



# Quarterly Investment Performance Analysis

Wyoming State Treasurer's Office

Period Ended: December 31, 2017



# WYOMING STATE TREASURER'S OFFICE

*FOURTH QUARTER 2017*

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## QUARTERLY COMMENTARY

- This two-page memo provides a written summary of significant observations regarding performance of the State's Funds, and provides an overview of performance during the quarter for each of the asset classes the State is invested in.

### **MARKET ENVIRONMENT ..... PAGE 5-13**

- This section is intended to review capital markets in general (i.e. not specific to Wyoming), and includes a written summary of events during the quarter, including economic influences and review of equity and bond markets as a whole. This section also includes various charts and exhibits displaying key characteristics of major market indices representing the broad range of available asset classes, including alternative investments such as absolute return and real estate. Also included is an asset class summary that describes the structure of each of the State's composites. Lastly, this section includes a review of the benchmarks referenced within the quarterly report.

### **PERFORMANCE SUMMARY ..... PAGE 14-20**

- These 7 pages provide all the market value, asset allocation, and performance information for the State's investments, in summary form.

### **INVESTMENT POLICY OBJECTIVE REVIEW ..... PAGE 21-37**

- This section provides a compliance check for the Total Fund, and for each individual manager portfolio, versus the guidelines and expectations outlined in the State's Master Investment Policy and Sub-Policies.

### **APPENDIX..... PAGE 38-44**

- The appendix includes a glossary, giving definitions and other information on data included throughout the report, including financial terms and ratios, indices, peers groups. The addendum page in the appendix includes important comments specific to Wyoming regarding market value, performance, and allocation information provided throughout the report.



## Memorandum

To	Wyoming State Loan and Investment Board
From	RVK, Inc.
Subject	Investment Performance Analysis Commentary
Date	December 31, 2017

Outlined below please find a summary of significant observations regarding performance of the State's Funds for the period ended December 31, 2017. We hope this summary will facilitate your review of our Investment Performance Analysis Report.

The Total Fund returned 1.7% net of fees during the fourth quarter as global equity markets continued to rally and fixed income assets took in a modest gain. Long-term performance for the Total Fund remains strong, with the State earning returns of 5.0% and 4.7% per annum over the trailing seven- and ten-year periods.

The Total Fund outperformed its custom benchmark by 0.1% over the quarter as relative performance was bolstered by the State's fixed income portfolio structure. Equity markets continued to produce strong gains during the fourth quarter of 2017, driven largely by expectations of ongoing economic growth and generally accommodative central bank policies. The State has lower strategic exposure to equities relative to the All Master Trust Universe and subsequently underperformed the peer group in the fourth quarter. Relative to the Universe, the State continues to generate more return for each unit of risk exposure, with risk-adjusted returns ranking in the top decile of all Plans over the trailing ten-year time period.

Absolute results were positive for the State's nine investment pools, and mixed relative to their respective benchmarks. The State's permanent funds with larger strategic allocations to equities and alternative investments generated higher absolute returns than the State's non-permanent funds, but slightly lower returns on a relative basis.

The yield curve flattened considerably as short-term interest rates increase while longer-term rates remained relatively static. The Bloomberg US Aggregate Bond Index returned 0.4% in the fourth quarter, as markets remained generally supportive of fixed income assets. The State's total fixed income portfolio (excluding convertibles) returned 0.5% for the quarter, outperforming the broad market index by 0.1%. Each of the State's actively managed fixed income portfolios outperformed the broad market, led by opportunistic European credit and convertibles. Emerging markets debt continued to generate strong absolute returns within the portfolio, earning 0.8% in the fourth quarter and 15.9% in the 2017 calendar year.

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US equity markets continued to generate strong returns in the fourth quarter, across all market capitalizations and styles. The State's US equity composite returned 6.0% versus 6.3% for the Russell 3000 Index. Epoch posted the strongest absolute performance in the US equity portfolio, returning 6.6%. RBC posted the strongest relative performance in the US equity portfolio, returning 4.8% and outperforming the Russell 2000 Index by 1.5%. The State Street All Cap kept pace with its custom index, returning 6.3%.

International equity markets also had a strong quarter, with the MSCI EAFE Index returning 4.2% and the MSCI Emerging Markets Index returning 7.4%. Although developed international stocks lagged the US market, both developed and emerging markets outpaced the domestic market for 2017. Northern Trust had the strongest absolute performance in the international equity composite, returning 5.0%. The Internal International Equity Portfolio and Fisher Investments returned 4.7% and 2.8%, respectively during the quarter. Arrowstreet, the State's global equity manager, returned 6.1%, outperforming the MSCI ACW Index by 0.4%.

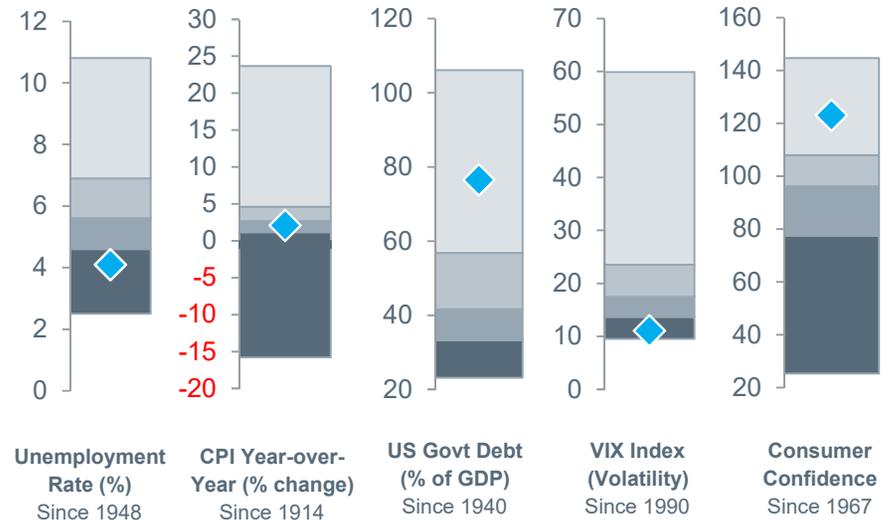
Core real estate continued a trend of delivering modest, positive returns, albeit slightly lower than in recent periods. This quarter caps off a year of substantial normalization of returns, reinforcing investor expectations of lower returns going forward as the market enters the later stages of the recovery. Between the State's two core real estate managers, Clarion and UBS, returns were 1.9% and 2.2%, respectively. The PAAMCO - Jackalope Fund (currently the State's single absolute return manager) returned 1.3% during the quarter, trailing the 2.0% earned by the HFRI FOF Comp Index.

**Fourth Quarter Economic Environment**

**Key Economic Indicators**

Price action across global financial markets continued to be driven by expectations of ongoing economic growth and generally accommodative central bank policies, with equity markets trading to record levels and global sovereign debt yields continuing to trade within recent ranges. The nominal Treasury curve continued to flatten over the quarter. Market participants suggest that recent and expected monetary policy actions, as well as expectations for increased Treasury issuance amidst fiscal stimulus policies, are driving short-maturity and mid-maturity yields higher. Comparatively, longer-dated yields proved stable, and reportedly continue to be heavily influenced by relatively modest expectations for sustained US economic growth and building inflation expectations. Finally, the US dollar continued to depreciate over the quarter, weakening by 1% against major currencies amidst continued economic improvements across developed international and emerging markets. The depreciation over the quarter contributed to a total dollar depreciation of nearly 10% for the year.

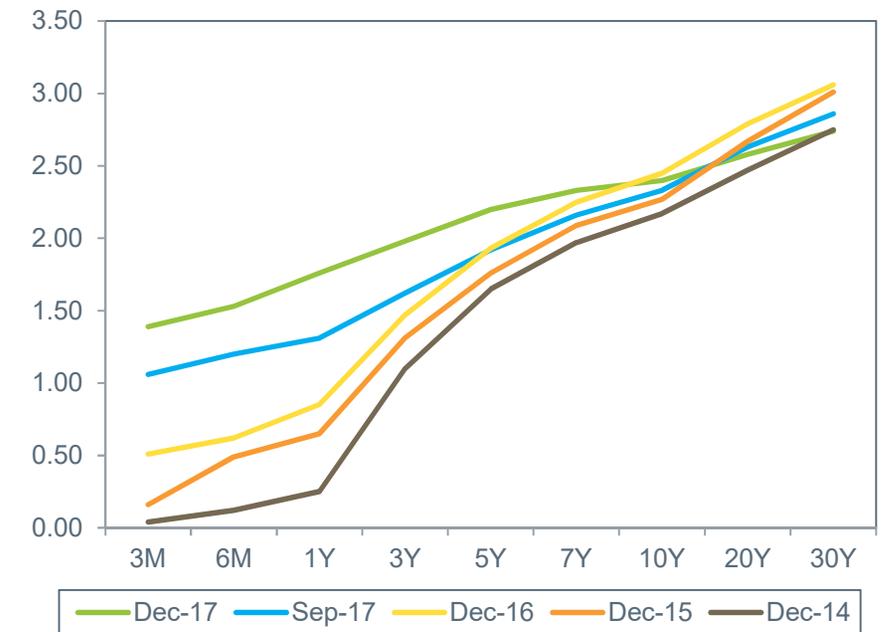
**Key Economic Indicators**



**Economic Indicators**

	Dec-17	Sep-17	Dec-16	Dec-14	20 Yr
Federal Funds Rate (%)	1.33 ▲	1.06	0.55	0.06	2.12
Breakeven Infl. - 1 Yr (%)	0.85 ▼	1.24	1.27	-0.21	N/A
Breakeven Infl. - 10 Yr (%)	1.98 ▲	1.85	1.97	1.68	N/A
CPI YoY (Headline) (%)	2.1 ▼	2.2	2.1	0.8	2.1
Unemployment Rate (%)	4.1 ▼	4.2	4.7	5.6	5.9
Real GDP YoY (%)	2.5 ▲	2.3	1.8	2.7	2.3
PMI - Manufacturing	59.3 ▼	60.2	54.3	54.7	52.4
USD Total Wtd Idx	87.47 ▼	88.10	95.72	85.07	86.73
WTI Crude Oil per Barrel (\$)	60.4 ▲	51.7	53.7	53.3	57.5
Gold Spot per Oz (\$)	1,303 ▲	1,280	1,152	1,185	831

**Treasury Yield Curve (%)**



**Market Performance (%)**

	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	6.64	21.83	21.83	15.79	8.50
Russell 2000	3.34	14.65	14.65	14.12	8.71
MSCI EAFE (Net)	4.23	25.03	25.03	7.90	1.94
MSCI EAFE SC (Net)	6.05	33.01	33.01	12.85	5.77
MSCI Emg Mkts (Net)	7.44	37.28	37.28	4.35	1.68
Bloomberg US Agg Bond	0.39	3.54	3.54	2.10	4.01
BofA ML 3 Mo US T-Bill	0.28	0.86	0.86	0.27	0.39
NCREIF ODCE (Gross)	2.07	7.62	7.62	11.53	5.03
Wilshire US REIT	1.70	4.18	4.18	9.35	7.28
HFRI FOF Comp	1.99	7.69	7.69	3.99	1.08
Bloomberg Comdty (TR)	4.71	1.70	1.70	-8.45	-6.83

Treasury data courtesy of the US Department of the Treasury. Economic data courtesy of Bloomberg Professional Service. Breakeven Inflation does not have 20 years of history; therefore, its 20-year average is shown as N/A.

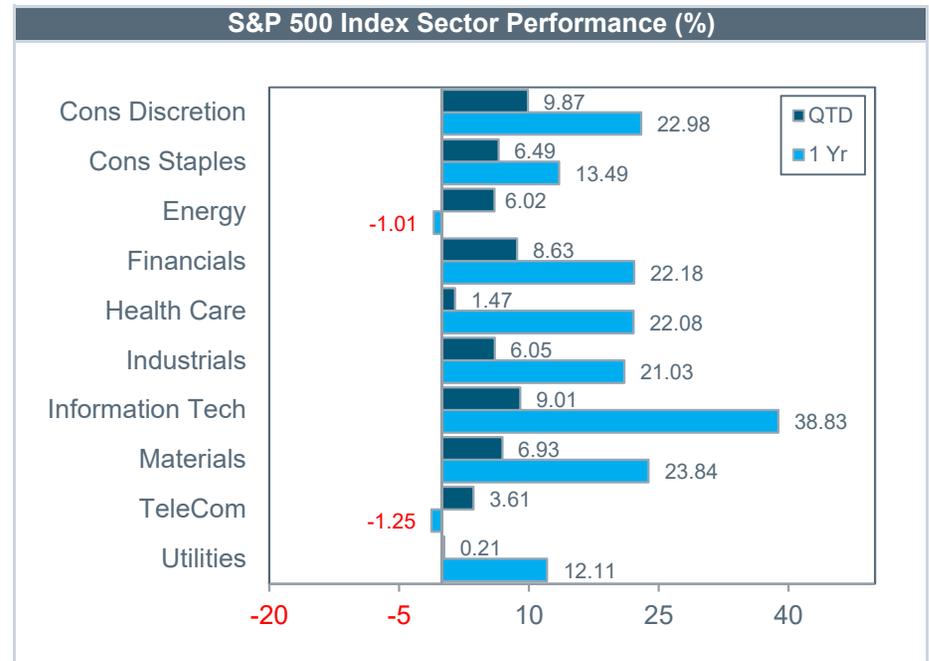
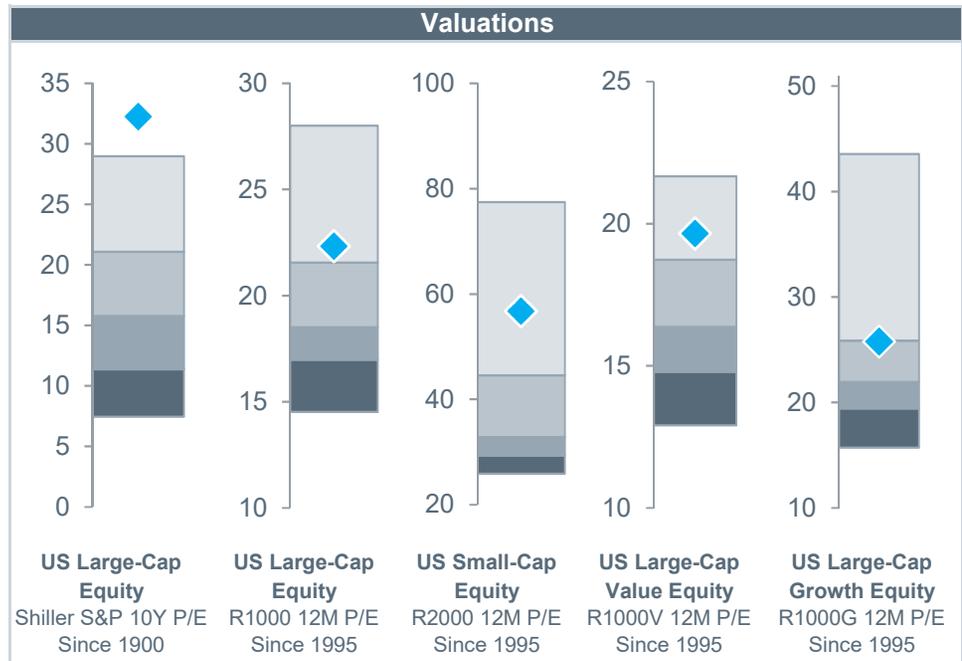


### Fourth Quarter Review

**Broad Market**  
 A small subset of companies particularly dominated broad market returns in 2017, with FAANG (Facebook, Amazon, Apple, Netflix, and Google), averaging returns of nearly 50% during 2017. As a result, many active managers with light or absent exposure to this lineup of companies experienced difficulty in keeping pace with their respective benchmarks.

