

WEST VIRGINIA COLLEGE PREPAID TUITION AND SAVINGS PROGRAM

ACTUARY'S REPORT ON THE SOUNDNESS OF THE WEST VIRGINIA PREPAID TUITION TRUST FUND

JUNE 30, 2017

August 2017



West Virginia College Prepaid Tuition and Savings Program

Actuary's Report on the Soundness of the West Virginia Prepaid Tuition Trust Fund June 30, 2017

Contents

	Page
Section I Executive Summary	1
Section II Summary of Current Assets	3
Section III Plan Description	4
Section IV Actuarial Methods and Assumptions	5
Section V Soundness of the Fund as of June 30, 2017	8
Section VI Sensitivity Testing	13
Section VII Changes in Surplus	14
Appendix A Active Contract Units Purchased	15
Appendix B Active Contract Units Remaining	16

Section I – Executive Summary

Adequacy of the Fund

As of June 30, 2017, the West Virginia Prepaid Tuition Trust Fund (the “Fund”) had an unfunded liability of \$9,010,693. The unfunded liability represents the difference between the sum of the present value of the expected future tuition and required fees, refunds and the sum of the market value of the assets and the present value of the expected future contract payments. The unfunded liability represents a \$4,060,859 decrease over last year’s unfunded liability of \$13,071,552. The primary sources of change are:

- a) Investment asset performance of 12.03% compared to the assumed investment return of 5.3%. The result was an asset gain of \$2,911,126. This estimate may vary from the actual asset performance as determined by the investment consultant.
- b) Tuition increases during the year increased 5.5% compared to the assumed 8.50%, resulting in a tuition gain of \$1.7 million.

The table below summarizes current balances:

Assets	
Cash and Investments	\$ 52,381,541
Future Contract Collections	<u>89,991</u>
Total Assets	\$ 52,471,532
Liabilities and Surplus	
Future Contract Benefits	\$ 61,482,225
Surplus Assets over Liabilities	<u>(9,010,693)</u>
Total Liabilities and Surplus (Deficit)	\$ 52,471,532

The Fund’s funded ratio is 85.3%, compared to 81.5% last year.

The assumptions used to measure the adequacy of the Fund, which were approved by the Board, are stated in Section IV. The most important assumptions are:

- The investment yield and;
- The rate of increase in tuition/fees.

An Escrow Account is available to the Fund to cover benefit costs should the Fund become depleted. As of June 30, 2017, the account balance was \$21,069,169. If combined with the Trust Fund Assets, the Fund would have a surplus of \$12,058,476 and have a Funded Ratio of 119.6%. The funded ratio on this basis last year was 109.5%.

Investment Yield

The investment yield is the expected long-term net earnings rate of return on the assets.

The actuarial valuation of the Fund was determined using the schedule of interest rates found in Section IV. We also assumed the Fund is exempt from federal income tax. It is important to highlight the sensitivity of this analysis to this assumption. As pointed out subsequently, a 25-basis points shortfall in such a goal would place the Fund in a much less favorable position. Additionally, the nature of this type of program involves payment of benefits at fixed future points in time, subjecting the Fund to greater than average investment risk due to short-term fluctuation and in matching investment maturities with expected outlays.

Rate of Increase in Tuition/Fees

The assumed annual increases are shown in Section IV.

Use of Report

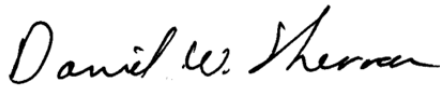
This report is prepared solely to assist the Board of the West Virginia College Prepaid Tuition and Savings Program in evaluating the actuarial soundness of the Fund each year. The report is not intended and is not suitable for any other purpose. Accordingly, Sherman Actuarial Services does not intend this report or the data contained therein to be used as personal financial advice. Other readers of this report should consult with their own financial advisors regarding the application of this report to their particular circumstances.

