



Virginia Sickness and Disability Program

**Actuarial Valuation of Self-Funded
Long-Term Care Benefit
As of June 30, 2013**

Prepared for:
Virginia Retirement System

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Milliman, Inc.

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INTRODUCTION

At the request of the Virginia Retirement System (VRS), Milliman, Inc. has completed an actuarial valuation of the self-funded long-term care (LTC) benefit that is part of the Virginia Sickness and Disability Program (VSDP) as of June 30, 2013. Milliman is pleased to present this report of the valuation results.

This report is intended for the sole benefit of VRS in the ongoing monitoring of their self-funded long-term care program. Other uses may be inappropriate. The report may not be distributed outside of VRS and its advisors without the written consent of Milliman, and any distribution of this report must be in its entirety. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work.

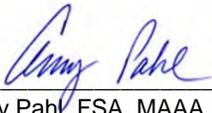
The projections and other figures in this report are based upon a series of assumptions. The validity of these projections depends on how well future experience conforms to our assumptions. The assumptions were derived from the following data provided by VRS:

- VSDP census of FY2013 enrollees (active and terminated)
- LTC porting experience to date
- VSDP FY2008 – FY2013 LTC claim experience
- VSDP FY2013 fund experience

These data were used without audit, although reasonability checks were performed.

To the extent that this information is incorrect, our analysis may also be incorrect. Actual results will vary from those presented herein, particularly over the long term where adjustments to assumptions based on plan experience will be required to achieve ongoing accuracy.

I, Amy Pahl, am associated with the firm of Milliman, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein. I have been involved in a review of the actuarial items included in this valuation report for the fiscal year ending June 30, 2013. On the basis of the foregoing, I certify that, to the best of my knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice, the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.



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EXECUTIVE SUMMARY

The self-funded long-term care benefit that is part of the VSDP benefit started December 18, 2007 when Aetna Long-Term Care Insurance, the previous insurer, transferred the liability for the covered lives to VRS. Prior to that date, the benefits had been insured with Aetna since the VSDP long-term care program's inception in March of 2002.

This is the sixth valuation of the self-funded long-term care insurance benefits under VSDP. According to the VRS Finance Division, the fund balance for the VSDP long-term care benefit as of June 30, 2013 was \$45,611,327. The projected required fund balance for the VSDP long-term care benefit as of June 30, 2013 is \$45,146,264. Based upon these values and assuming a 30 year amortization period, the recommended employer contribution for the long-term care benefit for Fiscal Year 2014 is \$4.62 million (including amortized contribution adjustments to date).

Table 1 below presents the key findings as of June 30, 2013 compared to expected values for June 30, 2013 that were developed in the last valuation report dated November 12, 2012.

Table 1 – Key Valuation Findings Summary (Dollars in Millions)

Key Valuation Findings Summary	Expected for June 30, 2013 [A]*	Actual as of June 30, 2013 [B]
Census Summary		
Active Members	75,641	76,897
Ported Members	1,745	922
Active Claimants	38	19
Expenses	\$0.53	\$0.57
Claims Incurred in FY2013	\$1.24	\$0.71
Paid Benefits	NA	\$0.29
Accrued Disabled Life Reserves	NA	\$0.41
Incurred But Not Reported Claims (IBNR)	NA	\$0.01
Contributions	\$5.05	\$3.21
Employer	\$4.84	\$2.93
Ported Members**	\$0.21	\$0.28
Investment earnings during FY2013	\$2.83	\$4.46
Fund balance on June 30, 2013***	\$43.56	\$45.61

*The values for June 30, 2013 can be found in Table 2 from the valuation report dated November 12, 2012.

**The ported contribution amount reflects the actual ported contributions as of end of FY2013 from the fund data.

***The comparison of these two numbers is not necessarily appropriate. The value in [A] is our projected required fund balance on July 1, 2013 as of our July 1, 2012 valuation. This number does not take into consideration the actual fund balance as of July 1, 2012 (which was less than of the projected required fund balance by \$1.9 million). The value in [B] is the actual fund balance as of July 1, 2013.

Note that GASB results are not included in this report. They will be sent separately.

VALUATION

Milliman's valuation of VSDP's long-term care claim experience and fund balance are based on a comparison of actual experience for the past year to that projected in our last report, dated November 12, 2012. In that report, Milliman laid out expectations for the next years' experience based on previous experience of the VSDP covered group.

The method used to establish the expected fund needs was to compare the present value of expected future claims and expenses against the present value of the expected future contributions. The difference between the first item and the second item represents the needed fund balance as of the valuation date of June 30, 2013. To the extent that the fund balance is less than the needed amount, the shortfall is amortized over the next 30 years as an increase in needed employer contributions. To the extent that the reverse is true and the fund balance is larger than the needed amount, the excess could be amortized over the next 30 years as a decrease in the needed employer contributions. The amount to be amortized for any given valuation year will carry forward, and a new amount will be estimated in each successive valuation such that the expected fund is being adjusted on an ongoing basis to maintain its adequacy. The amortized amounts carried forward from prior valuations were changed to a 30 year amortization period in this valuation based on a decision made by VRS Board of Trustees.

