Witness OCS – 5D
Revenue Requirement

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of	**)**	
Rocky Mountain Power for	**)**	**Docket No. 10-035-124**
Authority to Increase Its Retail	**)**	**Direct Testimony**
Electric Utility Service Rates in Utah	**)**	**Lori Smith Schell**
And for Approval of Its Proposed	**)**	**For the Office of**
Electric Service Schedules and	**)**	**Consumer Services**
Electric Service Regulations	**)**	

May 26, 2011

Direct Testimony on Issues Relating to Hedging
In Connection with Rocky Mountain Power's General Rate Case

REDACTED

Q. WHAT IS YOUR NAME, OCCUPATION AND BUSINESS ADDRESS?

A. My name is Lori Smith Schell. I am the founder and President of Empowered Energy, which has its business address at 174 North Elk Run, Durango, Colorado, 81303.

Q. PLEASE DESCRIBE EMPOWERED ENERGY.

A. Empowered Energy is a Colorado-based independent consulting firm that provides market and regulatory analysis of natural gas, power, and emissions markets. Empowered Energy provides industry expertise and quantitative skills to analyze these markets. Empowered Energy also works with end-users and energy providers to evaluate how the costs and benefits of emerging technologies are impacted by changes in natural gas, power, and emissions markets.

Q. HAVE YOU PREPARED A SUMMARY YOUR QUALIFICATIONS AND EXPERIENCE?

A. Yes. I have attached Appendix 1, which is a summary of my relevant experience and qualifications.

Q. ON WHOSE BEHALF ARE YOU APPEARING?

A. Empowered Energy is a subcontractor to GDS Associates, Inc. ("GDS") for work done in this proceeding. GDS was retained by the Utah Office of Consumer Services ("OCS") to review Rocky Mountain Power's natural gas risk management policies and procedures. Accordingly, I am appearing on behalf of the OCS.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I provided direct testimony in Phase I of Docket No. 09-035-15 on November 16, 2009, that discussed the stated goals of PacifiCorp Energy's Risk Management Policy and showed that, with respect to natural gas, PacifiCorp Energy was generally in compliance with its then-current volume-based hedge targets. (The Risk Management Policy applies to hedging of both natural gas and electricity, and to each of PacifiCorp's three main divisions: PacifiCorp Energy, Pacific Power, and Rocky Mountain Power.) I also provided direct testimony in Phase II, Part 1 of that same docket on June 16, 2010, that recommended that PacifiCorp Energy reduce its Year 1 maximum natural gas hedge target to no more than 85 percent of PacifiCorp's "Total MWh Requirements" to account for system balancing requirements. I provided surrebuttal testimony in Phase II, Part 1 of that same docket on August 10, 2010, that recommended that the acceptable range of the To-Expiry Value-at-Risk ("TEVaR") metric being substituted for the former hedge targets should be re-examined in light of my prior recommendations to reduce the overall level of PacifiCorp's natural gas hedge target.

Q. HAVE YOU PREPARED ANY EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. Yes. I have prepared Exhibit OCS-5.1, Exhibit OCS-5.2, and Exhibit OCS-5.3,[1] which are attached to this testimony. Exhibit OCS-5.1 contains one page of summary data that differentiates PacifiCorp's Test Period hedging gains and losses by time period, the totals of which are reported in the Net Power Costs ("NPC") study filed in this proceeding. Exhibit OCS-5.2 contains two graphs related to OCS-5.1. Exhibit OCS-5.3 contains one page of data showing the net volumes underlying the natural gas and electric swaps reported in the NPC study in order to determine an alternative hedging strategy using options instead of swaps.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to examine both the volumes and hedging gains and losses associated with the natural gas and power swaps included in the Test Period NPC study. I first allocate the trading gains and losses into "buckets" based on how far in advance of the first settlement month the underlying swaps were executed. I will show that the natural gas trading losses increase significantly the further in advance of the first settlement month that the underlying swaps were entered into. Conversely, the power trading gains generally decrease the further in

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[1] Exhibits OCS 5.1, 5.2 and 5.3 are confidential.

advance the underlying swaps were entered into. I then examine the net volumes associated with the Test Period natural gas and electric swaps in order to estimate how many financial options would have to have been purchased to cap the price on those same volumes. Based on a range of option premiums, I then estimate the costs associated with a hedging strategy using options purchases rather than swaps.