Qualifications

Daniel Sherman is an Associate of the Society of Actuaries, and a Member of the American Academy of Actuaries. He is the actuary for the West Virginia prepaid tuition plan, and is the current actuary for the Alabama, Texas, and Nevada prepaid tuition plans. He meets the Qualification Standards of the Academy to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions concerning it.

All assumptions were chosen by the Board. In my opinion the actuarial assumptions selected by the Board are reasonable. The Board provided the contract data and asset information.

Sherman Actuarial Services, LLC



Daniel Sherman, ASA, MAAA, EA
Director and Consulting Actuary

SECTION II – Summary of Current Assets

Current Assets

The assets are administered by the State Treasurer's Office and invested by external managers. The value of the assets as of June 30, 2017 is \$52,381,541. Asset totals shown below do not include securities lending collateral, investment transfers receivable, tuition contracts receivable or the related obligations for those assets.

Assets held as of June 30, 2017:

U.S. Equities	\$13,423,336
International Equities	11,380,129
Fixed Income	24,221,495
Cash and Cash Equivalents held by Hartford	<u>3,356,581</u>
Total	\$52,381,541

It is assumed that this mix will produce a net annual investment return of 5.3% in fiscal year 2017-18.

Investment Strategy

The goal of the investment strategy is to maximize the investment return given the short time horizon for the Fund and the need to avoid investment risk. The Board has determined that the protection of capital is critical and is the best approach for maximizing the Fund's ability to fulfill its contractual obligations to beneficiaries when they matriculate.

Because the Fund is in wind-down, the Fund plans to increase the Fixed Income allocation beginning with fiscal year 2018. The table below shows the target allocations by fiscal year for the current and next 6 fiscal years:

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
Broad Domestic Equity	22.0%	16.5%	11.0%	5.5%	0%
Global (ex-US) Equity	18.0%	13.5%	9.0%	4.5%	0%
Domestic Fixed & Cash	60.0%	70.0%	80.0%	90%	100%
Total	100%	100%	100%	100%	100%

SECTION III – Plan Description

Overview

The West Virginia College Prepaid Tuition Plan (“Plan”) is an Internal Revenue Code Section 529 prepaid tuition plan. It allows the contract holder to lock in the cost of undergraduate college tuition and required fees, thus providing protection against future tuition inflation. The Plan was closed to new contracts in 2003.

In 2003 the Legislature created the Prepaid Tuition Trust Escrow Account to guarantee payment of Prepaid Tuition Plan contracts. The Escrow Account will receive transfers of up to \$1,000,000 from the State Unclaimed Property Trust Fund each year there is an actuarially determined unfunded liability of the Prepaid Tuition Plan. If the Prepaid Tuition Plan is unable to pay current tuition benefits, funds may be withdrawn from the Escrow Account to meet those payments. At June 30, 2017, there was \$21,069,169 in the Escrow Account.

Contract Units

The contract holder bought units of tuition where one unit is worth one semester of undergraduate tuition plus mandatory fees.

When the beneficiary is ready for college, all of the tuition and required fees will be covered at all four- or two-year public colleges and universities in West Virginia.

The contract can also be used to help pay for tuition at all private colleges in West Virginia and out-of-state institutions. In this case, the participant will receive a benefit that is equal to the Current Tuition Value, which is the average tuition, weighted by enrollment, of all eligible West Virginia Public postsecondary institutions, but excluding those under the purview of the West Virginia Council for Community and Technical Education.

Refunds

For cancellations other than death, disability, or receipt of a scholarship, the purchaser may receive a refund of payments accumulated at the lesser of 1.5% per year less administrative expenses, or the actual investment return of the Trust Fund less administrative expenses.

SECTION IV – Actuarial Methods and Assumptions

Actuarial Methods

The actuarial method projects the expected future cash flows from contract payments, tuition and refund benefits. These projected future cash flows are discounted to the present and compared to the market value of the assets to indicate the soundness of the Fund. The discount rate is equal to the assumed investment yield.