Changes made in this year's valuation were for the following items, which will be discussed in more detail later in this report:

- Update to the FY2013 census,
- Update to the porting rates to more accurately reflect actual experience,
- Adjustment to the claim selection factors, and
- Adjustment to the amortization period.

PROJECTION AND BENCHMARKS FOR FISCAL YEAR 2013

Table 2 below presents our closed block 50 year projection of key elements for the long-term care benefit given current benefit levels. The fund balance values in Table 2 start from the projected balance as of June 30, 2013 and do not incorporate amortized gains/losses for the fund balances and contribution calculations in years going forward. The actual fund balance as of June 30, 2013 of \$45.61 million is approximately \$0.46 million above what we estimate is needed in our current projections.

Note that this projection does not incorporate possible future increases in the daily benefit amount, although increases equivalent to 5 years of compound inflation are scheduled to occur every five years. The first, and so far the only, such increase occurred in December 2007. The increase scheduled to occur in December 2013 may be considered for December 2014, and it is not reflected in our analysis. Such increases must be accompanied by a corresponding increase in contribution to cover the additional cost of the additional benefits. In other words, these inflation increases are not pre-funded.

The financial data in the second row in Table 2 provide the benchmarks for Fiscal Year 2014. The number of active and ported participants is the actual number as of June 30, 2013. To the extent that the covered census (active or ported members), contributions (employer or ported premium rates), claim levels, expense levels, investment income, or the total fund balance deviate from these benchmarks, VRS should be prepared to make adjustments to future contribution or benefit levels to compensate.

Table 2 – 50 Year Closed Block Projection of the Long-Term Care Fund Activity for Current Employees (Dollars In Millions)

FY	Number of Members		Starting Annual Contribution		Incurred Claims	Expenses	EOY Investment Income	EOY Required Fund Balance*
	BOY Active	BOY Ported	Active	Ported				
2013								\$45.15
2014	76,897	922	\$4.66	\$0.25	\$1.31	\$0.52	\$0.11	\$48.31
2015	69,185	1,939	\$4.21	\$0.46	\$1.48	\$0.52	\$3.47	\$55.20
2016	63,389	2,801	\$3.86	\$0.60	\$1.68	\$0.52	\$3.94	\$62.12
2017	58,717	3,584	\$3.55	\$0.74	\$1.88	\$0.53	\$4.41	\$69.05
2018	54,658	4,322	\$3.27	\$0.86	\$2.04	\$0.53	\$4.89	\$76.02
2019	50,970	5,039	\$3.00	\$1.09	\$2.24	\$0.55	\$5.37	\$83.12
2020	47,557	5,744	\$2.75	\$1.21	\$2.45	\$0.56	\$5.85	\$90.42
2021	44,373	6,438	\$2.51	\$1.33	\$2.68	\$0.58	\$6.35	\$97.84
2022	41,387	7,120	\$2.29	\$1.43	\$2.95	\$0.59	\$6.85	\$105.35
2023	38,574	7,787	\$2.08	\$1.53	\$3.22	\$0.61	\$7.37	\$112.93
2024	35,916	8,437	\$1.88	\$1.86	\$3.57	\$0.66	\$7.89	\$120.58
2025	33,402	9,066	\$1.70	\$1.94	\$3.91	\$0.68	\$8.41	\$128.47
2026	31,019	9,672	\$1.53	\$2.01	\$4.28	\$0.71	\$8.94	\$136.38
2027	28,753	10,256	\$1.38	\$2.07	\$4.68	\$0.74	\$9.48	\$144.26
2028	26,591	10,814	\$1.23	\$2.11	\$5.12	\$0.78	\$10.01	\$152.09
2029	24,525	11,346	\$1.10	\$2.55	\$5.73	\$0.86	\$10.54	\$159.80
2030	22,555	11,848	\$0.97	\$2.57	\$6.27	\$0.91	\$11.06	\$167.62
2031	20,679	12,316	\$0.86	\$2.57	\$6.85	\$0.96	\$11.58	\$175.20
2032	18,897	12,746	\$0.76	\$2.56	\$7.48	\$1.01	\$12.09	\$182.45

Table 2 – 50 Year Closed Block Projection of the Long-Term Care Fund Activity for Current Employees (Dollars In Millions)

