the plan, we believe it is appropriate to ignore the contingency of disability as being immaterial. |

| Eligible Spouse |
|---|
| The assumption is based on Plan experience. |

| Spousal Age Difference |
|---|
| The assumption is based on an industry standard showing males are typically 4 years older than their spouse. |

| Percent Electing Deferred Pension |
|---|
| The assumption is based on historical Plan termination experience. |

## *Actuarial Valuation Methods and Assumptions — Solvency 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.

We have used the market value of the Plan's assets in our valuation of the Plan for solvency purposes.

To determine the actuarial liability on the solvency basis, we have valued those benefits that would have been paid had the Plan been wound up on the valuation date, assuming all members are fully vested in their accrued benefits

We have considered that members under 55 years of age on that date would be entitled to a deferred pension payable from age 55, reduced in accordance with the Plan's early retirement provisions. Members aged 55 and over are entitled to an immediate pension, reduced in accordance with the Plan's early retirement provisions. For each individual Plan member, accumulated contributions with interest plus 50% of the present value of the accrued pension are established as a minimum actuarial liability.

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 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. 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 assumed that an appropriate proxy for estimating the cost of such purchase is using the yield on the long-term Government of Canada Real Return bonds reduced by 1.1%.

We have not included a margin for adverse deviation in the solvency valuation.

The assumptions are as follows:

**Actuarial Assumptions**

| | |
|---|---|
| For benefits to be settled through a lump sum | |
| Interest rate: | 3.00% for 10 years, 4.60% thereafter |
| Mortality rates: | UP94 table projected for mortality improvements on a generational basis |
| Cost-of-living adjustments: | 0.78% for 10 years, 1.36% thereafter, in respect of pre-2001 service<br>Based on value of Indexing Fund for post-2000 service |
| For benefits to be settled through the purchase of an annuity | |
| Interest rate: | 3.93% per year |
| Mortality rates: | UP94 table projected for mortality improvements on a generational basis |
| Cost-of-living adjustments: | 2.23% in respect of pre-2001 service<br>Based on value of Indexing Fund for post-2000 service |
| For all benefits | |
| Family composition: | Same as for going-concern valuation |
| Termination expenses: | $0.8 million |

In a solvency valuation, the accrued benefits are based on the member's final average salary on the valuation date; therefore no salary projection is used. Also, the employment of each member is assumed to have terminated on the valuation date; therefore, no assumption is required for future rates of termination of employment.

In determining the estimated termination expenses, we have assumed that the Plan sponsors are solvent.

## Incremental Cost

In order to determine the incremental cost, we estimate the solvency liabilities in three years' time. 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 solvency 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.

# APPENDIX C

## Membership Data

### Analysis of Membership Data

The actuarial valuation is based on membership data as at December 31, 2013, provided by the Special Forces Pension Plan and Alberta Pensions Services Corporation. This data included dates of birth, gender, accumulated contributions with interest and pensionable service, (including prior bought service). Service fields were split for pre-1992, mid (1992 to 2000) and post-2000 service. Pensionable salary and in-year service were also provided. Contribution information was also provided, split by pre, mid and post service.

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 the 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. Any outstanding questions were sent to Alberta Pensions Services Corporation and adjustments were made according to the responses received.

Despite these numerous tests, where data was still unreliable or unavailable, assumptions were required to complete the data. These assumptions are summarized below:

| Description | Assumption |
|---|---|
| Missing Earnings Information | For those members missing salary information in 2013, annualized salary was set to last year's annualized salary increased appropriately using the previous valuations' salary increase assumption. For members with no prior salary information, pay was set to the average pay for the active membership. |
| Tracking of Individual Payments | Due to the nature of the asset information provided, it was not possible to reconcile individual member refunds. We have relied on individual member refund data provided to us by Alberta Pensions Services Corporation. |
| Hold-on Deposit Members | Since hold-on deposit members were not explicitly provided by Alberta Pensions Services Corporation, we have assumed that terminated members without deferred pension amounts are considered hold-on deposit members. |
| Missing Spouse Dates of Birth for Pensioners | If we were not provided with a spousal date of birth for a pensioner with a joint and survivor pension form, we assumed that male spouses would be four years older than female spouses. |

