



INVESTMENT MANAGEMENT

MEMORANDUM

TO: Supplemental Retirement Board of Trustees

FROM: Loren de Mey, Assistant Investment Director

DATE: September 17, 2018

SUBJECT: Discussion / Action: NC 401k and NC 457b Plans: Recommend Replacement Fund for the PIMCO Inflation Response Multi Asset Fund

At its August 22, 2018, Investment Subcommittee meeting, staff recommended and the Subcommittee approved, the termination of the the PIMCO Inflation Response Multi-Asset Fund within the NC 401k and NC 457 Plans and NC 403b Program. Please see the memo dated August 22, 2018, attached. The decision to terminate the PIMCO Fund will be under consideration by the Supplemental Retirement Board of Trustees at its upcoming meeting.

The following outlines a recommended replacement manager for the PIMCO Inflation Response Multi-Asset Fund (IRMAF) for the NC 401k /NC 457 Plans. A separate recommendation memo has been provided for a replacement fund within the NC 403b Program.

The Investment Management Division (IMD) staff and Mercer recommend hiring BlackRock's diversified real assets strategy, the BlackRock Strategic Completion Fund (SCF), to replace the current investment manager, the PIMCO Inflation Response Multi Asset Fund, within the NC 401k and NC 457 Plans. The approximate amount of the mandate is \$374.2 million. Given the lower fees and expenses of the BlackRock Fund, 0.10% for the BlackRock Fund compared to 1.22% for the PIMCO Fund, savings to participants are approximately \$4.2 million on an annual basis (based on assets of \$374.2 million).

The key reasons supporting this recommendation include:

1. Diversified real assets offering
2. BlackRock's disciplined investment process
3. Experienced investment team
4. Low fees and expenses

IMD staff worked with Mercer to screen the universe of potential Real Asset managers to replace the PIMCO Fund. IMD staff reviewed the fund materials including due diligence questionnaires, manager presentations, consultant reports, and performance and risk statistics of the strategy. IMD staff conducted conference calls with BlackRock and Mercer to review the SCF Fund. After reviewing all materials and conducting conference calls with BlackRock, staff and Mercer recommend BlackRock's Strategic Completion Fund to replace the current manager, PIMCO, within North Carolina's Inflation Sensitive white label fund.



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Organization

BlackRock (BLK) was founded in 1988 and is a leading provider of investment management services to institutional and retail clients. The firm provides risk management and advisory services that combine capital markets expertise with internally-developed systems and technology. BlackRock manages \$6.29 trillion across equity, fixed income, real estate, cash management, alternatives, and asset allocation strategies, with \$4 trillion in index strategies (as of June 30, 2018). The firm has more than 13,500 employees with over 2,000 investment professionals with offices in 34 countries.

Investment Team

The Strategic Completion Fund is managed by both the Multi Asset Solutions Lifetime Asset Allocations Team, headed by Matt O'Hara, and the ETF & Index Investment Strategies Index Asset Allocation Team. Mr. O'Hara is also Head of Research for the US Retirement Group. He has ownership of the strategic asset allocation, research, product and development and enhancements of the strategy. He has been with BlackRock, originally BGI, since 2003. Alan Mason is Head of Americas ETF and Index Investments (EII). Mr. Mason has been with BlackRock, originally BGI, since 1992. Amy Whitelaw is the Head of the US & Canadian iShares Equity Portfolio Management team within BlackRock's Index Equity team. Ms. Whitelaw has been with BlackRock, originally BGI, since 1999. The EII team manages SCF on a day to day basis. This team ensures adherence to the investment guidelines and rebalances the portfolio on a monthly basis back to the target mix. Greg Savage was added to the team in 2018 as lead Portfolio Manager, having been with the firm, originally BGI, for 19 years. Three of the lead individuals have been involved with SCF since the Fund's launch in September of 2011.

Investment Philosophy and Process

BlackRock's Strategic Completion Fund originated at BlackRock as a way to provide Defined Contribution participants direct access to a complementary asset class. The Fund seeks returns that provide a hedge to inflation over the medium to long-term. SCF follows an asset allocation strategy constructed on the same platform and utilizing the same methodology and philosophy as BlackRock's own proprietary LifePath target date funds. BlackRock utilizes their firm's existing target-date methodology to determine the asset allocation and strategic target weights. The Strategic Completion Fund allocates to three underlying asset classes: US TIPS, Commodities and Global Real Estate, through three underlying Collective Investment Fund structures.

1. **US TIPS:** The inflation protecting feature of US TIPS can protect an investor's real purchasing power. While providing bond like volatility, TIPS have traditionally been less correlated to traditional fixed income. The allocation range within SCF has historically been 35%-41% since inception. The current allocation to US TIPS is 41%. The benchmark for this portion of the fund is the Bloomberg Barclays US TIPS Index. This index includes inflation indexed bonds issued by the US Treasury. The index covers 37 bonds with an effective duration of approximately 8 years.
2. **REITS:** The REIT allocation within SCF is meant to provide participants with some participation with growth over the long-term. The historical range within SCF since inception has been 36-37%. The current allocation to Global REITs is 37%. The benchmark for this portion of the Fund is the FTSE EPRA/NAREIT Developed Real



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Estate Index. This index provides exposure to a diverse set of real estate holdings, across countries, property types, and geography.

