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| Exhibit No.: | |
| Issue: | Fuel Costs;<br>Fuel Inventory;<br>$SO_2$ Emission Allowance<br>Management Program |
| Witness: | Wm Edward Blunk |
| Type of Exhibit: | Direct Testimony |
| Sponsoring Party: | Kansas City Power & Light Company |
| Case No.: | ER-2006-____ |
| Date Testimony Prepared: | January 27, 2006 |

**MISSOURI PUBLIC SERVICE COMMISSION**

**CASE NO.: ER-2006-____**

# DIRECT TESTIMONY

# OF

# WM. EDWARD BLUNK

# ON BEHALF OF

# KANSAS CITY POWER & LIGHT COMPANY

**Kansas City, Missouri**
**January 2006**

**"**[redacted]**" Designates that "Highly Confidential" Information has been Removed. "Highly Confidential" Information has been Removed from Certain Schedules Attached to This Testimony Designated ("HC") Pursuant to the Standard Protective Order.**

**DIRECT TESTIMONY**

**OF**

**WM. EDWARD BLUNK**

**Case No. ER-2006-____**

**Q: Please state your name and business address.**

A: My name is Wm. Edward Blunk. My business address is 1201 Walnut, Kansas City, Missouri 64106-2124.

**Q: By whom and in what capacity are you employed?**

A: I am employed by Kansas City Power & Light Company ("KCPL") as Supervisor, Fuel Planning.

**Q. What are your responsibilities?**

A. My primary responsibilities are to develop fuel forecasts and strategies for fuel procurement and fuel inventory, which includes the development of strategies for and the management of KCPL's sulfur dioxide ("$SO_2$") emission allowance inventory.

**Q. Please describe your education, experience and employment history.**

A. In 1978, I was awarded the degree of Bachelor of Science in Agriculture Cum Laude, Honors Scholar in Agricultural Economics by the University of Missouri at Columbia. The University of Missouri awarded the Master of Business Administration degree to me in 1980. I have also completed additional graduate courses in forecasting theory and applications.

Before graduating from the University of Missouri, I joined the John Deere Company from 1977 through 1981 and performed various marketing, marketing research, and dealer management tasks. In 1981, I joined KCPL as Transportation/Special Projects

Analyst. My responsibilities included fuel price forecasting, fuel planning and other analyses relevant to negotiation and/or litigation with railroads and coal companies. I was promoted to my present position in 1984.

**Q. Have you previously testified in a proceeding at the Missouri Public Service Commission or before any other utility regulatory agency?**

A. I have previously testified before both the Missouri Public Service Commission ("MPSC") and the Kansas Corporation Commission ("KCC") on multiple issues regarding KCPL's fuel prices and fuel price forecasts and the competitive market for natural gas transportation.

**Q. On what subjects will you be testifying?**

A. I will be testifying on fuel market uncertainty and fuel costs, fuel inventory, and KCPL's $SO_2$ Emission Allowance Management Program.

## I. FUEL MARKET UNCERTAINTY and FUEL COSTS

**Q. What is the purpose of this portion of your testimony?**

A. The purpose of this portion of my testimony is to discuss historical and anticipated uncertainty and volatility in coal and natural gas fuel markets, and the impact of that uncertainty on KCPL's cost of service ("COS").

**Q. How does fuel market uncertainty affect KCPL's COS?**

A. Fuel market uncertainty affects KCPL's cost of service in multiple ways. The first and most obvious impact is the effect of uncertainty in fuel prices and their direct effect on fuel expense. Uncertain or volatile fuel prices also affect off-system sales prices. KCPL Witness Burton Crawford discusses the impact of gas market uncertainty on off-system sales in his direct testimony.

__Uncertainty vs. Volatility__

**Q. Is uncertainty different from volatility?**

A. In some contexts, volatility is synonymous with uncertainty. For the purpose of this testimony I will use the word volatility to refer to "historical volatility," which is defined as the standard deviation of the daily change in the natural logarithm of the commodity's price for some period of time expressed as an annual rate. On the other hand, I will use the term uncertainty to indicate not knowing or being unsure. My testimony focuses more on price uncertainty than volatility.

**Q. Generally people use the term "volatility" when speaking of movements in prices. Why are you drawing a distinction between volatility and uncertainty?**

A. The levels of volatility that we are currently seeing in the markets for coal and natural gas, while high, are not unprecedented. In fact, they are merely on the high side of the ranges we have observed over the past few years. What is unusual about the current markets is the level of uncertainty and magnitude of the price movements we are now seeing. For example, in the later part of June 2000 natural gas prices were about $4.40/MMBtu and 20-day volatility was 74 percent. That 74 percent represented a standard deviation of $3.26/MMBtu. In the later part of December 2005, the average 20-day volatility was 76 percent but the settle price for the near month NYMEX contract was $12.50/MMBtu. That 76 percent now represented a standard deviation of $9.50/MMBtu, which is almost three times the level we saw in June 2000. Schedule WEB-1 compares the NYMEX near month settlement closing price with one standard deviation based on the 20-day volatility. It shows that since July 1990 there have been five (5) times when one standard deviation based on the 20-day volatility exceeded

$6.00/MMBtu. It also appears that the frequency and duration of these events is increasing.

**Q. How has the level of uncertainty changed in the markets for natural gas and Powder River Basin ("PRB") coal?**

A. Since about 2000, the level of uncertainty has increased significantly for both of these commodities. Both markets have shifted from being in states of supply-surplus to being supply-limited. A characteristic of supply-limited environments is that prices are set by the marginal buyer rather than the underlying supply curve. That means prices will rise until sufficient demand is destroyed as to bring supply and demand into balance. The specific factors driving demand and determining what price the marginal buyer will pay vary by commodity but are also interrelated.

**Q. How will this shift from supply-surplus to supply-limited markets affect KCPL's fuel costs and cost of service?**

A. Prices are higher in supply-limited markets than in supply-surplus markets. Prices are also more uncertain and volatile in supply-limited markets than in supply-surplus markets. Thus, as a result of the shift in these markets, KCPL's fuel costs are rising and, to the extent fuel supply is not "locked in", fuel costs are more uncertain.

<u>Natural Gas Market Uncertainty</u>

**Q. Please explain the shift in the natural gas market from supply-surplus to supply-limited and the effect of this shift on natural gas prices?**

A. The first revelation of the natural gas market being significantly supply-limited was winter 2000/2001. As can be seen in Schedule WEB-2, which is a chart of population weighted winter heating degree days, the four winters preceding winter 2000/2001 were all warmer than normal with winters 1998/1999 and 1999/2000 being significantly warmer than normal. Prior to the very cold winter of 2000/2001, the United States experienced a period of excess supply commonly referred to as the "gas bubble." As shown in Schedule WEB-3, natural gas storage levels were drawn down to unusually low levels in the very cold winter of 2000/2001. Natural gas prices responded by jumping to about $10.00/MMBtu, which was more than double the all-time high price (NYMEX near-month close) before September 2000. The natural gas industry responded with increased drilling thereby increasing natural gas production. Before September 2000, there had never been more than 800 rigs devoted to natural gas. By May 2001 over 1,000 rigs were working on natural gas wells. Consequently, storage was restored to a new record level of 3,238 Bcf in December 2001.

As shown by Schedule WEB-2, the following winter 2001/2002 was very mild resulting in lower than normal demand. Storage at the end of winter 2001/2002 was 1,491 Bcf, a record high end of winter level. Prices dropped to less than $2.00/MMBtu. The industry again responded but this time with decreased drilling. When prices started trending up later in 2002, the industry was much slower to respond. In fact, second quarter 2002 was the last quarter with U.S. marketed natural gas production of more than 5,000 Bcf. Production in third quarter 2005, which includes some impact from Hurricanes Katrina and Rita, was only 4,668 Bcf. U.S. marketed production has not been that low since third quarter 1993. Moreover, production for October was slightly less than 85 percent of average production for the preceding ten Octobers. In brief, the U.S. is now in a natural gas supply-limited environment which has driven prices up searching for a new demand/supply balance point.

**Q. What factors are driving the increased price uncertainty in the natural gas market?**

A. There are several factors driving the increased price uncertainty in the U.S. natural gas market. While the following list is not exhaustive, I believe it covers the key drivers:

- Uncertainty about what price is required to destroy the marginal demand;
- The speed at which we can swing from surplus of supply to being supply-limited;
- The influence of hedge funds; and
- Changing demand projection paradigms.