The development of the measurement of soundness has six stages:

Develop base line average tuition and required fees from data provided by the Fund;

Project average tuition and required fees through the expected term of the contracts, based on assumptions as to future tuition increases;

Determine the nominal cost of expected future tuition and required fees, based on the contract inventory and assumptions as to mortality, disability and utilization of benefits;

Project future contract payments based on the contracts and assumptions as to mortality, disability and voluntary surrender;

Determine the present value of expected future benefits and contract payments, based on the discount rate assumption;

As the indication of soundness, measure the surplus or deficit, which is the difference between the sum of the market value of the assets and the present value of the expected future contract payments and the sum of the present values of the expected future tuition and required fees, and refunds.

Actuarial Assumptions

Necessary adjustments to reflect new information were made to this year's assumptions. The assumptions were approved by either the Board, or the staff of the State Treasurer's Office. The revisions to the assumptions, if any, are noted herein.

Bias Load

A bias load of 8.5% was assumed to account for beneficiaries electing more expensive West Virginia Public schools. It is also assumed that the 75% of beneficiaries will attend a West Virginia Public school. The other 25% of beneficiaries are assumed to attend a Private or out-of-State school.

Investment Yield

The assumed annual net investment yield is shown below. NEPC, LLC provided the expected returns by fiscal year. Note that these returns reflect an assumption that each year, the Fund will shift 3% of assets into Fixed Income. These changes in asset allocation over time reduce the expected investment yield decreases each year until reaching 2.30% in fiscal year 2022.

<u>Fiscal Year</u>	<u>Assumptions</u>
2018	4.80%
2019	4.20%
2020	3.60%
2021	3.00%
2022	2.30%

Tuition/Fee Increase

Assumed annual increases in future tuition and required fees are shown in the following table.

<u>Fiscal Year</u>	<u>Assumptions</u>
2018	8.50%
2019+	8.50%

Utilization of Credits

Utilization of credits is assumed to follow the table below. There was no change in this assumption from the previous valuation.

<u>Years Purchased</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
1	85%	10%	5%							
2	45%	30%	15%	5%	5%					
3	33%	25%	18%	12%	7%	3%	2%			
4	24%	24%	20%	18%	7%	3%	2%	1%	1%	
5	19%	19%	16%	14%	13%	7%	5%	3%	2%	2%

WAT/CTV

Beneficiaries who matriculate at a non-Private in-State school are assumed to receive the Weighted Average Tuition (WAT) for actuarial valuation purposes. Beneficiaries who matriculate at a Private or Out-of-State school receive the Current Tuition Value (CTV). The WAT and CTV for the current and prior valuation are shown in the table below.

<u>School Year</u>	<u>WAT per semester</u>	<u>CTV per semester</u>
2017-2018	\$3,511	\$3,829
2016-2017	\$3,329	\$3,627

Expenses

Expenses are no longer paid from the Fund, therefore, no provisions for expenses are included in this actuarial valuation.

Mortality and Disability

Due to the transferability of the contract, there are no mortality or disability assumptions.

Early Voluntary Surrender of Contract

No early voluntary surrenders of contracts were assumed.

Matriculation Percent

We assumed the beneficiary of a contract, not voluntarily surrendered, matriculates at the date specified in the contract.

Federal Income Tax

We assume the income of the Fund is exempt from Federal Income Tax.

Timing of Tuition Payments

We assume 45% of tuition payments are made on September 1st, 45% on February 1st and 10% on July 1st.

Final Payments

We assumed that all contracts with expected unused hours as of June 30, 2022 would be cashed out using the Current Tuition Value either to a 529 Savings plan or to Unclaimed Property on July 1, 2022.