3. **Commodities:** Commodities are most sensitive to short-term inflation and will traditionally react favorably in an environment where supply is unexpectedly constrained or demand outstrips capacity. The historical range within SCF since inception has been 22%-29%. The current allocation within SCF to Commodities is 22%. The benchmark for this portion of the Fund is the Bloomberg Roll Select Commodity Index. This index provides broad diversification across various commodity markets. The index covers six major commodity sectors including precious metals, industrial metals, energy, grains, livestock and soft commodities (sugar, coffee, and cotton).

SCF Asset Allocation

| | TIPS | Commodities | REITS |
|---------------------|--------|-------------|--------|
| Current Allocation* | 41.17% | 21.45% | 37.38% |

*as of 6/30/18

BlackRock's SCF allocates to three underlying BlackRock collective investment trusts (CITS), including the US TIPS Index NL E Fund, the Bloomberg Commodity Roll Select Index E Fund, and the Developed Real Estate Index Non-Lendable E Fund.

SCF's allocations are strategic and long-term in nature, thereby seeking to avoid high turnover, elevated transaction costs and more extreme outcomes typically associated with a tactical asset allocation approach. SCF is rebalanced monthly back to the benchmark's target static weighting.

BlackRock SCF Performance, (net performance as of 6/30/18)

| | YTD | 1 Year | 3 Year | 5 Years | Since Inception |
|---------------|------|--------|--------|---------|-----------------|
| BlackRock SCF | 0.3% | 4.8% | 2.5% | 1.9% | 3.0% |
| Benchmark | 0.2% | 4.7% | 2.4% | 1.8% | 2.9% |

Note: net performance assuming fees of 0.10%

Benchmark: Bloomberg Barclays US TIPS Index, FTSE EPRA/NAREIT Developed Real Estate Index, Bloomberg Roll Select Commodity Index

Compared to PIMCO

| | YTD | 1 Year | 3 Year | 5 Year | 6 Year |
|---------------|-------|--------|--------|--------|--------|
| BlackRock SCF | 0.3% | 4.8% | 2.5% | 1.9% | 1.7% |
| PIMCO | -0.2% | 5.9% | 3.6% | 2.5% | 1.2% |

| | Standard Deviation |
|---------------|--------------------|
| BlackRock SCF | 6.3 |
| PIMCO | 7.4 |

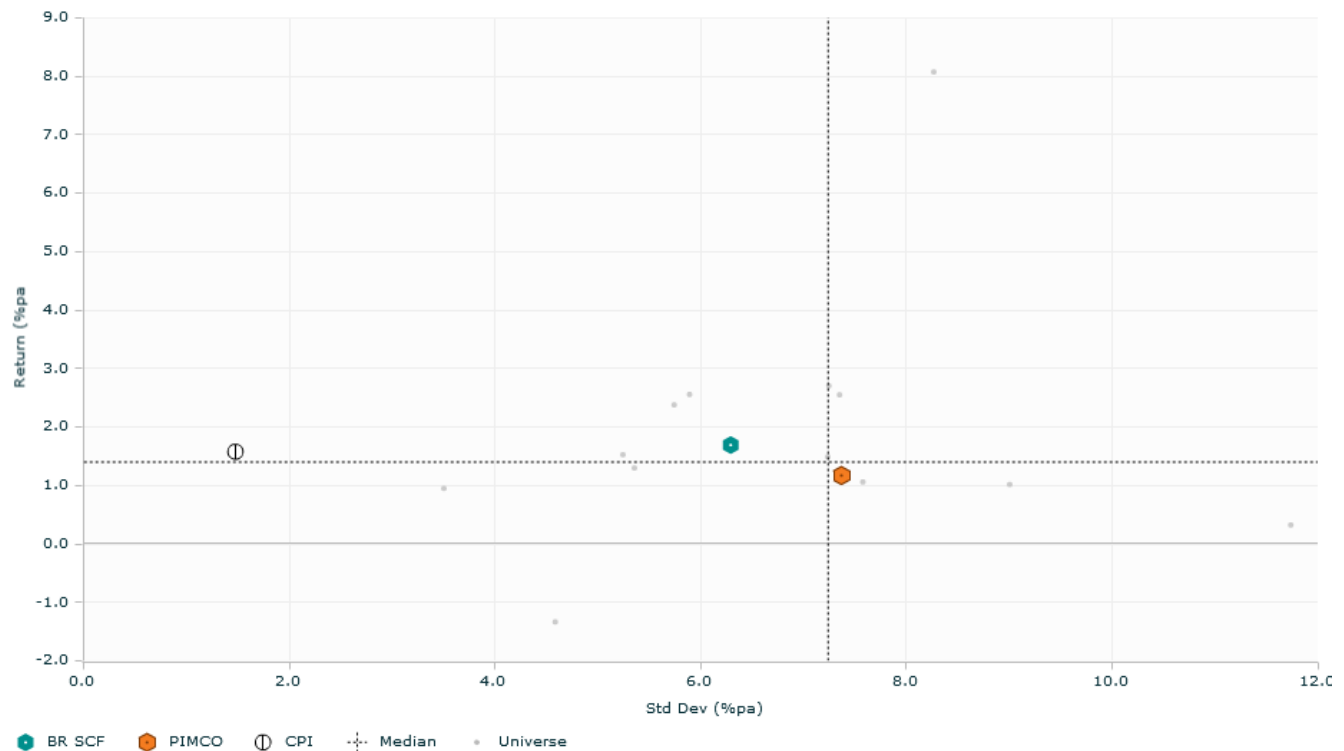


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Blackrock SCF has shown comparable historical performance with lower risk and much lower expenses compared to PIMCO IRMAF.