**Q. Why is there uncertainty about what price is required to destroy the marginal demand for natural gas?**

A. The power industry tends to be the marginal customer for natural gas and effectively determines the upper bound on natural gas prices because of its ability as an industry to switch fuels. In the past few years, the complexity of determining when that fuel switching will take place has increased. Traditionally, it was assumed that when natural gas was more expensive than oil on a $/MMBtu basis, fuel switching would take place. While that may still be true in some situations, the fuel switch decision is made on a unit-by-unit basis. It is a function of regional anomalies such as taxes and fuel transportation rates, and the unit's power generation technology (*i.e.*, steam generators, combustion turbine, or combined cycle), which in turn affects the unit's heat rate, emission levels, environmental constraints, and minimum run times.

**Q. What do you mean by the speed at which we can swing from surplus of supply to being supply-limited?**

A. Significant weather events can have major immediate impacts on the supply/demand balance for natural gas. Summer 2005 and Winter 2000/2001, which I discussed earlier, both show just how quickly the natural gas market can swing from a supply surplus to being supply-limited. Summer 2005 was the warmest in many years driving electric sector demand for natural gas to new levels. Exacerbating the supply and demand imbalance was the loss of significant quantities of natural gas production due to hurricanes. Summer/fall 2005 was probably the most active hurricane season on record. Hurricanes Katrina and Rita demonstrated just how much impact hurricanes can have on natural gas supply.

Hurricanes Katrina and Rita made landfall on August 28, 2005 and September 19, 2005, respectively. They are a major turning point for the natural gas industry. In the January 19, 2006 release of Minerals Management Service's *Impact Assessment of Offshore Facilities from Hurricanes Katrina and Rita*, MMS Regional Director Chris Oynes said, "The overall damage caused by Hurricanes Katrina and Rita has shown them to be the greatest natural disasters to oil and gas development in the history of the Gulf of Mexico. Just last year [2004], in the devastating Hurricane Ivan, there were seven platforms destroyed, compared with the 115 platforms destroyed in Katrina and Rita." Schedule WEB-4 shows that production following Hurricanes Katrina and Rita dropped to levels not seen since September 1989. Before Hurricanes Katrina and Rita, the U.S. Minerals Management Service estimated that natural gas production in the Gulf of Mexico was about 10 BCFD. Today (January 25, 2006), five months after those hurricanes struck, about 17 percent of Gulf natural gas production is still off-line. While no data is available yet on permanent losses *Natural Gas Week* reported in its January 9, 2006, edition that "perhaps 200 Mcf/d to 1 Bcf/d may be gone for good." Consequently, the predictions based on long-range weather trends saying that we are at the beginning of a decades-long season of hurricanes like 2005 further increases the uncertainty of natural gas production and drives even more price uncertainty.

**Q. How are hedge funds affecting the natural gas market?**

A. The influx of new hedge funds into the energy market has increased market volatility and uncertainty. Ron Denhardt, vice president of natural gas services at Strategic Energy and Economic Research put it this way in the April 22, 2005, edition of Platts' *Inside FERC's Gas Market Report*, "The way I'm seeing the market is that unless there is strong evidence the [supply/demand balance] is too loose, people playing the paper market can drive prices all over the place."

**Q. What demand projection paradigms are changing that add uncertainty to our understanding of the natural gas market?**

A. Existing demand forecasts were developed under different paradigms than exist today. Specifically, the price for natural gas is outside of the range of prices that would have been used to develop statistical price sensitivities. And as I discussed earlier, the algorithm for determining power sector demand is becoming more complex. It is no longer a simple comparison between the price of natural gas and oil on a $/MMBtu basis. In addition, from 1999 to 2004, gas-fired generation increased 27 percent and gas-fired capacity in the power industry more than tripled. That increase in demand and demand potential happened at the same time other natural gas demand was being destroyed. Moreover, we have not yet seen what all of that new gas-fired capacity could do to demand.

**Q. When do you expect the price uncertainty in natural gas markets to decrease?**

A. The lingering impact from Hurricanes Katrina and Rita, the expectation that hurricane seasons like 2005 may be the new norm, the possibility of a warmer than normal summer either followed or led by a colder than normal winter, are just a few of the factors that lead me to believe that while we may see lower prices, natural gas price uncertainty will not decrease until after new supply from sources such as liquefied natural gas ("LNG") imports increases significantly and that is not expected until 2007 or later.

**Q. When will natural gas prices return to their historic norms?**

A. We do not expect natural gas prices to return to the $3.33/MMBtu historic price (average near-month NYMEX close 4/4/90-1/23/06). The EIA's January 2006 *Short-Term Energy Outlook* shows Henry Hub natural gas prices, which averaged $9.00/MMBtu in 2005, are projected to average $9.80 in 2006 and $8.84 in 2007.

**Natural Gas Price Hedging**

**Q. Does KCPL have a program for managing the price risk of natural gas?**

A. Yes. In 2001, KCPL implemented a Natural Gas Price Risk Hedging Policy approved by the KCPL Risk Management Committee.

**Q. Please describe KCPL's natural gas price hedging program.**

A. In 2001, KCPL retained Kase and Company, Inc. ("Kase and Company"), a risk management and trading technology firm, to assist in establishing a risk management program, which employs a disciplined, methodical approach to hedging. KCPL's program is oriented toward finding a balance between the need to protect against high prices while not unreasonably limiting opportunities to purchase gas at low prices. This balance is sought through the use of Kase and Company's HedgeModel. The objective of KCPL's price risk management program is to reduce the price risk inherent with floating with the market.

**[redacted]**

**Q. How does KCPL determine the amount of natural gas to hedge under its price risk management program?**

A. **[redacted]**

**Q. How often does KCPL use the HedgeModel?**

A. KCPL monitors the HedgeModel daily. **[redacted]**

**Q. How well has this program performed for KCPL?**

A. **[redacted]

[redacted]

[redacted]**

**Coal Market Uncertainty**

**Q. What factors are driving the increased price uncertainty in PRB coal markets?**

A. The supply and demand balance for coal has been disrupted much like natural gas. There are at least three major factors disrupting that balance and driving uncertainty in PRB coal markets:

- PRB capacity constraint caused by a recent rail disruption;
- Influence of speculative traders; and
- Clean air regulations.

**Q. What was the recent rail disruption and how is it constraining the Powder River Basin's capacity?**

A. May 14 and 15, 2005, the Burlington Northern Santa Fe Railway ("BNSF") and the Union Pacific Railroad ("UP") experienced back-to-back derailments on the "Joint Line", a shared section of track serving the southern end of the PRB. The two derailments and the resulting intensive Joint Line maintenance program that lasted from July through early December, disrupted the flow of trains to and from the PRB and neither railroad has since been able to meet all of the demand for coal trains from the PRB.

Current indications from rail companies are that maintenance associated with the May 2005 service disruption will begin again in March 2006 and be completed in fall 2006. The rail companies have indicated that they expect the impact related to the 2006 maintenance program to be less than the 10 to 15 percent reduction experienced in 2005, but have offered no estimate on the likely reduction. This affects all users of PRB coal.

The result of the derailments has been a significant depletion of PRB coal stocks nationwide. PRB coal stocks have dropped to historic lows with no recovery expected until after the Joint Line is returned to full service in late 2006 or early 2007. The Energy Information Administration's ("EIA") data, as reflected in Schedule WEB-6, shows that coal inventories for those states that rely heavily on PRB coal dropped 30 percent from April through September 2005. Those tons will need to be made up and that make up will continue to disrupt the supply and demand balance for PRB coal for some time. In its December 18, 2005, *Coal News and Markets*, the EIA reported that "the partially rebuilt southern PRB rail routes cannot ship enough PRB coal going forward to restore adequate coal inventories before the end of 2007." In addition, it is likely that in aggregate these utilities will increase their inventory levels beyond levels prevailing before May 2005 because they realize there is little if any slack capacity in the railroad system to absorb future disruptions.

**Q. How has this constraint on PRB coal availability impacted coal prices?**

A. PRB coal prices had started to run up in April driven by a jump in $SO_2$ emission allowances prices. When the derailments occurred in May 2005, it compounded the supply/demand imbalance by suddenly restricting supply at the same time demand was increasing. The market price adjusted accordingly by going from about $6.55/ton for 8800 Btu/lb PRB coal at the beginning of March 2005 to $19.00/ton in October 2005. That is a 190 percent increase in eight (8) months.