**Market Cap**  
 Large cap stocks outpaced small cap stocks for the quarter, with the Russell 1000 outperforming the Russell 2000 by 325 basis points.

**Style and Sector**  
 Growth stocks led value stocks for the quarter, and the Russell 1000 Growth Index outperformed its value counterpart by 16.6% for the year. Consumer discretionary and tech stocks posted quarterly returns upwards of 9%, with tech stocks posting a 2017 return of nearly 39%.



Valuation data courtesy of Bloomberg Professional Service and Robert J. Shiller, Irrational Exuberance, Second Edition. P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.



**Fourth Quarter Review**

**Developed Markets**

Developed international markets had a strong quarter, though they lagged the US market. However, they outpaced the domestic market for 2017. In 2017, the EAFE Index returned 25.03% vs. 21.13% for the Russell 3000 Index.

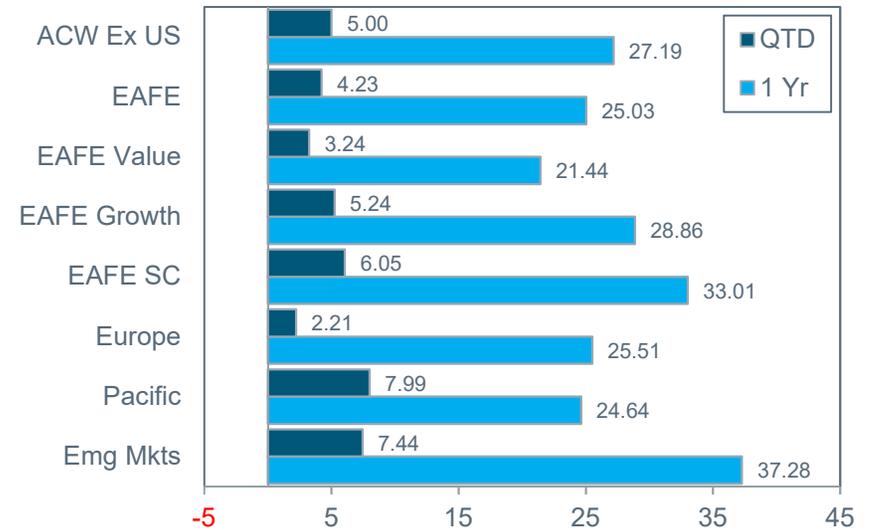
**Emerging Markets**

Emerging markets outperformed domestic and developed international markets for both the quarter and year, with the Emerging Markets Index outpacing the EAFE Index by 321 basis points for the quarter, and 1225 basis points for the year.

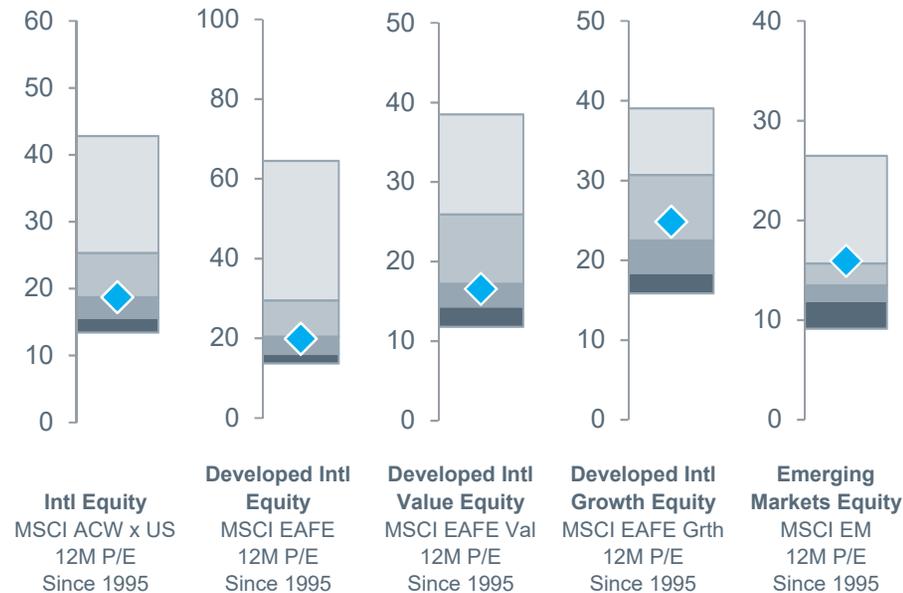
**Market Cap & Style**

The outperformance of value stocks last year did not persist, with growth stocks solidly outperforming for the quarter and year. Small cap also outperformed large cap for both Q4 and 2017.

**MSCI Style and Capitalization Market Performance (%)**



**Valuations**



**MSCI Region Performance (%)**



Valuation data courtesy of Bloomberg Professional Service.  
 P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.  
 All returns are shown net of foreign taxes on dividends.



**Fourth Quarter Review**

**Broad Market**

The flattening yield curve during the quarter and year detracted from the performance of short duration bonds, while contributing to the performance of long duration bonds. A flatter yield curve has caused some tactical investors and portfolio managers to shorten the duration of their portfolios as the perceived relative value of shorter-dated securities has increased.

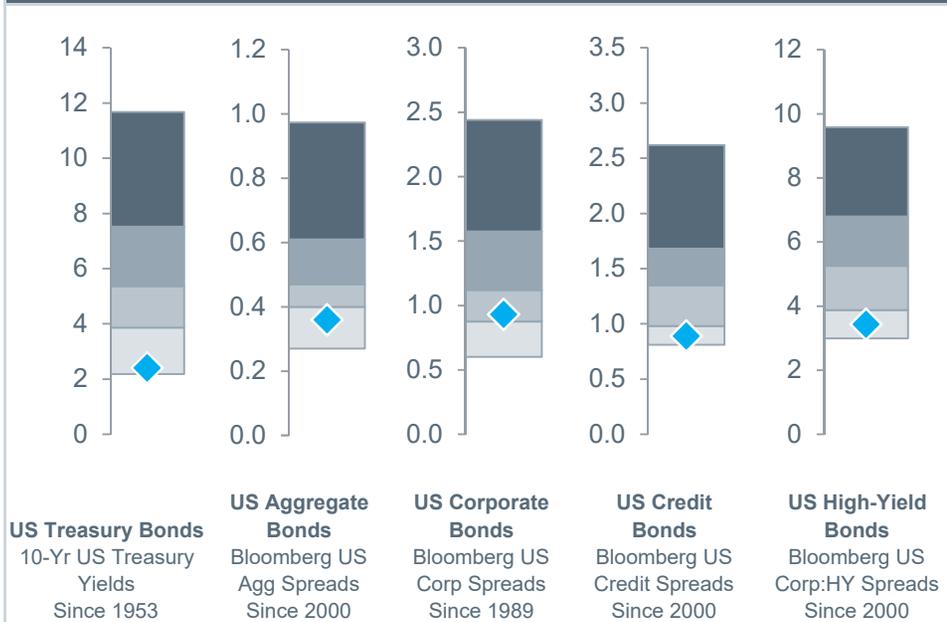
**Credit Market**

Investment grade and high yield credit spreads started the year below long-term averages and continued to grind tighter.

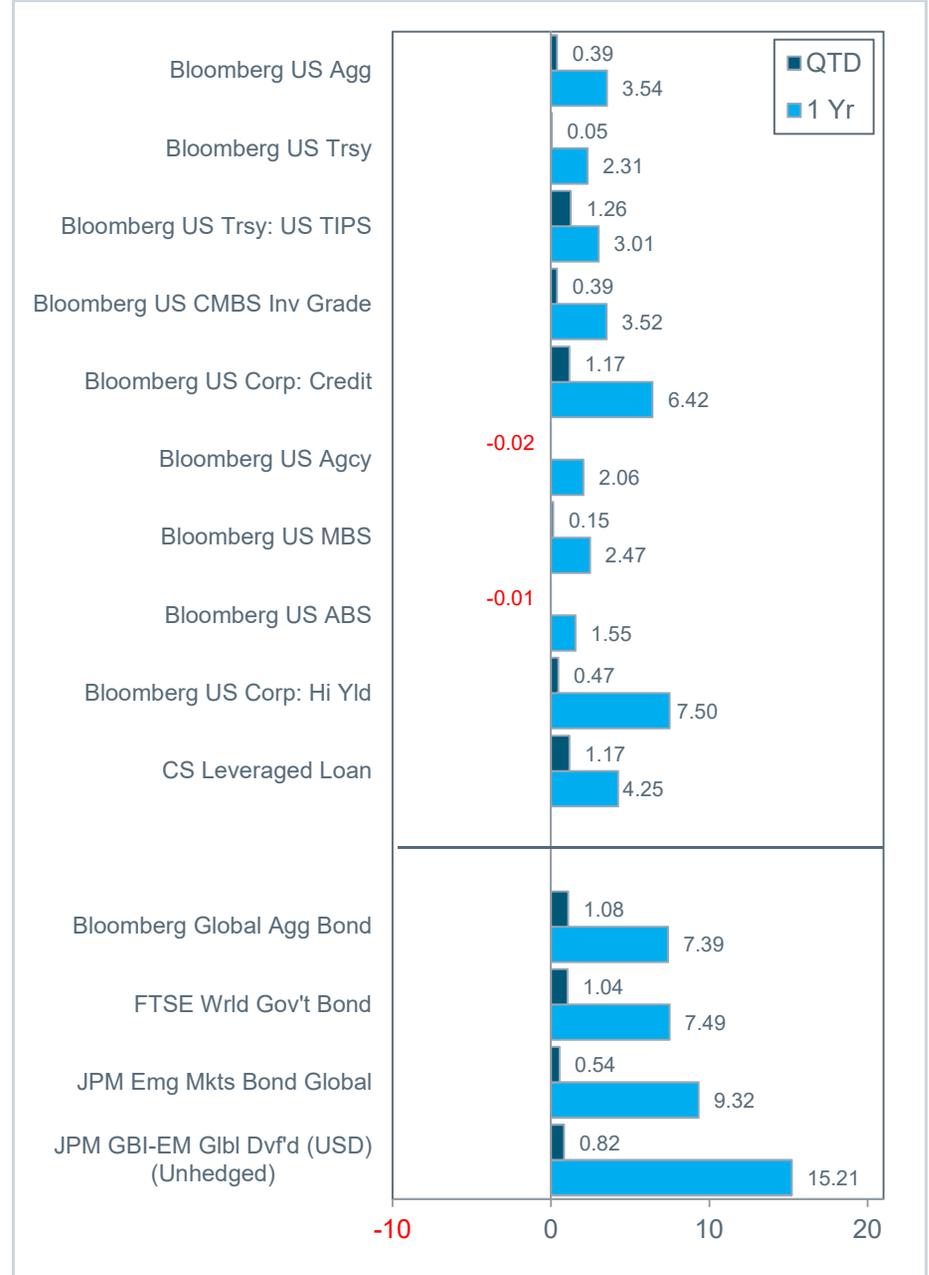
**Emerging Market Debt**

Non-US dollar denominated emerging market debt was the best performing sub-asset class within fixed income over the course of 2017, returning 15.21%. Important drivers of this performance included the improving fundamentals and stabilizing political environments experienced by many countries during the year.

**Valuations**



**Fixed Income Performance (%)**



Valuation data courtesy of Bloomberg Professional Service. Valuations shown represent the 5th through 95th percentiles to minimize the effect of outliers.



**Fourth Quarter Review - Absolute Return**

**General Market - Hedge Funds**

Hedge funds largely provided positive performance, as most fundamentally oriented managers benefited from low inter-stock correlation and a positive return environment across most underlying global risk assets. Multi-Strategy manager returns were generally positive during the quarter, but suffered in November due to corporate merger scrutiny by the DoJ. The best performing broad hedge fund category for the year has been traditional Equity Long-Short (ELS).

**General Market - Global Tactical Asset Allocation (GTAA)**

GTAA managers provided strong performance in Q4 to finish an already successful 2017. Global equity and global fixed income markets were broadly supportive during the quarter, providing a welcome backdrop for most multi-asset strategies. Although GTAA managers performed well in absolute terms, most modestly underperformed relative to a static, undiversified blend of US 60/40. The modest underperformance of tactical managers relative to this static benchmark was generally pronounced for managers who adhere to value-oriented investment processes.

**Fourth Quarter Review - Real Assets**

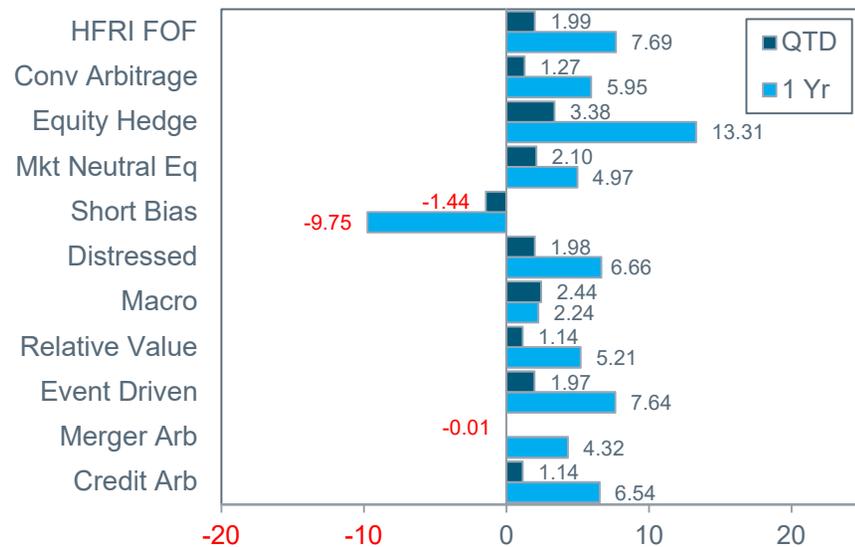
**General Market - Diversified Inflation Strategies (DIS)**

Performance for Diversified Inflation Strategies (“DIS”) in Q4 ranged widely, with managers providing positive performance in a quarter where market-based measures of future expected inflation increased. Market expectations increased from 1.85% to 1.98% based on the 10 year Treasury break-evens.

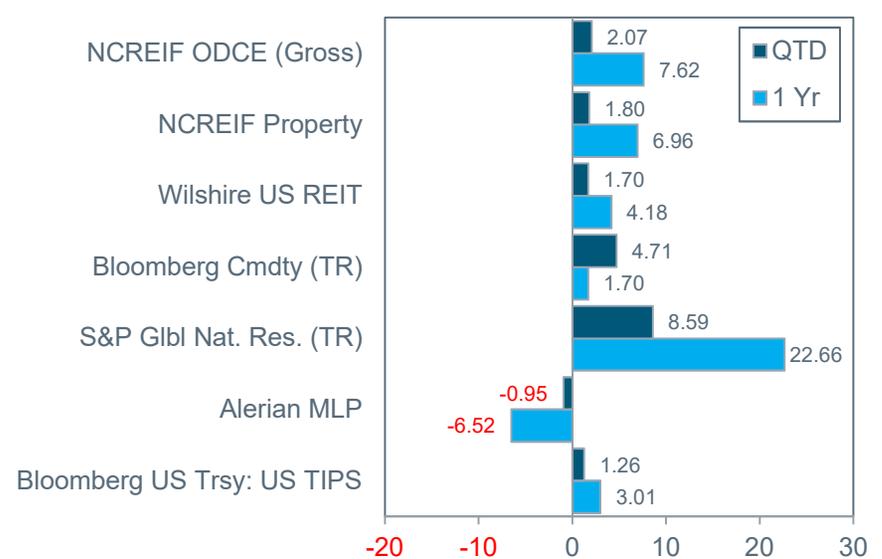
**General Market - Real Estate**

Real estate valuations remain healthy, supported by continuing strength in the overall economy. The core private real estate index, NCREIF-ODCE returned 2.1% during Q4, comprised of 1.1% income and 1.0% appreciation. Market participants characterized this as another quarter of normalizing returns reinforcing investor expectations of lower returns going forward as the market enters the later stages of the recovery. Investors in publicly traded real estate outperformed their private market counterparts during the quarter as measured by FTSE/NAREIT All REIT’s index return of 2.4%.