Q. CAN YOU BRIEFLY DESCRIBE HOW THE TEVaR IS USED TO DETERMINE THE HEDGE TARGETS IN PACIFICORP ENERGY'S FRONT OFFICE PROCEDURES?

A. The TEVaR measures the potential losses that PacifiCorp's combined natural gas and power swap positions could incur if those positions were held through their future settlement dates. Thus, the TEVaR measures potential increases in the NPC at any given time, based on expected market conditions and on PacifiCorp's natural gas and power swap positions at that time. The TEVaR is used by the Company to direct its hedging activities so as to limit the potential percentage change in the NPC; its use supplanted the former volumetric hedging targets as of May 17, 2010 (Front Office Procedures, Exhibit 10). Like the volumetric hedging targets that preceded it, the TEVaR [redacted]

[redacted]

Despite the change to the TEVaR from the volumetric hedge targets, the Company still enters into swap positions up to [redacted] months prior to the settlement date of the swap. Even though the TEVaR may improve on the previous method by considering natural gas and power swaps in combination, the sharp decline in market liquidity that occurs beyond 36 months forward calls into question the logic of hedging forward beyond 36 months in advance.

Q. HAVE YOU EXAMINED THE TEST PERIOD NET HEDGING GAINS AND LOSSES IN LIGHT OF THE TEVaR'S FORWARD TIME PERIOD BUCKETS?

A. Yes. Exhibit OCS-5.1 is based on mark-to-market values for power and natural gas swaps with settlement months in the Test Period, as provided by the Company in Confidential Filing Requirement R746-700-23-C.8. Exhibit OCS-5.1 provides a summary table that identifies for both power and natural gas the Test Period hedging gains and losses, categorized based on how far forward the swaps were entered into. In effect, the hedging gains and losses were "bucketed" by determining for each swap transaction affecting the Test Period the number of months between the date the swap was executed and the swap's first settlement month.

Q. HAVE YOU CALCULATED THE VOLUMETRIC HEDGE PERCENTAGES ASSOCIATED WITH THE "BUCKETED" TEST PERIOD NET HEDGING GAINS AND LOSSES?

A. No. The former volumetric hedge percentages were calculated separately for natural gas and power, and are not identifiable from the TEVaR values. The Company no longer calculates the volumetric hedge percentages. However, in response to UIEC Data Request 27.13, the Company indicates that 64% (= 42.6/67.0 million MMBtu) of its total natural gas burn was hedged using gas swaps in the calendar year 2008 Test Period filed in Docket No. 07-035-93. Similarly, in response to UIEC Data Request 27.14, the Company indicates that 80% (= 54.7/68.4 million MMBtu) of its total natural gas burn was hedged using gas swaps in the calendar year 2009 Test Period filed in Docket No. 08-035-38.

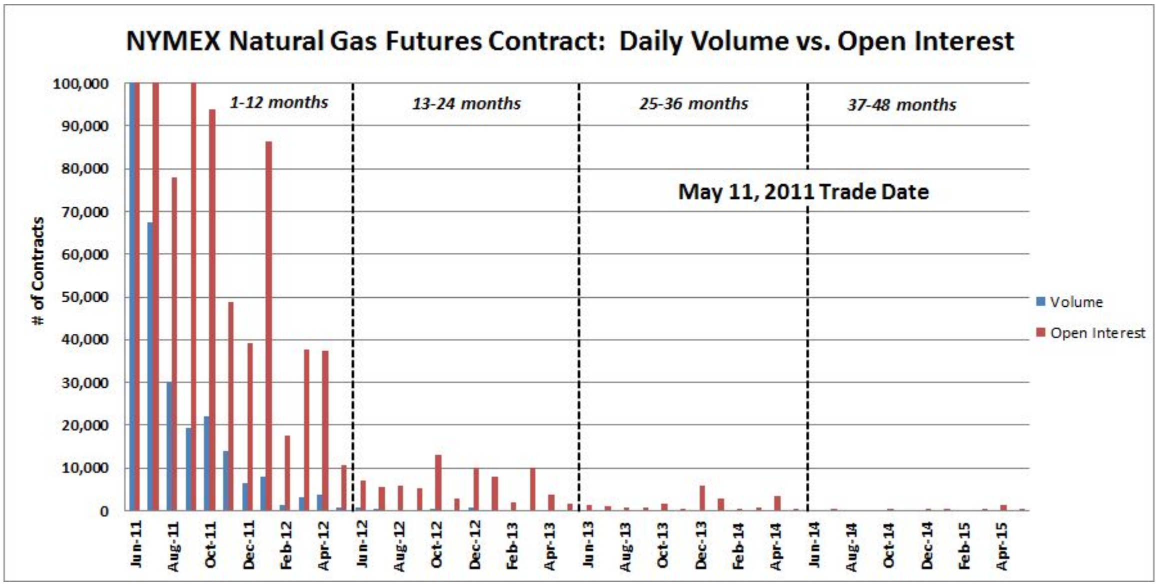
Q. WHAT ARE THE RESULTS OF "BUCKETING" THE TEST PERIOD NET HEDGING GAINS AND LOSSES BY FORWARD TIME PERIOD?