**Q. How are speculative traders adding price uncertainty to the market for PRB coal?**

A. When speculative traders take short positions, that is, they sell coal they do not have, they can be caught by unexpected illiquidity in the market and drive the price up in a desperate attempt to get the coal they need to fulfill their contractual obligation. It was rumored that the 2001 price spike for PRB coal, which is also evident in Schedule WEB-6, was driven by a speculative trader(s) being caught short and having to buy to satisfy those commitments. The December 2005 price run-up may have had a similar driver. According to the December 21, 2005 edition of *Coal & Energy Price Report*, some traders may be (or were) short for early 2006 coal. Apparently, after 8800 Btu/lb PRB coal ran up to $20.00/ton in October and then dropped to $14.00/ton, these traders expected the market to return to its old norm of less than $14.00/ton. They sold short with the expectation of covering their positions later when the market returned to the old normal levels. Instead, the market rebounded to over $20.00 per ton. Exacerbating the problem is the fact that PRB producers are using a sales tactic they have used before when market conditions were tight. The producers are not selling their coal spot but only under contracts with terms of at least two to three years.

Before February 2001, 8800 Btu/lb PRB spot coal generally traded between $4.00 and $5.00 per ton. In first quarter 2001, the price skyrocketed from about $4.60 to $12.00 per ton, by May 2001 it had reached $13.75 per ton. In five months time, the price of PRB coal had increased about 200 percent. We observed an even greater price jump in 2005. In March 2005, Evolution Markets reported a settlement price for 8800 PRB spot coal of $6.25/ton. On December 30, 2005, they reported a settlement price of $22.00/ton, an increase of more than 250 percent.

**Q. How are clean air regulations impacting the market for PRB coal?**

A. With $SO_2$ emission allowance prices at levels nine times the 2003 average price, the attractiveness of low-sulfur PRB coal in the East is powerful. At $1,500 per $SO_2$ emission allowance, this is the equivalent of adding about $80/ton or $3.50/MMBtu to the price of Illinois Basin coal. On the other hand, the promulgation of the Clean Air Interstate Rule ("CAIR") and Clean Air Mercury Rule ("CAMR") continue the trend of ever more stringent limitations on power plant emissions. These regulations will impact the fuel markets. Energy Ventures Analysis, Inc. estimates that over 140 GW of new Flue Gas Desulfurization ("FGD") controls will be required to comply with CAIR and CAMR. That will reduce the relative attractiveness of low-sulfur PRB coal versus higher-sulfur eastern coal.

<u>Coal Price Hedging</u>

**Q. Does KCPL have a program for managing the price risk of coal?**

A. Yes, it does.

**Q. Please describe KCPL's coal price hedging program.**

A. **[redacted]

[redacted]**

**Q. How has this strategy performed for KCPL?**

A. **[redacted]**

**Q. In his direct testimony, KCPL Witness Chris Giles mentioned that the cost of coal is largely "locked in" for 2007. Please explain what KCPL means by the cost of coal is "locked in"?**

A. KCPL has contractual commitments for all of its expected coal requirements for 2006 and 2007. All of our contracts specify base prices, which are subject to certain adjustments primarily for quality. Except for those adjustments we know what the price of our coal will be through 2007.

**Q. What do you expect the price of KCPL's coal to be through 2007?**

A. **[redacted]**

<u>**Fuel Price Forecast**</u>

**Q. What fuel prices did KCPL use to develop its COS?**

A. I provided KCPL witness Burton Crawford projected fuel prices that he used to develop the annualized fuel expense included in COS that resulted in Adj-38, "Annualize Fuel Expense at contract prices for net system input normalized for weather and annualized for customer growth" included in Schedule DAF-2 of the direct testimony of KCPL witness Don A. Frerking. We expect to true-up these projected prices to actual prices during the course of this proceeding in accordance with the Regulatory Plan Stipulation and Agreement approved by the Commission in Case No. EO-2005-0329.

**Q. How did you forecast the natural gas prices?**

A. Natural gas prices are based on the average of the six business days from December 27, 2005 through January 3, 2006 for the NYMEX closing prices for the September 2006

Henry Hub natural gas futures contract. Given the September 2006 price, the prices for the other months in the COS were developed by applying the long-term average relationship of each month's closing price to the following September. The monthly Henry Hub prices were then adjusted for basis using historical basis information from Kase and Company. These basis-adjusted values for October 2005 through September 2006 were used to develop the cost of natural gas in the COS. Natural gas transportation and hedging related costs were included in the COS as "fuel adders."

**Q. How did you forecast the oil prices?**

A. Oil prices are based on the average of the six business days from December 27, 2005 through January 3, 2006 for the NYMEX closing prices for each month from October 2005 through September 2006 for the heating oil futures contract. The heating oil futures contract prices are adjusted for basis and transportation to determine the station specific delivered cost.

**Q. How did you forecast the coal prices?**

A. The September 2006 delivered prices of PRB coal were forecast as the sum of mine price and transportation rate. All of KCPL's expected coal requirements for 2006 are under contract. **[redacted]

[redacted]**

Freight rates for those shipments of PRB coal that are under contract with a railroad were forecast by using indexes forecast by Global Insight to drive the contractual pricing mechanism. The freight rates for those shipments under "Circular" (or tariff), were projected to September 2006 by using Global Insight's forecast for light fuel oil to project DOE's "Retail On-Highway Diesel Fuel" price which was then used to develop the fuel surcharge in accordance with the terms of the Circular.

**[redacted]**

**Q. Are there costs related to fuel and included in Adj-38 that are not included in the price of fuel?**

A. Yes. We refer to those costs as "fuel adders." They include unit train lease expense, unit train lease revenue, unit train maintenance, unit train property tax, natural gas hedging costs, and costs associated with transporting natural gas.

**Q. Please describe the unit train-related expenses.**

A. Unit-train related expenses include the following:

- Unit train lease expense which is disaggregated into three components:
  - Long-term unit train lease expense;
  - Unit train lease revenue; and
  - Short-term unit train lease expense.
- Unit train maintenance expense consisting of:
  - Foreign car repair;
  - Shared expenses; and
  - Maintenance and repair of KCPL's railcar fleet.
- Unit train property tax.

*Long-Term Unit Train Lease Expense*: The amount presented here for unit train lease expense has been adjusted from actual to reflect KCPL's share of the long-term lease payments that will be made for unit trains that will be in KCPL's service in September 2006. It includes the payments for trainsets that are to be built later this year. It also includes an annualization of reductions resulting from refinancing a railcar lease and the loss of cars destroyed in railroad derailments.

*Unit Train Lease Revenue*: The current rail crisis has created a need for additional trainset capacity. **[redacted]**

*Short-Term Unit Train Lease Expense*: Short-term unit train lease expense has two subcomponents. The first reflects our estimate of KCPL's net lease expense under our unit train exchange agreement. That agreement allows us to exchange trainsets among the different plants within our system recognizing that ownership interests in Iatan and LaCygne are different from those of Hawthorn and Montrose. The other subcomponent is our estimate of railcar capacity that will be acquired through the short-term railcar lease market to move KCPL's coal requirements.

*Foreign Car Repair*: This represents the cost of repairing railcars that are running in service for KCPL but are not owned by or under a long-term lease to KCPL.

*Shared Expenses*. These are costs for things like AAR publications, Umler fees, and railcar management software fees that can not be assigned to an individual car.

*Maintenance and Repair of KCPL's Railcar Fleet*: These repair values have been adjusted and annualized to reflect the addition of a new trainset to KCPL's fleet this summer.

*Unit Train Property Tax*: Unit train property tax is tax that we pay on our railcar fleet. The value included here has been adjusted to reflect changes in tax rates and fleet makeup.

Q. **How did you determine the natural gas hedging costs?**

A. The natural gas hedging costs are based on the relationship of our historical gas hedging costs to the projected value of the natural gas those hedges were to safeguard. That historical relationship, defined as a percent of the projected value, was applied to the value of natural gas our hedge program would shield given the natural gas requirements identified in this case.

Q. **What are the costs associated with transporting natural gas?**

A. The costs components for transporting natural gas include the following: reservation, commodity, minimum annual payment, commodity balancing fees, transportation charges, access charges, mileage charges, fuel and loss reimbursement, FERC annual charge adjustment, storage fees, and costs for balancing.

Q. **How did you determine the costs associated with transporting natural gas?**

A. We disaggregated the costs of transporting natural gas into its various components. For those items specifically defined by tariff or contract, we used the defined mechanism. For items like costs to balance, we looked at the various components of the cost item and estimated each one separately. Those subcomponents were then aggregated and added to the specific tariff costs to determine the total cost of transportation. These costs are included in KCPL's COS as fuel adders.