Return and Std Deviation in \$US (after fees) over 6 yrs ending June-18

Comparison with the Mutual Fund Diversified Inflation Hedge universe (quarterly calculations)



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GoalMaker Fit

The Mercer asset allocation team modeled the GoalMaker portfolios assuming a manager change to the BlackRock SCF Fund and would not recommend making any changes to the glidepath asset allocation models given this change. The underlying allocations to TIPS for each Fund are very similar and the remaining allocations are to real asset sectors that are more growth oriented, such as REITs and commodities. Also, the Fund change caused only slight changes to the risk and return expectations to the GoalMaker portfolio with the highest allocation to the PIMCO Fund. Therefore, the Mercer asset allocation modeling team does not recommend making any changes to the underlying glidepath asset allocation models within GoalMaker.

Fee Schedule

Standard Fees are 0.17% per annum.

North Carolina has negotiated a discounted fee of 0.10% for the Strategic Completion Fund Non-Lendable F Share Class.

Investment Management Fee: 0.09%

Administrative Fee: 0.01% (capped at 0.01% per annum)



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Appendix A: Investment Team Biographies

Greg Savage, Managing Director (Lead Portfolio Manager)

Years of Industry Experience: 21

Years at BlackRock: 19

Years with Strategy: Since 2018

Greg Savage, CFA, Managing Director, is the Head of the Americas Index Asset Allocation team within BlackRock's ETF and Index Investment Group. He is responsible for overseeing the management of the LifePath Target Date Funds as well as a wide range of fund of funds for both Institutional and Defined Contribution clients. Previously, Greg was the Head of iShares Equity Portfolio Management team within BlackRock's Index Equity team where he was responsible for overseeing the management of the Americas listed iShares equity funds. Mr. Savage's service with the firm dates back to 1999, including his years with Barclays Global Investors (BGI), which merged with BlackRock in 2009. At BGI he was a senior portfolio manager and team leader in the iShares Index Equity Portfolio Management Group and was previously a transition manager in the Transition Management Group. Prior to BGI, Mr. Savage worked at Pacific Investment Management Company (PIMCO) from 1997 to 1999 in various roles. Mr. Savage earned a BS degree in Accounting from the University of Colorado at Boulder in 1994.

Matthew O'Hara, Managing Director

Years of Industry Experience: 15

Years at BlackRock: 14

Years with Strategy: Since Inception

Matthew O'Hara, PhD, CFA, Managing Director, is the co-head of LifePath. Dr. O'Hara's service with the firm dates back to 2003, including his years with Barclays Global Investors (BGI), which merged with BlackRock in 2009. As part of the Multi Asset Strategies (MAS) group Dr. O'Hara is responsible for all investing aspects of lifetime asset allocation globally including the LifePath complex globally and the 529 complex in the US as well as new product development in those areas. At BGI, he was Director of Research for the US & Canada Defined Contribution Group. He was responsible for research on defined contribution and pension outsourcing issues. Prior to joining the DC group, he was responsible for all research and model creation for asset-backed and commercial mortgage-backed securities. He also worked on corporate long/short strategies including the launch of the Fixed Income Global Alpha (FIGA) fund. Previous to working in finance, he worked as a research and design engineer in the disk drive industry. Dr. O'Hara has been a lecturer in the MFE program at UC Berkeley. He also serves as President of the board of the CFA Society of San Francisco. Dr. O'Hara earned a bachelor's degree in mechanical engineering from the University of Maryland in 1992. He earned an MS degree and a PhD in mechanical engineering from the University of California at Berkeley in 1995 and 1997, respectively. He also graduated as valedictorian and was awarded the Pyle Prize for best student paper from the Master's in Financial Engineering program at UC Berkeley in 2003.



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Alan Mason, Managing Director

Years of Industry Experience: 26

Years at BlackRock: 26

Years with Strategy: Since Inception

Alan Mason, Managing Director, is Head of Americas Portfolio Engineering for the ETF and Index Investments business. Mr. Mason's investment team is responsible for Index Equity, iShares Equity, Alternative Beta and Asset Allocation portfolios. Mr. Mason is a member of the EII Markets and Investments management committee and the Global Human Capital Committee. He is a global sponsor for OUT, the firm's LGBT employee network. Mr. Mason's service with the firm dates back to 1991, including his years with Barclays Global Investors (BGI), which merged with BlackRock in 2009. At BGI, Mr. Mason served as head of portfolio management and strategy for US transitions, strategist for the Global Index and Markets Group, head of US Asset Allocation, and most recently as head of Global Portfolio Management, Client Solutions. Mr. Mason has led three key growth efforts: developing the US transition capability from a service to a business, growing the key asset allocation product for the firm's US DC platform, LifePath, and building the foundation for key dimensions of the firm's rapidly growing solutions business. Mr. Mason earned a BA degree in music from Baylor University in 1983, *summa cum laude*, an MA degree in musicology from the University of Louisville in 1989, *with honors*, and an MA degree in ethnomusicology from University of California Berkeley in 1991. In the same year that Mr. Mason became head of portfolio management for BGI's transitions business, he was advanced to Ph.D. candidacy in ethnomusicology at UC Berkeley, having completed all coursework for the degree and comprehensive doctoral oral examinations with distinction.