A. The total natural gas [redacted] Exhibit OCS-5.1 and the related graphs in Exhibit OCS-5.2 clearly show that [redacted] of this net natural gas hedging [redacted], results from swaps that were entered into [redacted]

[redacted] prior to their first settlement date. Power hedging [redacted], conversely, tend to get smaller the further in advance of the first settlement date that the power swaps were entered into. The combined impact of these two effects is that [redacted] is associated with swaps entered into more than [redacted] ahead of the first settlement date of those swaps.

Q. HOW ARE THE OPPORTUNITIES FOR HEDGING AFFECTED BY THE TIME BETWEEN THE DATE THE SWAP IS EXECUTED AND THE SETTLEMENT DATES OF THE SWAP?

A. Market liquidity becomes limited the further out the settlement date. This lack of liquidity in the natural gas futures market is illustrated in the graph below for 48 forward settlement months as of the (randomly selected) May 11, 2011, trade date. For ease of comparison, the 48 forward settlement months have been divided into 12-month time periods. The rapid decline in market liquidity is evident as one moves through each successive 12-month time period and the graph clearly illustrates the very limited trading activity 37-48 months forward.



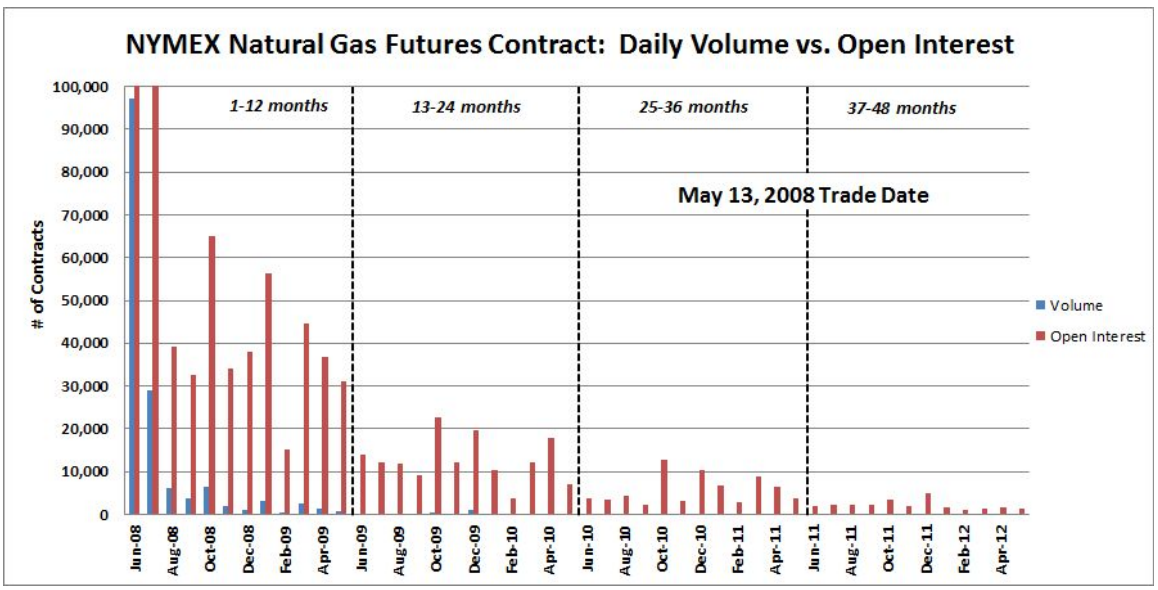
There are many fewer counterparties entering into swap transactions the further out the settlement date and this lack of liquidity tends to be reflected in wider bid-offer spreads, i.e., in greater differences between what sellers are willing to sell for and what buyers are willing to pay.