SECTION V – Soundness of the Fund as of June 30, 2017

As a measure of the soundness of the Fund as of June 30, 2017, we determined the difference between the value of the assets and the actuarial present value of the future contract payments and the actuarial present value of future benefits. This measurement of soundness is summarized on the following pages.

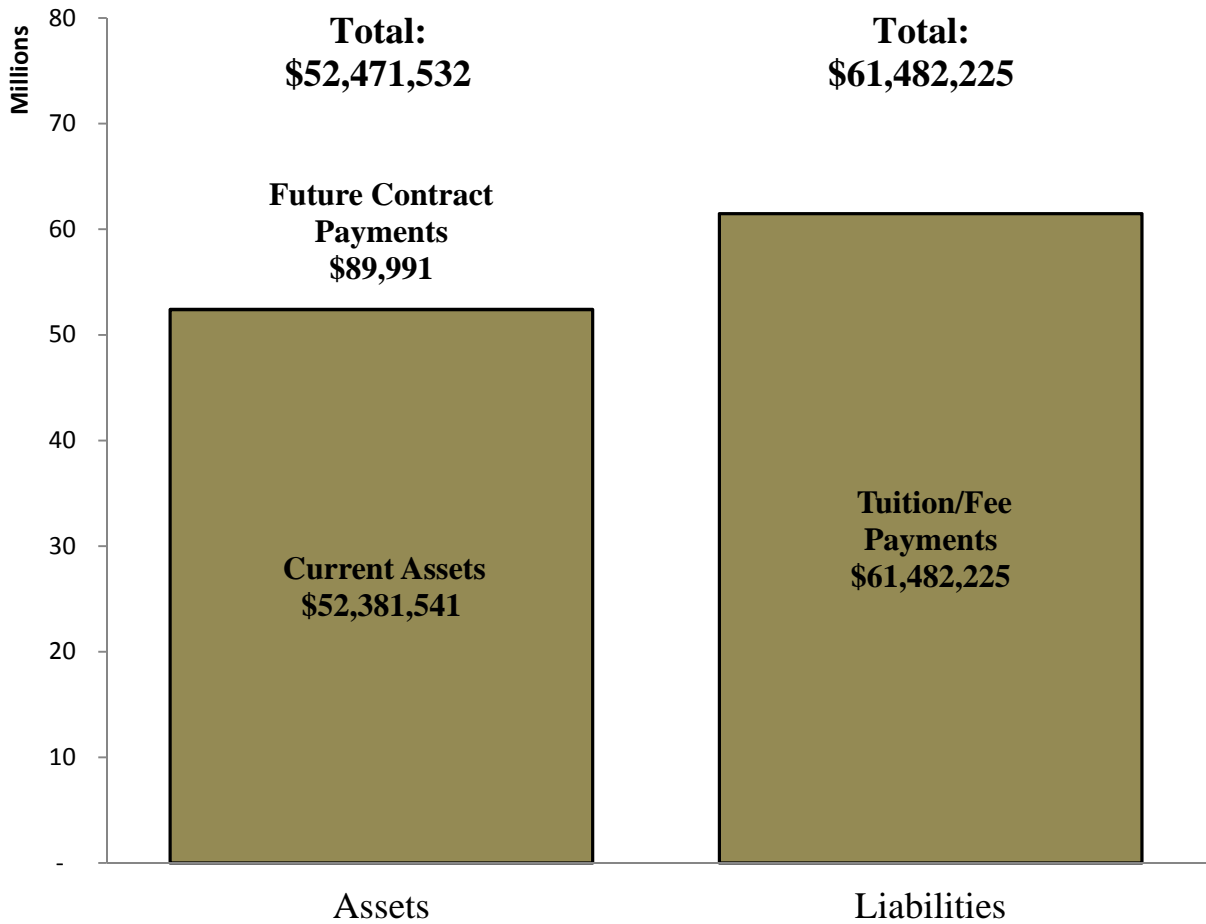
A projection of the status of the Fund at each future anniversary date through the life of these contracts is presented on page 11, labeled Present Value of Assets and Liabilities.