Amy Whitelaw, Managing Director

Years of Industry Experience: 23

Years at BlackRock: 18

Years with Strategy: Since Inception

Amy Whitelaw, Managing Director, is the Head of the US & Canadian iShares Equity Portfolio Management team within BlackRock's Index Equity team. She is responsible for overseeing the management of the Americas listed US & Canadian iShares equity funds. She is a member of the LifePath Executive Committee and serves as a member of the US & Canada Defined Contribution Operating Committee. Ms. Whitelaw also co-chairs the Women's Initiative Network on the West Coast. Ms. Whitelaw's service with the firm dates back to 1999, including her years with Barclays Global Investors (BGI), which merged with BlackRock in 2009. At BGI, she led the Defined Contribution Portfolio Management team in Client Solutions, responsible for the management of defined contribution strategies for institutional and retail investors. Previously, Ms. Whitelaw worked in the Transition Services group as both a transition manager and strategist, and was also an international equity trader on Barclays Global Investors' trading desk. Prior to BGI, she worked in the Institutional Derivatives Sales group at Goldman Sachs. Ms. Whitelaw earned a BA degree in International studies and French from Dickinson College in 1993.



Dale R. Folwell, CPA

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MEMORANDUM

TO: Supplemental Retirement Board of Trustees

FROM: Loren de Mey, Assistant Investment Director

DATE: September 17, 2018

SUBJECT: Discussion / Action: NC 403b Program: Recommend Replacement Fund for the PIMCO Inflation Response Multi Asset Fund

At its August 22, 2018, Investment Subcommittee meeting, staff recommended and the Committee approved, the termination of the PIMCO Inflation Response Multi-Asset Fund within the NC 401k, NC 457 Plans and NC 403b Program. Please see the memo dated August 22nd, 2018 attached. The decision to terminate the PIMCO Fund will be under consideration at the upcoming Supplemental Retirement Board of Trustees meeting.

The following outlines a recommended replacement for the PIMCO Inflation Response Multi-Asset Fund (IRMAF) for the NC 403b Program. When making investment recommendations, if possible, staff seeks to recommend consistent funds or managers across all Plans. As mandated by the Internal Revenue Code, the NC 403b Program may not invest in CITs or separate accounts, but is limited to mutual funds or variable annuities. Given this, Investment Management Division (IMD) staff focused the search on mutual funds for the NC 403b Program. BlackRock does not offer a similar investment strategy as recommended for the 401k/457 Plans in a mutual fund structure.

IMD staff recommends hiring the Principal Diversified Real Assets Fund to replace the current investment manager, the PIMCO Inflation Response Multi Asset Fund, within the NC 403b Program. The approximate amount of the mandate is \$607,814. Given the lower expense ratio of 0.80% on the Principal Fund, compared to 1.22% on the PIMCO Fund, savings to participants (based on assets of \$607,814), are approximately \$2,553 on an annual basis.

The key reasons supporting this recommendation include:

1. Principal's disciplined investment process
2. Diversified exposure to real assets
3. Open architecture structure seeking best in class investment managers
4. Experienced investment team

IMD staff screened the universe of potential Real Asset mutual funds to replace the PIMCO Fund. IMD staff reviewed the fund materials including the fund's due diligence questionnaire, prospectus, manager presentation, and performance and risk statistics of the strategy. IMD staff also conducted a conference call with the portfolio managers of the Fund. After reviewing



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materials and conducting a conference call with the portfolio managers, staff recommends Principal's Diversified Real Asset Fund to replace the current manager, PIMCO, within the 403b Program.

Organization

Principal Global Investors, LLC, is a wholly-owned, indirect subsidiary of Principal Financial Group, Inc. Listed on the Nasdaq Global Select Market under the ticker symbol PFG, Principal Financial Group, Inc., is a member of the Fortune 500 and a leading global financial institution offering a wide range of financial products and services through a diverse family of financial services companies. Comprised of a network of specialized investment boutiques and teams, Principal Global Investors currently manages \$445.1 billion of assets on behalf of a wide range of investors in over 80 countries.

The firm offers investments in fixed income, equity, and real estate as well as currency management, asset allocation, stable value management, and other structured investment strategies across multiple vehicles. Principal Portfolio Strategies is a specialized boutique within Principal Global Investors that engages exclusively in the creation of asset allocation solutions. The investment management of the DRA Fund falls within the Principal Portfolio Strategies group. Principal's DRA Fund currently has \$5.6 billion in assets under management.