Q. WHAT IS THE BASIS OF THE COMPANY'S HEDGING HORIZON?

A. In response to UIEC DR 9.7, the Company states that "[t]he hedging period was 24 months for the period for 2001 through mid-2006, and 48 months for the period mid-2006 through 2010." The Company explains in response to UIEC DR 9.8 that "[t]he hedging period was changed in response to the generally increased market liquidity."

Q. HAVE YOU COMPARED THE CURRENT MARKET LIQUIDITY IN NATURAL GAS FUTURES TO THAT OF ANY PRIOR TIME PERIOD?

A. Yes. The graph below illustrates in the same format as above the market liquidity in the natural gas futures market three years ago, as of the May 13, 2008, trade date. A comparison of the two graphs shows that market liquidity has been compressed into the earlier time periods over the past three years in terms of both the daily volume traded and the total number of unsettled futures contracts (known as the "open interest"). However, even three years ago, market liquidity in the natural gas futures market beyond the first 36 months was very limited.



Q. WHAT DO YOU CONCLUDE REGARDING THE COMPANY'S HEDGING HORIZON?

A. I conclude that the Company's trading activities beyond 36 months forward are not justified based on the limited market liquidity in the natural gas futures market beyond that point.

Q. DID YOU ALSO EXAMINE THE VOLUMES ASSOCIATED WITH THE COMPANY'S NATURAL GAS AND POWER HEDGES?

A. Yes. Exhibit OCS-5.3 shows the monthly natural gas and power volumes underlying the Company's Test Period swap positions, both by Test Period month and "bucketed" in the same manner as hedging losses and gains by determining for each swap transaction affecting the Test Period the number of months between the date the swap was executed and the swap's first settlement month. Exhibit OCS-5.3 is based on the net hedged volume of power and natural gas with settlement months in the Test Period, as provided by the Company in Confidential Filing Requirement R746-700-23-C.8.

Q. WHAT IS GAINED BY KNOWING THE VOLUMES ASSOCIATED WITH THE COMPANY'S NATURAL GAS AND POWER HEDGES?

A. Knowing the actual volumes that the Company has hedged for the Test Period allows one to examine alternative hedging strategies. In addition to showing the natural gas and power volumes underlying the Company's

Test Period swap positions, Exhibit OCS-5.3 also shows how many natural gas options would have to be purchased to cap the price exposure for the same volumes for each 12-month forward “bucket.” Whereas a swap locks in a specific price, purchasing call options establishes a price cap for buyers of a commodity and purchasing put options establishes a price floor for sellers of a commodity. The use of options thereby allows the purchaser to take advantage of favorable price movements (which is desired from a ratepayer perspective), as opposed to the use of swaps (which lock in specific prices regardless of future price movements).

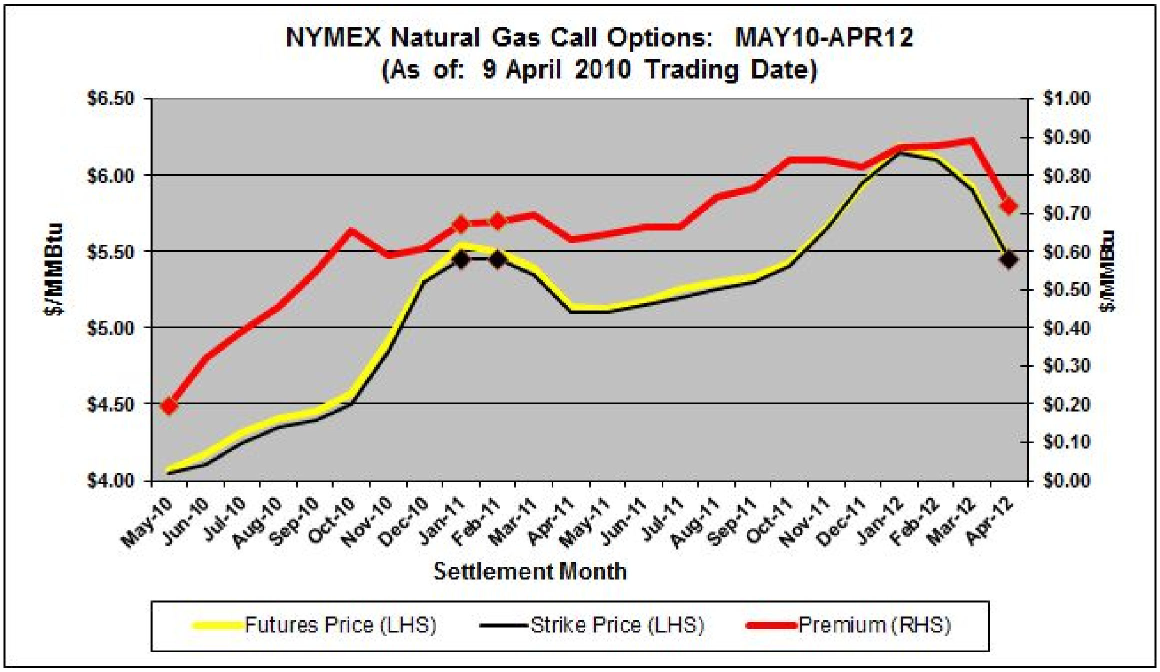
Q. CAN YOU BRIEFLY EXPLAIN HOW NATURAL GAS OPTIONS WORK?