FY	Number of Members		Starting Annual Contribution		Incurred Claims	Expenses	EOY Investment Income	EOY Required Fund Balance*
	BOY Active	BOY Ported	Active	Ported				
2033	17,206	13,136	\$0.66	\$2.54	\$8.14	\$1.07	\$12.56	\$189.30
2034	15,602	13,484	\$0.58	\$3.05	\$9.03	\$1.19	\$13.02	\$195.68
2035	14,081	13,789	\$0.50	\$2.99	\$9.77	\$1.26	\$13.44	\$201.84
2036	12,643	14,047	\$0.44	\$2.92	\$10.54	\$1.32	\$13.84	\$207.34
2037	11,292	14,257	\$0.37	\$2.84	\$11.31	\$1.39	\$14.19	\$212.12
2038	10,029	14,413	\$0.32	\$2.75	\$12.07	\$1.45	\$14.49	\$216.12
2039	8,855	14,515	\$0.27	\$3.25	\$13.05	\$1.59	\$14.75	\$219.28
2040	7,768	14,563	\$0.23	\$3.12	\$13.78	\$1.65	\$14.93	\$221.90
2041	6,765	14,556	\$0.19	\$2.98	\$14.45	\$1.70	\$15.09	\$223.60
2042	5,846	14,497	\$0.16	\$2.83	\$15.07	\$1.75	\$15.18	\$224.38
2043	5,014	14,382	\$0.13	\$2.68	\$15.62	\$1.79	\$15.20	\$224.27
2044	4,270	14,210	\$0.11	\$3.08	\$16.34	\$1.89	\$15.18	\$223.26
2045	3,612	13,985	\$0.09	\$2.90	\$16.74	\$1.91	\$15.09	\$221.67
2046	3,031	13,709	\$0.07	\$2.71	\$17.06	\$1.93	\$14.96	\$219.25
2047	2,521	13,388	\$0.06	\$2.53	\$17.29	\$1.94	\$14.78	\$216.05
2048	2,077	13,026	\$0.05	\$2.34	\$17.44	\$1.94	\$14.54	\$212.12
2049	1,693	12,626	\$0.04	\$2.62	\$17.71	\$1.98	\$14.26	\$207.52
2050	1,367	12,192	\$0.03	\$2.42	\$17.70	\$1.97	\$13.93	\$202.54
2051	1,091	11,728	\$0.02	\$2.22	\$17.60	\$1.94	\$13.58	\$197.01
2052	862	11,239	\$0.02	\$2.04	\$17.43	\$1.91	\$13.20	\$191.00
2053	673	10,729	\$0.01	\$1.85	\$17.19	\$1.87	\$12.78	\$184.59
2054	517	10,206	\$0.01	\$2.02	\$17.05	\$1.87	\$12.34	\$177.84
2055	391	9,672	\$0.01	\$1.83	\$16.71	\$1.82	\$11.87	\$170.95
2056	293	9,132	\$0.01	\$1.66	\$16.31	\$1.76	\$11.40	\$163.81
2057	218	8,588	\$0.00	\$1.49	\$15.87	\$1.71	\$10.91	\$156.49
2058	163	8,045	\$0.00	\$1.34	\$15.40	\$1.65	\$10.41	\$149.03
2059	121	7,509	\$0.00	\$1.42	\$15.01	\$1.62	\$9.91	\$141.48
2060	90	6,983	\$0.00	\$1.27	\$14.49	\$1.55	\$9.40	\$133.98
2061	67	6,470	\$0.00	\$1.13	\$13.96	\$1.49	\$8.89	\$126.44
2062	50	5,972	\$0.00	\$1.01	\$13.42	\$1.42	\$8.38	\$118.91
2063	37	5,492	\$0.00	\$0.89	\$12.87	\$1.36	\$7.86	\$111.40
2064	28	5,031	\$0.00	\$0.91	\$12.39	\$1.31	\$7.36	\$103.93

*End of the year fund balance includes investment earnings of 7.0%. This table presents simplified timing of cash flow for presentation purposes.

INCOME STATEMENT

Income to the long-term care fund during the past fiscal year (July 1, 2012 through June 30, 2013) is presented in Table 3 below.

Table 3 – Income Statement of the Long-Term Care Fund – FY2013

Revenues

Employer contributions	\$2,929,028
LTCG – Portability Contributions	\$277,092
Net Investment income	<u>\$4,461,491</u>
Total Revenue	\$7,667,611

Expenses

Paid Claims	\$288,297
TPA administrative services charges	510,308
VRS administration expenses	57,129
Other Expenses	<u>3,459</u>
Total operating expenses	\$859,193

Net increase (decrease) **\$6,808,418**

Investment income was higher than expected during the last fiscal year. Instead of the projected investment income of \$2.83 million (7.0% earning rate for one year), according to VRS end of year financial statement, the fund experienced a gain of \$4.46 million in investment income.

The actual expense levels were consistent with expectations. LTC administration expenses and other costs were \$0.57 million in Fiscal Year 2013 compared to \$0.53 million expected. Expected expenses are \$0.52 million for Fiscal Year 2014. We did not make any adjustment to the expense assumptions in our projections.

INCURRED CLAIMS STATEMENT

We restate the incurred claims which are composed of the disabled life reserve and the incurred but not reported reserve at each valuation incorporating the available information about the actual incurred claims. Table 4 presents the details behind the calculation of incurred claims on an actuarial basis for Fiscal Years 2012 and 2013.