Investment Philosophy and Process

The investment philosophy of the Principal Diversified Real Asset (DRA) Fund is based on the premise that stocks and bonds exhibit negative correlations to inflation over short and long-time horizons. In low-inflation environments, financial assets like traditional stocks and bonds are expected to do better than real assets. However, in high-growth, high-inflation environments, equities have performed poorly while certain commodities, real estate equity, and natural resource stocks can be expected to do well. In a low-growth, high-inflation environment (known as stagflation), most assets will fare poorly. In these conditions, TIPS and precious metals, such as gold and silver, may be effective.

Principal believes it is both imprudent and impractical to implement an investment strategy that attempts to rotate among different inflation-hedging vehicles, like TIPS, real estate, and commodities, based on current market information or forecasts. In their opinion, the most effective method to manage the impacts of longevity, sequential return, and inflation risks is to maintain an allocation to a diverse portfolio of real asset classes. The Fund allocates to the following sectors: US TIPS, commodities, global REITs, global agriculture, global timber, MLPs, global infrastructure, floating rate debt, currency, water and metals and mining.

The following outlines Principal's investment process:

- 1. Select Investable Real Asset Strategies** – Strategies chosen for the Fund must be liquid and investable and demonstrate a persistent correlation to inflation. The timeliness of the strategies' response to inflation changes is also considered. The Fund combines a diverse basket of asset class strategies designed to enhance return potential through economic cycles, regardless of the inflationary environment.
- 2. Develop Capital Market Forecasts** – Principal's dedicated team economist, working in collaboration with all of the investment professionals on the team, develops a macroeconomic and risk outlook. Detailed capital market assumptions for risk, return, beta and correlation are



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established quarterly for each investment strategy. Forward-looking return forecasts are developed by analyzing historical returns/correlations and obtaining economic input from consultants and sub-advisors.

3. Construct an Efficient Portfolio – Using the capital market forecasts developed, target weights are established for each strategy in order to optimize return per unit of risk. Correlations to other investment strategies and liquidity/sub-advisor risks are also considered.

4. Portfolio Construction & Design – DRA uses a multi-strategy, multi-manager approach featuring a broad array of inflation-sensitive asset class portfolios, each managed to a target tactical, active allocation. Manager weightings reflect Principal's outlook for opportunities within an asset class, optimized to maximize return per unit of risk. Target weights are set in order to achieve diversification and inflation-sensitivity targets.

5. Manager Search Process – The Manager Research Team and Portfolio Managers conduct extensive manager searches in order to hire specialist managers for each investment strategy. Principal focuses on the manager's investment philosophy and investment process to ensure that they align with the outcome of their portfolio. The managers are hired to deliver customized solutions in separately managed accounts, increasing transparency, reducing operational risk, and keeping investment fees low through the use of institutional fee schedules.

6. Monitoring DRA and underlying sub-advisors – The investment team reviews the fund's positioning and performance on a daily basis. Sector, risk factor, and issuer concentrations are monitored through FactSet. Portfolio level risks (holdings-based) are reviewed and monitored utilizing MSCI BarraOne on a monthly basis. Investment guidelines are established and monitored for each sub-advisor in DRA that establish criteria for beta targets, individual security weightings, sector allocation bands, and performance relative to the benchmark and peers. Monthly monitoring calls are also held with each sub-advisor. These calls are supplemented with reviews of managers' monthly and quarterly attribution and risk management materials, annual face-to-face meetings, and an annual re-underwriting of the investment and operations due diligence. Sub-advisors may be removed or replaced as needed.

7. Rules-Based Rebalancing – Ranges are established around the target weight for each manager. A rules-based rebalancing methodology is employed such that should a manager's weight approach an upper or lower band, the sleeve is rebalanced half-way back to target. Cash flows are utilized for rebalancing when possible. This approach balances transaction costs and policy drift for DRA.



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Strategy & Manager Allocation (as of 6/30/18)

| Investment Strategy | Sub-Advisor | Current Allocation | Allocation Ranges |
|--------------------------|---------------------------------------------------|--------------------|-------------------|
| TIPS | BlackRock | 12% | 9-15% |
| Floating Rate Debt | Symphony | 14% | 14-21% |
| Currency | BNP Paribas | 3% | 1-5% |
| MLPS | Tortoise | 4% | 4-8% |
| Infrastructure | Macquarie | 9% | 10-18% |
| | RARE | 5% | |
| Water Infrastructure | S&P Global Water Index | 3% | 2-6% |
| Commodities | Credit Suisse | 13% | 9-15% |
| Global REITS | Principal Global Investors | 14% | 8-14% |
| Global Timber (equities) | Pictet Asset Management | 4% | 4-18% |
| Global Natural Resources | S&P Global Natural Resources Equal Weighted Index | 12% | 11-21% |
| | The Boston Company | 7% | |

Some of the key advantages of the fund include the following:

Inflationary Risk Protection – The portfolio is constructed to provide a diversified approach to inflationary protection across multiple asset classes to manage the effects of both gradual and sudden inflation.

Diversification – The portfolio has several layers of diversification across asset classes, geography, investment manager, and security type. The portfolio construction ensures prudent diversification in controlled exposure to each underlying asset class.