**HFRI Hedge Fund Performance (%)**



**Real Asset Performance (%)**



Annual Asset Class Performance

As of December 31, 2017

Calendar Year Performance												Annualized Statistics (01/2006 - 12/2017)			
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CYTD (As of 12/17)		Return	Standard Deviation	Sharpe Ratio
Best	18.85	5.24	49.13	26.85	15.99	16.83	38.82	13.88	15.02	21.31	27.19	US Equity Custom Index - US All Cap	8.78	15.03	0.56
	18.11	3.06	45.12	21.74	14.26	16.76	32.39	13.69	13.33	13.00	23.97	S&P 500 Index - US Large Cap	8.83	15.01	0.57
	15.97	-5.22	34.63	16.77	11.16	16.35	32.39	12.50	5.59	12.74	21.83	Rusell 2000 Index - US Small Cap	8.58	18.96	0.47
	15.85	-6.46	32.46	16.36	7.84	16.13	24.96	11.82	1.38	11.96	21.13	MSCI ACW Index - Global	6.49	16.75	0.40
	11.66	-10.01	27.17	15.68	3.49	16.00	22.80	11.18	0.55	10.69	15.21	International Equity Custom Index - International	4.18	18.58	0.26
	11.63	-21.37	26.46	15.06	2.11	16.00	21.26	9.42	0.48	10.44	14.65	Cambridge US PE Index - Private Equity	11.50	8.60	1.20
	10.25	-22.48	26.46	15.06	2.11	14.96	15.29	5.97	0.18	9.94	13.70	NCREIF ODCE Index - Core Real Estate	6.80	7.94	0.74
	6.97	-23.62	21.98	13.11	0.66	13.43	13.94	4.89	-0.27	8.77	11.75	NCREIF Property Index - Value-Added Real Estate	7.71	5.47	1.22
	5.49	-33.79	13.22	12.67	-1.75	10.94	10.98	4.16	-1.47	7.97	7.69	HFRI FOF Comp Index	2.56	6.51	0.25
	5.49	-35.73	11.47	10.82	-4.18	10.77	8.96	3.37	-2.36	7.86	7.62	BofA ML All Cnvrts Index (All Qual) - Convertibles	7.53	13.35	0.53
	5.36	-37.00	5.93	9.28	-5.18	10.54	4.22	2.95	-3.24	4.50	6.96	Bloomberg US Agg Bond Index - Fixed Income	4.28	3.26	0.95
	4.53	-37.00	1.17	6.54	-5.72	4.79	0.12	0.18	-4.41	2.65	5.20	Credit Custom Index - Fixed Income	5.53	8.95	0.51
	2.76	-42.19	-16.85	5.70	-7.35	4.21	-2.02	-3.87	-5.66	0.51	3.54	JPM GBI-EM Gbl Dvfd Index (USD) - EMD	5.64	10.98	0.46
Worst	-1.57	-43.06	-29.76	0.73	-13.71	0.26	-8.98	-5.72	-14.92	0.38	0.84	JP Morgan Cash Custom Index - Cash Equiv	1.47	0.92	1.23

The Cambridge US Private Equity Index is shown for informational purposes only. Due to availability of data, current quarter performance assumes a 0.00% return. Calculations are based on a quarterly periodicity.



## ASSET CLASS SUMMARY

**US Equity:** The **US Equity** structure employs a core-satellite approach, which gains passive, low-cost beta exposure at its core and active management only where the highest conviction strategies can add value – All Cap and Small Cap Equity. The core component of the portfolio utilizes passive management coupled with low beta, minimum volatility strategies that are intended to outperform a market-capitalization weighted index at a similar absolute risk level. Active management in the All Cap space provides investment managers the flexibility to adjust for valuations across market capitalizations. The single active Small Cap investment manager utilizes fundamental stock analysis in a market segment that has historically provided a return premium relative to larger companies.

**Global Equity:** The **Global Equity** portfolio employs active management, and provides the investment manager the flexibility to overweight the portfolio towards US or International markets based on respective valuations. The portfolio is optimized to balance exposure to style and size factors in order to generate alpha primarily through stock selection.

**International Equity:** The **International Equity** structure follows an ACWI Ex US approach, which offers coverage of the broad international equity market, including developed and emerging markets. The International Equity portfolio is comprised of both passive and active management styles. The mix of passive and active management helps to minimize costs, while striving to maximize the probability of alpha generation at a similar absolute risk level.

**Private Equity:** The **Private Equity** asset class has primarily been accessed through fund of funds and customized fund of one structures. Investments also include exposure to direct co-investments and secondaries. Recent commitments within this asset class have added global diversification to the portfolio.

**Real Estate:** The **Real Estate** portfolio currently consists of Core and Non-Core Real Estate investments. The overall asset class structure has remained relatively conservative with regard to asset types and the use of financial leverage. Core Real Estate has historically been focused on diversified US markets, while Non-Core Real Estate investments allow the portfolio to take advantage of real estate market fundamentals. Recent commitments within Non-Core Real Estate have added global diversification through European-focused investments.

**Absolute Return:** The **Absolute Return** structure historically consisted of multi-Hedge Fund of Fund investments. In 2015, the portfolio began a transition to a core-satellite approach, utilizing a single Fund of Fund manager and satellite direct Hedge Funds. An increase in the use of direct Hedge Funds is anticipated to lower external management expenses and allow for greater control over the program.

**Convertible Bonds:** The **Convertible Bonds** portfolio consists of a single, specialized investment manager within the fixed income portfolio. The portfolio focuses on convertible issuers that demonstrate the ability to improve fundamental characteristic and attempts to participate in the majority the upside, while limiting the downside of the underlying equity to nearly half.

**Fixed Income:** The **Fixed Income** employs a core-satellite approach. Serving as “the anchor” to the portfolio, Core Fixed Income aims to preserve capital, by providing relatively “safe” investments and stable income. The Internally Managed Portfolio also provides liquidity and safety of capital. Treasury Inflation Protected Securities (“TIPS”) provide passive protection against expected changes in inflation. The satellite portfolios serve as dedicated specialists. Credit Fixed Income provides diversification from traditional fixed income investments and the potential for enhanced return. The custom credit portfolios are largely driven by allocations to bank loans, high yield fixed income securities, and investment grade credit. Investments in Emerging Market Debt (Local Currency) diversify US Dollar exposure and provide opportunities to capitalize on global growth trends. Opportunistic Fixed Income is employed to capitalize on severe market dislocations, such as European Debt.

## INDEX GLOSSARY

**Total Equity Custom Index:** The **Total Equity Custom Index** consists of the MSCI World Index through July 2010 and the MSCI All Country World Index thereafter.

**MSCI World:** The **MSCI World Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. The index consists of the following developed market countries: *Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States.*

**MSCI ACW:** The **MSCI All Country World Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. The index consists of the 23 developed countries that make up the MSCI World Index as well as the following emerging market countries: *Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey, and United Arab Emirates.*

**US Equity Custom Index:** The **US Equity Custom Index** consists of the S&P 500 Index (Cap Wtd) through September 2014 and the Russell 3000 Index thereafter.

**S&P 500:** The **S&P 500 Index (Cap Wtd)** is a commonly recognized, market-capitalization weighted index of 500 widely held equity securities designed to measure broad US equity performance.

**Russell 3000:** The **Russell 3000 Index** is a market-capitalization weighted index of 3,000 widely held equity securities designed to measure performance of the entire U.S. stock market.

**State Street All Cap Custom Index:** The **State Street All Cap Custom Index** consists of 69% Russell 3000 Index, 24% FTSE RAFI US 1000 Index, and 7% MSCI USA Minimum Volatility Index.

**Russell 2000:** The **Russell 2000 Index** measures the performance of the small-cap segment of the US equity market. It includes approximately 2,000 of the smallest securities by market cap from the Russell 3000 Index.

**International Equity Custom Index:** The **International Equity Custom Index** consists of the MSCI EAFE Index through July 2010 and the MSCI ACW Ex US Index thereafter.

**MSCI EAFE:** The **MSCI EAFE (Europe, Australasia, Far East) Index** is designed to measure equity market performance of 21 developed countries, excluding the US & Canada: *Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.*

**MSCI ACW Ex US:** The **MSCI ACW (All Country World) Ex US Index** consists of the same countries that make up the MSCI ACW Index, excluding the United States.

**FTSE All World Ex US:** The **FTSE All World Ex US Index** is a free float-adjusted market capitalization weighted index that is comprised of large- and mid-cap stocks providing coverage of Developed and Emerging Markets excluding the US. The index is derived from the FTSE Global Equity Index Series (GEIS), which covers 98% of the world's investable market capitalization.

**NCREIF ODCE:** The **NCREIF ODCE (Open End Diversified Core) Index** is an index of investment returns reporting on both a historical and current basis the results of 16 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NCREIF ODCE Index is capitalization-weighted and performance is time-weighted.

**NCREIF Property:** The **NCREIF Property Index** prepared by the National Council of Real Estate Investment Fiduciaries is a quarterly time series composite return measure for over 6,000 individual commercial real estate properties acquired in the private market for investment purposes. Total performance represents returns from appreciation and income, and includes multi-family, office, retail, and industrial properties.

**HFRI FOF Comp Index:** The **HFRI FOF (Fund of Funds) Comp Index** average is created by Hedge Fund Research, Inc. and contains over 800 funds of hedge funds that are each invested in multiple investment strategies.

**BofA ML All Convertibles:** The **BofA Merrill Lynch All Convertibles Index (All Qualities)** is a market capitalization-weighted index of domestic corporate convertible securities that are convertible to common stock.

**Bloomberg US Agg Bond:** The **Bloomberg US Aggregate Bond Index** covers the US dollar-denominated, investment-grade, fixed-rate, taxable bond market of SEC-registered securities: US Treasury and agency bonds, domestic corporate debt, and mortgage-backed securities.

**Credit Custom Index:** The **Credit Custom Index** consists of 20% Bloomberg US Credit Index, 20% BofA Merrill Lynch US High Yield Master II Constrained Index, and 60% S&P/LSTA Leveraged Loan Index.

**CS Western European Hi Yld:** The **Credit Suisse Western European High Yield Index** is designed to mirror the investable universe of the Western European high yield debt market. The index includes issues denominated in \$US and Western European currencies.

**JPMorgan GBI-EM Gbl Dvf'd:** The **JPMorgan GBI-EM Global Diversified Total Return Index (Unhedged)** is a global emerging markets index that consists of regularly traded, liquid fixed-rate, domestic currency government bonds.

**Bloomberg US Trsy: US TIPS:** The **Bloomberg US Treasury: US TIPS Index** is an unmanaged index that consists of inflation-protected securities issued by the U.S. Treasury.

**Bloomberg US Govt: Int Trm Bond:** The **Bloomberg US Gov't Intermediate Term Bond Index** covers public US government obligations with remaining maturities of between one and ten years.

**Bloomberg US Gov't/Credit Bond:** The **Bloomberg US Gov't/Credit Bond Index** covers the non-securitized component of the US Aggregate Index. It includes investment grade, US dollar denominated, fixed-rate Treasuries, government-related and corporate securities.

**BofA ML 3 Mo US T-Bill:** The **BofA Merrill Lynch 3-Month US T-Bill Index** consists of newly issued 90-day Treasury bills.

**JP Morgan Blended Index:** The **JP Morgan Blended Index** consists of an equal-weighted allocation to the BofA ML 1-3 Year US Treasury Index, BofA ML 1-3 Year Agencies Index, and BofA ML 0-3 Year Weighted Average Life Mortgage Index.

**Wyoming State Treasurer's Office**  
**Investment Performance**  
 December 31, 2017

**Investment Policy:**

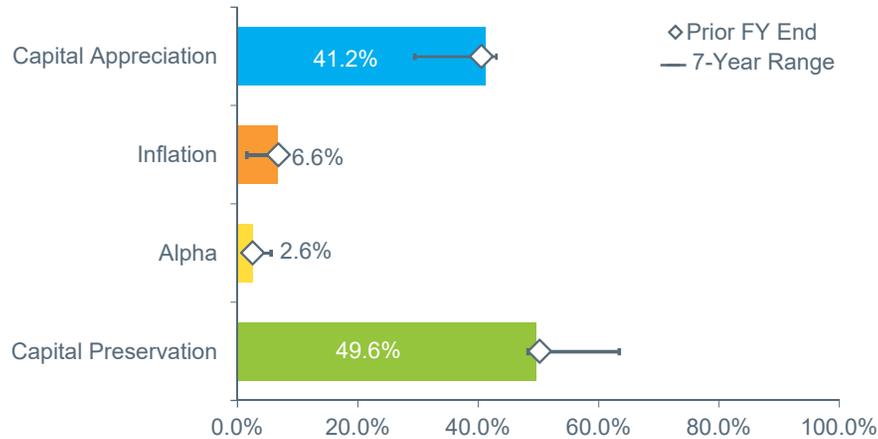
It is the investment policy for the State Loan and Investment Board to invest public funds of the State of Wyoming in a manner that strives for maximum safety, provides adequate liquidity to meet all operating requirements, and achieves the highest possible investment return consistent with the primary objectives of safety and liquidity.

**Investment Objectives and Priorities:**

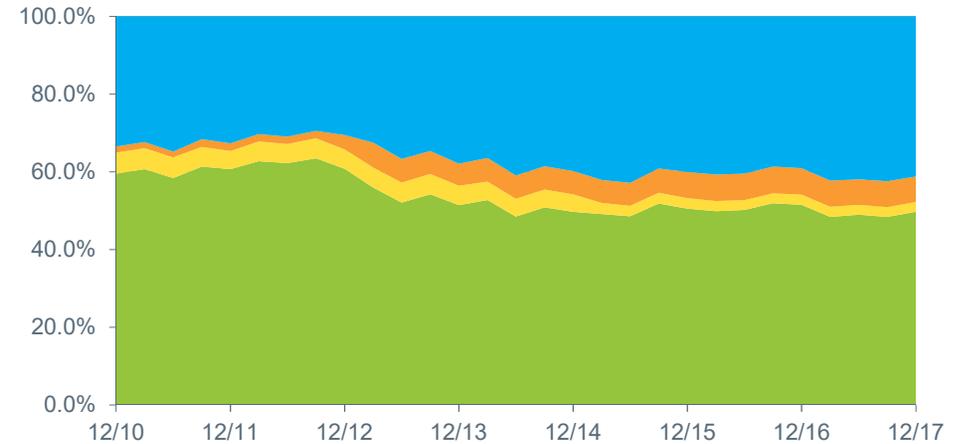
All available funds shall be invested with the following objectives and priorities:

- a) Safety of principal. Investments shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio.
- b) Liquidity requirements of anticipated and unanticipated expenditures.
- c) Yield.
- d) Recognition of differing objectives and needs of various fund portfolios.
- e) Conformance with State law and other pertinent legal restrictions.
- f) Maximization of the total rate of return on investment consistent with the foregoing objectives.
- g) Diversification by asset type, security, and investment manager in order to smooth the volatility of quarterly returns.