Table 4 - FY2012-FY2013 Incurred Claims and Reserves					
FY2012 Valuation					
Claims incurred in FY2012	Claims Paid in FY2012 (1)	Reserve Value at 6/30/2012 (2)	Claims Paid in FY2013 (3)	Restated Reserve Value at 6/30/2013 (4)	Adequacy Test (2) - PV[3,4]
Disabled Life Reserve (Known as of June 30, 2012)	\$10,806	\$182,493	\$50,017	\$113,970	\$27,626
IBNR (Unknown as of June 30, 2012)	\$0	\$38,660	\$0	\$0	\$38,660
Total	\$10,806	\$221,153	\$50,017	\$113,970	\$66,286
FY2013 Valuation					
Claims incurred in FY2013			Claims Paid in FY2013 (5)	Reserve Value at 6/30/2013 (6)	
Disabled Life Reserve (Known as of June 30, 2013)			\$3,759	\$60,818	
IBNR (Unknown as of June 30, 2013)			\$0	\$12,916	
Total			\$3,759	\$73,734	
Fiscal Year	Actuarial Basis Incurred Claims, (1)+(3)+(4)				
FY2008	\$127,201				
FY2009	\$195,043				
FY2010	\$315,081				
FY2011	\$357,536				
FY2012	\$174,793				
FY2013	\$77,493				

BALANCE SHEET

The balance sheet for the long-term care benefit is presented in Table 5 below. As of FY2013, VRS has decided to begin amortizing all of its outstanding gain/loss over a 30-year period (starting in this valuation). This also applies to the outstanding amounts from prior years.

Table 5 – Balance Sheet for the Long-Term Care Benefit Fund as of June 30, 2013

Assets	
Actual Fund balance	\$45,611,327
Outstanding Amortization Amount (over 30 years)	
First Year Amount, July 1, 2007	\$4,014,731
Second Year Amount, July 1, 2008	\$5,734,622
Third Year Amount, July 1, 2009	-\$9,749,353
Fourth Year Amount, July 1, 2010	-\$3,834,774
Fifth Year Amount, July 1, 2011	-\$1,617,767
Sixth Year Amount, July 1, 2012	\$7,363,114
Seventh Year Amount, July 1, 2013	-\$2,375,636
Subtotal	-\$465,062
TOTAL	\$45,146,264
Liabilities	
ALR and Expense Reserve	\$44,724,618
Disabled Reserve	\$408,730
IBNR	<u>\$12,915</u>
TOTAL	\$45,146,264

CONTRIBUTION AND RESERVE BUILD-UP GIVEN CHANGES IN ASSUMPTIONS

As noted above, Milliman made three changes to our assumptions for this valuation.

Table 6 presents the list of the changes in modeling assumptions and their expected impact on total employer contributions and needed reserves, respectively. The totals are presented in each row, showing the cumulative impact of each added change to the model. Also presented are the incremental impacts of each change in terms of dollars and percentage impact on totals. At the request of VRS, for this valuation we re-amortized all outstanding gain/loss amounts using 30 year amortization period.

Table 6 – FY2014 Contribution and Fund Amount Build Up - 30 Year Amortization Schedule

	LTC Census	% Change	Annual Contribution	% Change	Fund (Beginning of Year)	% Change
Projected FY2013 Value as of 6/30/2012 (a)	75,641		\$4,842,770		\$40,712,952	
Projected FY2014 Value as of 6/30/2012 (b)	NA		NA		\$47,073,260	
Adjusted to Reflect Actual Population as of 6/30/2013 (c)	76,897	1.7%	\$5,084,877	5.0%	\$48,082,152	2.1%
Adjusted to Reflect Porting Rates Update	NA		\$5,046,232	-0.8%	\$48,092,436	0.0%
Adjusted to Reflect Claim Experience Update	NA		\$4,656,083	-7.7%	\$45,146,264	-6.1%
Adjusted to Reflect the Amortization of Gain/Loss	NA		\$4,618,605	-0.8%	\$45,611,327	1.0%
Projected FY2014 Value as of 6/30/2013	76,897		\$4,618,605		\$45,611,327	

The rows in the table represent:

- (a) FY2013 values from the 2012 VSDP Long-Term Care valuation report projections.
- (b) FY2014 calculated fund balance (contribution method) derived from the FY2013 beginning of year fund balance.
- (c) FY2014 values adjusted to reflect the active LTC census as of June 30, 2013.

ASSUMPTION CHANGES

Milliman updated three assumptions while completing this valuation. A change was made to the census, the porting rates, and the claim selection factors. These changes are described below.

Census

The first factor to impact our estimate of required employer contribution is the size and composition of the most recent actively employed census. This is a straightforward change, the impact of which was a 5.0% increase in the annual contribution and a 2.1% increase in the required fund reserve.

The SPORS/VaLORS population represents a relatively small portion of the total eligible population at 12.3%. The age-gender distributions for this group and the remaining participants are in Appendix A. The SPORS/VaLORS population is significantly younger, with an average age of 39 in FY2013, and is also mostly male in gender (70%). The average age for the remaining population is 47, with a male percentage of 40%. In combination, these two characteristics make this population a much less expensive group in terms of the needed annual LTC contributions.

Distributions of the current and past year census by age and gender and a comparison of the total census to the SPORS/VaLORS census are presented in Appendix A.