Open architecture structure - The portfolio seeks to select the best-in-class asset managers from a variety of investment disciplines. These managers are selected and continuously monitored through Principal's Due Diligence Program.



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Investment Team

Portfolio Managers Kelly Grossman, Jake Anonson, Marc Dummer, Ben Rotenberg, and Jessica Bush are responsible for providing daily oversight of the Principal Diversified Real Asset Fund, developing and monitoring the investment guidelines for each underlying portfolio, and rebalancing the underlying portfolios as necessary. The investment team is also responsible for making asset allocation decisions for the Principal Diversified Real Asset Fund which includes the determination of the current allocation for each underlying portfolio, subject to pre-established ranges.

The portfolio managers, analysts and product specialists on the Diversified Real Asset team interact constantly. The team communicates throughout the day in an informal fashion. At least weekly the team meets to discuss market conditions, economic data, and research ideas. On a quarterly basis, there is a formal asset allocation meeting at which all target weights are discussed in the context of the current market, economic outlook, and feedback from their sub-advisors. Each underlying sub-advisor for the Principal Diversified Real Asset Fund has their own personnel teams in place for each underlying investment strategy, including trading and individual security purchase and sale decisions.

Principal DRA Performance, *(net performance as of 8/31/18)*

| | YTD | 1 Year | 3 Year | 5 Year | Since Inception |
|------------------|-------|--------|--------|--------|-----------------|
| Principal DRA | 0.86 | 3.78 | 3.44 | 1.94 | 4.05 |
| Strategic Index* | -0.85 | 2.61 | 5.40 | 2.45 | 2.96 |

Note: Performance shown is for the R6 Share Class for periods from 12/31/14 through 8/31/18. Inception date of R6 Share Class is 12/31/14. Prior to 12/31/14, performance shown is for the I-share class (inception date 3/16/2010) adjusted for the difference in expense ratios that were in effect during that time. The R6 share class is the lowest share class available.

*Diversified Real Asset Strategic Index is composed of 35% Bloomberg Barclays U.S. Treasury TIPS Index, 20% S&P Global Infrastructure Index, 20% S&P Global Natural Resources Index, 15% Bloomberg Commodity Index, and 10% FTSE EPRA/NAREIT Developed Markets Index.

Compared to PIMCO *(net performance as of 6/30/18)*

Principal DRA has shown stronger historical performance over the longer term at slightly lower volatility compared to the PIMCO Fund.

| | YTD | 1 Year | 3 Year | 5 Years | 6 Year |
|---------------|------|--------|--------|---------|--------|
| Principal DRA | 1.0 | 6.8 | 1.5 | 2.2 | 2.7 |
| PIMCO IRMAF | -0.2 | 5.9 | 3.6 | 2.5 | 1.2 |

| | Standard Deviation |
|---------------|--------------------|
| Principal DRA | 7.2 |
| PIMCO IRMAF | 7.4 |



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GoalMaker Fit

The Mercer asset allocation team modeled the GoalMaker portfolios assuming a change to the Principal DRA Fund and would not recommend making any changes to the GoalMaker model given this change. The Fund change caused only slight changes to the risk and return expectations to the GoalMaker portfolio with the highest allocation to the PIMCO Fund. Given the minor impact, the modeling team would not recommend any changes to the underlying glidepath or asset allocation within the GoalMaker portfolios.

Expense Ratio

Net Expense Ratio: 0.80%

Gross Expense Ratio: 0.84%

Note: the difference between the net and gross expense ratios is a fee waiver of 0.04% by Principal currently in place through 12/30/19.



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Appendix A: Investment Team Biographies

Kelly Grossman, FSA – Director, Investment Strategist & Research & Portfolio Manager

Kelly is the Director of Investment Strategy & Research, Portfolio Manager within Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. In this role she focuses on risk modeling and research capabilities for outcome-based solutions. She is also a Portfolio Manager where she focuses on overall process direction, risk assessment, monitoring, asset allocation, and execution for the funds. Additionally, Kelly is a member of the Investment Oversight and Risk Committee. Prior to joining Principal Funds in 2009, Kelly was a Managing Director within the Capital Markets Group at Principal Global Investors. She was responsible for the CDO issuance platform as well as the development and analysis of other structured spread-lending opportunities. Kelly joined the company in 1991 as an actuarial assistant and held various other actuarial positions in pricing and product development before moving into the fixed-income division of Principal Global Investors in 1999. She has over 17 years of industry experience. Kelly received a Bachelor's Degree in Mathematics and Computer Science from the University of Northern Iowa and is a Fellow of the Society of Actuaries and a member of the American Academy of Actuaries.

Jake Anonson, CFA, CAIA - Portfolio Manager

Jake is a Portfolio Manager for Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. In this role, he is responsible for conducting research, assessing risk, and making relative value recommendations relating to specific aspects of the Dynamic Outcome strategies. Jake is a member of the Investment Oversight and Risk Committee and has over 23 years of industry experience. Before joining Principal, he was a Managing Director with Miles Capital, a boutique institutional asset manager. Prior to joining Miles Capital, Jake served in various capacities with Principal Global Investors and Principal Real Estate Investors. While at Principal, he has worked with both retail and institutional strategies and clients. Prior to joining Principal, Jake worked as a Credit/Business Analyst with various firms as well as a Bank Examiner with the Office of the Comptroller of the Currency. Jake has earned the right to use the Chartered Financial Analyst® designation and has passed the CPA exam.² He has also earned the Chartered Alternative Investment Analyst designation.