**Current Asset Allocation:**



**Historical 7-Year Asset Allocation:**



**Historical Performance:**

	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,455.10</b>	<b>\$20,755.87</b>	<b>\$20,697.77</b>	<b>100.0%</b>	<b>1.69%</b>	<b>3.71%</b>	<b>8.35%</b>	<b>4.37%</b>	<b>4.70%</b>	<b>4.66%</b>
<i>Wyoming State Actual Allocation Index</i>					1.61%	3.54%	7.96%	4.24%	4.73%	4.39%
<b>Permanent Funds</b>	<b>\$13,846.67</b>	<b>\$14,431.69</b>	<b>\$15,092.23</b>	<b>72.9%</b>	<b>2.08%</b>	<b>4.56%</b>	<b>10.06%</b>	<b>5.13%</b>	<b>5.92%</b>	<b>5.07%</b>
<b>Non-Permanent Funds</b>	<b>\$5,608.43</b>	<b>\$6,324.18</b>	<b>\$5,605.54</b>	<b>27.1%</b>	<b>0.45%</b>	<b>1.37%</b>	<b>3.38%</b>	<b>2.17%</b>	<b>1.69%</b>	<b>3.63%</b>

Note[1]: Performance shown is net of fees.

Note[2]: Pooled investment performance and market values shown reflect State Agency participation and are calculated on a capital-weighted basis using beginning-period allocations.

Note[3]: Thematic allocations shown exclude Public Purpose Investments.

Note[4]: The Wyoming State Actual Allocation Index is calculated using beginning-month asset class weights applied to the appropriate asset class benchmark return.

Note[5]: Market Value and Total Investment Value are shown in (\$) Millions.



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	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,455,097,375</b>	<b>\$20,755,870,537</b>	<b>\$20,697,770,930</b>	<b>100.0%</b>	<b>1.69%</b>	<b>3.71%</b>	<b>8.35%</b>	<b>4.37%</b>	<b>4.70%</b>	<b>4.66%</b>
<i>Wyoming State Actual Allocation Index</i>					<i>1.61%</i>	<i>3.54%</i>	<i>7.96%</i>	<i>4.24%</i>	<i>4.73%</i>	<i>4.39%</i>
<b>Investment Funds:</b>										
Permanent Mineral Trust	\$7,323,930,659	\$7,665,940,594	\$8,036,242,525	38.8%	2.19%	4.79%	10.49%	5.32%	6.22%	4.90%
Common School Perm Land Fund	\$3,708,031,264	\$3,859,838,175	\$4,053,520,427	19.6%	2.08%	4.63%	10.44%	5.40%	6.31%	5.18%
Permanent Land Fund	\$180,979,413	\$189,247,457	\$198,156,964	1.0%	2.08%	4.61%	10.15%	5.17%	6.05%	4.74%
University Permanent Land Fund	\$20,216,098	\$21,764,049	\$23,400,273	0.1%	2.38%	5.18%	11.29%	5.62%	6.44%	4.73%
Hathaway Scholarship	\$558,383,980	\$588,863,703	\$607,661,896	2.9%	2.17%	4.64%	9.99%	4.99%	5.47%	5.52%
Higher Education	\$115,358,592	\$121,412,872	\$125,491,052	0.6%	2.17%	4.64%	9.98%	4.96%	5.46%	5.47%
Workers Compensation Fund	\$1,939,770,854	\$1,984,625,770	\$2,047,755,439	9.9%	1.58%	3.53%	7.76%	4.01%	4.24%	5.27%
Pool A*	\$236,132,528	\$84,071,542	\$237,009,537	1.1%	0.58%	1.70%	4.20%	2.59%	2.03%	4.21%
State Agency Pool*	\$5,372,293,988	\$6,240,106,375	\$5,368,532,817	25.9%	0.45%	1.36%	3.36%	2.17%	1.68%	3.62%
<b>Asset Class Performance:</b>										
US Equity US Equity Custom Index	\$1,575,104,377	\$2,254,550,255	\$2,110,962,665	10.2%	5.99% 6.34%	10.61% 11.20%	18.59% 21.13%	10.18% 11.12%	15.15% 15.65%	8.67% 8.43%
Global Equity MSCI ACW	\$379,181,793	\$426,401,778	\$443,993,273	2.1%	6.13% 5.73%	11.46% 11.21%	27.32% 23.97%	N/A 2.00%	N/A 10.80%	N/A 4.65%
International Equity International Equity Custom Index	\$1,467,714,733	\$1,672,665,173	\$1,797,652,814	8.7%	4.34% 5.00%	10.80% 11.48%	27.73% 27.19%	7.92% 7.83%	7.03% 6.80%	2.19% 1.45%
Private Equity S&P 500 + 5%	\$419,105,934	\$585,156,569	\$577,170,873	2.8%	7.95%	14.17%	27.92%	16.98%	21.58%	13.92%
Core Real Estate NCREIF ODCE	\$507,607,260	\$596,442,590	\$608,894,114	2.9%	2.01% 1.85%	3.69% 3.52%	6.96% 6.66%	9.30% 9.42%	10.06% 10.52%	3.83% 4.07%
Value-Added Real Estate NCREIF Property	\$267,466,094	\$268,812,182	\$285,008,947	1.4%	1.80%	3.52%	6.96%	9.38%	10.19%	6.08%
Absolute Return HFRI FOF Comp Index	\$499,635,960	\$507,134,714	\$520,211,693	2.5%	1.30% 1.99%	2.58% 4.34%	4.90% 7.69%	1.26% 2.58%	3.84% 3.99%	2.47% 1.08%
Convertible Bonds BofA ML All Quality Convertible	\$486,668,624	\$517,843,821	\$506,469,548	2.4%	2.28% 1.56%	6.18% 5.39%	14.76% 13.70%	6.17% 6.71%	9.90% 10.68%	7.73% 7.32%
Fixed Income Bloomberg US Aggregate	\$11,574,159,119	\$11,576,435,726	\$11,569,246,221	55.9%	0.53% 0.39%	1.51% 1.24%	3.99% 3.54%	2.54% 2.24%	1.81% 2.10%	4.21% 4.01%
Public Purpose Investments	\$399,605,243	\$811,819,612	\$399,605,243	1.9%	N/A	N/A	N/A	N/A	N/A	N/A
Cash Equivalents JP Morgan Cash Custom Index	\$1,878,848,240	\$1,538,608,117	\$1,878,555,540	9.1%	0.16% 0.24%	0.43% 0.50%	0.84% 0.84%	0.46% 0.47%	0.33% 0.34%	0.71% 0.75%

\* Denotes Non-Permanent Fund.

Note[1]: Performance shown is net of fees. Investment performance is calculated on invested assets only.

Note[2]: Pooled investment performance and market values shown reflect State Agency participation and are calculated on a capital-weighted basis using beginning-period allocations.

Note[3]: US Equity Custom Index consists of S&P 500 (Cap Wtd) through September 2014 and the Russell 3000 thereafter.

Note[4]: International Equity Custom Index consists of MSCI EAFE (Gross) through July 2010 and the MSCI ACW Ex US (Net) thereafter.

Note[5]: Market values for non-core real estate and private equity are as of the most recent valuation, adjusted for subsequent cash flows. Investment (Cost) Values are not lagged.

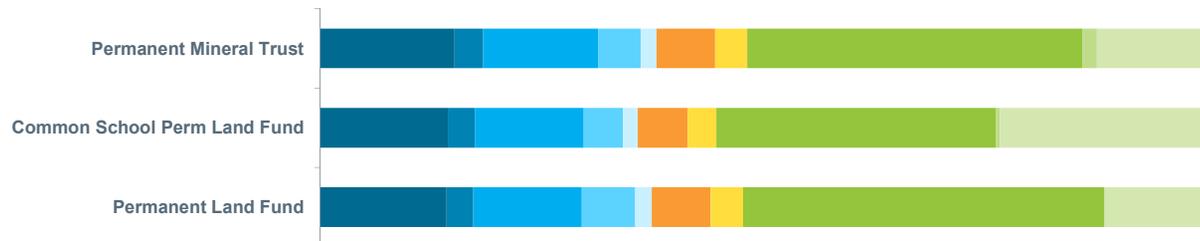
Note[6]: Performance for Private Equity and Value-Added Real Estate investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives performance report.

Note[7]: Cash Equivalents performance includes Extended Cash performance.

Note[8]: Market values shown for Public Purpose Investments reflect cost value of the investments.

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	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,455,097,375</b>	<b>\$20,755,870,537</b>	<b>\$20,697,770,930</b>	<b>100.0%</b>	<b>1.69%</b>	<b>3.71%</b>	<b>8.35%</b>	<b>4.37%</b>	<b>4.70%</b>	<b>4.66%</b>
<b>Investment Funds:</b>										
<b>Permanent Mineral Trust</b>	<b>\$7,323,930,659</b>	<b>\$7,665,940,594</b>	<b>\$8,036,242,525</b>	<b>100.0%</b>	<b>2.19%</b>	<b>4.79%</b>	<b>10.49%</b>	<b>5.32%</b>	<b>6.22%</b>	<b>4.90%</b>
US Equity	\$901,294,900	\$1,297,262,339	\$1,206,319,749	15.0%						
Global Equity	\$218,517,668	\$245,617,219	\$255,750,324	3.2%						
International Equity	\$844,493,733	\$958,116,815	\$1,030,815,776	12.8%						
Private Equity	\$278,021,489	\$376,229,716	\$380,449,444	4.7%						
Real Estate	\$464,100,225	\$497,311,710	\$524,730,682	6.5%						
Absolute Return	\$275,796,426	\$279,936,067	\$287,154,500	3.6%						
Convertible Bonds	\$137,484,327	\$146,547,185	\$143,328,324	1.8%						
Fixed Income	\$3,000,800,974	\$3,006,629,507	\$3,005,024,284	37.4%						
Public Purpose Investments	\$130,046,505	\$132,978,738	\$130,046,505	1.6%						
Cash (invested in State Agency Pool)	\$1,073,374,413	\$725,311,298	\$1,072,622,938	13.3%						
<i>Actual Allocation Index</i>					2.35%	4.98%	10.73%	5.35%	6.31%	4.57%
<b>Common School Perm Land Fund</b>	<b>\$3,708,031,264</b>	<b>\$3,859,838,175</b>	<b>\$4,053,520,427</b>	<b>100.0%</b>	<b>2.08%</b>	<b>4.63%</b>	<b>10.44%</b>	<b>5.40%</b>	<b>6.31%</b>	<b>5.18%</b>
US Equity	\$430,507,963	\$613,886,992	\$577,505,966	14.2%						
Global Equity	\$104,588,239	\$117,558,429	\$122,408,382	3.0%						
International Equity	\$401,617,383	\$458,520,325	\$492,006,489	12.1%						
Private Equity	\$125,420,373	\$195,110,810	\$177,866,668	4.4%						
Real Estate	\$197,512,181	\$228,592,933	\$226,061,419	5.6%						
Absolute Return	\$124,156,282	\$126,019,153	\$129,268,684	3.2%						
Convertible Bonds	\$65,130,000	\$68,755,007	\$67,244,826	1.7%						
Fixed Income	\$1,260,203,853	\$1,263,723,168	\$1,262,949,480	31.2%						
Public Purpose Investments	\$18,359,738	\$393,359,738	\$18,359,738	0.5%						
Cash (invested in State Agency Pool)	\$980,535,252	\$394,311,619	\$979,848,775	24.2%						
<i>Actual Allocation Index</i>					2.21%	4.78%	10.62%	5.42%	6.41%	4.69%
<b>Permanent Land Fund</b>	<b>\$189,979,413</b>	<b>\$189,247,457</b>	<b>\$198,156,964</b>	<b>100.0%</b>	<b>2.08%</b>	<b>4.61%</b>	<b>10.15%</b>	<b>5.17%</b>	<b>6.05%</b>	<b>4.74%</b>
US Equity	\$20,956,491	\$30,318,918	\$27,929,573	14.1%						
Global Equity	\$5,082,421	\$5,697,577	\$5,932,634	3.0%						
International Equity	\$19,537,784	\$22,337,233	\$24,019,720	12.1%						
Private Equity	\$8,907,134	\$12,250,541	\$11,762,272	5.9%						
Real Estate	\$11,532,260	\$12,325,096	\$13,054,374	6.6%						
Absolute Return	\$6,878,080	\$6,981,304	\$7,161,324	3.6%						
Convertible Bonds	\$3,549,159	\$3,757,476	\$3,674,944	1.9%						
Fixed Income	\$79,786,474	\$79,939,649	\$79,889,839	40.3%						
Cash (invested in State Agency Pool)	\$24,749,611	\$15,639,662	\$24,732,284	12.5%						
<i>Actual Allocation Index</i>					2.22%	4.76%	10.28%	5.15%	6.13%	4.37%

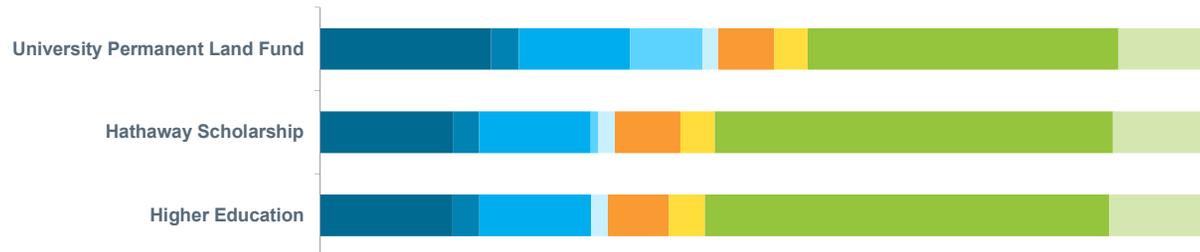


Note[1]: Performance shown is net of fees.  
 Note[2]: Pooled investment performance and market values shown reflect State Agency participation.  
 Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.  
 Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.