Porting Rates

We updated the porting rates to more accurately reflect the actual porting rate experience through FY2013. This change had an impact of -0.8% on employer contributions and 0.0% on the needed fund balance.

The new porting rates used in this year's valuation can be found in Appendix B.

Claim Selection Factors

We reviewed the actual emerging claim experience to date and revised our claim selection factors to partially reflect the favorable claim experience. These factors were reduced to reflect the fact that actual morbidity in the early years of the program is much lower than what the 2011 Milliman *Long-Term Care Guidelines* assumptions suggest, likely reflecting the value of covering all employees who are actively at work.

The small change reflecting the emerging claim experience had an overall impact of -7.7% on the annual contribution and -6.1% on the required fund reserve.

Appendix C presents tables of selection factors used to adjust these values for the VSDP population for actively employed and ported members.

Amortization Period

At the request of VRS, for this valuation we re-amortized all outstanding gain/loss amounts using 30 year amortization period. We increased the amortization period to 30 years from 29 used in last year's valuation per instructions from Rory Badura, VRS Senior Staff Actuary. This change had an impact of -0.8% on employer contributions and 1.0% on the needed fund balance.

PORTING PREMIUMS

VRS and their third party administrator (TPA) will need to be able to determine the appropriate premium (“porting premium”) for members who choose to port their long-term care coverage upon employment termination. While employed, a person has the amount of coverage currently in place for the entire employed group. Upon termination, that person has the option to port the amount of coverage current for the group. The issue is what that person will pay to port the coverage.

In order to assist VRS in calculating the correct porting premiums for various employment/eligibility scenarios, Milliman previously prepared an Excel spreadsheet to calculate porting premiums. The user must enter the employee’s date of birth and dates of hire/termination for a maximum three hire/termination events. If applicable, the user also indicates whether the individual has ported the coverage upon previous termination and whether the individual has purchased additional coverage for any inflation increases offered by VSDP during the porting period. The final porting premium is the output of the model. Because VRS did not elect to increase benefits by 5% which would have been effective as of December 2013, this model will not need to be updated. Going forward, if benefits are increased the model will need to be updated in order to accommodate the changing premium rates associated with the scheduled increase

We have performed an adequacy examination along with sensitivity testing of porting premiums under a no inflation increase scenario and believe that the current porting premiums are still adequate. We will continue to monitor this going forward.

SUMMARY OF BENEFITS

The VRS benefit is a two year maximum coverage period with a \$96 per day indemnity benefit paid for service in the nursing home, for a lifetime maximum benefit of \$70,080. The daily benefit for home health care usage is half that daily amount and the same lifetime maximum, which therefore uses the maximum “pot of money” more slowly and results in twice the coverage duration. The benefit schedule includes the possibility of an increase for inflation every 5 years in the amount of 5% compounded annually since the last inflation increase, accompanied by a corresponding increase in premium. The benefits were increased to \$96 per day starting in December 2007.

ASSUMPTIONS

We used the assumptions presented in this section to create the expected values for the long-term care benefit. Note that the assumptions used may differ from those used for the VSDP disability benefits valuation in some cases.

Employment Termination

In the FY2009 valuation, we studied VRS employment termination experience over the last seven years, from which we developed two-dimensional gender specific termination assumptions by participant's age and accrued service. Last year, we made a small update to these rates reflecting experience through FY2012. For added conservatism, we adjusted these rates to reflect 90% of actual experience, or lowered the rates by 10%. We analyzed the aggregate past termination experience as of June 30, 2013 and made no modifications to our termination assumptions. The turnover values for selected ages and accrued service are presented in the Appendix D.

Morbidity

Our claim cost assumptions are based upon the proprietary 2011 Milliman *Long Term Care Guidelines* (LTCGs). These *Guidelines* provide a flexible, but consistent, basis for the determination of claim costs for a wide variety of long term care benefit packages. These rating structures can be used to anticipate future claim levels, evaluate past experience and establish inter-relationships between different long term care (LTC) coverage options. The *Guidelines* are used by many of the smaller companies in the insurance industry (who do not have enough of their own experience to price their coverage) to develop long-term care premiums. The *Guidelines* are based on insured experience, studied and updated in 2011.

Part of the morbidity assumption used to estimate costs associated with the self-funded plan includes adjustments for selection. Selection is the extent to which participants represent a risk level different than the average insured person with long-term care coverage through an employer. A positively select group is one where the claim risk of the group is assumed to be less than average, whereas an adversely select group is one where the claim risk is assumed to be higher than average.

The VRS plan participants are actively at work, and therefore assumed to be positively select and less likely to use LTC benefits in the early years of coverage. Over time, this effect is assumed to wear off.

We assumed people who port their coverage are adversely select, and therefore more expensive than average. Please refer to Appendix E for sample claim rates and expected length of stay, and Appendix C for tables of selection factors used to adjust these values for the VSDP population for actively employed and ported members.

Mortality

We used the Static 1994 Group Annuity Mortality table (GAM) to estimate the long term death rates, which is presented in Appendix F. The following setbacks were used (and assuming 100% death rate at age 120):

For State Employees and Judges:

- a. Pre-Retirement – one year setback in age for males and females.
- b. Post-Retirement – one year setback in age for males and females.