Q. **What is "Adj-58 Adjust Fuel Handling Expense to include the costs the 2006 freight rate complaint before the Surface Transportation Board" as shown in the Summary of Adjustments in Schedule DAF-2 attached to the direct testimony of KCPL Witness Don A. Frerking?**

A. **[redacted]** In that rate complaint, KCPL charged that UP's rates for the movement of coal from origins in the Powder River Basin of Wyoming to KCPL's Montrose Generating Station were unreasonably high. Currently, KCPL and UP are engaged in discovery and anticipate filing opening evidence in second quarter 2006. KCPL anticipates the STB will issue an order by fourth quarter 2007. **[redacted]

[redacted]**

**Q. Why has KCPL filed a rate complaint with the Surface Transportation Board?**

A. KCPL's Montrose Station is captive to the UP; that is, UP is the only railroad that holds out to provide coal delivery service from Southern Powder River Basin (SPRB) to the Montrose Station. In anticipation of the need for unit train coal service to Montrose Station after 2005, KCPL expressed to UP its desire to negotiate an extension of the existing contract or a new contract. Consistent with the public pronouncements made at the unveiling of its Circular 111 (tariff) program in March 2004, UP insisted that it would only transport PRB coal to Montrose Station after December 31, 2005, under rates and terms set forth in Circular 111. According to UP's 2004 Annual Report, this tariff was intended to be a "new coal pricing mechanism for all shipments from Southern Powder River Basin (SPRB) in Wyoming…." In the absence of a successor agreement to its existing contract, KCPL had no means to procure PRB coal delivery service to the Montrose Station other than under the terms of UP's common carrier Circular 111 even though KCPL did not consider the rates and service terms in the Circular to be equitable or reasonable. KCPL accepted the terms of UP's Circular 111 under duress and subsequently filed a rate complaint with the STB, the agency which governs captive shipper rail rates.

**Q. Why are the costs of that rate complaint case so high?**

A. The STB is the exclusive forum available for contesting rates for railroad services. Before the STB will prescribe rate relief, a shipper must meet three burdens of proof. First, the shipper must prove that it is subject to railroad "market dominance", *i.e.*, that it is captive. Market dominance means that there are no other transportation options available to the rail customer. Second, the shipper must prove that it is paying a rate that is above the legal threshold. That is, the revenue from the rate must exceed 180% of the variable cost to provide the service. Third, the rail customer must prove that its rate is "unreasonably high." The standard that the STB uses for determining if a captive rail shipper's rate is "unreasonably high" is a concept called "stand-alone cost." The "stand-alone cost" is the lowest cost at which a hypothetical, efficient "stand-alone railroad" could provide the transportation service required by the complaining shipper. The costs of building and operating such a railroad are then compared to the revenues that such a system could expect to earn. If the shipper demonstrates that the stand-alone railroad would earn more from its shippers than is necessary to cover all of its costs, the shipper is entitled to rate relief. In a stand-alone cost rate case, the parties typically litigate over many issues such as how much traffic might be carried by the stand-alone railroad; how the stand-alone railroad would have to operate in order to meet the requirements of the railroad's shippers; how much it would cost to conduct such operations; and how much revenue the system would generate. To develop this hypothetical railroad, the captive shipper must retain lawyers, accountants, railroad economists and other such experts. Because of the evidentiary and burden of proof requirements set by the STB, the costs for determining the "stand-alone costs" of a "stand-alone railroad" are substantial.

## II. FUEL INVENTORY

**Q. What is the purpose of this portion of your testimony?**

A. The purpose of this portion of my testimony is to explain the process by which KCPL determines the amount of fuel inventory to keep on hand and how the level of fuel inventory impacts KCPL's COS.

**Q. Why does KCPL hold fuel inventory?**

A. KCPL holds fuel inventory because of the uncertainty inherent in both fuel requirements and fuel deliveries. Both fuel requirements and deliveries can be impacted by weather. Fuel requirements can also be impacted by unit availability; both the availability of the unit holding the inventory and of the availability of other units in KCPL's system. Fuel deliveries can also be impacted by breakdowns at a mine or in the transportation system. Events like the flood of 1993 interrupt the delivery of coal to KCPL's plants. Fuel inventories are insurance against events that interrupt the delivery of fuel or unexpectedly increase the demand for fuel. All of these factors vary randomly. Fuel inventories act like a "shock absorber" when fuel deliveries do not exactly match fuel requirements. That is, they are the working stock that enables KCPL to continue generating electricity between fuel shipments.

**Q. How does KCPL manage its fuel inventory?**

A. Managing fuel inventory involves ordering fuel, receiving fuel into inventory, and burning fuel out of inventory. KCPL controls inventory levels primarily through our fuel ordering policy. That is, we set fuel inventory targets and then order fuel to achieve those targets. We define inventory targets as the inventory level that we aim to maintain on average during "normal" times. In addition to fuel ordering policy, plant dispatch policy can be used to control inventories. For example, KCPL might reduce the operation of a plant that is low on fuel to conserve inventory. Of course, this might require other plants in the system to operate more and to use more fuel than they normally would, or it might require either curtailing generation or purchasing power in the market. One can view this as a transfer of fuel "by wire" to the plant with low inventory. To determine the best inventory level, KCPL balances the cost of holding fuel against the expected cost of running out of fuel.

Q. **What are the costs associated with holding fuel inventory?**

A. Holding costs reflect cost of capital and operating costs. Holding inventories requires an investment in working capital. That requires providing investors and lenders those returns that constitute the cost of capital. It also includes the income taxes associated with providing the cost of capital. The operating costs of holding inventory include costs other than the cost of the capital tied up in the inventories. For example, we treat property tax as an operating cost.

Q. **Please explain what you mean by the expected cost of running out of fuel?**

A. The cost of running out of fuel at a power plant is the additional cost incurred when KCPL must use replacement power instead of operating the plant. If the plant runs out of fuel and replacement power is unavailable, KCPL could fail to meet customer demand for electricity. The cost of replacement power depends on the circumstances under which the power is obtained. We would expect replacement power (and the opportunity cost of forgone sales) to cost less at night than during the day and less on weekends than during the week. In other words, replacement power costs (and opportunity costs of forgone sales) are cyclical. A varying replacement power cost (or opportunity cost of forgone sales) translates directly into a varying shortage cost. As a result, if KCPL was running low on fuel it could mitigate the shortage cost by selectively reducing burn when the cost of replacement power is lowest. During any significant period of disruption, we would expect many replacement power cost cycles.

**Q. How does KCPL determine the best inventory level, *i.e.*, the level that balances the cost of holding fuel against the expected cost of running out?**

A. KCPL uses the Electric Power Research Institute's ("EPRI") Utility Fuel Inventory Model ("UFIM") to identify those inventory levels with the lowest expected cost. UFIM identifies an inventory target as a concise way to express the following fuel ordering rule:

Current Month Order = (Inventory Target – Current Inventory)
+ Expected Burn this Month
+ Expected Supply Shortfall.

That is, UFIM's target assumes all fuel on hand is available to meet expected burn. "Basemat" is added to the available target developed with UFIM to determine KCPL's inventory target. Generally, and in the rest of my testimony, references to inventory targets mean the sum of fuel readily available to meet burn plus basemat.

**Q. What is basemat?**

A. Basemat is the quantity of coal occupying the bottom eighteen inches of our coal stockpiles. It may or may not be useable due to contamination from water, soil, clay, or fill material on which the coal is placed. Because of this uncertainty about the quality of the coal, it is not considered readily available, but because it is dynamic and it can be burned, although with difficulty, it is not written off nor considered sunk. Eighteen inches was identified in previous KCPL cases as being the error range for placement of a dozer blade or scraper on a coal pile and the appropriate depth for basemat. For determining basemat under our compacted stockpiles, we only consider the area of a pile that is thicker than nine inches. The area of the coal piles that covers either a hopper or concrete slab is not included in the calculation of basemat. The basemat values presented here are based on work performed in August and September 2005 by MIKON Corporation, a consulting engineering firm that specializes in coal stockpile inventories and related services for utilities nationwide.

**Q. How does the UFIM model work?**

A. The fundamental purpose of UFIM is to develop least-cost ordering policies, *i.e.*, targets, for fuel inventory. UFIM does this by dividing time into "normal" periods and "disruption" periods where a disruption is an event of limited duration with an uncertain occurrence. It develops normal-times inventory targets and disruption management policies. The inventory target that UFIM develops is that level of inventory that balances the cost of holding inventory with the cost of running out of fuel.