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

**Membership Data**

| | 31.12.2013 | 31.12.2011 |
|---|---|---|
| **Active Members** | | |
| • Number | 4,180 | 4,067 |
| • Total unlimited pensionable earnings for following year[8] | $420,651,800 | $392,141,500 |
| • Average unlimited pensionable earnings for following year[8] | $100,600 | $96,400 |
| • Total limited pensionable earnings for following year | $419,361,300 | $390,772,800 |
| • Average limited pensionable earnings for following year | $100,300 | $96,100 |
| • Average years of pensionable service | 11.2 years | 10.9 years |
| • Average age | 39.5 years | 39.1 years |
| • Average accumulated contributions with interest | $101,400 | $87,700 |
| **Deferred Pensioners[9]** | | |
| • Number | 166 | 151 |
| • Total annual deferred pension | $1,087,600 | $811,700 |
| • Average annual deferred pension | $6,600 | $5,400 |
| • Average age | 40.8 years | 39.9 years |
| **Hold-on-Deposit Members** | | |
| • Number | 12 | 13 |
| • Average reserve held on deposit | $4,100 | $3,800 |
| • Average age | 59.0 years | 54.7 years |
| **Pensioners and Survivors[9]** | | |
| • Number | 2,341 | 2,175 |
| • Total annual pension in payment | $92,313,900 | $82,860,600 |
| • Average annual pension in payment | $39,400 | $38,100 |
| • Average age | 64.9 years | 63.9 years |

[8] Used in determining benefits for service prior to January 1, 1992.

[9] For purposes of this table, pensions at December 31 of a given year do not include cost-of-living adjustments granted January 1 of the following year.

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

**Membership Reconciliation**

| | Active Members | Deferred and HODs | Pensioners and Survivors | Total |
|---|---|---|---|---|
| Number at December 31, 2011 | 4,067 | 164 | 2,175 | 6,406 |
| New entrants | 385 | - | - | 385 |
| Return to active status | 4 | (4) | - | - |
| Retirements | (179) | (5) | 184 | - |
| Terminations of employment | | | | |
| - Held on deposit | - | - | - | - |
| - Deferred pensions | (40) | 40 | - | - |
| - Refunds and lump sum | (50) | (17) | - | (67) |
| Deaths | | | | |
| - With further entitlement | (4) | - | (39) | (43) |
| - Without further entitlement | (3) | - | (21) | (24) |
| Expiry of guarantee | - | - | (1) | (1) |
| New survivor pensions | - | - | 43 | 43 |
| Number at December 31, 2013 | 4,180 | 178 | 2,341 | 6,699 |

The distribution of the active members by age and pensionable service (and including 2014 expected unlimited annualized earnings for all members) as at December 31, 2013, is summarized as follows:

**Distribution of Active Members as of December 31, 2013**

| | Service Group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Age Group** | **0-4** | **5-9** | **10-14** | **15-19** | **20-24** | **25-29** | **30-34** | **35+** | **Total** |
| | | | | | | | | | # Average Earnings |
| Under 25 | 101 | 1 | | | | | | | 102 |
| | $68,014 | * | | | | | | | * |
| 25 - 29 | 364 | 129 | | | | | | | 493 |
| | $76,358 | $96,738 | | | | | | | $81,690 |
| 30 - 34 | 255 | 441 | 58 | | | | | | 754 |
| | $80,696 | $98,207 | $105,053 | | | | | | $92,812 |
| 35 - 39 | 155 | 366 | 296 | 50 | | | | | 867 |
| | $85,948 | $98,478 | $106,563 | $112,527 | | | | | $99,808 |
| 40 - 44 | 91 | 225 | 276 | 252 | 43 | | | | 887 |
| | $86,079 | $100,028 | $107,676 | $113,743 | $116,954 | | | | $105,694 |
| 45 - 49 | 30 | 83 | 96 | 138 | 226 | 55 | | | 628 |
| | $89,157 | $101,872 | $106,923 | $111,472 | $117,517 | $127,610 | | | $112,031 |
| 50 - 54 | 14 | 24 | 28 | 27 | 92 | 68 | 53 | 1 | 307 |
| | $109,627 | $102,099 | $105,287 | $106,591 | $114,361 | $124,629 | $121,639 | * | * |
| 55 - 59 | 2 | 6 | 1 | 3 | 7 | 17 | 50 | 24 | 110 |
| | * | $114,570 | * | $99,903 | $115,189 | $113,646 | $127,369 | $125,022 | * |
| 60+ | 1 | | | | 2 | 2 | 13 | 14 | 32 |
| | * | | | | * | * | $119,512 | $115,979 | * |
| **Total** | 1,013 | 1,275 | 755 | 470 | 370 | 142 | 116 | 39 | 4,180 |
| | * | * | * | $112,448 | $116,541 | $124,307 | $123,870 | * | $100,634 |

* Certain cells have been suppressed in order to preserve confidentiality.