Marc Dummer, CAIA, CIMA – Managing Director & Portfolio Manager

Marc is a Managing Director and Portfolio Manager for Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. In this role, he is responsible for conducting research, assessing risk, and making relative value recommendations relating to specific aspects of the Dynamic Outcome strategies. He is a member of the Investment Oversight and Risk Committee and has over 31 years of industry experience. Prior to his Portfolio Manager role, Marc was a Senior Relationship Manager for Principal Global Investors, where he represented portfolios to Principal Global Investor's largest and most sophisticated institutional clients, with mandates spanning the equity, real estate, fixed-income, and currency asset classes. Before joining Principal, he co-managed fixed-income general account assets for a group of privately held insurance companies. Marc received an M.B.A. and a Bachelor's Degree in Finance from the University of Utah. Marc has earned the right to use the Certified Investment Management Analyst SM and Chartered Alternative Investment Analyst designations.



Dale R. Folwell, CPA

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Jessica Bush, CFA - Portfolio Manager

Jessica is a Portfolio Manager for Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. She is responsible for the manager selection and asset allocation modeling for the Dynamic Outcome strategies. Jessica is a member of the Investment Risk and Oversight Committee. Prior to her dedicated role on these strategies, she served as a Senior Research Analyst on the Manager Research team responsible for the evaluation and monitoring of the sub-advisors under the due diligence program used by Principal Funds. Jessica has over 14 years of industry experience. Prior to joining Principal in 2006, she was a Senior Portfolio Analyst on the fixed-income team at Putnam Investments. Jessica earned a B.A. in Business Administration from the University of Michigan. She has earned the right to use the Chartered Financial Analyst® designation.

Ben Rotenberg, CFA, CAIA - Portfolio Manager

Ben is a Portfolio Manager for Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. In this role, he is responsible for conducting research, assessing risk, and making relative value recommendations relating to specific aspects of the Principal Global Diversified Income Fund, Diversified Real Asset Fund, Global Multi-Strategy Fund, and the Multi-Manager Equity Long/Short Fund. Ben is a member of the Investment Oversight and Risk Committee and has over 23 years of industry experience. Before joining Principal, he was a Managing Director with Cliffwater LLC, an independent investment consulting firm specializing in alternative asset classes and strategies. At Cliffwater, Ben was a member of the firm's Investment Oversight and Risk Committee and was responsible for investment manager due diligence and assisting clients with asset allocation, manager selection, and portfolio construction. Prior to joining Cliffwater, Ben was Director of Research with National Fiduciary Advisors, an investment consulting firm based in Los Angeles, where he was responsible for conducting investment manager due diligence across multiple asset classes. Ben began his investment career at Wilshire Associates providing services to investment consultants in Wilshire's Cooperative Universe Service division. Ben has earned the right to use the Chartered Financial Analyst® and Chartered Alternative Investment Analyst designations and is a member of the Los Angeles Society of Financial Analysts.

John Merante, CFA – Economist & Macro Strategist

John is an Economist & Macro Strategist for Principal Portfolio Strategies, a specialized boutique that engages in the creation of asset allocation solutions. As a member of the investment team, he is responsible for evaluating global economic developments, constructing economic scenarios and risk analysis, and assessing the opportunities and challenges they create. Based upon the analysis, he will provide recommendations on portfolio strategy and positioning for the Dynamic Outcome strategies. Prior to joining Principal, John was the Product Specialist for the International and Emerging Market Equity teams at Neuberger Berman. Previously, he was an Investment Banker with Lehman Brothers, providing economic and financial advice to sovereign clients including the Indonesian Ministry of Finance and Central Bank. John was a Foreign Service Officer and Economist with the U.S. Department of State. He has extensive experience in economic and financial modeling and financial communications. He received a B.A. from Vassar College and an M.S. in Finance from George Washington University.



INVESTMENT MANAGEMENT

To: North Carolina Supplemental Retirement Board of Trustees

From: Loren de Mey, Assistant Investment Director

Date: August 22, 2018

Subject: Discussion / Action: 401k, 457b, 403b Plans: Recommend Termination of the PIMCO Inflation Response Multi Asset Fund

Staff is recommending to terminate the PIMCO Inflation Response Multi-Asset Fund due to the following reasons:

1. Increase in the net expense ratio
2. Mutual fund structure may provide less control over and insight into investment costs and expenses
3. The Fund's underlying investment strategies, such as the financing strategy within the TIPS portfolio, may be too complex for a defined contribution plan

PIMCO Inflation Response Multi Asset Fund – Increase in Net Expense Ratio

While conducting the quarterly performance and expense review of the PIMCO Inflation Response Multi-Asset Fund (IRMAF), Staff determined that the Fund's net expense ratio, as reported in the Fund's most recent prospectus, issued on July 30, 2018, had increased.