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	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Investment Funds:</b>										
<b>University Permanent Land Fund</b>	<b>\$20,216,098</b>	<b>\$21,764,049</b>	<b>\$23,400,273</b>	<b>100.0%</b>	<b>2.38%</b>	<b>5.18%</b>	<b>11.29%</b>	<b>5.62%</b>	<b>6.44%</b>	<b>4.73%</b>
US Equity	\$3,203,495	\$4,717,799	\$4,465,361	19.1%						
Global Equity	\$617,884	\$694,776	\$723,440	3.1%						
International Equity	\$2,326,224	\$2,707,331	\$2,904,057	12.4%						
Private Equity	\$811,229	\$1,147,817	\$1,891,359	8.1%						
Real Estate	\$1,352,799	\$1,378,438	\$1,460,329	6.2%						
Absolute Return	\$834,425	\$846,952	\$868,792	3.7%						
Convertible Bonds	\$396,770	\$425,390	\$416,047	1.8%						
Fixed Income	\$8,122,192	\$8,121,550	\$8,121,596	34.7%						
Cash (invested in State Agency Pool)	\$2,551,079	\$1,723,997	\$2,549,292	10.9%						
<i>Actual Allocation Index</i>					2.53%	5.39%	11.44%	5.67%	6.61%	4.60%
<b>Hathaway Scholarship</b>	<b>\$558,383,980</b>	<b>\$588,863,703</b>	<b>\$607,661,896</b>	<b>100.0%</b>	<b>2.17%</b>	<b>4.64%</b>	<b>9.99%</b>	<b>4.99%</b>	<b>5.47%</b>	<b>5.52%</b>
US Equity	\$67,130,474	\$94,863,475	\$90,048,683	14.8%						
Global Equity	\$15,109,173	\$17,064,655	\$17,768,669	2.9%						
International Equity	\$60,839,175	\$70,453,136	\$75,617,250	12.4%						
Private Equity	\$5,945,708	\$417,685	\$5,201,129	0.9%						
Real Estate	\$36,046,788	\$42,129,753	\$44,405,866	7.3%						
Absolute Return	\$22,366,808	\$22,702,633	\$23,288,043	3.8%						
Convertible Bonds	\$10,710,409	\$11,541,298	\$11,287,797	1.9%						
Fixed Income	\$270,059,249	\$269,758,696	\$269,917,395	44.4%						
Cash (invested in State Agency Pool)	\$70,176,195	\$59,932,372	\$70,127,064	11.5%						
<i>Actual Allocation Index</i>					2.27%	4.72%	10.14%	5.08%	5.68%	5.24%
<b>Higher Education</b>	<b>\$115,358,592</b>	<b>\$121,412,872</b>	<b>\$125,491,052</b>	<b>100.0%</b>	<b>2.17%</b>	<b>4.64%</b>	<b>9.98%</b>	<b>4.96%</b>	<b>5.46%</b>	<b>5.47%</b>
US Equity	\$13,848,189	\$19,597,857	\$18,552,139	14.8%						
Global Equity	\$3,165,925	\$3,576,152	\$3,723,688	3.0%						
International Equity	\$12,588,523	\$14,606,907	\$15,666,656	12.5%						
Real Estate	\$6,952,088	\$8,591,294	\$8,478,944	6.8%						
Absolute Return	\$4,890,998	\$4,964,452	\$5,092,465	4.1%						
Convertible Bonds	\$2,248,679	\$2,429,909	\$2,376,537	1.9%						
Fixed Income	\$56,675,505	\$56,588,284	\$56,622,431	45.1%						
Cash (invested in State Agency Pool)	\$14,988,685	\$11,058,016	\$14,978,191	11.9%						
<i>Actual Allocation Index</i>					2.27%	4.72%	10.14%	5.05%	5.67%	5.21%

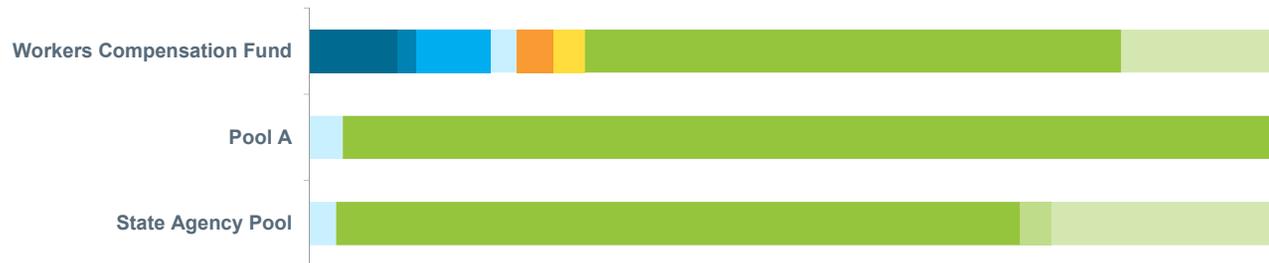


Note[1]: Performance shown is net of fees.  
 Note[2]: Pooled investment performance and market values shown reflect State Agency participation.  
 Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.  
 Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.



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	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Investment Funds:</b>										
<b>Workers Compensation Fund</b>	<b>\$1,939,770,854</b>	<b>\$1,984,625,770</b>	<b>\$2,047,755,439</b>	<b>100.0%</b>	<b>1.58%</b>	<b>3.53%</b>	<b>7.76%</b>	<b>4.01%</b>	<b>4.24%</b>	<b>5.27%</b>
US Equity	\$138,162,865	\$193,902,874	\$186,141,193	9.1%						
Global Equity	\$32,100,483	\$36,192,970	\$37,686,135	1.8%						
International Equity	\$126,311,911	\$145,923,426	\$156,622,866	7.6%						
Real Estate	\$57,577,013	\$74,925,548	\$75,711,446	3.7%						
Absolute Return	\$64,712,941	\$65,684,153	\$67,377,885	3.3%						
Convertible Bonds	\$53,256,782	\$56,705,540	\$55,460,021	2.7%						
Fixed Income	\$1,125,662,406	\$1,126,384,680	\$1,127,008,865	55.0%						
Cash (invested in State Agency Pool)	\$341,986,453	\$284,906,579	\$341,747,026	16.7%						
<i>Actual Allocation Index</i>					1.56%	3.43%	7.70%	3.96%	4.48%	5.04%
<b>Pool A</b>	<b>\$236,132,528</b>	<b>\$84,071,542</b>	<b>\$237,009,537</b>	<b>100.0%</b>	<b>0.58%</b>	<b>1.70%</b>	<b>4.20%</b>	<b>2.59%</b>	<b>2.03%</b>	<b>4.21%</b>
Convertible Bonds	\$8,077,226	\$2,683,232	\$8,043,322	3.4%						
Fixed Income	\$225,613,613	\$76,090,889	\$226,526,235	95.6%						
Cash (invested in State Agency Pool)	\$2,441,689	\$5,297,422	\$2,439,980	1.0%						
<i>Actual Allocation Index</i>					0.43%	1.37%	3.84%	2.35%	2.24%	4.05%
<b>State Agency Pool</b>	<b>\$5,372,293,988</b>	<b>\$6,240,106,375</b>	<b>\$5,368,532,817</b>	<b>100.0%</b>	<b>0.45%</b>	<b>1.36%</b>	<b>3.36%</b>	<b>2.17%</b>	<b>1.68%</b>	<b>3.62%</b>
Convertible Bonds	\$140,262,145	\$181,437,608	\$146,274,610	2.7%						
Fixed Income	\$3,780,414,610	\$4,587,734,635	\$3,770,840,448	70.2%						
Public Purpose Investments	\$171,190,944	\$230,210,197	\$171,190,944	3.2%						
Cash Equivalents	\$1,280,426,289	\$1,240,723,935	\$1,280,226,815	23.8%						
<i>Actual Allocation Index</i>					0.38%	1.19%	3.33%	2.06%	1.94%	3.51%



Note[1]: Performance shown is net of fees.

Note[2]: Pooled investment performance and market values shown reflect State Agency participation.

Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.

Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.

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Allocation by Asset Class	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,455,097,375</b>	<b>\$20,755,870,537</b>	<b>\$20,697,770,930</b>	<b>100.0%</b>	<b>1.69%</b>	<b>3.71%</b>	<b>8.35%</b>	<b>4.37%</b>	<b>4.70%</b>	<b>4.66%</b>
<i>Wyoming State Actual Allocation Index</i>					1.61%	3.54%	7.96%	4.24%	4.73%	4.39%
<b>US Equity</b>										
<b>State Street All Cap</b>	<b>\$1,188,501,734</b>	<b>\$1,468,388,420</b>	<b>\$1,604,624,047</b>		<b>6.34%</b>	<b>11.00%</b>	<b>19.76%</b>	<b>10.84%</b>	<b>N/A</b>	<b>N/A</b>
State Street All Cap Custom Index					6.32%	11.03%	19.85%	10.94%	15.51%	8.91%
Russell 3000					6.34%	11.20%	21.13%	11.12%	15.58%	8.60%
<b>Epoch</b>	<b>\$218,530,785</b>	<b>\$263,860,478</b>	<b>\$284,347,148</b>		<b>6.60%</b>	<b>11.70%</b>	<b>23.36%</b>	<b>9.82%</b>	<b>N/A</b>	<b>N/A</b>
Russell 3000					6.34%	11.20%	21.13%	11.12%	15.58%	8.60%
<b>UW Portfolio Management Program</b>	<b>\$1,000,000</b>	<b>\$1,410,522</b>	<b>\$1,467,535</b>		<b>6.26%</b>	<b>10.68%</b>	<b>21.83%</b>	<b>10.92%</b>	<b>13.82%</b>	<b>4.57%</b>
S&P 500					6.64%	11.42%	21.83%	11.41%	15.79%	8.50%
<b>RBC</b>	<b>\$167,071,858</b>	<b>\$201,620,672</b>	<b>\$219,937,489</b>		<b>4.80%</b>	<b>11.90%</b>	<b>11.12%</b>	<b>9.51%</b>	<b>N/A</b>	<b>N/A</b>
Russell 2000					3.34%	9.20%	14.65%	9.96%	14.12%	8.71%
<b>Lazard</b>	<b>\$0</b>	<b>\$319,270,163</b>	<b>\$586,447</b>		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Total US Equity</b>	<b>\$1,575,104,377</b>	<b>\$2,254,550,255</b>	<b>\$2,110,962,665</b>	<b>10.2%</b>						
<b>Global Equity</b>										
<b>Arrowstreet</b>	<b>\$379,181,793</b>	<b>\$426,401,778</b>	<b>\$443,993,273</b>		<b>6.13%</b>	<b>11.46%</b>	<b>27.32%</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
MSCI ACW					5.73%	11.21%	23.97%	9.30%	10.80%	4.65%
<b>Total Global Equity</b>	<b>\$379,181,793</b>	<b>\$426,401,778</b>	<b>\$443,993,273</b>	<b>2.1%</b>						
<b>International Equity</b>										
<b>Internal International Equity Portfolio</b>	<b>\$135,000,000</b>	<b>\$160,143,255</b>	<b>\$174,767,998</b>		<b>4.72%</b>	<b>10.91%</b>	<b>27.20%</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
FTSE All World Ex US					5.28%	11.55%	27.11%	8.27%	7.19%	2.26%
<b>Northern Trust</b>	<b>\$972,567,204</b>	<b>\$839,582,600</b>	<b>\$1,159,809,849</b>		<b>4.95%</b>	<b>11.66%</b>	<b>27.47%</b>	<b>7.86%</b>	<b>6.88%</b>	<b>N/A</b>
MSCI ACW Ex US					5.00%	11.48%	27.19%	7.83%	6.80%	1.84%
<b>Fisher Investments</b>	<b>\$360,147,528</b>	<b>\$427,481,219</b>	<b>\$463,071,218</b>		<b>2.83%</b>	<b>9.82%</b>	<b>29.58%</b>	<b>8.71%</b>	<b>8.00%</b>	<b>3.46%</b>
MSCI ACW Ex US [4]					5.00%	11.48%	27.19%	7.83%	6.80%	1.45%
<b>Manning &amp; Napier</b>	<b>\$0</b>	<b>\$245,415,336</b>	<b>\$3,750</b>		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>The Boston Company</b>	<b>\$0</b>	<b>\$42,764</b>	<b>\$0</b>		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Total International Equity</b>	<b>\$1,467,714,733</b>	<b>\$1,672,665,173</b>	<b>\$1,797,652,814</b>	<b>8.7%</b>						
<b>Private Equity</b>										
<b>Access Venture Partners II</b>	<b>\$5,177,175</b>	<b>\$14,559,968</b>	<b>\$12,252,112</b>							
Cheyenne Capital Fund, L.P.	\$169,096,424	\$294,496,615	\$266,791,713				See Note[6]			
Hamilton Lane Nowood Fund, L.P.	\$118,232,334	\$119,855,970	\$130,403,628				See Note[6]			
Neuberger Berman Sauger Fund, L.P.	\$126,600,000	\$156,244,016	\$167,723,420				See Note[6]			
S&P 500 + 5%					7.95%	14.17%	27.92%	16.98%	21.58%	13.92%
<b>Total Private Equity</b>	<b>\$419,105,934</b>	<b>\$585,156,569</b>	<b>\$577,170,873</b>	<b>2.8%</b>						
<b>Real Estate</b>										
<b>Clarion Lion</b>	<b>\$266,303,630</b>	<b>\$324,319,700</b>	<b>\$331,478,697</b>		<b>1.90%</b>	<b>3.88%</b>	<b>8.27%</b>	<b>10.44%</b>	<b>11.11%</b>	<b>3.17%</b>
<b>UBS Trumbull</b>	<b>\$241,303,630</b>	<b>\$272,122,890</b>	<b>\$277,415,418</b>		<b>2.15%</b>	<b>3.46%</b>	<b>5.42%</b>	<b>7.77%</b>	<b>8.63%</b>	<b>4.23%</b>
NCREIF ODCE					1.85%	3.52%	6.66%	9.42%	10.52%	4.07%
<b>Core Real Estate</b>	<b>\$507,607,260</b>	<b>\$596,442,590</b>	<b>\$608,894,114</b>	<b>2.9%</b>						
<b>Cornerstone</b>	<b>\$6,979,060</b>	<b>\$7,305,816</b>	<b>\$7,155,955</b>							
Heitman	\$1,764,838	\$75,996	\$81,086				See Note[6]			
M&G	\$73,677,687	\$64,640,734	\$58,404,982				See Note[6]			
<b>Northwood</b>	<b>\$117,778,488</b>	<b>\$125,693,992</b>	<b>\$139,614,228</b>				See Note[6]			
SC Capital	\$29,918,000	\$15,520,739	\$30,782,809				See Note[6]			
TA Realty	\$5,978,150	\$7,257,306	\$4,149,536				See Note[6]			
<b>WestRiver</b>	<b>\$31,369,870</b>	<b>\$48,317,599</b>	<b>\$44,820,351</b>				See Note[6]			
NCREIF Property					1.80%	3.52%	6.96%	9.38%	10.19%	6.08%
<b>Value-Added Real Estate</b>	<b>\$267,466,094</b>	<b>\$268,812,182</b>	<b>\$285,008,947</b>	<b>1.4%</b>						
<b>Total Real Estate</b>	<b>\$775,073,354</b>	<b>\$865,254,772</b>	<b>\$893,903,061</b>	<b>4.3%</b>						

Note[1]: Returns are stated in traditional total return terms and do not specify realized income.  
Note[2]: State Street All Cap Custom Index consists of 69% R 3000, 24% FTSE RAFI US 1000, 7% MSCI USA Minimum Volatility.  
Note[3]: Market values shown for Manning & Napier and Lazard represents residual assets and subsequent transactions from the liquidation process.  
Note[4]: Fisher Index consists of MSCI EAFE (Gross) through July 2010 and the MSCI ACW Ex US (Net) thereafter.  
Note[5]: Market values for non-core real estate and private equity are as of the most recent valuation, adjusted for subsequent cash flows. Investment (Cost) Values are not lagged.  
Note[6]: Performance for Private Equity and Value-Added Real Estate investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives report.  
Note[7]: Market values for M&G are converted from British Pounds using the noon New York City Federal exchange rate. Cost values are converted using the 5pm London WM Benchmark rate.