The projections of future benefits and contract payments are presented on page 12, labeled Expected Cash Flows.

Our measurement of the present value and projection are based on asset and contract information provided and on the assumptions chosen by the Board.

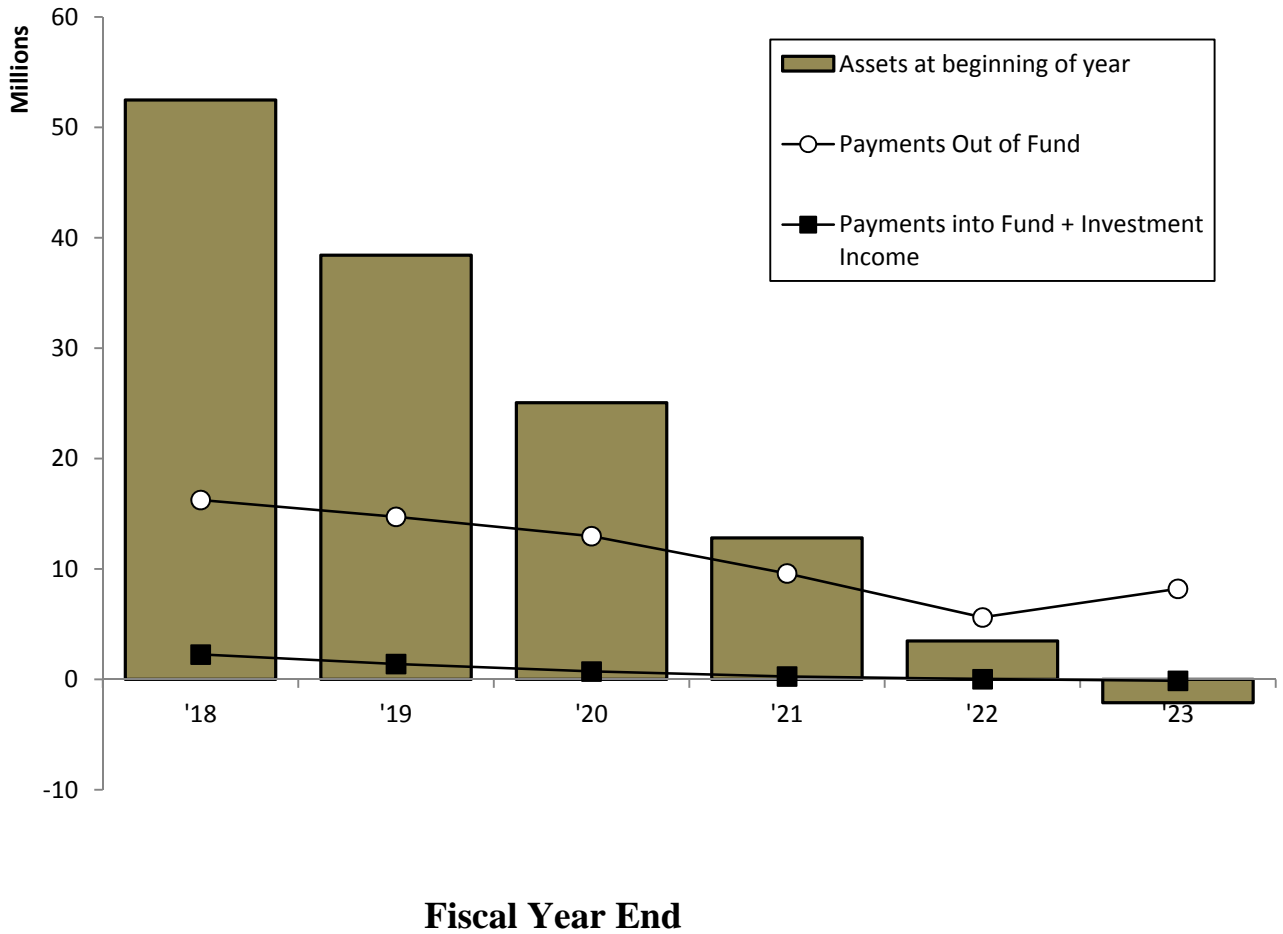
Funded Status

As of June 30, 2017, the value of the liabilities of the trust fund exceeds the assets (including the value of future payments by contract purchasers) by \$9,010,693. The funded ratio, assets divided by liabilities, is equal to 85.3%. Asset totals shown below do not include securities lending collateral, investment transfers receivable or the related obligations for those assets. The assumptions used to perform the actuarial valuation of the fund were approved by the Board and are described in Section III.



Cash Flow Projection

The expected income and disbursements of the trust fund, based on the assumptions used in the actuarial valuation, and the current group of contract beneficiaries, are shown below. These amounts are cash amounts, not present value amounts.



Present Value of Assets and Liabilities

6/30 of Year	Present Value of Future Benefits	Value of Assets and Present Value of Future Collections	Surplus of Assets Over Liabilities
2017	61,482,225	52,471,532	(9,010,693)
2018	47,726,109	38,425,893	(9,300,216)
2019	34,642,125	25,064,680	(9,577,444)
2020	22,642,803	12,806,182	(9,836,620)
2021	13,556,463	3,477,522	(10,078,941)
2022	8,171,935	(2,115,123)	(10,287,058)

Expected Annual Cash Flows

Fiscal Year Ending	Benefit Payments	Contract Payment Receipts	Annual Cash Flow
2018	16,249,426	54,408	(16,195,018)
2019	14,725,098	29,713	(14,695,385)
2020	12,971,786	10,080	(12,961,706)
2021	9,596,141	0	(9,596,141)
2022	5,620,138	0	(5,620,138)
2023	8,202,965	0	(8,202,965)

Note: The amounts shown above are annual expected amounts for the year corresponding to the “Fiscal Year Ending” column. They are not cumulative amounts. In addition, Payment Receipts are frontloaded.

SECTION VI – Sensitivity Testing