**Q. What are the primary inputs to UFIM?**

A. The key inputs are: holding costs, fuel supply cost curves, costs of running out of fuel, fuel requirement distributions, "normal" supply uncertainty distributions, and disruption characteristics.

**Q. What are the holding costs you used to develop coal inventory levels for this case?**

A. KCPL based the holding costs it used to develop fuel inventory levels for this case on the cost of capital structure proposed and described in the direct testimony of KCPL witness Samuel C. Hadaway.

**Q. What do you mean by "fuel supply cost curves"?**

A. The fuel supply cost curve recognizes that the delivered cost of fuel may vary depending on the quantity of fuel purchased in a given month. For example, our fuel supply cost curves for PRB coal recognize that when monthly purchases exceed normal levels we may need to lease additional trainsets. Those lease costs cause the marginal cost of fuel above normal levels to be slightly higher than the normal cost of fuel.

Q. **What was the normal cost of fuel?**

A. The normal fuel prices underlying all of the fuel supply cost curves were the same September 2006 projected prices I discussed earlier and that were used to determine the fuel expense in the COS, which KCPL Witness Burton Crawford discusses in his direct testimony.

Q. **What did you use for the costs of running out of fuel?**

A. There are several components to the cost of running out of fuel. The first cost is the opportunity cost of forgone non-firm off-system power sales. I developed that cost by constructing a price duration curve derived from the distribution of monthly non-firm off-system MWh sales for 2003 through 2005. I supplemented those points with estimates for purchasing additional energy and using oil-fired generation. The last point on the price duration curve is the socio-economic cost of failing to meet load for which I used KCPL's assumed cost for unserved load. These price duration curves are referred to in UFIM as burn reduction cost curves. These burn reduction cost curves can vary by inventory, location and disruption.

Q. **What fuel requirement distributions did you use?**

A. In his testimony KCPL Witness Burton Crawford discusses how KCPL uses the MIDAS™ model as its production cost computer modeling tool for developing generation levels and resulting fuel expenses. The fuel requirement distributions used to develop the fuel inventory targets presented here were based on the burn projections underlying the fuel expenses discussed by Mr. Crawford.

**Q. What do you mean by "normal" supply uncertainty?**

A. We normally experience random variations between fuel burned and fuel received in any given month. These supply shortfalls or overages are assumed to be independent from period to period and are not expected to significantly affect inventory policy. To determine these normal variations, I developed probability distributions of receipt uncertainty based on the difference between historical burn and receipts.

**Q. What are disruptions?**

A. A disruption is any change in circumstances that persists for a finite duration and significantly affects inventory policy. A supply disruption might entail a complete cut-off of fuel deliveries, a reduction in deliveries, or an increase in the variability of receipts. A demand disruption might consist of an increase in expected burn or an increase in the variability of burn. Other disruptions might involve temporary increases in the cost of fuel or the cost of replacement power. Different disruptions have different probabilities of occurring and different expected durations.

**Q. What disruptions did KCPL use in developing its inventory targets?**

A. KCPL recognized three types of disruptions in development of its inventory targets:

- PRB capacity constraints;
- Fuel yard failures; and
- Major floods.

**Q. Please explain what you mean by disruptions related to PRB capacity constraints.**

A. Supply capacity is the ultimate quantity of coal that can be produced, loaded, and shipped out of the PRB in a given time period. Constraints to supply capacity can come from either the railroads or from the mines, but regardless of which of these is the constraint source, the quantity of coal that can be delivered is restricted. A constrained supply caused by railroad capacity constraints can come from an inability of the railroad to ship a greater volume of coal from the basin. A scenario such as this can arise from not having enough slack capacity to place any more trains in service. It can also come from an infrastructure failure such as the May 2005 derailments on the joint line in southern PRB I discussed earlier. A constrained supply caused by the mines can come from situations such as there not being enough available load-outs, or not enough space to park waiting trains, or reaching the productive limits of equipment such as shovels, draglines, conveyors, and trucks.

Q. **Please explain what you mean by disruptions related to fuel yard failures.**

A. KCPL and other utilities have experienced major failures in the equipment used to receive fuel. Perhaps KCPL's most significant fuel yard failure occurred in 1986 when a conveyor belt caught fire at Hawthorn. The ensuing fire destroyed Hawthorn's normal ability to unload coal received by train. This disruption is designed to cover a variety of circumstances that could result in a significant constraint on a plant's ability to receive fuel.

Q. **Please explain what you mean by "Major flood" disruptions.**

A. The third disruption we recognized in developing targets for this case was modeled after the 1993 flood. A large flood such as the flood of 1993 can lengthen railroad cycle times and curtail the deliveries of coal to generating stations. For example, at Iatan Station the average standard deviation in cycle time for the flood year is nearly double the standard deviation of the year before or after the flood, and during the months most affected by flooding the differences are even more substantial.

**Q. How does KCPL manage disruptions?**

A. The target inventory levels presented here assume KCPL will actively manage its fuel inventory. That is, the Company would take whatever actions were deemed appropriate to ensure an adequate supply of fuel was kept on hand for generating energy necessary to serve native load. If KCPL runs low on fuel, it might choose to curtail generation and reduce burn. KCPL would manage the cost of any such disruption to take advantage of replacement power cost cycles. This assumption allows us to operate with lower inventory targets.

**Q. What are the coal inventory targets used in this case?**

A. The coal inventory targets resulting from application of UFIM and their associated value for incorporation into rate base are shown in the attached Schedule WEB-7 **(HC)** and are the values used to determine Adj-51, "Adjust Fossil Fuel Inventories to required levels" included in the Summary of Adjustments in Schedule DAF-2 in the direct testimony of KCPL witness Don A. Frerking. Since these coal inventory targets are a function of fuel prices, cost of capital and other factors that may be adjusted or trued-up in the course of this proceeding, we expect to adjust the coal inventory targets as necessary.

**Q. How were the inventory values for oil, lime, and limestone determined.**

A. Inventory values for oil, lime and limestone were calculated as the average month-end quantity on hand for the 13-month period August 2004 through September 2005 multiplied by the September 2005 per unit value, i.e. price for inventory per the

Company's accounting records. These values are also shown in Schedule WEB-7 **(HC)** and were included in the derivation of Adj-51.

## III. KCPL'S $SO_2$ EMISSION ALLOWANCE MANAGEMENT PROGRAM

**Q. What is the purpose of this portion of your testimony?**

A. The purpose of this portion of my testimony is to describe how KCPL's $SO_2$ emission allowance management program impacts KCPL's COS and rate base, to review the actions KCPL has taken under its initial $SO_2$ Plan, and to explain how KCPL's 2006 $SO_2$ Plan differs from our initial $SO_2$ Plan.

**Q. How does KCPL's $SO_2$ allowance management program impact KCPL's COS and rate base?**

A. KCPL was first authorized to manage its $SO_2$ emission allowance inventory, including the sales of such allowances, under the Stipulation and Agreement in Case No. EO-95-184. That Stipulation and Agreement and a similar Stipulation and Agreement under Case No. EO-2000-357, required KCPL to record all $SO_2$ emission allowance sales proceeds as a regulatory liability in Account 254, Other Regulatory Liabilities. The Stipulation and Agreement concerning KCPL's Regulatory Plan, which was approved by the MPSC in Case No. EO-2005-0329 ("Regulatory Plan Stipulation and Agreement") included a $SO_2$ Emission Allowance Management Policy ("SEAMP") which provided for KCPL to sell $SO_2$ emission allowances in accordance with the initial $SO_2$ Plan submitted to the MPSC, Staff, Office of Public Counsel ("OPC") and other parties in January 2005. While the Regulatory Plan Stipulation and Agreement also requires KCPL to record all $SO_2$ emission allowance sales proceeds as a regulatory liability in Account 254, it further provides that KCPL may recommend an appropriate amortization period for $SO_2$

emission allowance sales proceeds that have been booked to Account 254 to be included in the 2009 rate case revenue requirement.