For SPORS and VaLORS:

- a. Pre-Retirement – one year setback in age for males and females.
- b. Post-Retirement – four year setback in age for males and females.

Interest

Investment income return used in this pricing was 7.0%. We were instructed to use this assumption by VRS as this is the interest rate assumption used in valuing VRS' pension obligations, and it is assumed that this investment performance will be mirrored in the self-funded long-term care program over the long term. Judging the reasonableness of this assumption would require significant work outside the scope of this engagement.

Porting Rates

Porting rates represent the probability that an individual will choose to port the coverage upon employment termination. Porting rate assumptions are based upon experience over the first five years of the program, with substantial increases over the life of the program. We analyzed the aggregate past porting experience as of June 30, 2013 and made modifications to the porting rates to more closely reflect the actual porting experience to date, especially at the later policy durations.

In estimating the financial needs of the program, the contribution level is very sensitive to porting rates; therefore they will require careful monitoring as the program continues to develop.

Porting rates by age and employment duration are presented in Appendix B.

Expenses

We used the same expense schedule as we have used in our last valuation. Expenses include the following:

- TPA (Long-Term Care Group),
- ongoing costs to administer the program
 - expenses, salaries and benefits within VRS
 - costs for consulting services
- claims expense, which include adjudication and administration
- new member expense to set up the administration for a new hire

A breakdown of expense assumptions is presented in Appendix G.

APPENDIX A: VSDP CENSUS DATA

Current Active Census as of 6/30/2013

Age, 2013	Females	Males	Total	Females	Males	Total
<20	4	8	12	0%	0%	0%
20-29	4,262	3,938	8,200	6%	5%	11%
30-39	8,807	7,146	15,953	11%	9%	21%
40-49	10,685	8,389	19,074	14%	11%	25%
50-59	13,089	8,877	21,966	17%	12%	29%
60-69	6,093	4,888	10,981	8%	6%	14%
70-79	257	427	684	0%	1%	1%
80-89	7	20	27	0%	0%	0%
Total	43,204	33,693	76,897	56%	44%	100%

Prior Active Census as of 6/30/2012

Age, 2012	Females	Males	Total	Females	Males	Total
<20	19	12	31	0%	0%	0%
20-29	4,419	3,749	8,168	6%	5%	11%
30-39	8,550	6,941	15,491	11%	9%	20%
40-49	10,974	8,372	19,346	15%	11%	26%
50-59	12,982	8,784	21,766	17%	12%	29%
60-69	5,560	4,643	10,203	7%	6%	13%
70-79	247	367	614	0%	0%	1%
80-89	6	16	22	0%	0%	0%
Total	42,757	32,884	75,641	57%	43%	100%

SPORS/VaLORS Population Distribution as of 6/30/2013

Age, 2013	Other		SPORS/VaLORS		Other		SPORS/VaLORS	
	Female	Male	Female	Male	Female	Male	Female	Male
<20	4	4	0	4	0%	0%	0%	0%
20-29	3,695	2,293	567	1,645	5%	3%	6%	17%
30-39	7,986	5,205	821	1,941	12%	8%	9%	21%
40-49	9,889	6,655	796	1,734	15%	10%	8%	18%
50-59	12,555	7,893	534	984	19%	12%	6%	10%
60-69	5,979	4,612	114	276	9%	7%	1%	3%
70-79	253	420	4	7	0%	1%	0%	0%
80-89	7	19	0	1	0%	0%	0%	0%
Subtotal	40,368	27,101	2,836	6,592	60%	40%	30%	70%
Total	67,469		9,428		88%		12%	

APPENDIX B: PORTING RATES

Current Selected Policy Porting Rate Assumptions by Policy Issue Age and Policy Duration

Policy Duration (in years)

Issue Age	0	5	10	15	20	25	30	35	40	45	50
25	0.1000	0.1010	0.1144	0.1313	0.1739	0.2555	0.3693	0.5263	0.6812	0.8874	1.0000
30	0.1000	0.1019	0.1234	0.1534	0.2185	0.3194	0.4537	0.5822	0.7574	0.9609	1.0000
35	0.1000	0.1021	0.1303	0.1778	0.2683	0.3935	0.5001	0.6454	0.8406	1.0000	1.0000
40	0.1000	0.1063	0.1608	0.2383	0.3423	0.4320	0.5526	0.7169	0.9230	1.0000	1.0000
45	0.1001	0.1177	0.2001	0.2931	0.3754	0.4755	0.6119	0.7978	0.9983	1.0000	1.0000
50	0.1027	0.1304	0.2244	0.3262	0.4116	0.5247	0.6790	0.8833	1.0000	1.0000	1.0000
55	0.1072	0.1410	0.2422	0.3585	0.4524	0.5804	0.7549	0.9624	1.0000	1.0000	1.0000
60	0.1162	0.1596	0.2667	0.3924	0.4986	0.6434	0.8407	1.0000	1.0000	1.0000	1.0000
65	0.1329	0.1887	0.2999	0.4307	0.5508	0.7146	0.9257	1.0000	1.0000	1.0000	1.0000
70	0.1485	0.2129	0.3308	0.4741	0.6099	0.7952	0.9985	1.0000	1.0000	1.0000	1.0000
75	0.1700	0.2444	0.3693	0.5231	0.6768	0.8863	1.0000	1.0000	1.0000	1.0000	1.0000
80	0.1875	0.2682	0.4043	0.5786	0.7524	0.9645	1.0000	1.0000	1.0000	1.0000	1.0000
85	0.1941	0.2770	0.4310	0.6413	0.8379	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
90	0.2012	0.2863	0.4601	0.7123	0.9347	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
95	0.2088	0.2960	0.4917	0.7925	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	0.2171	0.3063	0.5261	0.8833	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
105	0.2259	0.3171	0.5635	0.9860	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
110	0.2354	0.3284	0.6042	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
115	0.2457	0.3404	0.6485	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
120	0.2567	0.3529	0.6966	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