The Program operates under conditions of risk and uncertainty. For example, while it is assumed the assets of the fund will earn the annual net rate found in Section IV, we also expect actual returns to vary from year to year. To accept the reasonableness of the basis for the measurement of the soundness, it is useful to know how the status of the fund may be affected by the vagaries of the markets and other factors. We have rerun the valuation under the following alternative scenarios, and the surplus as of June 30, 2017 under each of these scenarios is presented in the following table:

Scenarios	Surplus
Baseline	(9,010,693)
Tuition increases are 25 basis points higher in each future year than assumed	(9,269,348)
The investment return is 25 basis points lower than assumed	(9,346,547)
Tuition increases are 25 basis points higher in each future year and the investment return is 25 basis points lower than assumed	(9,607,459)
Tuition increases are 25 basis points lower in each future year than assumed	(8,753,301)
Tuition increases are 25 basis points lower in each future year and the investment return is 25 basis points lower than assumed	(9,086,911)
The investment return is 50 basis points lower than assumed	(9,685,995)
The investment return is 75 basis points lower than assumed	(10,029,089)
The investment return is 100 basis points lower than assumed	(10,375,881)
Tuition increases are 50 basis points higher in each future year than assumed	(9,529,272)
Tuition increases are 75 basis points higher in each future year than assumed	(9,790,469)
Tuition increases are 100 basis points higher in each future year than assumed	(10,052,945)

SECTION VII – Changes in Surplus

Adequacy of the Fund

As of June 30, 2017, the Fund had an unfunded liability of \$9,010,693. The unfunded liability represents the difference between the sum of the present value of the expected future tuition and required fees, refunds and the sum of the market value of the assets and the present value of the expected future contract payments. The unfunded liability represents a \$4,060,859 decrease over last year's unfunded liability of \$13,071,552.