A. Yes. Natural gas options are based on natural gas futures contracts in units of 10,000 MMBtu per month. Natural gas options premiums are quoted in $/MMBtu, so purchasing one natural gas option at a $1.00/MMBtu option premium would cost $10,000. A natural gas option includes a strike price expressed in $/MMBtu. Buying a call option gives the buyer the right (but not the obligation) to buy 10,000 MMBtu of natural gas at the strike price in a specified future settlement month. Buying a put option gives the buyer the right (but not the obligation) to sell 10,000 MMBtu of natural gas at the strike price in a specified future settlement month. The call option (put option) buyer may let the option expire unused, i.e., may choose not to buy (sell) natural gas at the strike price because the market price on the settlement date is below (above) the strike price. In this case, the cost of the option premium can be considered an insurance premium that is added to (subtracted from) the natural gas cost (revenue) for the settlement month.

Q. CAN YOU PROVIDE AN EXAMPLE SHOWING HOW OPTIONS PREMIUMS ARE RELATED TO FUTURES PRICES?

A. Yes. The graph below shows the call option premium required for a strike price similar to the natural gas futures settlement price for the April 9, 2010 trade date. Two items are of particular note. First, call option strike prices are discontinuous, meaning that they are available only in certain increments as determined by market demand. Second, for any given strike price, the option premium is higher the further out the settlement month. This can be seen by comparing the option premium for each of the three settlement months highlighted in the graph below. Each of the three settlement months highlighted has an option strike price of $5.45/MMBtu. The option premium is $0.672/MMBtu for the January 2011 settlement month, $0.680/MMBtu for the February 2011 settlement month, and $0.720/MMBtu for the April 2012 settlement month.

Redacted



Q. ARE THE OPTIONS PREMIUMS SHOWN IN THE GRAPH ABOVE THE ONLY OPTIONS PREMIUMS AVAILABLE ON THAT DATE?

A. No. The $0.20-0.90/MMBtu range of options premiums shown above are for options strike prices at or near the underlying futures contract price, referred to as “at the money.” There are a range of options premiums and associated strike prices available for any given forward settlement month, with options premiums generally increasing over time and increasing (decreasing) for call (put) options for lower (higher) strike prices. On the trading date illustrated above, natural gas options for settlement in May 2011 near the $5.132/MMBtu futures contract settlement price ranged from a $0.738/MMBtu premium for a $4.90/MMBtu strike price to a $0.647/MMBtu premium for a $5.10/MMBtu strike price. Buying a swap on that day at $5.132/MMBtu would have locked the Company into that price for May 2011. However, if the Company had bought an option at the $5.10/MBMtu strike price by paying the $0.647/MMBtu premium, it would have capped its natural gas price exposure at $5.10/MMBtu and not limited its ability to benefit from downward price movement. As it turns out, the May 2011 natural gas futures contract settled at $4.377/MMBtu, which means that the Company could have purchased natural gas in the spot market at or near that price and let the $5.10/MMBtu option expire unused. Adding the $0.647/MMBtu option premium to the Company's May 2011 $4.377/MMBtu natural gas cost would have resulted in a total natural gas cost of $5.024/MMBtu, $0.108/MMBtu less than the alternative cost of a concurrently executed swap at $5.132/MMBtu.