The distribution of the inactive members (pensioners, survivors and deferreds) by age and average annual pension (excluding January 1, 2014 COLA) as at December 31, 2013, is summarized as follows:

**Distribution of Inactive Members by Age Group as of December 31, 2013**

| | Deferred Pensioners | | Pensioners and Survivors | |
|---|---|---|---|---|
| **Age** | **Number** | **Average Annual Pension** | **Number** | **Average Annual Pension** |
| Under 25 | 1 | * | 1 | * |
| 25 – 29 | 8 | $771 | | |
| 30 – 34 | 32 | $1,420 | | |
| 35 – 39 | 37 | $3,934 | 1 | * |
| 40 – 44 | 46 | $5,920 | 5 | $17,134 |
| 45 – 49 | 24 | $12,199 | 46 | $45,734 |
| 50 – 54 | 12 | $14,743 | 234 | $45,437 |
| 55 – 59 | 5 | $29,578 | 533 | $45,416 |
| 60 – 64 | 1 | * | 475 | $42,245 |
| 65 – 69 | | | 433 | $35,047 |
| 70 – 74 | | | 256 | $34,669 |
| 75 – 79 | | | 159 | $32,876 |
| 80 – 84 | | | 141 | $31,088 |
| 85 – 89 | | | 47 | $27,513 |
| 90 – 94 | | | 9 | $24,123 |
| 95 – 99 | | | 1 | * |
| Total | **166** | **$6,552** | **2,341** | **$39,434** |

* Cells with fewer than 3 members have been suppressed in order to preserve confidentiality.

# APPENDIX D

## Summary of Plan Provisions

Mercer has used and relied on the plan documents, including amendments and interpretations of plan provisions, supplied by the Special Forces Pension Plan and Alberta Pensions Services Corporation. 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.

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

| | |
|---|---|
| **Origin** | The Special Forces Pension Plan is a contributory defined benefit pension plan for police officers employed by participating employers in Alberta. Prior to 1993, the Special Forces Pension Plan Act provided for the payment of pension and related ancillary benefits to eligible participants. In 1993, the Public Sector Pension Plans Act covering six public sector pension plans (including the Special Forces Pension Plan) was passed. |
| **Eligibility for Membership** | Eligible participants include full-time and part-time police officers who are employed by a participating local police authority. All eligible participants are required to join the plan effective from their date of hire. |
| **Pensionable Service** | Pensionable service, as defined under the provisions of the plan, is limited to 35 years. Pensionable service is used to determine eligibility for benefits, credit service and determination of highest average salary. |

| | |
|---|---|
| **Contributions** | Members and employers are required to make contributions to the plan in order to meet the funding requirements of the Public Sector Pension Plans Act.<br><br>***Current Service Contributions***<br>Members and employers contribute to current service costs until members attain 35 years of pensionable service. Employers are required to contribute 1.1% of pensionable earnings in excess of member contribution rates.<br><br>***Cost-of-Living Adjustment Contributions***<br>In addition to current service contributions, members and employers contribute to an indexing fund. The indexing fund is used to provide cost-of-living adjustments in respect of service after December 31, 2000.<br><br>***Unfunded Liability Contributions***<br>The pre-1992 unfunded liability is funded through additional contributions by members, employers and the Government of Alberta. The post-1991 unfunded liability is funded through additional equal contributions by members and employers. |
| **Credited Interest** | Prior to January 1, 1994, members' contributions were accumulated at the rate of 4% per annum, compounded semi-annually. Effective January 1, 1994, the rate of interest credited to members' contributions is the average yield of five year personal fixed term chartered bank deposits (CANSIM series V122515) over the most recent 12 month period. |
| **Vesting** | Benefits for members are vested on the completion of five years of pensionable service. |
| **Retirement Dates** | ***Normal Retirement Date***<br>The normal retirement age is age 55 with five years of pensionable service, or the age at which the member attains 25 years of pensionable service, if earlier.<br><br>***Early Retirement Date***<br>Members are not eligible to retire before their normal retirement age. |
| **Normal Retirement Pension** | The annual pension payable at retirement is determined as follows:<br><br>• 2.0% of the highest average pensionable earnings, less<br>• 0.6% of the lesser of the highest average pensionable earnings and the average YMPE, beginning at age 65,<br><br>all multiplied by pensionable service. |
| **Pensionable Earnings** | Highest average pensionable earnings are the member's average eligible earnings in the five consecutive years of service (including service in excess of 35 years) in which such average is the highest.<br><br>Average YMPE is the average of the Year's Maximum Pensionable Earnings in the years used in calculating the member's highest average pensionable earnings.<br><br>Pensionable earnings used to calculate benefits for service prior to January 1, 1992 are not limited by the *Income Tax Act*. Pensionable earnings used to calculate benefits for service after December 31, 1991 are limited to: the *Income Tax Act* maximum benefit limit divided by 2%, plus 30% of the YMPE (a limit of $147,364 in 2012). |