Following is a comparison of the assumed and the actual results for the year ended June 30, 2017.

Investment Return

Assets performed better than expected during the 2017 fiscal year, returning 12.03% versus the prior year assumption of 5.3%. The result was an asset gain of \$2.91 million.

Tuition and Required Fee Increase

The Weighted Average Tuition increased from \$3,329 per semester to \$3,511, an increase of 5.5% which is lower than the assumed 8.5% increase. This generated a \$1.75 million gain.

Change in Surplus Summary

During the last year, the Fund's deficit decreased from \$13.1 million to \$9.01 million. The sources of change are as follows:

Surplus / (Deficit) as of 6/30/2016		\$(13,071,552)
Expected increase in deficit		(692,792)
Asset gain (12.03% return)	2,911,126	
Tuition gain	1,749,834	
Other actuarial gain	92,691	
Total actuarial gain		<u>4,753,651</u>
Surplus / (Deficit) as of 6/30/2017		\$(9,010,693)

APPENDIX A – Active Contract Units – Total Purchased

Matriculation Year	Purchase Year					Total	% of Total
	1998	1999	2000	2001	2002		
2003		8				8	0.0%
2006	12					12	0.1%
2007	226	53	50	26		355	1.6%
2008	404	146	82	21	24	677	3.1%
2009	486	112	67	64	24	753	3.5%
2010	480	143	189	21		833	3.8%
2011	537	154	175	73	18	956	4.4%
2012	651	271	229	114	4	1,268	5.8%
2013	815	319	303	100	66	1,602	7.4%
2014	1,421	595	459	197	81	2,752	12.7%
2015	1,577	451	481	155	165	2,830	13.1%
2016	1,417	588	505	133	99	2,742	12.6%
2017	744	950	446	185	74	2,399	11.1%
2018	8	922	814	216	123	2,084	9.6%
2019	10	2	1,128	389	101	1,630	7.5%
2020	36			198	321	555	2.6%
2021	6	8	8		108	130	0.6%
2022	24		8		8	40	0.2%
2023	8					8	0.0%
2024		8				8	0.0%
2025		8				8	0.0%
2026		8				8	0.0%
2027		8	10			18	0.1%
2030	2					2	0.0%
Total	8,862	4,754	4,954	1,893	1,216	21,679	100.0%
% of Total	40.9%	21.9%	22.9%	8.7%	5.6%	100.0%	

APPENDIX B – Active Contract Units – Remaining

Matriculation Year	Purchase Year					Total	% of Total
	1998	1999	2000	2001	2002		
2003		2				2	0.0%
2006	9					9	0.1%
2007	93	19	20	5		137	0.9%
2008	116	53	13	3	10	195	1.3%
2009	178	46	22	15	5	267	1.8%
2010	178	60	82	8		328	2.2%
2011	189	66	85	38	11	390	2.6%
2012	272	128	115	65	1	582	3.8%
2013	462	159	135	55	43	854	5.6%
2014	697	309	227	108	41	1,381	9.1%
2015	1,060	307	315	106	119	1,908	12.5%
2016	1,181	490	427	113	88	2,298	15.1%
2017	744	950	446	185	70	2,395	15.7%
2018	8	922	814	216	123	2,084	13.7%
2019	8	2	1,128	389	101	1,628	10.7%
2020	36			198	321	555	3.6%
2021	6	8	6		108	128	0.8%
2022	24		8		8	40	0.3%
2023	8					8	0.1%
2024		8				8	0.1%
2025		8				8	0.1%
2026		8				8	0.1%
2027		8	10			18	0.1%
2030	2					2	0.0%
Total	5,273	3,553	3,854	1,505	1,049	15,234	100.0%
% of Total	34.6%	23.3%	25.3%	9.9%	6.9%	100.0%	