Q. HOW MANY NATURAL GAS OPTIONS WOULD BE REQUIRED TO PLACE THE COMPANY IN AN EQUIVALENT VOLUMETRIC HEDGED POSITION TO THE VOLUMETRIC HEDGED POSITION REFLECTED IN THE NPC STUDY?

A. Exhibit OCS-5.3 calculates that the Company would need to purchase [redacted] call options and [redacted] put options to achieve an equivalent volumetric hedged position to that reflected in the NPC study. Exhibit OCS-5.3 also shows the breakout of the total number of call options and put options that would be required by each of the [redacted] 12-month forward time periods, based on the "bucketing" of swap volumes described above.

Q. WHY DO YOU EXPRESS THE VOLUMETRIC HEDGED POSITION FOR POWER IN TERMS OF MMBTU OF NATURAL GAS?

A. Converting the volumetric hedged position for power into MMBtu of natural gas allows for a more straight forward combination of results in Exhibit OCS-5.3. The net MWh of hedged power is converted to natural gas assuming a relatively high heat rate of 10,000 Btu/kWh. Choosing a lower heat rate for the conversion would reduce the required number of equivalent natural gas options and the resultant total cost of this hedging alternative.

Q. WHAT IS THE SIGNIFICANCE OF THE OPTIONS PRICING RESULTS PRESENTED IN EXHIBIT OCS-5.3?

A. The options pricing results presented in Exhibit OCS-5.3 are intended to illustrate the potential costs to ratepayers of PacifiCorp's hedging practices. Exhibit OCS-5.3 does this by using options premiums as a measure of the cost of hedging the Test Period hedged volumes of natural gas and power. The three different levels of options premiums assumed in Exhibit OCS-5.3 reflect a range of options premiums that could be available to purchase at any given point in time, and the potential cost of using options is calculated at options premium levels of \$0.50/MMBtu, \$0.75/MMBtu, and \$1.00/MMBtu. This can be seen at the bottom of Exhibit OCS-5.3, where the total potential cost of hedging the Test Period volumes at the three levels of option premiums illustrated would be [redacted] , [redacted], and [redacted], respectively. These potential costs using financial options are presented in contrast to the net hedging [redacted] that are included in the Test Period NPC study based on the use of financial swaps for hedging. The cost of hedging using options with a $1.00/MMBtu options premium [redacted] included in the Test Period.

Q. WHAT ARE THE ADVANTAGES OF USING FINANCIAL OPTIONS RATHER THAN FINANCIAL SWAPS FOR HEDGING?

A. The use of options limits exposure to adverse price movements but allows the buyer to benefit from favorable price movements. For someone who needs to buy a commodity, purchasing a call option protects the buyer when market prices rise above the option strike price but allows the buyer to benefit if market prices fall below the strike price. For someone who is selling a commodity, buying a put option protects the buyer from price movement below the strike price and allows the buyer to benefit if prices move above the strike price.

Q. WHY HAS THE COMPANY CHOSEN TO USE SWAPS RATHER THAN OPTIONS FOR HEDGING NATURAL GAS AND POWER?

A. One reason may be that the Company is concerned that the cost paid for options that are not exercised will be disallowed. Buying an option is like buying an insurance policy and like an insurance policy, one hopes never to have to use it, i.e., to exercise the option. Like an insurance policy, the option provides protection against a significant adverse event. Assuring recovery of reasonable options premium costs as an alternative to locking in commodity prices through the use of swaps should be considered by the Commission as a means to increase the hedging alternatives available to the Company.

Q. WHAT DO YOU CONCLUDE?

A. I conclude that the Company's policy of hedging its natural gas and electric price exposure up to [redacted] months in advance is not justified due to limited market liquidity for future settlement months. I also conclude that the Company should investigate alternatives to its ongoing trading practices, including the use of financial options as a hedging tool to allow ratepayers to benefit from favorable market price movements. Ratepayers should have input into the Company's investigation to the extent that the financial risk of the Company's trading practices are included in rates.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Confidential Material Redacted

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Confidential Material Redacted

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Confidential Material Redacted

Redacted

Appendix 1

Lori Smith Schell, Ph.D.