**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**

December 31, 2017

Allocation by  
Asset Class

	Total Investment Value	Fiscal Year Ending 06/30/17 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Absolute Return</b>										
PAAMCO - Jackalope Fund HFRI FOF Comp Index	\$499,635,960	\$507,134,714	\$520,211,693		1.30%	2.58%	4.90%	1.19%	4.04%	2.22%
					1.99%	4.34%	7.69%	2.58%	3.99%	1.08%
<b>Total Absolute Return</b>	<b>\$499,635,960</b>	<b>\$507,134,714</b>	<b>\$520,211,693</b>	<b>2.5%</b>						
<b>Convertible Bonds</b>										
Allianz Global Investors BofA ML All Quality Convertible	\$486,668,624	\$517,843,821	\$506,469,548	2.4%	2.28%	6.18%	14.76%	6.17%	9.90%	7.73%
					1.56%	5.39%	13.70%	6.71%	10.68%	7.32%
<b>Fixed Income</b>										
C.S. McKee	\$1,257,929,482	\$1,265,292,081	\$1,265,942,557		0.55%	1.43%	3.50%	2.45%	2.08%	N/A
JP Morgan Core	\$2,139,443,009	\$2,158,626,120	\$2,157,651,658		0.26%	1.02%	3.42%	2.32%	2.19%	N/A
PIMCO Core	\$2,180,792,918	\$2,220,137,910	\$2,219,693,500		0.57%	1.71%	4.16%	2.54%	2.09%	N/A
Bloomberg US Aggregate					0.39%	1.24%	3.54%	2.24%	2.10%	4.01%
Neuberger Berman Credit	\$933,407,548	\$939,349,147	\$937,737,844		0.71%	1.85%	4.03%	3.94%	N/A	N/A
Seix	\$943,160,037	\$965,016,793	\$967,971,473		1.12%	2.47%	5.40%	4.98%	N/A	N/A
Credit Custom Index					0.96%	2.27%	5.20%	4.69%	4.24%	5.65%
Grosvenor Silvery Lupine Fund	\$249,091,160	\$323,784,574	\$309,537,520		2.62%	4.80%	9.66%	7.62%	N/A	N/A
CS Western European HY					0.87%	3.19%	8.41%	7.10%	7.03%	8.58%
Investec	\$297,714,010	\$213,007,182	\$218,863,062		1.30%	5.23%	16.95%	1.79%	N/A	N/A
Stone Harbor	\$297,712,381	\$204,548,478	\$208,526,420		0.34%	4.11%	14.78%	2.10%	N/A	N/A
JPM GBI-EM Gbl Dv'fd					0.82%	4.40%	15.21%	2.53%	-1.55%	3.56%
State Street TIPS	\$726,314,898	\$713,634,440	\$728,042,892		1.42%	2.39%	3.10%	2.07%	0.15%	N/A
Bloomberg US Trsy: US TIPS (Series B)					1.41%	2.33%	3.30%	2.10%	0.17%	3.60%
Internal Fixed Income Portfolio	\$2,548,593,676	\$2,573,039,000	\$2,555,279,287		-0.24%	0.14%	1.84%	1.54%	1.33%	2.62%
Bloomberg US Gov't: Int. Term Bond Index					-0.40%	-0.06%	1.14%	1.12%	0.92%	2.73%
Neuberger Berman Core	\$0	\$0	\$8		N/A	N/A	N/A	N/A	N/A	N/A
<b>Total Fixed Income</b>	<b>\$11,574,159,119</b>	<b>\$11,576,435,726</b>	<b>\$11,569,246,221</b>	<b>55.9%</b>						
<b>Public Purpose Investments</b>										
	\$399,605,243	\$811,819,612	\$399,605,243	1.9%	N/A	N/A	N/A	N/A	N/A	N/A
<b>Cash &amp; Cash Equivalents</b>										
JP Morgan Cash Composite	\$1,878,848,240	\$1,538,608,117	\$1,878,555,540	9.1%	0.16%	0.43%	0.84%	0.46%	0.33%	0.71%
JP Morgan Cash Custom Index					0.24%	0.50%	0.84%	0.47%	0.34%	0.75%

Note[1]: Performance shown is net of fees.

Note[2]: Returns are stated in traditional total return terms and do not specify realized income.

Note[3]: The Credit Custom Index consists of 20% Bloomberg US Credit, 20% BofA ML US HY Master II Constrained, 60% S&P/LSTA Leveraged Loan.

Note[4]: Internal Fixed Income Portfolio performance excludes distressed securities taken in from dismissed managers (market value includes distressed securities).

Note[5]: Internal Fixed Income Portfolio Index consists of the Bloomberg US Gov't: Int. Term Bond Index; prior to December 2009 the index consisted of the Bloomberg US Gov't/Credit Bond Index.

Note[6]: Market values shown for Public Purpose Investments reflect cost value of the investments.

Note[7]: Market value shown for Neuberger Berman Core represents residual assets and subsequent transactions from the liquidation process..

Investment Policy Guidelines	Meeting Objective			Explanation
	Yes	No	N/A	
<b>1. Total Fund</b>				
Exceed the rate of inflation (C.P.I.) over a market cycle of 5-years.	✓			Wyoming returned 4.7% vs. 1.4% for the C.P.I. for the current 5-year period
Exceed a weighted index of the total fund's asset allocation and component benchmarks over rolling 5-year periods by an appropriate amount.		✗		Wyoming returned 4.7% vs. 4.7% for the Actual Allocation Index for the current 5-year period
Not more than 1% of the outstanding common shares of any corporation shall be owned by the State. An exception may be made for Alternative Investments.	✓			
Not more than 1.5% of the total book value of permanent funds shall be invested in the common stock of any corporation. An exception may be made for Alternative Investments.	✓			

	Yes	No	N/A	Explanation
<b>2. Investment Funds</b>				
<b>a) Permanent Mineral Trust Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Permanent Mineral Trust Fund return was 6.2% vs. 6.3% for the Actual Allocation Index
<b>b) Common School Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Common School Permanent Land Fund return was 6.3% vs. 6.4% for the Actual Allocation Index
<b>c) Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Permanent Land Fund return was 6.1% vs. 6.1% for the Actual Allocation Index
<b>d) University Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: University Permanent Land Fund return was 6.4% vs. 6.6% for the Actual Allocation Index
<b>e) Hathaway Scholarship Endowment Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Hathaway Scholarship Endowment Fund return was 5.5% vs. 5.7% for the Actual Allocation Index
<b>f) Higher Education Endowment Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Higher Education Endowment Fund return was 5.5% vs. 5.7% for the Actual Allocation Index
<b>g) Workers Compensation Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Workers Compensation Fund return was 4.2% vs. 4.5% for the Actual Allocation Index
<b>h) Pool A</b>				
At least 5% to 10% of the fund balance should be invested in securities with maturities of less than one year.	✓			
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: Pool A return was 2.0% vs. 2.2% for the Actual Allocation Index
<b>i) State Agency Pool</b>				
At least 10% to 15% of the fund balance should be invested in securities with maturities of less than one year.	✓			
No public and/or private equities are permitted.	✓			
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		×		5-year: State Agency Pool return was 1.7% vs. 1.9% for the Actual Allocation Index

	Yes	No	N/A	Explanation
<b>3. US Equity Portfolios</b>				
<b>a) State Street Global Advisors – All Cap – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Apple Inc = 2.77%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the State Street All Cap Custom Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 01/2015
<b>b) Epoch – All Cap</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Apple Inc = 5.82%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the Russell 3000 Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014

	Yes	No	N/A	Explanation
<b>c) RBC – Small Cap</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Patrick Industries Inc = 4.99%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the Russell 2000 Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014

	Yes	No	N/A	Explanation
<b>4. Global Equity Portfolios</b>				
<b>a) Arrowstreet – Global Equity</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Samsung Electronics Co = 2.85%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the MSCI ACW Index (Net), net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 03/2015
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 03/2015

	Yes	No	N/A	Explanation
<b>5. International Equity Portfolios</b>				
<b>a) Internal International Equity Portfolio – Int'l – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Tencent Holdings Ltd = 1.24%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the FTSE All World Ex US Index (Net), net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception Date: 02/2016
<b>b) Northern Trust – Int'l – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Tencent Holdings Ltd = 1.36%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the MSCI ACW Ex US Index (Net), before fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Northern Trust gross of fees return was 6.9% vs. 6.8% for the MSCI ACW Ex US Index (Net)

	Yes	No	N/A	Explanation
<b>c) Fisher – Int'l Active</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Tencent Holdings Ltd = 4.24%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the MSCI ACW Ex US Index (Net)*, net of fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Fisher net of fees return was 8.0% vs. 6.8% for the MSCI ACW Ex US Index (Net)
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: Fisher ranked in the 68th percentile for International Equity

\*Fisher Index consists of MSCI EAFE Index (Gross) through July 2010 and the MSCI ACW Ex US Index (Net) thereafter.

	Yes	No	N/A	Explanation
<b>6. Alternative Strategies</b>				
<b>Core Real Estate</b>				
<b>a) Clarion Lion</b>				
Outperform the NCREIF Fund Index – Open-End Diversified Core Equity (ODCE), net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: Clarion Lion net of fees return was 11.1% vs. 10.5% for the NCREIF ODCE Index (Net) (AWA)
<b>b) UBS Trumbull</b>				
Outperform the NCREIF Fund Index – Open-End Diversified Core Equity (ODCE), net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: UBS Trumbull net of fees return was 8.6% vs. 10.5% for the NCREIF ODCE Index (Net) (AWA)
<b>Absolute Return</b>				
<b>c) PAAMCO</b>				
Outperform the 90-Day T-Bills by 500 basis points, net of all fees (including underlying fund manager fees), over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: PAAMCO net of fees return was 4.0% vs. 0.3% for the BofA ML 3 Mo US T-Bill Index
Outperform the HFRI FOF Comp Index, net of all fees (including underlying fund manager fees), over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: PAAMCO net of fees return was 4.0% vs. 4.0% for the HFRI FOF Comp Index

	Yes	No	N/A	Explanation
<b>7. Convertible Bond Portfolios</b>				
<b>a) Allianz Global Investors</b>				
Outperform the BofA ML All Quality Convertible Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Allianz Global Investors net of fees return was 9.9% vs. 10.7% for the BofA ML All Quality Convertible Bond Index

	Yes	No	N/A	Explanation
<b>8. Fixed Income Portfolios</b>				
<b>a) C.S. McKee – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.	✓			
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg Barclays US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform the Bloomberg US Aggregate Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: C.S. McKee net of fees return was 2.1% vs. 2.1% for the Barclays US Aggregate Bond Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: C.S. McKee ranked in the 74th percentile for Core Fixed Income

	Yes	No	N/A	Explanation
<b>b) JP Morgan – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.			N/A	
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.			N/A	
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.			N/A	
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform the Bloomberg US Aggregate Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: JP Morgan net of fees return was 2.2% vs. 2.1% for the Barclays US Aggregate Bond Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: JP Morgan ranked in the 64th percentile for Core Fixed Income

	Yes	No	N/A	Explanation
<b>c) PIMCO – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.	✓			
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform the Bloomberg US Aggregate Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: PIMCO net of fees return was 2.1% vs. 2.1% for the Barclays US Aggregate Bond Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: PIMCO ranked in the 68th percentile for Core Fixed Income

	Yes	No	N/A	Explanation
<b>d) Neuberger Berman – Credit</b>				
Duration must not exceed plus two (2) years of the custom index.	✓			
Minimum Issue Credit Rating for commercial paper will be A1.	✓			
Average portfolio credit quality must be B or better.	✓			
Obligations of specific issuers are subject to five percent (5%) per issuer limit, excluding investments in commingled vehicles.	✓			
Standalone purchases of private placements, including 144A securities, are not allowed.	✓			
Outperform the State's custom benchmark as measured by twenty percent (20%) Bloomberg US Credit Index, twenty percent (20%) BofA Merrill Lynch US High Yield Master II Constrained Index and sixty percent (60%) S&P/LSTA Leveraged Loan Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 04/2013
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 04/2013
<b>Investment Grade Credit Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: BBB- for individual securities.	✓			
Minimum of ten percent (10%) of the total portfolio must be invested in investment grade rated securities and a maximum of sixty percent (60%) of the total portfolio can be invested in investment grade rated securities.	✓			
<b>High Yield Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: CCC- for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Maximum of forty percent (40%) of the total portfolio can be invested in high yield bonds.	✓			
<b>Bank Loan Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: CCC for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Minimum of forty percent (40%) of the total portfolio must be invested in bank loans and a maximum of eighty percent (80%) of the total portfolio can be invested in bank loans.	✓			

	Yes	No	N/A	Explanation
<b>e) Seix – Credit</b>				
Duration must not exceed plus two (2) years of the custom index.	✓			
Minimum Issue Credit Rating for commercial paper will be A1.	✓			
Average portfolio credit quality must be B or better.	✓			
Obligations of specific issuers are subject to five percent (5%) per issuer limit, excluding investments in commingled vehicles.	✓			
Standalone purchases of private placements, including 144A securities, are not allowed.	✓			
Outperform the State's custom benchmark as measured by twenty percent (20%) Bloomberg US Credit Index, twenty percent (20%) BofA Merrill Lynch US High Yield Master II Constrained Index and sixty percent (60%) S&P/LSTA Leveraged Loan Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 05/2013
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 05/2013
<b>Investment Grade Credit Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: BBB- for individual securities.	✓			
Minimum of ten percent (10%) of the total portfolio must be invested in investment grade rated securities and a maximum of sixty percent (60%) of the total portfolio can be invested in investment grade rated securities.	✓			
<b>High Yield Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be:  CCC- for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Maximum of forty percent (40%) of the total portfolio can be invested in high yield bonds.	✓			
<b>Bank Loan Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be:  CCC for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Minimum of forty percent (40%) of the total portfolio must be invested in bank loans and a maximum of eighty percent (80%) of the total portfolio can be invested in bank loans.	✓			

	Yes	No	N/A	Explanation
<b>f) Grosvenor Silvery Lupine Fund – Opportunistic Fixed Income</b>				
Outperform the CS Western European Hi Yld Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 07/2014
<b>g) Investec – Emerging Market Debt (Local Currency)</b>				
Duration must fall in the range of plus or minus twenty percent (20%) of the index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 for commercial paper B- for individual securities Where a security is not rated at the issue level, the issuer rating will be relied upon.	✓			
Average portfolio credit quality must be BB+ or better.	✓			
Obligations of individual sovereign/quasi-sovereign issuer are subject to a twenty-five percent (25%) per issuer limit.	✓			
Private placements, including 144A securities are not allowed.	✓			There are three 144A securities held by this portfolio. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
The investment manager, as part of managing the account, can take net investment positions of up to twenty percent (20%) of the portfolio in currency and currency forwards.	✓			
Outperform the JP Morgan GBI-EM Global Diversified Unhedged Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 04/2013
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 04/2013

	Yes	No	N/A	Explanation
<b>h) Stone Harbor – Emerging Market Debt (Local Currency)</b>				
Duration must fall in the range of plus or minus twenty percent (20%) of the index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 for commercial paper B- for individual securities Where a security is not rated at the issue level, the issuer rating will be relied upon.	✓			The portfolio currently holds securities which are rated below B-. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
Average portfolio credit quality must be BB+ or better.	✓			
Obligations of individual sovereign/quasi-sovereign issuer are subject to a twenty-five percent (25%) per issuer limit.	✓			
Private placements, including 144A securities are not allowed.	✓			The portfolio holds private placement and 144A securities. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
The investment manager, as part of managing the account, can take net investment positions of up to twenty percent (20%) of the portfolio in currency and currency forwards.	✓			
Outperform the JP Morgan GBI-EM Global Diversified Unhedged Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 04/2013
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 04/2013
<b>i) State Street – US TIPS – Passive</b>				
Meet the performance of the Bloomberg US TIPS Index with minimal tracking error, gross of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: State Street gross of fees return was 0.2% vs. 0.2% for the Barclays US TIPS Index and a tracking error of 0.3%

	Yes	No	N/A	Explanation
<b>8. Cash and Cash Equivalents Portfolios</b>				
<b>JP Morgan Cash Composite*</b>				
<b>a) JP Morgan Treasury Cash</b>				
Portfolio's weighted average maturity is not to exceed 90 days.	✓			
Portfolio's maximum average cash flow weighted duration of the portfolio must not exceed 90 days.	✓			
The market value of the portfolio must remain within plus or minus one-half percent (0.5%) of one percent (1%) of amortized cost.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment in any single issuer must not exceed 5% of the outstanding issues of that issuer except for government securities.	✓			
Investment performance must exceed Monitored Repurchase Agreement Rate and the cash equivalents allocation by the 90-day T-Bill rate, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Treasury Cash net of fees return was 0.2% vs. 0.3% for the BofA ML 3 Mo US T-Bill Index
<b>b) JP Morgan Treasury Extended Cash</b>				
Portfolio's average cash flow weighted duration is not to exceed 3 years.	✓			
Average cash flow weighted duration is not to exceed 3 years.	✓			
Individual securities must not exceed cash flow weighted duration of greater than 5-years.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment Performance must exceed an Equal Weighted Blend of the BofA Merrill Lynch 1-3 Year Agency, 1-3 Year Treasury, and a 0-3 Year Mortgage Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: JP Morgan Treasury Extended Cash net of fees return was 0.8% vs. 0.7% for the Blended Index
The extended portfolio must not exceed 35% of the total JP Morgan managed portfolio.	✓			

\*During the fourth quarter of 2011, JP Morgan Treasury Cash and JP Morgan Treasury Extended Cash were combined. Net of fees performance shown consists of performance calculated by RVK, Inc. prior to 12/31/2011 and performance calculated by JP Morgan thereafter.