Q. **[redacted]**

A. **[redacted]**

**Q. In the SEAMP included in the Regulatory Plan Stipulation and Agreement, KCPL agreed to provide MPSC Staff and OPC an $SO_2$ Plan by December 31 each year. Did KCPL submit a new $SO_2$ Plan prior to December 31, 2005?**

A. Yes, we did. We submitted a "2006 $SO_2$ Plan" to MPSC Staff and OPC on December 29, 2005.

**Q. Describe how you developed the 2006 $SO_2$ Plan that KCPL submitted in December 2005.**

[redacted] **[redacted]

[redacted]**

**Q. Does the methodology you used to develop the 2006 $SO_2$ Plan meet the requirements defined in the SEAMP?**

A. Yes, I believe it does.

**Q. Describe the proposed actions to be taken in 2006 by the 2006 $SO_2$ Plan.**

A. **[redacted]**

Q. **[redacted]**

A. **[redacted]

[redacted]**

**Q.** **[redacted]**

A. **[redacted]**

**Q.** **[redacted]**

A. **[redacted]**

**Q. Does that conclude your testimony?**

A. Yes, it does.

**BEFORE THE PUBLIC SERVICE COMMISSION**
**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the Matter of the Application of Kansas City Power & Light Company to Modify Its Tariff to Begin the Implementation of Its Regulatory Plan | ) ) ) | Case No. ER-2006-____ |

## AFFIDAVIT OF WILLIAM EDWARD BLUNK

**STATE OF MISSOURI** )
) ss
**COUNTY OF JACKSON** )

William Edward Blunk, appearing before me, affirms and states:

1. My name is William Edward Blunk. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Supervisor, Fuel Planning.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of thirty-seven (37) pages and Schedules WEB-1 through WEB-7, all of which having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

[signature]
William Edward Blunk

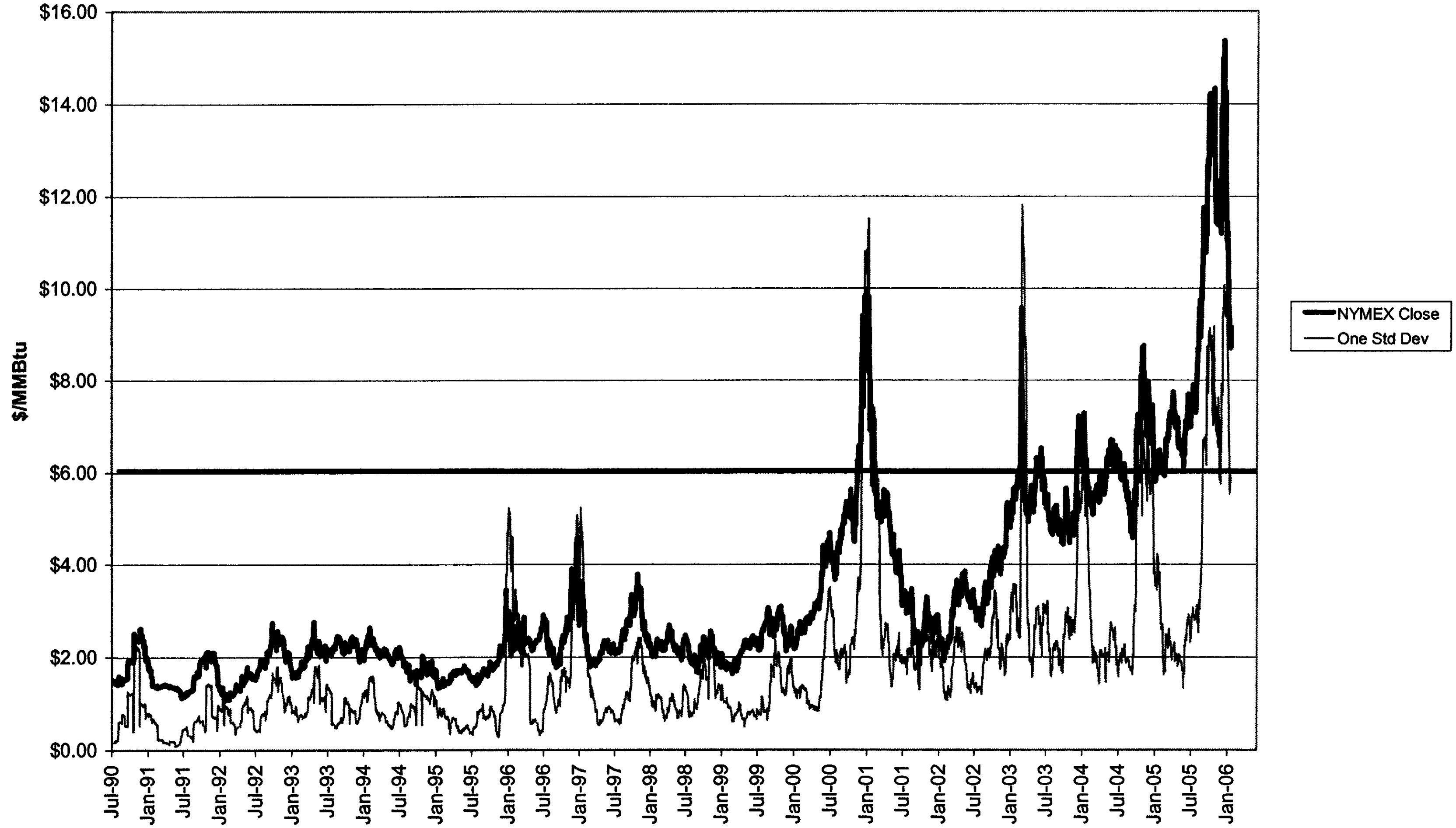
Subscribed and affirmed to before me this 30th day of January, 2006.

Nicole A. Wehry
Notary Public

My commission expires:
Feb. 4, 2007

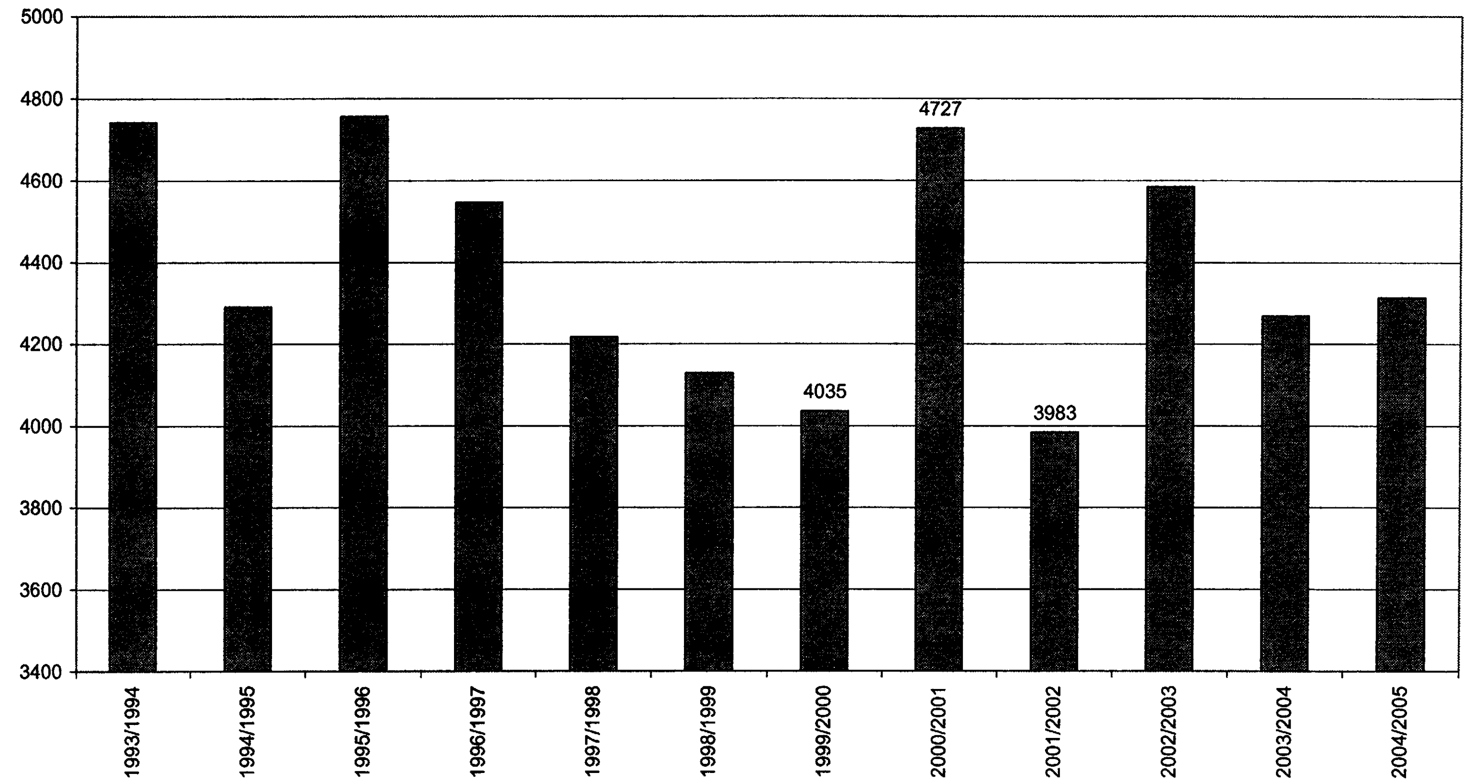
**NICOLE A. WEHRY**
**Notary Public - Notary Seal**
**STATE OF MISSOURI**
**Jackson County**
**My Commission Expires: Feb. 4, 2007**