Empowered Energy, 174 N. Elk Run, Durango, Colorado 81303

EDUCATION: Pennsylvania State University, 1988
Ph.D., Operations Research and Mineral Economics

University of Washington, 1979
B.A., Economics (Honors); Mortar Board and Phi Beta Kappa

RELEVANT EXPERIENCE:

EMPOWERED ENERGY **2002-Present**
President and founder of this Colorado-based independent energy consulting firm specializing in power, natural gas, emissions and renewable energy markets.

- Testified on behalf of Utah Office of Consumer services on hedging-related issues with respect to implementation of an energy cost adjustment mechanism.
- Expert witness in multi-state Appalachian natural gas royalty litigation, including issues of prudence of long-term natural gas hedges, affiliate sales, spin-down of gathering and transportation facilities, post-production deductions and underlying cost-of-service, and natural gas liquids valuation and make-up volumes.
- Provided analytical support in Staff prudency review of natural gas and purchased power procurement practices of two western U.S. electric utilities.
- Direct fuels procurement and negotiate fuels supply and transportation contracts for a large state university in Colorado; similar work done for university in eastern U.S.
- Expert witness in Alberta electric rate case dealing with cost allocation between regulated and retail rates; instrumental in $14.8 million rate reduction. Participated in two subsequent, related rate cases that were ultimately settled.

TRIGEN ENERGY CORPORATION **1999-2002**
A New York-based combined heat & power company with 37 operating units specializing in energy efficiency, on-site cogeneration, trigeneration, and district energy systems.

Director, Energy Risk Management, Project Advisory Group 2000-2002
Director, Fuels Management, Division of Operating Assets 1999-2000

- As head of Risk Management Committee, developed and implemented corporate-wide risk management policy for electricity, fuels, and emissions allowances; responsible for related hedging and controls, mark-to-market determinations, and FAS 133 effectiveness tests.
- Directed commodity market analyses and issued electricity and primary energy forecasts for budgeting and hedging; electricity focus on NYISO, PJM, and Cinergy/Entergy.

- Supported business development and existing operating assets with commodity and basis market analyses, forecasts, and in-depth natural gas pipeline and LDC tariff rate assessment.
- Provided contractual support and oversight for electricity and primary energy purchases and sales for all Trigen operating units.

AIR PRODUCTS AND CHEMICALS, INC. 1993-1999

A Pennsylvania-based Fortune 300 producer of industrial gases and chemicals, with production costs dominated by volatile electricity and natural gas prices.

Manager, Regulatory Affairs & Market Analysis, Corporate Energy 1995-1999
Senior Principal Energy Analyst, Corporate Energy 1993-1994

- Assessed potential benefits of renegotiating long-term natural gas supply agreement for a 120-MW Florida QF cogen facility; managed facility's daily natural gas supply and transportation (including capacity release) with the goal of optimizing commodity and regulatory costs.
- Responsible for intervening, testifying, and being cross-examined at the Federal Energy Regulatory Commission (FERC) in proceedings directly impacting natural gas pipeline transportation costs to flagship Air Products facilities. Major cases addressed (i) market power and market-based rates, and (ii) appropriate pricing of pipeline expansions.
- Demonstrated cost-shifting impact of zone-gate rates and the inappropriateness of such rates on Koch Gateway's network pipeline system for a nine-member industrial coalition. Maintained coalition's direction and consensus while negotiating a 20 percent discount to settle the case.
- Underwent oral cross-examination to defend several rounds of written testimony analyzing and critiquing the market power analysis of Koch Gateway in the first major market power case brought before the FERC. Administrative Law Judge's initial decision in favor of opposing intervenors was ultimately upheld by the D.C. Circuit Court.
- Advocated interruptible transportation rate design changes applicable to Tennessee Gas Pipeline through written testimony at the FERC.
- Opposed incremental AFUDC calculations for expansion capacity by Florida Gas Transmission through written testimony at the FERC.
- Directed FERC interventions in four natural gas pipeline restructuring proceedings.

BENJAMIN SCHLESINGER AND ASSOCIATES, INC. 1988-1993
Boutique natural gas consulting firm providing project and market analysis from exploration and production downstream to the burnertip.

Project Manager/Senior Economist 1988-1993

- Provided contractual, regulatory, and deliverability risk evaluation (wellhead-to-burnertip) for a dozen project-financed natural gas-fired QF cogeneration units developed under PURPA.

Redacted

- Performed market valuation to support buy-out of a major international gas supply contract.
- Multi-client research relating existing natural gas spot markets to (developing) futures market.