**Death Benefits**

***Death After Retirement***

If the member does not have a spouse at retirement, the normal form pension is a life annuity guaranteed for five years. If the member dies before 60 monthly payments are made, the balance of the 60 payments are payable to the member's spouse or beneficiary.

If the member has a spouse at retirement, the normal form pension is a joint and survivor 65% annuity guaranteed for five years. If the member dies and the spouse is still alive, the spouse receives a pension for life that is equal to 65% of the pension that would have been payable to the pensioner had he continued to live. If both the member and the spouse die before 60 monthly payments are made, the balance of the 60 payments are payable to the member's beneficiary.

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

***Death Prior to Retirement***

| Pre-1992 Service | Benefit |
|---|---|
| No Spouse | |
| - Not vested and death not as an active employee | - Refund of the member's contributions with interest. |
| - Vested or died while an active employee | - A pension equal to 15% of the accrued pension for each dependent child, up to a maximum of four dependents; or,<br>- Refund of two times the member's contributions with interest. |
| Spouse | |
| - Not vested and death not as an active employee | - Refund of the member's contributions with interest. |
| - Vested or died while an active employee | - 65% of the accrued pension, plus 10% of the accrued pension for each dependent child, up to a maximum of three dependents; or,<br>- Refund of two times the Member's contributions with interest. |

**Death Benefits**

| Post-1991 Service | Benefit |
|---|---|
| No Spouse | |
| - Not vested | - Refund of the member's contributions with interest. |
| - Vested | - Transfer of 100% of commuted value plus excess contributions. |
| Spouse | |
| - Not vested | - Refund of the member's contributions with interest. |
| - Vested | - A pension for life determined as though the member had retired on the day before death and elected a J&S 100% optional form pension, plus excess contributions; or,<br>- Transfer of 100% of commuted value plus excess contributions. |

**Termination Benefits**

If a member's employment terminates for reasons other than death or retirement, the benefits payable from the plan will depend on the member's length of plan membership, as follows:

**Benefits in the Event of Termination of Employment**

| Pre-1992 Service | Benefit |
|---|---|
| - Not vested | - Refund of the member's contributions with interest. |
| - Vested | - Deferred pension; or<br>- Refund of the member's contributions with interest. |

| Post-1991 Service | Benefit |
|---|---|
| - Not vested | - Refund of the member's contributions with interest. |
| - Vested | - Deferred pension plus excess contributions; or<br>- Transfer of 100% of commuted value plus excess contributions. |

| | |
|---|---|
| **Disability Benefits** | If the member is permanently and totally disabled, and the member is vested, the member is entitled to an immediate unreduced pension based on pensionable service and salary to the date of the disability. If the member is partially disabled, the pension is reduced before age 55, in accordance with the plan. Members in receipt of disability income from an approved plan continue to accrue current service. |
| **Cost-of-Living Increases** | For service up to December 31, 2000, cost-of-living increases based on 60% of the Alberta CPI apply to both deferred pensions and pensions in payment.<br><br>For service after December 31, 2000, cost-of-living increases are based on Board policy and financial affordability. |

# APPENDIX E

## Alberta Pensions Services Corporation Certification

With respect to the report on the actuarial valuation of the *Special Forces Pension Plan*, as at December 31, 2013, on behalf of Alberta Pensions Services Corporation, I hereby certify that, to the best of my knowledge and belief:

- The membership data provided to the actuary is reasonably free of material misstatement under the terms of the plan for service up to December 31, 2013, and
- All events that I am aware of subsequent to December 31, 2013, which I believe would have a material impact on the results of the valuation have been communicated to the actuary.

**ALBERTA PENSIONS SERVICES CORPORATION**

Sept 12, 2014
Date

L. Bowering
Signed

Lesley Bowering
Name
Vice President, Policy & Research

Mercer (Canada) Limited
222 - 3rd Avenue SW, suite 1200
Calgary, Alberta T2P 0B4
1 403 269 4945