PIMCO's process for reflecting changes in costs or expenses in the Fund's net expense ratio is based on actual fund expenses incurred in the Fund's reporting year prior to the release of the prospectus. In this case, the increase in the net expense ratio was based on the average of the actual fund expenses incurred from March 31, 2017, through March 31, 2018. The actual increase in expenses were then reflected in the Fund's updated prospectus released on July 30, 2018.

The following chart breaks down the net expense ratio of the Fund.

| | Current Net Expense Ratio | New Net Expense Ratio | Increase |
|--------------------------------|----------------------------------|------------------------------|-----------------|
| Investment Management Fee | 0.69% | 0.69% | 0.0% |
| Interest Expense | 0.14% | 0.53% | 0.39% |
| Other Fund Fees | 0.23% | 0.29% | 0.06% |
| Fee Waiver | -0.23% | -0.29% | -0.06% |
| Total Net Expense Ratio | 0.83% | 1.22% | 0.39% |



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Increase in Interest Expense

The net expense ratio is increasing from 0.83% to 1.22% due to an increase in interest expense from 0.14% to 0.53%. The Fund had experienced an increase in interest expense during the March 31, 2017, through March 31, 2018, reporting period given the increase in interest rates over the year.

PIMCO utilizes a strategy within its TIPS (Treasury Inflation Protected Securities) portfolio where they own a portion of their TIPS exposure through forward instruments. PIMCO finances these forward purchases paying a rate slightly less than LIBOR. When PIMCO finances this TIPS exposure, this creates interest expense from an accounting standard. This then frees up the Fund's cash whereby PIMCO seeks to add incremental return by investing in enhanced cash instruments that pay a yield advantage over their borrowing rate by approximately 40-50 basis points. Representatives from PIMCO have stated that while the interest expense is required to be reported within the net expense ratio, the additional yield or income advantage to investors, is not also required to be reported. However, this income will be included as part of the Fund's net return.

Interest Rates Likely to Continue to Increase

The interest expense increase is based on actual expenses incurred ending March 31, 2018. The Fed has increased rates an additional 25 basis points since the end of March and market expectations are for two additional increases by the end of this year. Therefore, interest expense will likely continue to increase within the Fund throughout 2018 given the Fed has and will likely continue to raise rates.

Mutual Fund Structure

Mutual fund structures in general provide fewer opportunities to negotiate the monitoring and management of expenses and costs relative to separately managed accounts and collective investment trusts. Although we are limited to mutual funds in the 403b Program, in the 401k and 457 Plans where the assets are much greater, Staff believes it is preferable, if possible, to increase our opportunities to monitor and manage costs and expenses by investing through collective investment trusts or separate accounts.

Underlying Investment Strategies

The PIMCO Inflation Response Multi-Asset Fund (IRMAF) is a real return asset allocation strategy that was designed to hedge global inflation risks while targeting enhanced return opportunities that inflation dynamics may present. The Fund invests in TIPS, commodities, emerging market currencies, REITs, and gold. The Fund may also pursue tactical use of floating rate securities. The Fund utilizes options, swaps, futures, forwards, derivatives and may pursue both long and short investment strategies.

Although the strategies the PIMCO Fund pursues have shown to provide alpha overtime, many of its strategies may be too complex for a defined contribution plan. For example, explaining the Fund's financing strategy within the TIPS portfolio is an example of this type of complexity. If we cannot break down the net expense ratio for our participants in a simple explanation, the Fund may not be the best fit for participants in a defined contribution plan.

North Carolina Supplemental Retirement Plan's Investments

PIMCO's IRMAF Fund is held in the North Carolina Supplemental Retirement 401k and 457 Plans and the 403b Program. Below are the assets within each Plan as of 7/31/18:

401k/457: \$374.2 million (\$349.8 million of which is in GoalMaker)

403b: \$607,814 (\$459,004 of which is in GoalMaker)



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Total assets within PIMCO IRMAF: \$1.13 billion (total assets within the mutual fund)

North Carolina Supplemental Retirement Plan's assets represent approximately 33.2% of the total PIMCO IRMAF assets.

Net Fund Returns, ending June 30 2018

| | Quarter | YTD | One-Year | Three-Year | Since Inception * |
|------------------|---------|--------|----------|------------|-------------------|
| PIMCO | -0.06% | -0.18% | 5.90% | 3.56% | 2.3% |
| Benchmark | -0.02% | -0.72% | 3.04% | 1.30% | 0.1% |

Benchmark: 45% Bloomberg Barclays US TIPS, 20% Bloomberg Commodity Index, 15% JPMorgan Emerging Markets Index Plus (Unhedged), 10% Dow Jones US Select REIT Total Return Index, 10% Bloomberg Gold Subindex

**initial inception date of PIMCO account within NC SRP: October 2013 – initially the PIMCO account was funded as a separate account, and then moved to the mutual fund in December 2015.*

Recommendation

Given the reasons stated above, Staff recommends termination of the PIMCO Inflation Response Multi-Asset Fund within the 401k & 457 Plans and 403b Program. Staff will recommend replacement Fund options at the Supplemental Retirement Board of Trustees meeting on September 20, 2018.