APPENDIX C: CLAIM SELECTION FACTORS

VSDP-Specific Adjustments To Claim Rates (Selection Factors)

Actively Employed Members			
Policy Year	Issue Age		
	<50	50-64	65+
1	0.143	0.148	0.177
2	0.232	0.238	0.274
3	0.304	0.310	0.366
4	0.358	0.365	0.471
5	0.394	0.402	0.557
6	0.471	0.480	0.588
7	0.508	0.518	0.616
8	0.538	0.549	0.638
9	0.567	0.579	0.659
10	0.603	0.617	0.683
11	0.642	0.657	0.723
12	0.687	0.704	0.770
13	0.747	0.765	0.805
14	0.815	0.835	0.846
15	0.883	0.883	0.886
16	0.891	0.891	0.894
17	0.901	0.901	0.903
18	0.912	0.912	0.915
19	0.926	0.926	0.928
20+	0.943	0.943	0.944

VSDP-Specific Adjustments To Claim Rates (Selection Factors)

Ported Members		
Porting rate	Initial (First Year of Porting)	Ultimate
0%	2.35	1.19
5%	2.29	1.18
10%	2.22	1.18
15%	2.16	1.17
20%	2.09	1.16
25%	2.03	1.16
30%	1.96	1.15
35%	1.90	1.14
40%	1.83	1.13
45%	1.77	1.13
50%	1.70	1.12
55%	1.64	1.11
60%	1.57	1.11
65%	1.51	1.10
70%	1.44	1.09
75%	1.38	1.09
80%	1.31	1.08
85%	1.25	1.07
90%	1.18	1.06
95%	1.12	1.06
100%	1.05	1.05

APPENDIX D: TERMINATION RATE ASSUMPTIONS

Current Assumption: Selected Employment Turnover Assumptions by Hire Age And Accrued Service

Female

Employment Duration (years)

Hire Age	0	5	10	15	20	25	30	35	40	41+
20	0.413	0.186	0.085	0.043	0.021	0.017	0.041	0.052	0.087	0.116
25	0.282	0.113	0.061	0.039	0.022	0.024	0.067	0.111	0.177	0.202
30	0.275	0.100	0.056	0.029	0.020	0.032	0.086	0.163	0.243	0.269
35	0.272	0.074	0.044	0.028	0.026	0.052	0.131	0.230	0.282	0.283
40	0.260	0.059	0.040	0.031	0.041	0.097	0.225	0.296	0.326	0.325
45	0.244	0.050	0.041	0.045	0.082	0.190	0.305	0.358	0.402	0.407
50	0.228	0.046	0.057	0.095	0.146	0.233	0.345	0.406	0.455	0.462
55	0.208	0.059	0.102	0.163	0.219	0.295	0.390	0.459	0.515	0.522
60	0.239	0.073	0.163	0.269	0.341	0.411	0.544	0.642	0.722	0.732
65	0.314	0.092	0.216	0.353	0.445	0.578	0.770	0.913	1.000	1.000
70	0.444	0.143	0.258	0.499	0.632	0.825	1.000	1.000	1.000	1.000
71+	0.483	0.161	0.284	0.518	0.656	0.858	1.000	1.000	1.000	1.000

Male

Employment Duration (years)

Hire Age	0	5	10	15	20	25	30	35	40	41+
20	0.371	0.141	0.063	0.044	0.028	0.034	0.088	0.133	0.185	0.200
25	0.280	0.094	0.049	0.030	0.020	0.022	0.056	0.097	0.195	0.246
30	0.273	0.089	0.051	0.031	0.028	0.045	0.090	0.143	0.250	0.281
35	0.246	0.075	0.044	0.027	0.030	0.068	0.138	0.205	0.287	0.318
40	0.235	0.062	0.038	0.029	0.047	0.113	0.204	0.265	0.350	0.381
45	0.234	0.051	0.039	0.047	0.097	0.199	0.279	0.349	0.489	0.460
50	0.211	0.047	0.058	0.105	0.185	0.281	0.383	0.483	0.680	0.639
55	0.206	0.054	0.098	0.146	0.234	0.332	0.463	0.579	0.817	0.767
60	0.215	0.067	0.125	0.168	0.243	0.376	0.534	0.669	0.947	0.889
65	0.226	0.101	0.162	0.207	0.289	0.470	0.670	0.841	1.000	1.000
70	0.288	0.142	0.237	0.329	0.486	0.799	1.000	1.000	1.000	1.000
71+	0.303	0.153	0.269	0.375	0.555	0.915	1.000	1.000	1.000	1.000

APPENDIX E: CLAIM INCIDENCE RATES AND LENGTH OF STAY

Claims Probabilities (Incidence Rates)				
Gender	Male	Female	Male	Female
Age	Nursing Facility		Home Health	
25	0.00001	0.00001	0.00008	0.00008
30	0.00003	0.00002	0.00010	0.000101
35	0.00008	0.00005	0.00012	0.000127
40	0.00013	0.00009	0.00018	0.000148
45	0.00021	0.00014	0.00028	0.000173
50	0.00031	0.00020	0.00039	0.000285
55	0.00047	0.00029	0.00053	0.00047
60	0.00060	0.00065	0.00085	0.000922
65	0.00100	0.00107	0.00150	0.001624
70	0.00210	0.00191	0.00249	0.002953
75	0.00480	0.00507	0.00482	0.005411
80	0.01023	0.01327	0.00895	0.00917
85	0.02155	0.03171	0.01541	0.01511
90	0.04111	0.06180	0.02249	0.020418
95	0.05844	0.08370	0.02522	0.021901
100	0.07276	0.09756	0.02598	0.021978
105	0.09059	0.11372	0.02677	0.022056
110	0.11279	0.13255	0.02758	0.022133

Length Of Stay (In Months) By Age And Type Of Claim				
Gender	Male	Female	Male	Female
Age	Nursing Facility		Home Health	
25	11.15	13.96	19.14	12.54
30	11.60	14.42	18.81	12.47
35	12.04	14.98	18.67	12.45
40	12.29	14.87	16.77	13.48
45	12.50	14.77	14.99	14.56
50	12.90	14.16	15.36	13.78
55	13.30	13.52	15.77	13.02
60	12.99	14.12	15.15	12.40
65	13.36	14.30	12.84	12.80
70	14.00	14.32	11.80	13.53
75	13.99	15.09	11.50	13.50
80	13.76	15.61	10.90	13.18
85	13.62	15.90	10.05	12.86
90	13.09	16.19	8.78	12.70
95	12.30	16.51	8.23	12.66
100	11.32	16.10	8.70	13.34
105	9.84	14.77	9.56	14.60
110	8.31	13.32	9.33	14.89

APPENDIX F: MORTALITY RATES

Mortality Rates								
State Employees & Judges			SPORS/VaLORS					
Pre- and Post- Retirement			Pre-Retirement			Post-Retirement		
Age	Male	Female	Age	Male	Female	Age	Male	Female
25	0.00062	0.00029	25	0.00062	0.00029	25	0.00053	0.00029
30	0.00078	0.00033	30	0.00078	0.00033	30	0.00070	0.00029
35	0.00085	0.00045	35	0.00085	0.00045	35	0.00082	0.00037
40	0.00100	0.00065	40	0.00100	0.00065	40	0.00086	0.00051
45	0.00146	0.00092	45	0.00146	0.00092	45	0.00116	0.00077
50	0.00233	0.00131	50	0.00233	0.00131	50	0.00172	0.00103
55	0.00398	0.00208	55	0.00398	0.00208	55	0.00287	0.00157
60	0.00709	0.00386	60	0.00709	0.00386	60	0.00495	0.00256
65	0.01294	0.00762	65	0.01294	0.00762	65	0.00899	0.00509
70	0.02173	0.01271	70	0.02173	0.01271	70	0.01624	0.00969
75	0.03405	0.02038	75	0.03405	0.02038	75	0.02595	0.01495
80	0.05586	0.03536	80	0.05586	0.03536	80	0.04086	0.02533
85	0.08961	0.06098	85	0.08961	0.06098	85	0.06862	0.04395
90	0.13945	0.10459	90	0.13945	0.10459	90	0.10579	0.07535
95	0.21570	0.17068	95	0.21570	0.17068	95	0.16726	0.12875
100	0.30130	0.25671	100	0.30130	0.25671	100	0.25151	0.20254
105	0.38786	0.36102	105	0.38786	0.36102	105	0.33346	0.29663
110	0.47315	0.46447	110	0.47315	0.46447	110	0.42560	0.40522
115	0.50000	0.50000	115	0.50000	0.50000	115	0.49636	0.49511
120	1.00000	1.00000	120	1.00000	1.00000	120	1.00000	1.00000

APPENDIX G: EXPENSE ASSUMPTIONS

Expense Assumptions	
Annual TPA Fee (Long-Term Care Group)	2% of Premium
Ongoing costs to administer the program	6% of Premium
Claims expense, adjudication and administration	10% of Claim
New member expense to set up the administration	\$25 Per Member