# NYMEX Natural Gas
## Closing Price vs. One Standard Deviation




Schedule WEB-1

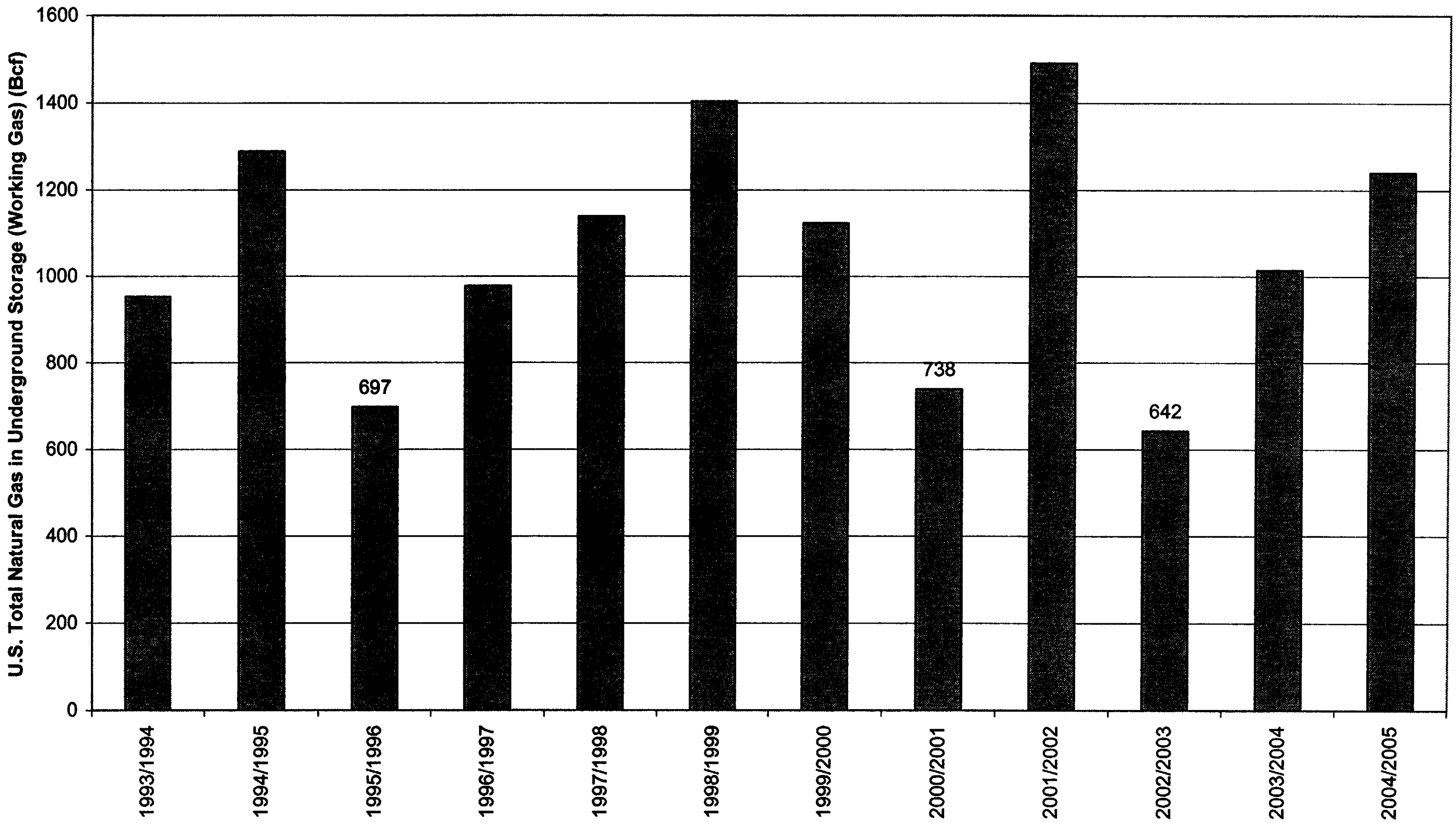
# Population Weighted Heating Degree Days