	Yes	No	N/A	Explanation
<b>JP Morgan Wyo-Star Cash Composite*</b>				
<b>c) JP Morgan Wyo-Star Cash</b>				
Portfolio's weighted average maturity is not to exceed 90 days.	✓			
Portfolio's maximum average cash flow weighted duration of the portfolio must not exceed 90 days.	✓			
The market value of the portfolio must remain within plus or minus one-half percent (0.5%) of one percent (1%) of amortized cost.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment in any single issuer must not exceed 5% of the outstanding issues of that issuer.	✓			
Investment performance must exceed Monitored Repurchase Agreement Rate and the cash equivalents allocation by the 90-day T-Bill rate, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Wyo-Star Cash net of fees return was 0.2% vs. 0.3% for the BofA ML 3 Mo US T-Bill Index
<b>d) JP Morgan Wyo-Star Extended Cash</b>				
Portfolio's average cash flow weighted duration is not to exceed 3 years.	✓			
Average cash flow weighted duration is not to exceed 3 years.	✓			
Individual securities must not exceed cash flow weighted duration of greater than 5-years.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment Performance must exceed an Equal Weighted Blend of the BofA Merrill Lynch 1-3 Year Agency, 1-3 Year Treasury, and a 0-3 Year Mortgage Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Wyo-Star Extended Cash net of fees return was 0.6% vs. 0.7% for the Blended Index
The extended portfolio must not exceed 35% of the total JP Morgan managed portfolio.	✓			

\*During the fourth quarter of 2011, JP Morgan Wyo-Star Cash and JP Morgan Wyo-Star Extended Cash were combined. Net of fees performance shown consists of performance calculated by RVK, Inc. prior to 12/31/2011 and performance calculated by JP Morgan thereafter.

**Custom Benchmark Comments**

The Wyoming State Actual Allocation Index is calculated using beginning month asset class weights applied to the appropriate asset class benchmark return, using the US Equity Custom Index for US equities, MSCI ACW Index (Net) for global equities, MSCI ACW Ex US Index (Net) for international equities, Bloomberg US Aggregate Bond Index for fixed income, BofA Merrill Lynch All Convertibles Index (All Qualities) for convertible bonds, NCREIF Open-End Diversified Core Equity Index (Gross) (AWA) for core real estate, NCREIF Property Index for value-added real estate, the State's actual private equity investment returns for private equity, HFRI FOF Comp Index for absolute return, and BofA Merrill Lynch 90 day US T-Bill rate for cash equivalents.

Pooled Fund actual allocation indices are calculated using beginning month asset class weights applied to the appropriate asset class benchmark return, using the US Equity Custom Index for US equities, MSCI ACW Index (Net) for global equities, MSCI ACW Ex US Index (Net) for international equities, Bloomberg US Aggregate Bond Index for fixed income, BofA Merrill Lynch All Convertibles Index (All Qualities) for convertible bonds, NCREIF Open-End Diversified Core Equity Index for core real estate, NCREIF Property Index for value-added real estate, the State's actual private equity investment returns for private equity, HFRI FOF Comp Index for absolute return, and the State Agency Pool Custom Index for the State Agency Pool allocation.

The Total Equity Custom Index consists of the MSCI World Index (USD) (Net) through July 2010 and the MSCI All Country World Index (USD) (Net) thereafter.

The US Equity Custom Index consists of the S&P 500 Index (Cap Wtd) through September 2014 and the Russell 3000 Index thereafter.

The State Street All Cap Custom Index consists of 69% Russell 3000 Index, 24% FTSE RAFI US 1000 Index and 7% MSCI USA Minimum Volatility Index (Net).

The International Equity Custom Index and the Fisher Custom Benchmark both consist of MSCI EAFE Index (Gross) through July 2010 and the MSCI ACW Ex US Index (Net) thereafter.

The Credit Custom Index consists of 20% Bloomberg US Credit Index, 20% BofA Merrill Lynch US High Yield Master II Constrained Index, and 60% S&P/LSTA Leveraged Loan Index.

The Internal Fixed Income Portfolio Custom Index consists of the Bloomberg US Gov't: Int. Term Bond Index; prior to December 2009 the index consists of the Bloomberg US Gov't/Credit Bond Index.

The JP Morgan Blended Index consists of an equal-weighted allocation to the BofA Merrill Lynch 1-3 Year US Treasury Index, BofA Merrill Lynch 1-3 Year US Agencies Index, and BofA Merrill Lynch 0-3 Year Weighted Average Life Mortgage Index.

The JP Morgan Cash Custom Index is calculated monthly using beginning of the month investment weights applied to each corresponding primary benchmark return. Currently, the primary benchmark for JP Morgan Cash is the BofA ML 3 ML US T-Bill Index and for JP Morgan Extd is the JP Morgan Blended Index.

The Wyo-Star Cash Custom Index is calculated monthly using beginning of the month investment weights applied to each corresponding primary benchmark return. Currently, the primary benchmark for Wyo-Star Cash is the BofA ML 3 ML US T-Bill Index and for Wyo-Star Extd is the JP Morgan Blended Index.

**Performance & Holding Comments**

RVK, Inc. shows performance beginning with the first full month following inception. Inception date shown for the Global Equity, Int'l Equity, and JP Morgan Cash Composites represents the first date of performance calculated by RVK, Inc.

Performance shown for Pooled Funds is calculated on a capital-weighted basis using beginning-period allocations and does not reflect net cash flows.

Performance shown for the UW Portfolio Management Program prior to 07/01/2009 includes their participation in the State Agency Pool. Performance calculated for the UW Portfolio Management Program after 02/01/2013 has not been verified by RVK as the assets have been moved to a platform in which the custodian does not provide a reconcilable return.

Performance for the Internal Fixed Income Portfolio excludes distressed securities taken in-kind following the liquidation of WAMCO Core Plus.

Performance shown for the JP Morgan Cash Composite and the Wyo-Star Cash Composite consists of the respective operating and extended cash accounts.

Due to portfolio turnover, buy and hold attribution may not accurately represent quarterly performance relative to the benchmark.

**Alternative Investment Comments**

Reporting for Private Equity performance was changed from cost basis to the latest portfolio valuation adjusted for cash flows, consistent with the supplementary alternatives report. This methodology change involved reflecting the difference between cost value and the most recent valuation, resulting in a significant positive performance impact on the total fund during 2nd quarter 2008.

Valuations for value-added real estate and private equity were changed from a one-quarter lag to as of the most recent valuation, adjusted for subsequent cash flows. This methodology change involved reflecting all cash flows occurring during 4th quarter 2011 as of January 2012, resulting in a minor positive performance impact on the total fund during 1st quarter 2012. Investment (Cost) Values are not lagged.

Performance for value-added real estate and private equity investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives performance report.

Cheyenne Capital Fund valuations set forth herein could be materially different once underlying investments are realized. Market conditions at the time of exit could be substantially different than at the reporting period, resulting in valuations different than those represented above.

**Miscellaneous Comments**

Wyoming State Treasurer's Office fiscal year ends on June 30th.

Fixed Income style peer groups have low populations, and may cause ranks to change significantly from quarter to quarter.

"IM" is the acronym for Investment Metrics, the provider of peer group data used in ranking investment manager and asset class performance.

During the 4th quarter of 2012, WAMCO Core Plus, Neuberger Berman Core Plus, PIMCO Core Plus, PIMCO Mortgages, JP Morgan Mortgages, WAMCO Corporates, Logan Circle, and PIMCO Global/EM began the liquidation process to transition assets to the State's new fixed income asset class structure. The proceeds were used to fund State Street TIPS, C.S. McKee, JP Morgan Core, MacKay Shields, Neuberger Berman Core, PIMCO Core, and Wells Capital. During the 1st quarter of 2013, additional assets were transitioned to Neuberger Berman Credit, Seix, Investec, and Stone Harbor.

During the 4th quarter of 2014, State Street S&P 500 and Gabelli began the liquidation process to transition assets to the State's new US equity asset class structure. The proceeds were used to fund State Street All Cap, Epoch, Lazard, and RBC. During the 1st quarter of 2015, additional assets were transitioned to Arrowstreet.

During the 4th quarter of 2015, the Workers Compensation Fund was reclassified as a Permanent Fund.

During the 1st quarter of 2016, the State funded the Internal International Equity Portfolio, using proceeds from the liquidation of The Boston Company.

During the 3rd quarter of 2016, Bloomberg acquired the Barclays Global Family of Fixed Income Indices. Naming conventions have been updated to "Bloomberg" to reflect the acquisition.

During the 3rd quarter of 2016, MacKay Shields began the liquidation process, with proceeds used to increase allocations to C.S. McKee and the Internal Fixed Income Portfolio.

During the 1st quarter of 2017, Neuberger Berman Core and Wells Capital began their respective liquidation processes.

During the 2nd quarter of 2017, Manning & Napier began the liquidation process.

During the 4th quarter of 2017, Lazard began the liquidation process.

## Glossary

**Active Share** - Measures the degree to which the holdings of a fund differ from the holdings of the benchmark. Active share is calculated by taking the sum of the absolute value of the differences of the weight of each holding in the fund versus the weight of each holding in the benchmark and dividing by two.

**Alpha** - A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market or a portfolio's non-systematic return.

**Alpha Ratio** - A measure of a portfolio's non-systematic return per unit of downside risk. It is measured by dividing the alpha of a portfolio by the downside risk. The non-systematic return is a measure of a portfolio's historical performance not explained by movements of the market.

**Average Quality** - Bond quality ratings are reported using the investment managers' and the index providers' preferred rating agency. *Average Quality for managers unable to provide this statistic is instead provided by Morningstar; if unavailable on Morningstar, it has been estimated using a credit quality distribution provided by the manager.* There are two primary rating agencies in the US. *Moody's* assigns ratings on a system that employs up to four symbols (consisting of letters and numbers) such as, Aaa, Aa2, etc., with Aaa being the highest or safest rating. *Standard & Poor's (S&P)* employs a system that uses + and - along with letters such as AAA, AA+, etc. The two rating agencies' systems are summarized below:

<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>	<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>
<b>Higher Credit Quality – Investment Grade</b>			<b>Lower Credit Quality – Below Investment Grade</b>		
AAA	Aaa	Prime/Highest credit quality	BB+	Ba1	Speculative/Low credit quality
AA+	Aa1	High credit quality	BB	Ba2	
AA	Aa2		BB-	Ba3	
AA-	Aa3		B+	B1	Highly speculative
A+	A1	Upper-medium credit quality	B	B2	
A	A2		B-	B3	
A-	A3		CCC+	Caa1	Substantial credit/default risk
BBB+	Baa1	Lower-medium credit quality	CCC	Caa2	Extremely speculative
BBB	Baa2		CCC-	Caa3	
BBB-	Baa3		CC	Ca	Vulnerable to default
			C	Ca	
			D	C	In default

**Benchmark Effect** - The difference between the blended return of each respective managers' benchmark within a composite and the composite's benchmark return.

**Beta** - A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk.

**Box Plots** - A graphical representation of the distribution of observations. From top to bottom, the four boxes represent the spread between the maximum value and the minimum value in each quartile. A quartile represents the values that divide the observations into four quarters (i.e., 1<sup>st</sup> quartile, 2<sup>nd</sup> quartile, 3<sup>rd</sup> quartile, and 4<sup>th</sup> quartile). The median observation is where the 2<sup>nd</sup> quartile and 3<sup>rd</sup> quartile meet.

**Buy and Hold Attribution** - At the beginning of the time period under analysis, the manager and benchmark portfolios are broken down into segments (i.e., styles, sectors, countries, and regions) based on the desired type of attribution. The formula assumes zero turn-over to the manager and benchmark portfolios throughout the period and calculates the segment returns ("buy and hold returns") to arrive at performance attribution. Due to portfolio turnover, buy and hold attribution may not accurately represent quarterly performance relative to the benchmark. Country, region, sector, and style allocations are as of the date one quarter prior to the reporting date, and the returns shown are for those segments throughout the quarter reported. Due to disclosure guidelines set by each investment manager, equity characteristics shown are as of the most recent date available. The following is the methodology for segment classification:

**Sector** - Attribution is calculated using the Global Industry Classification Standard (GICS) which is a detailed and comprehensive structure for sector and industry analysis. Stocks are classified by their primary sector, as defined by S&P Capital IQ data.

**Country/Region** - Attribution is calculated using the Morgan Stanley Capital International (MSCI) region standards. Stocks are classified by their domicile country/region, as defined by S&P Capital IQ data.

**Style** - Stocks are classified into the following style boxes: large/mid/small vs. growth/neutral/value. Stocks are classified along large/mid/small categories at the time of the Russell index rebalancing, using the index market cap boundaries as cutoff points. Stocks are classified along growth/neutral/value categories at the time of the Russell index rebalancing, using the price/book ratio as supplied by S&P Capital IQ. Stocks in the Russell 3000 Index portfolio are sorted by price/book ratio; names with the highest price/book ratio that make up 1/3 of the total market capitalization are assigned to the growth category, names that make up the subsequent 1/3 of the total market capitalization are assigned to the neutral category, while the balance of the names are assigned to the value category.

Portfolio Characteristics and Buy and Hold Attribution reports utilize product-specific data for all mutual funds and commingled funds.

### Capital Markets Review -

**Breakeven Inflation** - Measures the expected inflation rate at each stated maturity by taking the difference between the real yield of the inflation-linked maturity curve and the yield of the closest nominal Treasury maturity.

**Consumer Confidence** - Measures domestic consumer confidence as defined by the degree of optimism on the state of the economy that consumers express through saving and spending.

**Consumer Price Index (CPI)** - Measures the change in the price level of consumer goods and services.

**Federal Funds Rate** - The interest rate at which a depository institution lends funds maintained at the Federal Reserve to another depository institution overnight. It is one of the most influential interest rates in the US economy, since it affects monetary and financial conditions, which in turn have a bearing on key aspects of the broad economy including employment, growth and inflation.

**Option-Adjusted Spread** - Measures the flat spread of an index or bond to the Treasury yield curve after removing the effect of any embedded options.

**Purchasing Managers Index (PMI)** - Measures economic activity by surveying purchasing managers on a monthly basis as to whether business conditions have improved, worsened, or stayed the same.



## Glossary

**Real Gross Domestic Product (Real GDP)** - An inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year.

**US Dollar Total Weighted Index** - Measures the value of the US Dollar relative to a basket of other world currencies. It is calculated as the weighted geometric mean of the dollar's value versus the EUR, GBP, CAD, SEK, CHF, and JPY.

**Unemployment Rate** - The percentage of the total labor force that is unemployed but actively seeking employment.

**VIX** - Measures the implied volatility of S&P 500 Index options by looking at the market's expectation of the S&P 500 Index volatility over the next 30 day period. Commonly referred to as the "fear index" or the "fear gauge."

**Cash Flow Effect** – The composite's active return minus the sum of each managers' active return minus the benchmark effect.

**Consistency** - The percentage of quarters that a product achieved a rate of return higher than that of its benchmark. The higher the consistency figure, the more value a manager has contributed to the product's performance.

**Convexity** - A measure of the shape of the curve that describes the relationship between bond prices and bond yields.

**Correlation** - A statistical measure of the relationship between asset class returns. A value of 1.00 is a perfect correlation; that is, the asset classes always move in the same direction. A value of -1.00 indicates a perfect negative correlation, in which the asset classes always move in opposite directions of each other. A value of 0 indicates there is no relationship between the direction of returns of the two asset classes. Correlation calculations only consider the direction of changes relative to two variables and not the magnitude of those changes.

**Coupon Rate** - The percentage rate of interest paid on a bond or fixed income security; it is typically paid twice per year.

**Current Yield** - The annual income of a security divided by the security's current price.

**Down Market Capture** - Down market by definition is negative benchmark return and down market capture represents the ratio in % terms of the average portfolios return over the benchmark during the down market period. The lower the value of the down market capture the better the product's performance.

**Downside Risk** - A measure similar to standard deviation, but focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative monthly returns. The higher the factor, the riskier the product.

**Earnings Per Share** - It is backward looking, calculated using the one year current EPS divided by the one year EPS five years ago.

**Effective Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield.

**Excess Return vs. Market** - Average of the monthly arithmetic difference between the manager's return and the benchmark return over a specified time period, shown on an annualized basis.

**Excess Return vs. Risk Free** - Average of the monthly arithmetic difference between the manager's return and the risk-free return (i.e., BofA ML 3 Mo US T-Bill Index unless specified otherwise) over a specified time period, shown on an annualized basis.

**Excess Risk** - A measure of the standard deviation of a portfolio's performance relative to the risk free return.

**Expense Ratios** - Morningstar is the source for mutual fund expense ratios.

**Gain/Loss** - The net increase or decrease in the market value of a portfolio excluding its Net Cash Flow for a given period.

**Indices** - All indices and related information are considered intellectual property and are licensed by each index provider. The indices may not be copied, used or distributed without the index provider's prior written approval. Index providers make no warranties and bear no liability with respect to the indices, any related data, their quality, accuracy, suitability and/or completeness.

**Information Ratio** - Measured by dividing the active rate of return by the tracking error. The higher the information ratio, the more value-added contribution by the manager.

**Liability Driven Investing (LDI)** - A method to optimally structure asset investments relative to liabilities. The change in liabilities is estimated by the Ryan Labs Generic PPA Index of appropriate duration for that Plan. This benchmark is based on generic data and is therefore an approximation. RVK is not an actuarial firm, and does not have actuarial expertise.

**Estimated Funded Status** - The estimated ratio of a Plan's assets relative to its future liabilities. This is calculated by dividing the Plan's asset market value by the estimated present value of its liabilities. The higher the estimated funded status, the better the Plan's ability to cover its projected benefit obligations. An estimated funded status of 100% indicates a Plan that is fully funded.

**Estimated PV of Liabilities** - An estimate of a Plan's future liabilities in present value terms. The beginning of the period liability is provided by the Plan's actuary. The period-end present value liability estimate provided in this report is derived by applying the estimated percentage change generated using the Ryan Labs Generic PPA Index with duration similar to that reported on the most recent actuarial valuation report.

**Duration of Liabilities** - The sensitivity of the value of a Plan's liabilities to changes in interest rates, as calculated by the Plan's actuary.

**Duration of Assets** - The dollar-weighted average duration of all the individual Plan assets.

**Estimated Plan Hedge Ratio** - The estimate of how well a Plan's investment portfolio is hedged against changes in interest rates - a primary driver of funded status movements. This is calculated by dividing the dollar-weighted values of both the Plan asset duration by the liability duration and multiplying by the estimated funded status. An estimated plan hedge ratio of zero indicates that the Plan's liabilities have not been hedged, whereas a value of one indicates fully hedged.

**Modified Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield, assuming the bonds' expected cash flows do not change.

## Glossary

**Mutual Fund Performance** - Whenever possible, manager performance is extended for any share class that does not have 10 years of history. Using Morningstar's methodology, a single ticker within the same fund family (often the oldest share class) is chosen to append historical performance.

**Net Cash Flow** - The sum, in dollars, of a portfolio's contributions and withdrawals. This includes all management fees and expenses only when performance shown is gross of fees.

### Peer Groups -

**Plan Sponsor Peer Groups** - RVK utilizes the Mellon Analytical Solutions Trust Universe along with the Investment Metrics Plan Sponsor Universe. The combined Mellon Analytical Solutions Trust Universe and Investment Metrics Plan Sponsor Universe is used for comparison of total fund composite results and utilizes actual client returns compiled from consultant and custodial data. The Plan Sponsor Peer Group database includes performance and other quantitative data for over 2,100 plans which include corporate, endowment, foundation, public, and Taft Hartley plans. Plan Sponsor Peer Groups are gross of fees.

**Institutional Peer Groups (Separate Account and Commingled Fund)** - RVK utilizes the Investment Metrics Separate Account and Commingled Fund Manager Peer Groups for peer comparison and rankings. The Separate Account and Commingled Fund Peer Group database includes performance and other quantitative data for over 1,000 investment management firms, 6,400 investment products, across 100 standard peer groups. Separate Account and Commingled Fund Peer Groups are gross of fees.

**Mutual Fund (MF) Peer Groups** - RVK utilizes the Lipper Mutual Fund Manager Peer Groups for peer comparison and rankings. The Lipper Manager Peer Group database includes performance and other quantitative data for over 700 investment management firms and 24,500 investment products, across more than 140 standard peer groups. Mutual Fund Peer Groups are net of fees.

For more information on Peer Groups, visit <https://www.invmetrics.com/style-peer-groups>.

**Percentile Rankings** - Percentile rank compares an individual fund's performance with those of other funds within a defined peer group of managers possessing a similar investment style. Percentile rank identifies the percentage of a fund's peer group that has a higher return (or other comparative measurement) than the fund being ranked. Conversely, 100 minus the individual fund's ranking will identify the percentage of funds within the peer group that have a lower return than the fund being ranked.

1 - Highest Statistical Value

100 - Lowest Statistical Value

*Example: American Funds AMCP;R-4 (RAFEX) is ranked in the 4<sup>th</sup> percentile within the IM US Equity Large-Cap Growth Funds (MF) Peer Group for the Sharpe Ratio. Within the IM US Equity Large-Cap Growth Funds peer group, 4% of the other funds performed better than American Funds AMCP;R-4 (RAFEX), while 96% of the funds performed worse.*

**Performance Methodology** - RVK calculates performance for investment managers and composites using different methodologies.

**Investment Managers** - Performance is calculated for interim periods between all large external cash flows for a given month and geometrically linked to calculate period returns. An external cash flow is defined as cash, securities, or assets that enter or exit a portfolio. RVK defines a "large cash flow" as a net aggregate cash flow of  $\geq 10\%$  of the beginning-period portfolio market value or any cash flow that causes RVK calculated performance to deviate from manager/custodian reported performance in excess of 5 basis points for a given month.

**Composites** - The Modified Dietz methodology is utilized to calculate asset class, sub-asset class, and total fund composite performance. The Modified Dietz method calculates a time-weighted total rate of return that considers the timing of external cash flows; however, it does not utilize interim period performance to mitigate the impact of significant cash in- and outflows to the composite.

RVK calculates performance beginning with the first full month following inception. Since inception performance may vary from manager reported performance due to RVK using the first full month of returns as the inception date. Performance for both managers and composites is annualized for periods greater than one year.

**Portfolio Characteristics** - Due to disclosure guidelines set by each investment manager, portfolio characteristics shown are as of the most recent date available.

**Price to Earnings Ratio** - The ratio of a company's share price to its per-share earnings

**Private Equity Quartile Ranks** - Private Equity quartile ranks are generated using vintage year peer group data provided by Thomson Reuters, and are based on each fund's annualized, since inception internal rate of return (IRR). Three Private Equity peer groups are available via Thomson Reuters: Buyout, Venture, and All Private Equity. Ranks are available quarterly, at a one-quarter lag.

**Return** - Compounded rate of return for the period.

**% Return** - The time-weighted rate of return of a portfolio for a given period.

**R-Squared** - The percentage of a portfolio's performance explained by the behavior of the appropriate benchmark. High R-Squared means a higher correlation of the portfolio's performance to the appropriate benchmark.

**Risk Free Benchmark** - BofA ML 3 Mo US T-Bill Index unless specified otherwise.

## Glossary

**RVK Liquidity Rating** - A qualitative method for determining the relative amount of liquidity in a portfolio. The characteristics considered when determining relative liquidity include trading volume, gates for redemption, leverage, nature of transactions, and pricing mechanisms. The RVK Liquidity Rating is calculated using beginning of month investment weights applied to each corresponding asset class liquidity rating.

<u>Asset Class</u>	<u>RVK Liquidity Rating</u>	<u>Asset Class</u>	<u>RVK Liquidity Rating</u>
<u>Liquid Investments</u>		<u>Less Liquid Investments</u>	
T-Bills and Treasuries	100	Fixed Income Plus Sector	50
Cash Equivalents	98	Bank Loans	50
TIPS	95	Stable Value (Plan Sponsor Directed)	50
US Large Cap Equity	95	Absolute Return Strategies	35
Diversified Real Return	93		
Stable Value (Participant Directed)	91		
Non-US Large Cap Equity	90	<u>Not Liquid Investments</u>	
Global Tactical Asset Allocation	88	Core Real Estate	25
US Small Cap Equity	85	Core Plus Real Estate	15
REITS	85	Non-Core Real Estate	5
Non-US Small Cap Equity	85	Private Equity Funds of Funds	5
Emerging Markets Equity	85		
Core Fixed Income	85		
Core Plus Fixed Income	80		

**Sector Allocation** - Negative fixed income sector allocation reflects manager's use of derivatives, short selling, or interest rate swaps.

**Sharpe Ratio** - Represents the excess rate of return over the risk-free return (i.e., BofA ML 3 Mo US T-Bill Index unless specified otherwise), divided by the standard deviation of the excess return to the risk free asset. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.

**Simple Alpha** - The difference between the manager's return and the benchmark's return.

**Spread Duration** - The approximate percentage change in a bond's price for a 100 basis point change in its spread over a Treasury of the same maturity.

**Standard Deviation** - A statistical measure of the range of a portfolio's performance. The variability of a return around its average return over a specified time period.

**Time Period Abbreviations** - **QTD** - Quarter-to-Date. **CYTD** - Calendar Year-to-Date. **FYTD** - Fiscal Year-to-Date. **YOY** - Year Over Year.

**Thematic Classification** - Represents dedicated manager allocations; as such, thematic allocations are approximations. RVK categorizes the following asset classes as Alpha, Capital Appreciation, Capital Preservation, and Inflation:

<u>Alpha</u>	<u>Capital Appreciation</u>	<u>Capital Preservation</u>	<u>Inflation</u>
Absolute Return Strategies	Public Equity	Core Fixed Income	TIPS
Currency Overlay	Private Equity	CMBS Fixed Income	Bank Loans
	Preferred Securities	Asset Backed Fixed Income	Core Real Estate
	High Yield	Domestic Core Plus Fixed Income	Real Return
	Convertible Fixed Income	Mortgage Backed Fixed Income	Inflation Hedges
	TALF Funds	International Developed Fixed Income	REITS
	Distressed Debt	Cash Equivalents	Commodities
	Emerging Market Fixed Income	Stable Value	
	Value Added Real Estate		
	Opportunistic Real Estate		

**Total Fund Attribution** – The Investment Decision Process (IDP) model provides an approach to evaluating investment performance that applies to all asset classes and investment styles. The IDP model is based on a top-down hierarchy framework of investment decisions, with each decision contributing to the overall profit or loss. The IDP approach starts from the strategic asset allocation and follows the flow of the investments down to the manager's skill.

**Strategic Asset Allocation (SAA)** – The percentage return gained or lost from the long-term strategic asset allocation decision, the most significant determinant of long-term performance. SAA is the product of the target asset allocation multiplied by the corresponding benchmark returns.

**Tactical Asset Allocation (TAA)** – The percentage return gained or lost from not having been precisely allocated at the target asset allocation mix, whether by deviations that are tactical in nature or a by-product of moving towards the target mix. TAA is the product of the actual asset allocation multiplied by the broad asset class benchmarks, less the SAA.

**Style Selection (SS)** – The percentage return gained or lost from intentional style biases within each asset class (e.g. value rather than core or overweight to emerging markets relative to benchmark). SS is the product of the actual manager allocation within each asset class multiplied by their specific benchmark, less TAA.

**Manager's Skill (MS)** – The percentage return gained or lost from manager value added relative to their specific benchmark. MS is the product of the actual manager allocation multiplied by their achieved excess return.

**Total Fund Beta** - Total Fund Beta is calculated using the S&P 500 as the benchmark. It represents a measure of the sensitivity of the total fund to movements in the S&P 500 and is a measure of the Total Fund's non-diversifiable or systematic risk.

**Tracking Error** - A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

## Glossary

**Treynor Ratio** - Similar to Sharpe ratio, but focuses on beta rather than excess risk (standard deviation). Treynor ratio represents the excess rate of return over the risk-free rate (i.e., BofA ML 3 Mo US T-Bill Index unless specified otherwise) divided by the beta. The result is the absolute rate of return per unit of risk. The higher the value, the better historical risk-adjusted performance.

**Unit Value** - The dollar value of a portfolio, assuming an initial nominal investment of \$100, growing at the compounded rate of %Return for a given period.

**Up Market Capture** - Up market by definition is positive benchmark return and up market capture represents the ratio in % terms of the average portfolios return over the benchmark during the up market period. The higher the value of the up market capture the better the product's performance.

**Yield to Maturity** - The rate of return achieved on a bond or other fixed income security assuming the security is bought and held to maturity and that the coupon interest paid over the life of the bond will be reinvested at the same rate of return. The 30-Day SEC Yield is similar to the Yield to Maturity and is reported for mutual funds.

**Yield to Worst** - The bond yield calculated by using the worst possible yield taking into consideration all call, put, and optional sink dates.

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