Source: Energy Information Administration

Schedule WEB-2

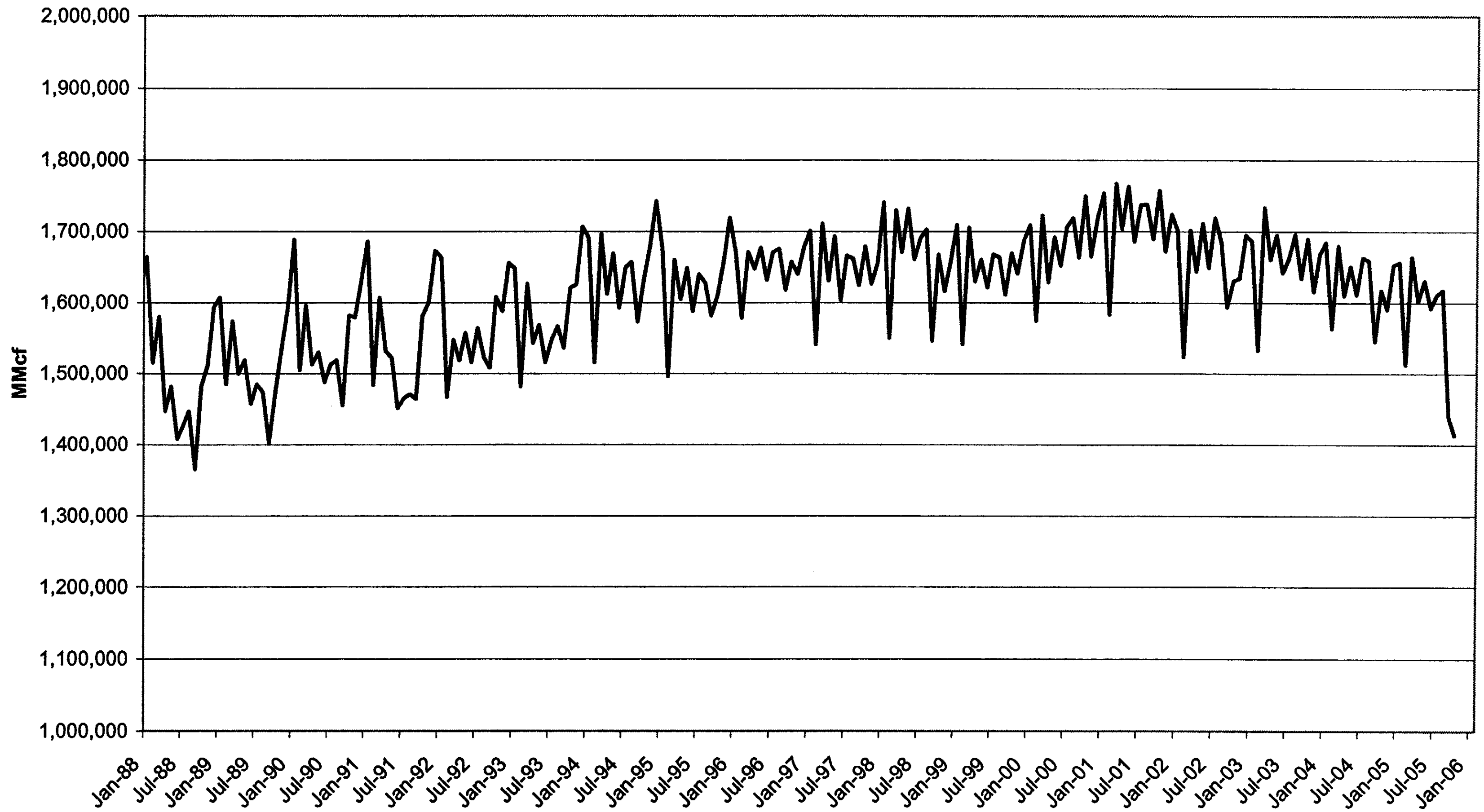
# Winter Low Natural Gas Storage




Source: Energy Information Administration

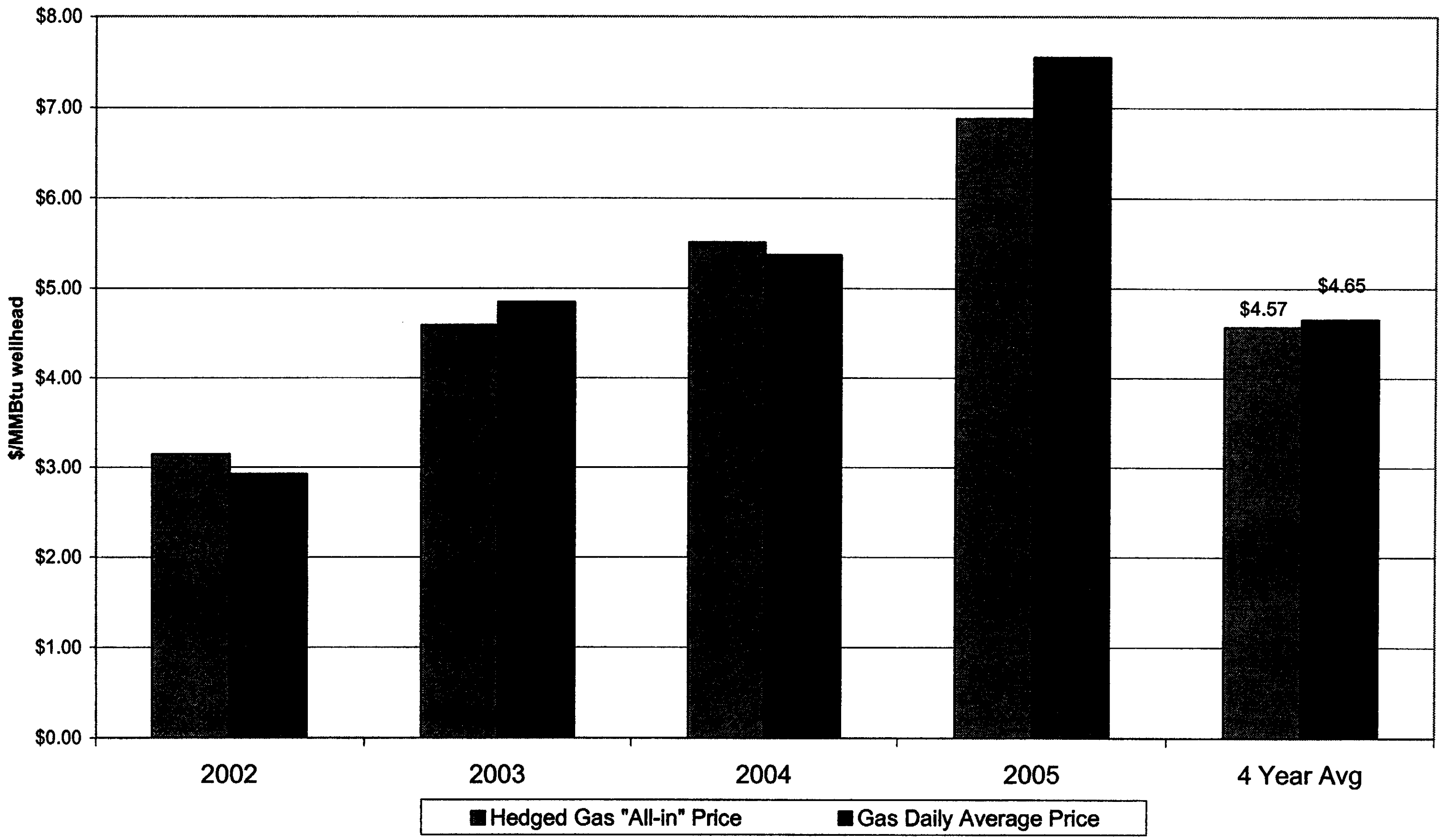
Schedule WEB-3

# U.S. Natural Gas Marketed Production



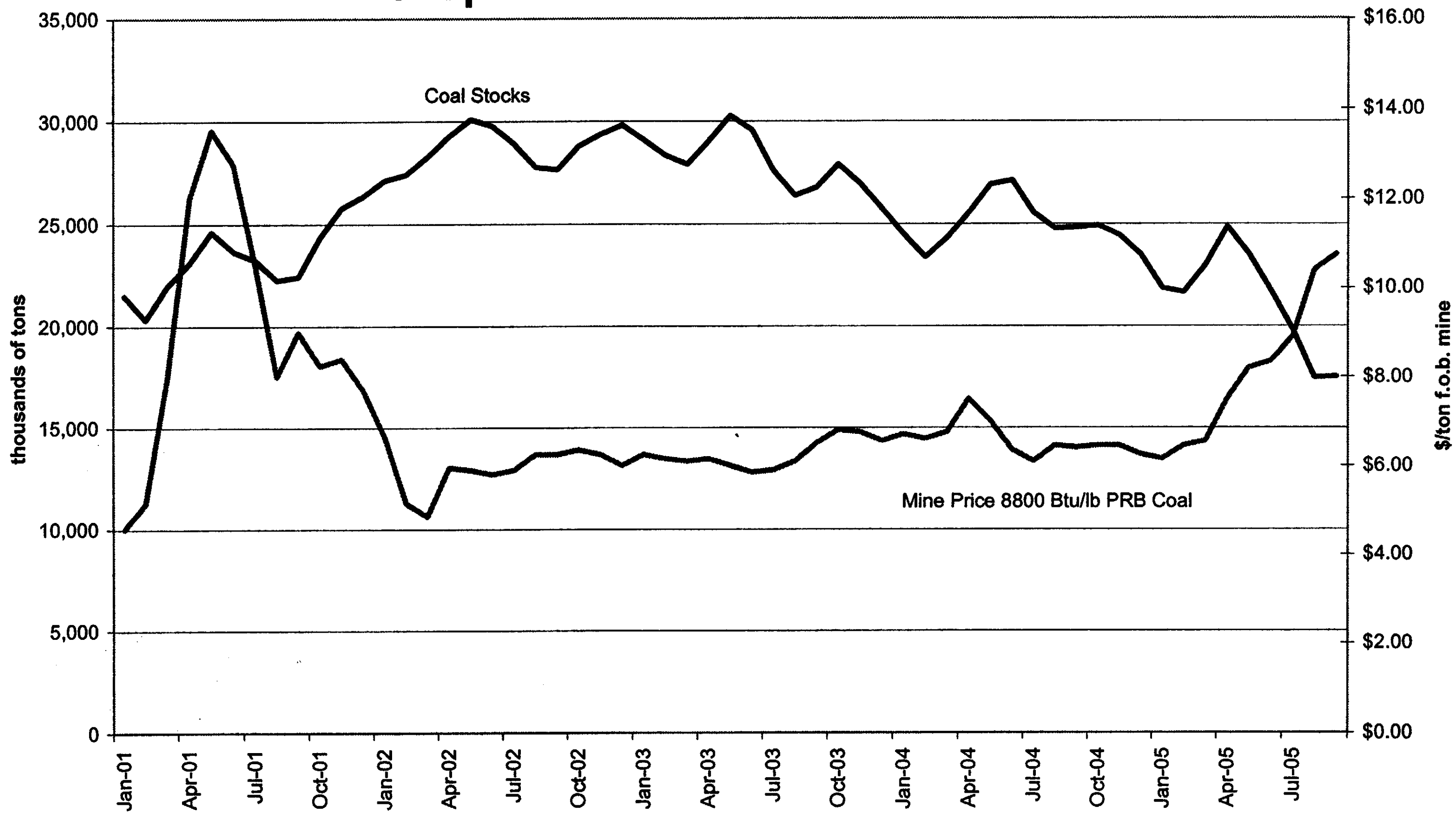

Source: Energy Information Administration

# KCPL Natural Gas Hedge Program




Schedule WEB-5

## Coal Stocks in States With >95% PRB Coal vs. Spot Price for 8800 Btu/lb PRB Coal




Sources: Energy Information Administration and *Coal Daily*

Schedule WEB-6

# SCHEDULE WEB-7

# THIS DOCUMENT CONTAINS HIGHLY CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC