BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the General Investigation Into KCP&L and Westar Generation Capabilities, Including as these Capabilities May Be Affected by Environmental Requirements	))))	**Docket No. 11-GIME-492-GIE**

KANSAS CITY POWER & LIGHT COMPANY'S RESPONSE TO STAFF'S LIST OF QUESTIONS

COMES NOW Kansas City Power & Light Company ("KCP&L") and, pursuant to the direction in ordering paragraph (B) of the order of the Kansas Corporation Commission ("Commission" or "KCC") issued on January 27, 2011 in the above-captioned docket ("492 Docket" and "492 Order"),[1] files its responses to Staff's list of questions regarding KCP&L generation capabilities and the effects on those capabilities due to environmental regulations. In addition to this Response, which only KCP&L and Westar were directed to file, KCP&L also is filing, in a separate pleading, Initial Comments providing information regarding potential environmental upgrade requirements on the electric generating units ("EGUs") owned by KCP&L, as directed in ordering paragraph (C) of the 492 Order, which all parties and intervenors were invited to file.

KCP&L's responses to Staff's list of questions, as set forth in paragraph 8 of the 492 Order, are as follows:

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[1] *In the Matter of a General Investigation into KCP&L and Westar Generation Capabilities, Including as These Capabilities May Be Affected by Environmental Requirements*, Docket No. 11-GIME-492-GIE, Order Opening Docket, Setting Schedule, Granting CURB Intervention, Designating Prehearing Officer and Assessing Costs (issued January 27, 2011).

Question a. ***What EPA and KDHE regulatory programs [current and emerging] apply to each EGU within the KCP&L and Westar fleets?***

The following regulatory programs—grouped as waste, air, or water programs—are applicable to KCP&L's fleet of EGUs as shown in Tables 1, 2 and 3 attached hereto as Attachments a-1, a-2, and a-3. Note that the impact of many of these programs on the La Cygne generating station is more fully discussed in the Direct Testimony of Mr. Paul Ling in KCC Docket No. 11-KCPE-581-PRE (the "581 Docket"). Mr. Ling's full testimony is attached hereto as Attachment a-4.

Waste Regulatory Programs

- State delegated Resource Conservation and Recovery Act ("RCRA"), 40 Code of Federal Regulations ("CFR") Subtitle D, regulates landfills receiving coal combustion products ("CCPs") which are currently considered nonhazardous and pass the Environmental Protection Agency ("EPA") guidelines for being nonhazardous.

- The RCRA hazardous waste regulations, 40 CFR 260, regulates hazardous waste disposal.

- The EPA has proposed to regulate coal combustion residuals ("CCRs") under the RCRA to address the risks from the disposal of CCRs generated from the combustion of coal at electric generating facilities. The EPA is considering two options in this proposal. Under the first proposal, the EPA would regulate CCRs as special wastes subject to regulation under Subtitle C of RCRA, when they are destined for disposal in landfills or surface impoundments. Under the second proposal, the EPA would regulate disposal of CCRs under Subtitle D of RCRA.

- The Emergency Planning and Community Right to Know Act ("EPCRA"), 40 CFR 372, is a public awareness program aimed at first responders in emergencies. Regulated chemicals above threshold amounts kept on site are annually submitted to the state regulators and to the emergency response groups that would respond to a specific location.

Air Regulatory Programs

- The National Ambient Air Quality Standards ("NAAQS"), 40 CFR 50, define levels of air quality (i.e., ambient concentrations of various pollutants over certain averaging periods) necessary to protect the public health and welfare.

- The Regional Haze regulations, found in 40 CFR 51, specify that states must address regional haze in Class I areas both within and outside of the state. To meet the requirements for regional haze in those areas, states submit a long term strategy to address regional visibility impairment that includes enforceable emission limitations, compliance schedules, and other measures.

- The Acid Rain Program, 40 CFR 72, regulates SO_2 emissions at the national level. It requires that each source subject to the program surrender allowances equal to the prior year's emissions on an annual basis.

- Continuous Emission Monitoring, 40 CFR 75, establishes requirements for the monitoring, recordkeeping, and reporting of sulfur dioxide (SO_2), nitrogen oxides (NOx), and carbon dioxide (CO_2) emissions, volumetric flow, and opacity data from affected units under the Acid Rain Program.

- The Utility Maximum Available Control Technology ("MACT"), a subpart of 40 CFR 63, will regulate emissions of hazardous air pollutants ("HAP") from electric utility steam generating units.

- The Clean Air Interstate Rule ("CAIR"), 40 CFR 96, is an emission allowance trading program, similar to the Acid Rain Program. However, it is not national in scope, and applies to both annual and ozone season NOx as well as SO_2. CAIR is being phased out by the Transport Rule.

- The Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone ("Transport Rule"), 40 CFR 97, is similar to CAIR in that it is a NOx and SO_2 emission allowance trading program. However, it includes more states than CAIR and has different, state-specific, emission caps.

- Compliance Assurance Monitoring, 40 CFR 64, requires additional monitoring of pollution control equipment operating parameters to ensure continuous compliance with pollutant-specific emission limits.

- Chemical Accident Prevention Provisions, 40 CFR 68, is applicable to an owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process. Part 68 sets forth the list of regulated substances and thresholds and the requirements for owners or operators of stationary sources concerning the prevention of accidental releases.

- State Operating Permit Programs, 40 CFR 70, requires all facilities with an annual potential to emit above certain thresholds to obtain a state operating permit. Part 70 operating permits contain all of the applicable air quality requirements (both state and federal) for a particular facility and must be revised as necessary and renewed every five years.

- Protection of Stratospheric Ozone, 40 CFR 82, regulates certain controlled substances including chlorofluorocarbons ("CFC"), hydrochlorofluorocarbon ("HCFC") refrigerants, halons, carbon tetrachloride, and methyl chloroform. Part 82 requires recordkeeping of maintenance and calculation of leak rates for CFC and HCFC-containing equipment.

- Mandatory Reporting of Greenhouse Gases, 40 CFR 98, requires tracking and annual reporting of various greenhouse gases ("GHG"). Beginning with emissions occurring in 2010, all facilities required to report carbon dioxide ("CO_2") under the Acid Rain Program as well as other facilities with actual CO_2 equivalent (CO_2e) emissions above 25,000 tons per year must report their annual GHG emissions.

- The Industrial Boiler MACT, a subpart of 40 CFR 63, will regulate emissions of HAP from non-electric generating boilers such as auxiliary or steam boilers. It will affect all industrial boilers, regardless of installation or construction date.

- New Source Review ("NSR"), 40 CFR 52.21, now requires new and modified sources of GHG to undergo Prevention of Significant Deterioration ("PSD") construction permitting for GHG in addition to the other NSR regulated pollutants. PSD permitting includes an evaluation of the best available control technology for GHG emissions.

- New Source Performance Standards ("NSPS"), Clean Air Act Section 111(b) and (d), emission requirements for new, modified, and existing electrical generating units. EPA has entered into a settlement agreement to revise the existing standards and develop new standards which will include GHG emissions for the first time.

<u>Water Regulatory Programs</u>

- Oil Pollution Prevention, 40 CFR 112, establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore facilities into or upon the navigable waters of the United States. Requires facilities with an oil storage capacity of 1,320 gallons or more to prepare and implement a Spill Prevention, Control, and Countermeasure ("SPCC") Plan. In addition, facilities with an oil storage capacity of one million gallons or more are required to prepare and implement a Facility Response Plan.

- EPA Administered Permit Programs: The National Pollutant Discharge Elimination System, 40 CFR 122, implements the National Pollutant Discharge Elimination System ("NPDES") Program. Any person who discharges or proposes to discharge pollutants except persons covered by general permits must comply.

- Criteria and Standards for the National Pollutant Discharge Elimination System, 40 CFR 125, establishes criteria and standards for the imposition of technology-based treatment requirements in permits under section 301(b) of the Act, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under section 402(a)(1) of the Act. 40 CFR 125.90 establishes requirements that apply to the location, design, construction, and capacity of cooling water intake structures at existing facilities that are subject to this subpart (*i.e.*, Phase II existing facilities). The purpose of these requirements is to establish the best technology available for minimizing adverse environmental impact associated with the use of cooling water intake structures. EPA will soon be proposing regulations for existing facilities.

- Water Quality Standards, 40 CFR 131, describes the requirements and procedures for developing, reviewing, revising, and approving water quality standards by the States as authorized by section 303(c) of the Clean Water Act. Compliance with these standards is incorporated into NPDES Permits.

- Steam Electric Power Generating Point Source Category, 40 CFR 423, establishes provisions applicable to discharges resulting from the operation of a generating unit by an facility primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. 40 CFR 423.12 establishes effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available. EPA is reviewing these effluent guidelines and plans to update soon.

Question b. What are the emission allowances for each unit?

KCP&L's generating units receive three types of emission allowances: (i) CAIR annual NOx allowances, (ii) CAIR ozone season NOx allowances, and (iii) Acid Rain Program annual SO_2 allowances. Table 4 lists the allowance allocations for each KCP&L facility (note: the allocations are for the whole facility) and is attached hereto as Attachment b-1.

The allowances in Table 4 represent KCP&L's allocation as of calendar year 2010. For the annual SO_2 allowances under the Acid Rain Program, Table 4 lists those annual allowances that are withheld from each facility for purpose of the EPA annual auction. The proceeds from the sale of these allowances at auction, or any allowances not sold are returned to each facility. In 2010, the withheld annual SO_2 allowances were not returned but instead KCP&L received the proceeds from the sale. The initials "NA" in the table are an indication that the facility does not receive any allowances and is not covered by that particular program. CAIR only applies to KCP&L's Missouri units, and the Northeast facility is covered by CAIR but not by the Acid Rain Program. A zero in the table is an indication that the facility is covered by the listed program, but it does not receive any allocation of allowances. Facilities with a zero must obtain allowances from other sources or on the open market.

Question c. ***What are Westar and KCP&L's expected capacity and/or energy needs over the appropriate investment planning horizons (e.g., 10, 15, 25 years) given the Companies' existing generation portfolios?***

Capacity and Load Balance for KCP&L both with and without the La Cygne units are shown in CONFIDENTIAL-RESTRICTED Schedule BLC2011-11 from Mr. Burton Crawford's Direct Testimony in the 581 Docket, attached hereto as CONFIDENTIAL-RESTRICTED Attachment c-1. (*See also* 581 Docket, Crawford Direct Testimony, page 10.)

Question d. ***If capacity and/or energy is not needed, then how should non-compliant plants be treated?***

Conceptually the analysis is the same whether capacity and energy is or is not needed. A resource plan analysis is used to determine the least cost resources to meet projected capacity and energy needs during the planning period. This analysis includes consideration of various resource alternatives. The lowest net present value of revenue requirement ("NPVRR") indicates the least cost resource alternative.

For instance, KCP&L cannot meet its projected capacity and energy needs without the capacity and energy currently provided by La Cygne generating units 1 and 2. Thus, under this scenario, the expected values of NPVRR associated with alternative resource plans are compared to the expected value of NPVRR of the resource plan that includes adding environmental equipment to La Cygne Units 1 and 2 (equipment necessary to have the capacity and energy available from La Cygne Units 1 and 2 beyond June 15, 2015). This comparison indicates adding environmental equipment to La Cygne Units 1 and 2 results in the lowest expected NPVRR when compared to that of alternative resource plans.

Under a scenario where the capacity and energy from La Cygne Units 1 and 2 were not needed, the NPVRRs of alternative resource plans, with and without La Cygne, would still be compared to determine the lowest cost resource plan to meet KCPL&L customer needs.

Question e. ***If capacity and/or energy is needed, should KCP&L and Westar retrofit existing non-compliant plants or build new plants?***

There is no generic, one-size fits all answer to this question. Such determinations must be made on a case-by-case basis. Each decision should be based upon analysis of the alternatives. For example, in the 581 Docket, KCP&L demonstrates how and why the capacity and energy from La Cygne Units 1 and 2 is needed. Specifically, based on the Company's resource plan analysis and the NPVRR results shown in CONFIDENTIAL-RESTRICTED Schedule BLC2011-12 (attached to the Direct Testimony of Burton Crawford in the 581 Docket and as CONFIDENTIAL-RESTRICTED Attachment e-1 hereto) retrofit of the existing La Cygne Units 1 and 2 is the lowest expected NPVRR option to continue to supply the capacity and energy needs of our customers.

Question f. ***What criteria should be employed to determine optimal retrofit configurations to meet regulatory requirements? Has this analysis been performed for individual plants? Which plants?***

In general, the criterion that should be employed is the minimization of NPVRR. This analysis has been performed by KCP&L and is discussed in detail in the 581 Docket. Other than La Cygne Units 1 and 2, the only KCP&L plants that do not generally meet best available retrofit technology are the three Montrose units. KCP&L has determined that it is least cost to continue to run these plants absent environmental retrofits until required to do otherwise.

Although NPVRR is the primary basis for resource alternative evaluation, other factors relevant to the decision-making process also may be considered. For instance, maintaining a balanced portfolio—a mix of generation resources—is an important non-quantitative factor in the decision making process. Based on KCP&L's resource planning analysis, KCP&L has determined that, of the two existing generation sites in need of BART retrofits—namely Montrose Station and La Cygne Station—Montrose would be the first existing generation site to retire rather than be retrofit. Given this, it is important to retain operation of the La Cygne site to maintain a balanced portfolio of coal, gas, nuclear, and renewable generation. The least cost alternative to retrofitting existing units to meet BART is combined cycle gas generation ("CC"). Retiring La Cygne generating station and replacing it with CC generation, followed by retirement of Montrose station generation with CC replacement would result in a significant reliance on the relatively more volatile natural gas market. NPVRR is based on the long-term economics of resource alternatives. It does not reflect shorter-term variations in fuel cost that can impact customers immediately. For instance, even if the NPVRR was lowest for CC, which it is not in the case of La Cygne, one still needs to consider that customers would be exposed in the shorter-term to larger variability in their bills attributable to the volatile gas market. Many customers already use natural gas for some portion of their space/water heating and cooking. With a generation portfolio more dependent on gas, the currently less volatile electric bill would become more volatile in line with gas price variability. This would result in increased customer dissatisfaction. (See Mr. Blunk's testimony for further discussion of natural gas market volatility.) (581 Docket, Crawford Direct Testimony, page 11.) Mr. Blunk's Direct Testimony in the 581 Docket is attached hereto as Attachment f-1. As explained in Mr. Blunk's testimony, there are risks associated with moving towards a heavy reliance on combined cycle gas generation. Indeed, KCP&L's analysis in the 581 Docket demonstrates that making environmental upgrades to La Cygne is the least cost alternative.

Question g. ***Do the environmental retrofit projects that are currently installed, under construction or planned represent the end of the upgrading process for their 4 corresponding generation units, or will the environmental retrofit projects, in-turn, require additional improvements to these units?***

From an analysis perspective, KCP&L takes into account potential regulation changes to the extent that they are in place or proposed. To the extent they are probable, KCP&L models them. For example, KCP&L expects that cooling towers will need to be added to its coal plants. These costs have been included in this analysis. (581 Docket, Crawford Direct Testimony, page 12.)

It is expected, however, that the [La Cygne] retrofit projects proposed in the 581 Docket represent the vast majority of the upgrading process for the La Cygne generating units based upon current and proposed environmental regulations. The proposed upgrades identified in the 581 Docket include all "improvements" needed to address the current regulations. KCP&L cannot anticipate or predict with precision the impact of all regulations that may be promulgated sometime in the future. However, KCP&L's resource planning analysis considers both existing regulations and proposed regulations (probable regulations). So, for example, a cooling tower currently is not required at La Cygne, we know there are rules being considered that may require a cooling tower at some point in the future. In the

Company's analysis, we conferred with our environmental experts on a best guess at when this would be required, received estimates on the costs from engineering, and then included the costs in the analysis as if they would happen. (581 Docket, Heidtbrink Direct Testimony, page 23.)

Question h. ***For any planned but incomplete environmental upgrades, has analysis been performed on how the planned upgrades may impact the expected life of the plant at the completion of the upgrades? If so, what criteria for analysis was used?***

Yes. How the planned upgrades may impact the expected life of the plant has been considered. For instance, as discussed in more detail below, the equipment installation being proposed for La Cygne Units 1 and 2 will not impact the useful life of the units. KCP&L has modeled continuation of La Cygne Units 1 and 2 throughout the planning period by incorporating normal maintenance activities and overlaid the cost of a long-range asset management plan. (581 Docket, Crawford Direct Testimony, page 12.)

The retrofit equipment being proposed for La Cygne Units 1 and 2, with the exception of the low NOx burners ("LNBs") and the over-fire air system ("OFA"), is typically referred to as "back-end" equipment. "Back-end" equipment is designed and utilized to reduce emissions downstream of the boiler and generally has no impact on the mechanical useful life of the primary components of the boiler and generation equipment. Likewise, the LNBs and OFA system reduce emissions and have no impact on boiler or other equipment mechanical life.

With a complex and integrated electric generating machine the size of La Cygne Station, various individual components such as the existing Unit 1 wet scrubber wear out and/or become obsolete over different time periods. In order to maintain reliability, KCP&L

periodically replaces components as necessary, such as the recent replacement of the Unit 1 cyclones to extend the life of the Units. Because a coal plant is such an expensive asset to build initially, it makes sense to continue replacing components as needed to extend the life of the original asset. Mr. Crawford describes in his testimony how the MIDAS™ model reflects potential additional investments in La Cygne Units 1 and 2 beyond normal maintenance outages. If the environmental upgrades are approved, KCP&L envisions this asset producing low cost energy for our customers well into the future. (581 Docket, Heidtbrink Direct Testimony, page 23.)

Question i. ***If replacement of a plant is considered as an option, what criteria should be used to determine the size and type of the generation plant to be built?***

The primary criterion employed is the same as that used to analyze the retrofits; that is, minimization of NPVRR. However, in some cases, it may be prudent to select a resource plan that has a higher NPVRR if in doing so the risk associated with changes in critical uncertainties, environmental regulations, or other factors is mitigated. (581 Docket, Crawford Direct Testimony, page 13.)

Question j. ***What factors were considered in any hypothetical resource portfolio scenarios which have been run?***

As discussed in the Direct Testimony of Burton Crawford in the 581 Docket, various scenarios and input variables were considered by KCP&L when it analyzed the proposed La Cygne environmental upgrades being proposed in the 581 Docket. Mr. Crawford's testimony from the 581 Docket is attached hereto as CONFIDENTIAL-RESTRICTED Attachment j-1.

Question k. ***How do Westar and KCP&L plan to regulate the wind and other renewable generation that is required by the Renewable Energy Standards Act (KSA 66-1256 through 66-1262)? If Westar and KCP&L plan to add generation to regulate wind and other renewable generation, how much generation and what fuel sources are planned to be used at these new plants used for regulation?***

Wind resources required by the Renewable Energy Standards Act (K.S.A. 66-1256 through 66-1262) will cause additional demands for load regulation and other ancillary services. In the near-term, KCP&L will use its existing resources for regulation. KCP&L anticipates the Southwest Power Pool ("SPP") will consolidate Balancing Authorities (anticipated in 2014). At that time KCP&L will no longer be required to regulate for its load directly. Rather, KCP&L will be required to either purchase regulating reserve or supply its share based on whatever SPP rules are ultimately approved. These rules are currently under development. (581 Docket, Crawford Direct Testimony, page 13.)

Respectfully submitted,

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COUNSEL FOR KANSAS CITY POWER & LIGHT

Table 1. Waste Regulatory Programs

Facility	40 CFR Subtitle D RCRA Subtitle D Landfill Regulations	40 CFR260 RCRA Hazardous Waste Regulations for Generators	40 CFR Subtitle C RCRA Proposed Subtitle C Regulations of Ash as Hazardous	40 CFR 372 EPCRA Community Right to Know Act
Coal Units				
Hawthorn 5A	C	C	E	C
Iatan 1	C	C	E	C
Iatan 2	C	C	E	C
La Cygne 1	C	C	E	C
La Cygne 2	C	C	E	C
Montrose 1	C	C	E	C
Montrose Comb. Stack 2 – 3	C	C	E	C
Gas and Oil Units				
Hawthorn 6	NA	C	NA	C
Hawthorn 7	NA	C	NA	C
Hawthorn 8	NA	C	NA	C
Hawthorn 9	NA	C	NA	C
Osawatomie	NA	C	NA	C
West Gardner Units 1 – 4	NA	C	NA	C
Northeast Units 11 – 18	NA	C	NA	C

C - Current Regulations
E - Emerging Regulations
NA - Not Applicable

Table 2. Air Regulatory Programs

Facility	40 CFR 50 National Ambient Air Quality Standards	40 CFR 51 Regional Haze Regulations	40 CFR 72 Acid Rain Program	40 CFR 75 Continuous Emission Monitoring	40 CFR 63 National Emission Standards for Hazardous Air Pollutants for Source Categories[1]	40 CFR 96 CAIR NOx and SO2 Trading Programs for State Implementation Plans	40 CFR 97 Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone	40 CFR 64 Compliance Assurance Monitoring	40 CFR 68 Chemical Accident Prevention Provisions	40 CFR 70 State Operating Permit Programs	40 CFR 82 Protection of Stratospheric Ozone	40 CFR 98 Mandatory Reporting of Greenhouse Gases	40 CFR 63 National Emission Standards for Hazardous Air Pollutants for Source Categories[2]	40 CFR 52.21 New Source Review	CAA Section 111 New Source Performance Standards
Coal Units															
Hawthorn 5A	C	C	C	C	E	C	E	C	C	C	C	C	E	C	C, E
Iatan 1	C	C	C	C	E	C	E	C	C	C	C	C	E	C	C, E
Iatan 2	C	C	C	C	E	C	E	C	C	C	C	C	E	C	C, E
La Cygne 1	C	C	C	C	E	NA	E	C	C	C	C	C	E	C	C, E
La Cygne 2	C	C	C	C	E	NA	E	C	C	C	C	C	E	C	C, E
Montrose 1	C	C	C	C	E	C	E	C	C	C	C	C	E	C	C, E
Montrose Comb. Stack 2 – 3	C	C	C	C	E	C	E	C	C	C	C	C	E	C	C, E
Gas and Oil Units															
Hawthorn 6	C	C	C	C	NA	C	E	NA	C	C	C	C	NA	C	C, E
Hawthorn 7	C	C	C	C	NA	C	E	NA	C	C	C	C	NA	C	C, E
Hawthorn 8	C	C	C	C	NA	C	E	NA	C	C	C	C	NA	C	C, E
Hawthorn 9	C	C	C	C	E	C	E	C	C	C	C	C	NA	C	C, E
Osawatomie	C	C	C	C	NA	NA	E	NA	C	C	C	C	NA	C	C, E
West Gardner Units 1 – 4	C	C	C	C	NA	NA	E	NA	C	C	C	C	NA	C	C, E
Northeast Units 11 – 18	C	C	NA	NA	NA	C	E	NA	C	C	C	C	NA	C	C, E

[1] The emerging regulation of coal fired boilers under 40 CFR 63 is also known as the Utility MACT.

[2] The emerging regulation of coal fired boilers under 40 CFR 63 is also known as the Industrial Boiler MACT.

C - Current Regulations
E - Emerging Regulations
NA - Not Applicable

Table 3. Water Regulatory Programs

Facility	40 CFR 112 Oil Pollution Prevention	40 CFR 122 EPA Administered Permit Programs: The National Pollutant Discharge Elimination System	40 CFR 125 Criteria and Standards for the National Pollutant Discharge Elimination System	40 CFR 131 Water Quality Standards	40 CFR 423 Steam Electric Power Generating Point Source Category
Coal Units					
Hawthorn 5A	C	C	C, E	C	C, E
Iatan 1	C	C	C, E	C	C, E
Iatan 2	C	C	C, E	C	C, E
La Cygne 1	C	C	C, E	C	C, E
La Cygne 2	C	C	C, E	C	C, E
Montrose 1	C	C	C, E	C	C, E
Montrose Comb. Stack 2 – 3	C	C	C, E	C	C, E
Gas and Oil Units					
Hawthorn 6	C	C	C, E	C	C, E
Hawthorn 7	C	NA	NA	NA	NA
Hawthorn 8	C	NA	NA	NA	NA
Hawthorn 9	C	C	C, E	C	C, E
Osawatomie	C	NA	NA	NA	NA
West Gardner Units 1 – 4	C	NA	NA	NA	NA
Northeast Units 11 – 18	C	NA	NA	NA	NA

C - Current Regulations
E - Emerging Regulations
NA - Not Applicable

**BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

DIRECT TESTIMONY OF

PAUL M. LING

**ON BEHALF OF
KANSAS CITY POWER & LIGHT COMPANY**

**IN THE MATTER OF THE PETITION OF
KANSAS CITY POWER & LIGHT COMPANY ("KCP&L")
FOR DETERMINATION OF THE RATEMAKING PRINCIPLES
AND TREATMENT THAT WILL APPLY TO THE RECOVERY
IN RATES OF THE COST TO BE INCURRED BY KCP&L FOR
CERTAIN ELECTRIC GENERATION FACILITIES
UNDER K.S.A. 66-1239**

DOCKET NO. 11-KCPE-____-PRE

Q: Please state your name and business address.

A: My name is Paul M. Ling. My business address is 1200 Main Street, Kansas City, Missouri 64105.

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

A: I am employed by Kansas City Power & Light Company ("KCP&L" or the "Company") as Manager – Environmental Services.

Q: What are your responsibilities?

A: My responsibilities include managing the environmental compliance, permitting, and policies of KCP&L.

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

A: I have a B.S. in Civil Engineering awarded in May 1992 from Iowa State University. I have an M.S. in Civil Engineering awarded in December 1994 from the University of

Kansas. I have an M.B.A. awarded in May 1997 from the University of Kansas. I have a J.D. awarded in August 2001 from the University of Kansas. I am a registered professional engineer in Missouri and Kansas and was employed by Black and Veatch for seven years designing generation facilities. I have been employed by KCP&L for the last nine years, for the first four years as an attorney, member of the Missouri and Kansas Bars, in the Legal Department and for the last five years as the manager of the Environmental Services Department.

Q: Have you previously testified in a proceeding before the Kansas Corporation Commission ("Commission" or "KCC") or any other utility regulatory agency?

A: No.

Q: What is the purpose of your testimony?

A: This testimony describes significant current environmental regulations and active initiatives surrounding proposed legislation and rulemakings that require or impact the proposed emission controls at the La Cygne Generating Station and support the need to install emission control technologies to reduce emissions from the La Cygne Generating Station. This includes the Regional Haze Agreement that KCP&L executed at the request of the Kansas Department of Health and Environment ("KDHE") for inclusion in the Kansas Regional Haze State Implementation Plan ("SIP") which requires the proposed equipment be installed at La Cygne Generating Station by no later than June 1, 2015. Additional testimony supporting the timing of these investments is provided by Mr. Scott Heidtbrink and Mr. Bob Bell. My testimony also responds to two of the questions posed by the Commission in Docket No. 11-GIME-492-GIE (the "492 Docket") as they relate to the La Cygne Generating Station. Specifically, I will address the following two questions from paragraph 8 of the Commission's January 27, 2011 Order:

(a) What Environmental Protection Agency ("EPA") and KDHE regulatory programs [current and emerging] apply to the La Cygne Generating Station? and

(b) What are the emission allowances for each unit?

Q: **To summarize your testimony, is it correct to say that the proposed emission control equipment for La Cygne Generating Station under consideration in this docket is (a) currently required by existing regulations, and (b) in addition, will likely be required by further regulations announced by EPA and anticipated to soon be effective?**

A: Yes. The proposed emission control equipment currently is required to be installed pursuant to the Region Haze Rule and the executed Regional Haze Agreement. In addition, as discussed throughout my testimony, there are various expected actions, including finalization of several rules currently proposed or announced and under review, enactment of legislation currently being discussed, and approval by the EPA of the pending recommendations of National Ambient Air Quality Standards ("NAAQS") non-attainment of the Kansas City area, that will require the installation of some or all of this proposed emission control equipment in the near future even absent the Regional Haze Rule.

Q: **Is it also correct to say that a Kansas state agency, namely KDHE, specifically requested an agreement from KCP&L to implement the environmental controls under consideration in this docket for compliance with the Regional Haze Rule on a**

specific schedule regardless of the statutes or outcome of other existing or proposed environmental regulations?

A: Yes. The resulting agreement, the Regional Haze Agreement with KDHE, is discussed in my testimony.

I. CURRENT ENVIRONMENTAL REGULATIONS

Q: What are the current environmental regulations that affect the La Cygne Generating Station?

A: There are three significant regulations currently affecting the La Cygne Generating Station: (1) the Regional Haze Rule, (2) the NAAQS, and (3) the Acid Rain Program.

A. REGIONAL HAZE RULE

Q: What is the Regional Haze Rule?

A: Under the 1999 Regional Haze Rule, states are required to set periodic goals for improving visibility in the 156 natural areas in the United States. As states work to reach these goals, they must develop Regional Haze implementation plans that contain enforceable measures and strategies for reducing visibility-impairing pollution.

The pollutants that reduce visibility include fine particulate matter ("$PM_{2.5}$"), and compounds which contribute to $PM_{2.5}$ formation, such as nitrogen oxides ("NOx"), sulfur dioxide ("SO_2"), and, under certain conditions, volatile organic carbons ("VOCs") and ammonia.

States were to develop their implementation plans by December 2007. States were to identify the facilities that would have to reduce emissions under BART and then set BART emissions limits for those facilities.

In June 2005, the EPA finalized amendments (also referred to as the Best Available Retrofit Technology ("BART") Rule) to the 1999 Regional Haze Rule. These amendments apply to the provisions of the Regional Haze Rule that require emission controls known as best available retrofit technology, or BART, be installed for industrial facilities emitting air pollutants that reduce visibility by causing or contributing to regional haze.

The BART requirements of the Regional Haze Rule apply to facilities built between 1962 and 1977 that have the potential to emit more than 250 tons a year of visibility-impairing pollution. Those facilities fall into 26 categories, including utility and industrial boilers, and large industrial plants such as pulp mills, refineries and smelters.

Q: How does the Regional Haze Rule affect the La Cygne Generating Station?

A: The Regional Haze Rule directs state air quality agencies (KDHE for Kansas) to identify whether visibility-reducing emissions from sources subject to BART are below limits set by the state or whether retrofit measures are needed to reduce emissions. It also directs these agencies to file Regional Haze SIPs with the EPA for approval.

Q: Has KDHE complied with these requirements?

A: Yes. KDHE determined La Cygne Generating Station Units 1 and 2 were BART-eligible units subject to BART requirements and required a full BART analysis be performed on these units. KCP&L timely submitted the BART analysis covering both units in August 2007. From the BART analysis, KDHE determined both Units 1 and 2 currently complied with the presumptive BART limits based on KDHE's BART guidance.

KDHE determined to negotiate agreements with the owners of Kansas facilities subject to BART and approached KCP&L to negotiate an agreement regarding the La Cygne Generating Station. KCP&L and Westar each executed Regional Haze Agreements for their respective BART-eligible facilities at the request of KDHE. KCP&L as the operator of La Cygne Generating Station, executed the agreement for that facility. The agreements contain the applicable emission limits, compliance schedules, and monitoring requirements. KDHE incorporated these executed Regional Haze Agreements into the Kansas Regional Haze SIP.

The KDHE held a hearing regarding the proposed Kansas Regional Haze SIP in August 2008. KDHE received comments and held a second hearing in August 2009. KDHE submitted the Regional Haze SIP for approval to EPA in October 2009. Compliance with the SIP is required no later than five years after the date of EPA approval, but as indicated in this testimony, the Regional Haze Agreement with KDHE requires KCP&L to install the proposed emission controls at La Cygne Generating Station no later than June 1, 2015.

KDHE is required to revise its Regional Haze SIP by 2018, and every ten years thereafter. Future BART progress goals in these revised Kansas Regional Haze SIPs could require further reductions in SO_2, NOx and fine particulate matter emissions from the proposed emission controls at La Cygne Generating Station.

Q: Please describe the Regional Haze Agreement executed by KCP&L and KDHE.

A: KDHE requested the execution of Regional Haze Agreements for all the BART-eligible facilities in Kansas for inclusion in their Regional Haze SIP. KCP&L and KDHE executed a Regional Haze Agreement regarding La Cygne Generating Station in

November 2007 incorporating limits for stack PM emissions, as well as limits for NOx and SO_2 emissions that complied with the presumptive limits under BART. KCP&L further agreed to use its best efforts to install emission control technologies to reduce those emissions from the La Cygne Generating Station prior to the required compliance date under BART, but in no event later than June 1, 2015.

Q: Why did KCP&L agree to execute the Regional Haze Agreement with KDHE?

A: As described above, KDHE determined La Cygne Generating Station Units 1 and 2 were BART-eligible and required presumptive emission limits to be met by the units. KDHE approached KCP&L to negotiate and ultimately executed an agreement that contained the BART requirements for inclusion in their Regional Haze SIP.

Q: What is the impact of the Collaboration Agreement that KCP&L executed on the Regional Haze Agreement?

A: In March 2007, KCP&L, the Sierra Club and the Concerned Citizens of Platte County entered into a Collaboration Agreement. In the Collaboration Agreement, KCP&L agreed to seek a consent agreement, which it has done through the Regional Haze Agreement, with the KDHE incorporating limits for stack PM emissions, as well as limits for NOx and SO_2 emissions at the La Cygne Generation Station that will be below the presumptive limits under BART. KCP&L further agreed to use its best efforts to install emission control technologies to reduce those emissions from its La Cygne Generating Station prior to the required compliance date under BART, but in any event no later than June 1, 2015.

Q: What additional emission controls are required for the La Cygne Generating Station to comply with the Regional Haze Rule?

A: KCP&L will install (1) low NOx burners and selective catalytic reduction technologies ("SCR") on Unit 2 to remove NOx; (2) scrubbers on both Units 1 and 2 to remove SO_2; (3) additional and/or upgraded particulate removal equipment on both Units 1 and 2; and (4) along with various associated support equipment, including but not limited to, (i) new dual flue stack; (ii) induced draft fans; (iii) emergency generator and pump; and (iv) ash, gypsum and limestone storage and handling equipment.

B. <u>NATIONAL AMBIENT AIR QUALITY STANDARDS</u>

Q: What is the NAAQS?

A: The Clean Air Act ("CAA") requires the EPA to establish NAAQS for six common air pollutants. These commonly found air pollutants (also known as "criteria" pollutants) are (1) particulate matter ("PM"); (2) ground-level ozone; (3) nitrogen dioxide ("NO_2"); (4) SO_2; (5) lead; and (6) carbon monoxide ("CO"). The EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called the primary standard. Another set of limits intended to prevent environmental and property damage is called the secondary standard. Based on information and recommendations supplied by the states, the EPA classifies areas of the country as (i) "attainment" areas (*i.e.*, locations in which air quality is in compliance with NAAQS), and (ii) "non-attainment" areas (*i.e.*, locations where air quality fails to meet the standard for one or more criteria air pollutants). A finding that an area is in non-attainment requires development of a plan, called a Maintenance Plan, to bring the area into compliance with the NAAQS. The CAA delegates to the states the responsibility for developing and implementing compliance plans. In Kansas, the administering agency is the KDHE.

(1) <u>PM NAAQS</u>

Q: What is the PM NAAQS?

A: The EPA revised the air quality standards for PM in 2006. The 2006 standards tightened the 24-hour fine particulate matter ("$PM_{2.5}$") emission standard from 65 micrograms per cubic meter ("$\mu g/m^3$") to 35 $\mu g/m^3$, and retained the annual fine particulate matter emission standard at 15 $\mu g/m^3$. The EPA retained the existing 24-hour course particle ("PM_{10}") standard of 150 $\mu g/m^3$ but revoked the annual PM_{10} standard. Ambient air particulate particles are currently measured by a state operated monitoring network with monitors across the state. In February 2009, the United States Court of Appeals for the District of Columbia Circuit granted petitions for review of the revised primary and secondary annual fine particulate matter standards and remanded the matter to the EPA for reconsideration. The EPA currently anticipates issuing a revised proposed PM rule in February 2011 and a final rule by October 2011.

Q: Is the Kansas City area currently in attainment of the PM NAAQS?

A: Yes. The Kansas City area is currently in attainment of the 2006 PM NAAQS. No additional environmental controls currently are needed at the La Cygne Generating Station to comply with this standard. It is not yet known whether the Kansas City area will be designated as in attainment of the revised standard set to be proposed and finalized by EPA in 2011.

(2) OZONE NAAQS

Q: What is the Ozone NAAQS?

A: Ground-level ozone is not emitted directly into the air, but is created by chemical reactions between NOx and volatile organic compounds ("VOCs") in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOCs. Ground-level ozone is measured at various monitoring stations in and around the Kansas City metropolitan area to determine compliance with this standard. The 1997 primary and secondary standards are identical: an 8-hour standard of 0.08 parts per million ("ppm"). In practice, because of rounding, an area meets the standard if ozone levels are 0.084 ppm or lower.

In March 2008, the EPA significantly strengthened the NAAQS for ground-level ozone. The EPA's final rule revised both ozone standards: the primary standard, designed to protect human health; and the secondary standard, designed to protect welfare (such as vegetation and crops). The EPA set the primary standard to a level of 0.075 ppm. The EPA also strengthened the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard.

In January 2010, the EPA proposed to strengthen the 2008 NAAQS for ground-level ozone yet again. The EPA is proposing to strengthen the 8-hour "primary" ozone standard, designed to protect public health, to a level within the range of 0.060-0.070 ppm. The EPA is also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. The EPA is proposing to set the level of the secondary standard within the range of 7-15 ppm-hours. The proposed revisions result from a reconsideration of the identical primary and secondary ozone standards set at 0.075 ppm in 2008. The EPA intends to complete this reconsideration of the 2008 ozone NAAQS by July 29, 2011.

Q: Is the Kansas City area currently in attainment of the Ozone NAAQS?

A: Yes. The Kansas City area is currently in attainment of the 1997 Ozone NAAQS; however, there is a recommendation pending at the EPA indicating the Kansas City area should be placed in non-attainment of the 2008 Ozone NAAQS. In addition, until the 2011 Ozone NAAQS is finalized and designations determined, it is unknown if the Kansas City area will be in attainment of the 2011 Ozone NAAQS. Currently, no additional environmental controls are needed at the La Cygne Generating Station to comply with the 1997 Ozone NAAQS, but if additional phases of the 1997 Ozone NAAQS Maintenance Plan are triggered, or if a non-attainment designation of the 2008 or 2011 Ozone NAAQS is determined, additional environmental controls could be required.

Q: Please explain.

A: In June 2007, monitor data indicated that the Kansas City area violated the primary 8-hour 1997 Ozone NAAQS. Missouri and Kansas implemented the Phase 1 responses established in their respective Maintenance Plans for control of ozone. Kansas has not yet implemented Phase 2 of the Maintenance Plan which could require NOx reduction at additional sources yet to be identified. The EPA has various options over and above the implementation of the maintenance plans for control of ozone to address the violation but has not yet acted to impose any additional options.

In 2008, KDHE released a proposed recommendation that the Kansas City area violated the 2008 8-hour Ozone NAAQS based on the 2006-2008 ozone monitoring data. The proposed boundaries for the 8-hour ozone non-attainment areas in Kansas City include the following Kansas counties: Johnson and Wyandotte. KDHE accepted comments on the recommendation, and then submitted its recommendation to the EPA in March 2009. The EPA has not yet acted on KDHE's recommendation as the standards in question are currently under review as noted above. The Kansas City area is considered in attainment unless and until the EPA confirms KDHE's recommendation or a subsequent designation recommendation.

Also in January 2010, the EPA extended the deadline for designating areas as non-attainment under the March 2008 NAAQS for ground-level ozone. Both KDHE and the Missouri Department of Natural Resources ("MDNR") had already proposed Kansas City area counties as non-attainment under the 2008 ozone standard.

(3) <u>NO_2 NAAQS</u>

Q: What is the NO_2 NAAQS?

A: In January 2010, the EPA strengthened the health-based NAAQS for NO_2. The EPA set a new one-hour NO_2 standard at the level of 100 parts per billion ("ppb"). EPA retained, with no change, the current annual average NO_2 standard of 53 ppb. All areas of the country presently meet the current standard. The annual average NO_2 concentrations range from approximately 10-20 ppb across the country.

To determine compliance with the new standard, the EPA is establishing new ambient air monitoring and reporting requirements for NO_2. In urban areas, monitors are required near major roads as well as in other locations where maximum concentrations are expected. All new NO_2 monitors must begin operating no later than January 2013. These changes will not affect the secondary NO_2 standard, set to protect public welfare. The EPA is considering the need for changes to the secondary standard under a separate review.

Q: Is the Kansas City area currently in attainment of the NO_2 NAAQS?

A: Yes. The Kansas City area is currently in attainment of the NO_2 NAAQS. It is not yet known whether the Kansas City area will be designated as in attainment of the 2010 NO_2 NAAQS revised standard. States are required to submit non-attainment area recommendations for the 2010 NO_2 NAAQS this year. EPA will designate areas as "unclassifiable" until the new ambient air monitoring is full deployed. Currently, no additional environmental controls are needed at the La Cygne Generating Station to comply with this standard.

(4) <u>SO_2 NAAQS</u>

Q: What is the SO_2 NAAQS?

A: In June 2010, the EPA strengthened the primary NAAQS for SO_2. The EPA revised the primary SO_2 standard, designed to protect public health, to 75 ppb measured over one hour. The EPA revoked the two existing primary standards of 140 ppb measured over 24 hours, and 30 ppb measured over an entire year. The EPA is also considering the need for changes to the secondary standard under a separate review.

Q: Is the Kansas City area currently in attainment of the SO_2 NAAQS?

A: Yes. The Kansas City area is currently in attainment of the SO_2 NAAQS. It is not yet known whether the Kansas City area will be designated as in attainment of the 2010 SO_2 NAAQS revised standard; although, the Kansas City area is anticipated to be designated non-attainment based upon existing monitoring data. States are required to submit non-attainment area recommendations for the 2010 SO_2 NAAQS this year. Currently, no additional environmental controls are needed at the La Cygne Generating Station to comply with this standard, but a future non-attainment designation of the 2010 SO_2 NAAQS could require additional environmental controls.

(5) <u>LEAD NAAQS</u>

Q: What is the Lead NAAQS?

A: In October 2008, the EPA substantially strengthened the NAAQS for lead. The EPA revised the level of the primary standard from 1.5 micrograms per cubic meter ($\mu g/m^3$), to 0.15 $\mu g/m^3$, measured as total suspended particulates. The EPA revised the secondary standard to be identical in all respects to the primary standard.

Q: Is the Kansas City area currently in attainment of the lead NAAQS?

A: Yes. The Kansas City area is currently in attainment of the lead NAAQS based on existing ambient air monitoring. The states are required to install additional ambient air monitoring in the coming years that may impact the attainment status of the Kansas City area. Currently, no additional environmental controls are needed at the La Cygne Generating Station to comply with this standard.

(6) <u>CO NAAQS</u>

Q: What is the CO NAAQS?

A: EPA has proposed and indicated it will finalize a CO NAAQS this year.

Q: Is the Kansas City area currently in attainment of the CO NAAQS?

A: Yes. The Kansas City area is currently in attainment of the CO NAAQS. It is not yet known whether the Kansas City area will be designated as in attainment of the standard proposed and anticipated to be finalized by EPA in 2011. Currently, no additional environmental controls are needed at the La Cygne Generating Station to comply with this standard.

Q: How does NAAQS affect the La Cygne Generating Station?

A: A finding that an area is in non-attainment requires development of a plan to bring the area into compliance with the NAAQS standards. For the Kansas City areas in Kansas deemed in non-attainment, KDHE has responsibility for development of such a plan. As part of the plan, KDHE may require the installation of emission control equipment on certain power plants such as the La Cygne Generating Station or other emission sources if such equipment is not already in place. Currently, the counties in KCP&L's Kansas and Missouri service territories are all in attainment of the NAAQS. Notably, a violation and non-attainment designation has been recommended regarding ozone, but currently no action has been taken by the EPA.

Q: How does the ozone NAAQS violation affect the La Cygne Generating Station?

A: The Maintenance Plans for the Control of Ozone for the Kansas City area were submitted by KDHE and MDNR and approved by the EPA in July 2007. The plans cover both Missouri and Kansas sources affecting the Kansas City metropolitan area and include contingency control measures that go into effect if associated triggers (such as a violation of the 8-hour ozone standard) occur.

In June 2007, the Kansas City area violated the 8-hour ozone NAAQS. Missouri has implemented the Phase I contingency measures established in its Maintenance Plan for control of ozone. The Phase I trigger required early implementation of Clean Air Interstate Rule ("CAIR") NOx controls at Iatan Unit 1 and the Sibley Station units. The installation of the NOx controls at these units is complete and the controls are in operation.

If Phase II of the Kansas Maintenance Plan is triggered by continued high ozone values, it would require additional emission controls to be implemented within two years following the end of the ozone season that triggered the Phase II contingency measure. The consequence of the Phase II trigger of the Kansas Maintenance Plan is additional NOx controls at La Cygne Unit 2. Phase II has not yet been triggered.

Q: **How does the ozone NAAQS recommended non-attainment designation affect the La Cygne Generating Station?**

A: In March 2009, both KDHE and MDNR made non-attainment recommendations for ozone NAAQS for Kansas City metropolitan counties. By 2013, states must submit SIPs outlining how states will reduce ozone to meet the standards in non-attainment areas. In January 2010, the EPA proposed to strengthen the NAAQS for ground-level ozone.

In consideration of the above, the Kansas City metropolitan area is likely to be in non-attainment for ozone within the next few years. In developing compliance plans, the largest emission sources are usually targeted for reductions first because of the economic advantage of such additional emission controls. Therefore, non-attainment will likely make the La Cygne Generating Station subject to more stringent NOx emission requirements. This will likely require the installation of the NOx emission control equipment included as part of the proposed environmental upgrades to the La Cygne Generating Station under consideration in this docket (assuming that at the point attainment/non-attainment status is determined, such equipment is not already completed pursuant to other regulations discussed in this testimony).

C. ACID RAIN PROGRAM

Q: What is the Acid Rain Program?

A: Acid rain occurs when SO_2 and NOx, emissions are transformed in the atmosphere to acids and are returned to the ground in the form of rain and dust. The Acid Rain Program was established in Title IV of the 1990 amendments to the CAA to reduce emissions that cause this phenomenon. Title IV establishes a nationwide cap on electric utility SO_2 emissions, implemented through an emission trading system.

Under this system, the EPA annually assigns a specified number of SO_2 allowances to each emitter that can be used that year or any year thereafter. For each such allowance, the allowance holder has the right to emit one ton of SO_2. Allowances are like land, there is a fixed quantity available, but they are tradable and there is a secondary market for them.

At the end of each year, each emitting unit must have enough allowances to cover its emissions for that year. Operators of units that are anticipated to emit SO_2 in excess of their allowances must acquire additional allowances to meet the excess or pay a penalty to the EPA.

In addition to the cap on SO_2 emissions, the Acid Rain Program requires extensive monitoring and reporting of plant emissions, requires Acid Rain Permits, establishes a system-wide NOx emission rate limit for coal-fired generating units, and requires the installation, operation, calibration, and annual certification of continuous emission monitors.

Q: How does the Acid Rain Program affect the La Cygne Generating Station?

A: The La Cygne Generating Station will need to continue to maintain Acid Rain Program allowances for SO_2 emissions. KCP&L and Westar must each provide sufficient allowances annually for their individual shares of generation from the Station. The environmental control investment under consideration in this docket includes stack monitoring costs required by the Acid Rain Program.

II. OTHER LEGISLATION AND EPA RULEMAKINGS

Q: What other air quality initiatives may ultimately require the proposed emission controls at the KCP&L La Cygne Generating Station?

A: Other proposed legislation or the EPA rulemaking initiatives may ultimately require the proposed emission controls at the La Cygne Generating Station including (1) multi-pollutant legislation, (2) utility Maximum Achievable Control Technology ("MACT") Rule, and (3) the proposed Transport Rule which is designed to replace the CAIR. There are also utility waste regulations that affect the plant.

A. MULTI-POLLUTANT LEGISLATION

Q: What is multi-pollutant legislation?

A: In April 2010, a draft of the Clean Air Act Amendments of 2010 ("CAAA") was circulated for comment. It establishes more stringent SO_2 and NOx caps when compared to the CAIR, including a two-zone program for NOx. It directs the EPA to establish new allowance program rules for auctioning allowances; not allowing use of existing Acid Rain Program allowances for compliance. The draft CAAA directs the EPA to regulate mercury emissions, setting a minimum 90% reduction level starting no later than 2015.

The draft CAAA has been discussed as a potential amendment to climate change legislation.

Q: What is the potential impact of multi-pollutant legislation on the La Cygne Generating Station?

A: The proposed compliance pace and stringency of this draft CAAA reduction program or other similar legislation would be challenging. Zone 2 would include Kansas for the first time in a NOx program. The stringency of the draft CAAA may require the proposed emission controls at the La Cygne Generating Station if the controls are not already completed pursuant to other regulations discussed in this testimony.

B. UTILITY MACT RULE

Q: What is the EPA's proposed utility MACT rule?

A: In December 2000, the EPA announced its finding that it was "appropriate and necessary" to regulate coal- and oil-fired electric utilities under the CAA. This finding, known as the Utility Air Toxics Determination, triggered a requirement for the EPA to propose regulations to control air toxics emissions, including mercury, from these facilities.

In January 2004, the EPA proposed a rule with two basic approaches for controlling mercury from power plants. One approach would require power plants to meet emissions standards reflecting the application of the MACT determined according to the procedure set forth in CAA. A second approach proposed by the EPA would create a market-based cap and trade program.

The January 2004 EPA proposed rule also proposed to revise the EPA's December 2000 finding that it is "appropriate and necessary" to regulate utility hazardous air emissions using the MACT standards provisions in the CAA. This action would give the EPA the flexibility to consider a more efficient and more cost-effective way to control mercury emissions.

In March 2005, the EPA issued the final Clean Air Mercury Rule ("CAMR"), which builds on the EPA's CAIR to significantly reduce mercury emissions from coal-fired power plants. When fully implemented, these rules would reduce utility emissions of mercury from 48 tons a year to 15 tons, a reduction of nearly 70 percent.

The CAMR established "standards of performance" limiting mercury emissions from new and existing utilities and created a market-based cap-and-trade program that will reduce nationwide utility emissions of mercury in two distinct phases. In the first phase, due by 2010, emissions will be reduced by taking advantage of "co-benefit" reductions – that is, mercury reductions achieved while reducing SO_2 and NOx under the CAIR. In the second phase, due in 2018, utilities will be subject to a second cap, which will reduce emissions to 15 tons upon full implementation.

In May 2006, the EPA issued its determination that regulation of electric utility steam generating units under the CAA was neither necessary nor appropriate.

In February 2008, the United States Court of Appeals for the D.C. Circuit vacated the EPA's rule removing power plants from the CAA list of sources of hazardous air pollutants. At the same time, the court vacated the CAMR. In May 2008, petitions for rehearing of the matter by the full court were denied. In February 2009, an appeal to the Supreme Court was denied.

In December 2008, environmental groups filed a petition asking the D.C. Circuit Court to compel the EPA to promulgate final regulations to regulate hazardous air pollutants ("HAP") under a MACT standard. In April 2010, in a court-approved settlement agreement, the EPA agreed to develop proposed MACT standards for mercury and potentially other hazardous air pollutant emissions by March 2011 and final standards by November 2011.

Q: What is the potential impact of the EPA's proposed utility MACT rule on the La Cygne Generating Station?

A: A final rule issued by November 2011 will require implementation by about 2015 unless extensions are granted. This will likely include mercury but also could include other HAPs like hydrochloric acid, hydrogen fluoride, etc. The requirements of the final rule may require the proposed emission controls on La Cygne Generating Station if not already completed pursuant to other regulations discussed in this testimony.

C. EPA TRANSPORT RULE

Q: What is the EPA's proposed Transport Rule which is to replace the CAIR rule?

A: In March 2005, the EPA issued the CAIR which did not apply to Kansas. In July 2008, the United States Court of Appeals for the D.C. Circuit vacated CAIR in its entirety and remanded the matter to the EPA to promulgate a new rule consistent with its opinion. The EPA and others sought rehearing of the Court's decision. On December 23, 2008, the Court denied all petitions for rehearing and issued an order remanding the CAIR to the EPA to revise the rule consistent with its July 2008 order instead of vacating the rule.

In July 2010, the EPA proposed the Transport Rule to replace the CAIR. The Transport Rule, like CAIR, will require the states within its scope to reduce power plant SO_2 and NOx emissions that contribute to ozone and fine particle nonattainment in other states. The geographical scope of the Transport Rule is broader than CAIR, and includes

Kansas in addition to Missouri and other states. The Transport Rule also would impose more stringent emissions limitations than CAIR and, unlike CAIR, would not utilize Acid Rain Program allowances for compliance. The EPA is proposing a preferred approach and is taking comment on two alternatives. In the EPA's preferred approach, the EPA would set an emissions budget for each of the affected states and the District of Columbia. The preferred approach would allow limited interstate emissions allowance trading among power plants; however, it would not permit trading of SO_2 allowances between the KCP&L's Kansas and Missouri power plants. In the first alternative, the EPA is proposing to set an emissions budget for each state and allow emissions allowance trading only among power plants within a state. In the second alternative, the EPA is proposing to set an emissions budget for each state, specify the allowable emission limit for each power plant and allow some averaging. Compliance with the Transport Rule would begin in 2012, with additional reductions in SO_2 allowances allocable to the KCP&L's Missouri power plants taking effect in 2014 pursuant to the preferred approach. There is no such additional reduction in SO_2 allowances allocable to the KCP&L's Kansas power plants.

In September 2010, October 2010, and January 2011, the EPA supplemented the record supporting the proposed Transport Rule. The EPA made available additional information relevant to the rulemaking, including, among other things, an updated version of the power sector modeling that the EPA proposes to use to support the final rule and two allowance allocation methods for EPA's preferred approach.

Q: What is the potential impact of the EPA's proposed Transport Rule on La Cygne Generating Station?

A: The proposed Transport Rule is complex and contains alternative approaches. The EPA has indicated they intend to issue the final Transport Rule in mid-2011. KCP&L is unable to predict the actual requirements until the rule is finalized. Preliminary analysis of the Transport Rule has raised various questions regarding the emission allowances allocation to, and the allowable emission rates for, KCP&L's power plants pursuant to the preferred approach and alternatives. KCP&L projects that it may not be allocated sufficient SO_2 or NOx emissions allowances to cover their currently expected operations starting in 2012 pursuant to the preferred approach. Any shortfall in allocated allowances would need to be addressed through permissible allowance trading, installing additional emission control equipment, changes in plant operation, purchasing additional power in the wholesale market, or a combination of these and other alternatives. The requirements of the final rule may require the proposed emission controls on La Cygne Generating Station if not already completed pursuant to other regulations discussed in this testimony.

D. UTILITY WASTE REGULATIONS

Q: How do the utility waste regulations affect the La Cygne Generating Station?

A: KCP&L generates utility "waste" known as coal combustion products ("CCPs") from the generation of electricity. The proposed emission control equipment collects the CCPs. While the regulations define CCPs as waste, many CCPs have beneficial and productive uses.

Q: What is the EPA's proposed coal combustion residuals rule?

A: In May 2010, the EPA proposed to regulate coal combustion residuals ("CCRs") under the Resource Conservation and Recovery Act ("RCRA") to address the risks from the disposal of CCRs generated from the combustion of coal at electric generating facilities. The EPA is considering two options in this proposal. Under the first proposal, the EPA would regulate CCRs as special wastes subject to regulation under subtitle C of RCRA, when they are destined for disposal in landfills or surface impoundments. Under the second proposal, the EPA would regulate disposal of CCRs under subtitle D of RCRA.

Q: What is the potential impact of the EPA's proposed CCRs rule on the La Cygne Generating Station?

A: KCP&L cannot determine the impacts of the EPA's proposed CCRs rule until an option is selected by the EPA and the final regulation is enacted. Both the subtitle C and D regulatory options proposed would require: (i) liner systems for new landfills and surface impoundments; (ii) surface impoundment design, operation, and inspection programs; (iii) location restrictions for disposal facilities; and (iv) groundwater monitoring. Under both options, existing surface impoundments would need to be retrofitted with a liner or close within seven years. To close the surface impoundments would require the conversion from wet handling to dry handling of CCRs for disposal in a dry landfill. Currently, the La Cygne Generating Station Unit 1 scrubber discharges a slurry to a surface impoundment. The requirements of the final rule may require the proposed emission controls, which include dry handling of CCRs from the proposed scrubbers, on the La Cygne Generating Station if not already completed pursuant to other regulations discussed in this testimony.

III. SELECTION OF PROPOSED EMISSION CONTROL EQUIPMENT

Q: What input did you provide in the selection of the proposed emission control equipment for the La Cygne Generating Station?

A: I provided some of the selection decision parameters including existing permit emission limits and conditions. In addition, I provided the emission limits for compliance with the Regional Haze Rule that are documented in our Regional Haze Agreement. I also provided potential emission limits and requirements due to the other rulemakings discussed in this testimony. All of these parameters were inputs into the decision of which control equipment was viable for compliance with the near-term emission requirement along with the ability to potentially comply with reasonably foreseeable future emission requirements.

IV. 492 DOCKET

Q: What EPA and KDHE regulatory programs [current and emerging] apply to the La Cygne Generating Station?

A: In addition to the regulations provided above, the following are some other additional regulatory programs that apply to the La Cygne Generating Station.

Waste Regulatory Programs

- State delegated Resource Conservation and Recovery Act ("RCRA"), 40 CFR Subtitle D, regulates landfills receiving CCPs which are currently considered nonhazardous and pass the EPA guidelines for being nonhazardous.
- The RCRA hazardous waste regulations, 40 CFR 260, regulates hazardous waste disposal.

- The Emergency Planning and Community Right to Know Act ("EPCRA"), 40 CFR 372, is a public awareness program aimed at first responders in emergencies. Regulated chemicals above threshold amounts kept on site are annually submitted to the state regulators and to the emergency response groups that would respond to a specific location.

Air Regulatory Programs

- Compliance Assurance Monitoring, 40 CFR 64, requires additional monitoring of pollution control equipment operating parameters to ensure continuous compliance with pollutant-specific emission limits.
- Chemical Accident Prevention Provisions, 40 CFR 68, is applicable to an owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process. Part 68 sets forth the list of regulated substances and thresholds and the requirements for owners or operators of stationary sources concerning the prevention of accidental releases.
- State Operating Permit Programs, 40 CFR 70, requires all facilities with an annual potential to emit above certain thresholds to obtain a state operating permit. Part 70 operating permits contain all of the applicable air quality requirements (both state and federal) for a particular facility and must be revised as necessary and renewed every five years.
- Protection of Stratospheric Ozone, 40 CFR 82, regulates certain controlled substances including chlorofluorocarbons ("CFCs"), hydrochlorofluorocarbon ("HCFC") refrigerants, halons, carbon tetrachloride, and methyl chloroform.

Part 82 requires recordkeeping of maintenance and calculation of leak rates for CFC and HCFC-containing equipment.

- Mandatory Reporting of Greenhouse Gases, 40 CFR 98, requires tracking and annual reporting of various greenhouse gases ("GHG"). Beginning with emissions occurring in 2010, all facilities required to report carbon dioxide ("CO_2") under the Acid Rain Program as well as other facilities with actual CO_2 equivalent (CO_2e) emissions above 25,000 tons per year must report their annual GHG emissions.
- The Industrial Boiler MACT, a subpart of 40 CFR 63, will regulate emissions of HAP from non-electric generating boilers such as auxiliary or steam boilers. It will affect all industrial boilers, regardless of installation or construction date.
- New Source Review ("NSR"), 40 CFR 52.21, now requires new and modified sources of GHG to undergo Prevention of Significant Deterioration ("PSD") construction permitting for GHG in addition to the other NSR regulated pollutants. PSD permitting includes an evaluation of the best available control technology for GHG emissions.
- New Source Performance Standards ("NSPS"), Clean Air Act Section 111(b) and (d), are emission requirements for new, modified, and existing electrical generating units. EPA has entered into a settlement agreement to revise the existing standards and develop new standards which will include GHG emissions for the first time.

Water Regulatory Programs

- Oil Pollution Prevention, 40 CFR 112, establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore facilities into or upon the navigable waters of the United States. Requires facilities with an oil storage capacity of 1,320 gallons or more to prepare and implement a Spill Prevention, Control, and Countermeasure ("SPCC") Plan. In addition, facilities with an oil storage capacity of 1 million gallons or more are required to prepare and implement a Facility Response Plan.
- EPA Administered Permit Programs: The National Pollutant Discharge Elimination System, 40 CFR 122, implements the National Pollutant Discharge Elimination System ("NPDES") Program. Any person who discharges or proposes to discharge pollutants except persons covered by general permits must comply.
- Criteria and Standards for the National Pollutant Discharge Elimination System, 40 CFR 125, establishes criteria and standards for the imposition of technology-based treatment requirements in permits under section 301(b) of the Act, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under section 402(a)(1) of the Act. 40 CFR 125.90 establishes requirements that apply to the location, design, construction, and capacity of cooling water intake structures at existing facilities that are subject to this subpart (*i.e.*, Phase II existing facilities). The purpose of these requirements is to establish the best technology available for minimizing

adverse environmental impact associated with the use of cooling water intake structures. EPA will soon be proposing regulations for existing facilities.

- Water Quality Standards, 40 CFR 131, describes the requirements and procedures for developing, reviewing, revising, and approving water quality standards by the states as authorized by section 303(c) of the Clean Water Act. Compliance with these standards is incorporated into NPDES Permits.
- Steam Electric Power Generating Point Source Category, 40 CFR 423, establishes provisions applicable to discharges resulting from the operation of a generating unit by a facility primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. 40 CFR 423.12 establishes effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available. EPA is reviewing these effluent guidelines and plans to update soon.

Q: What are the emission allowances for La Cygne Units 1 and 2?

A: La Cygne Generating Station Units 1 and 2 receive an allocation of SO_2 allowances each year pursuant to the Acid Rain Program. Unit 1 received 14,405 and Unit 2 received 15,087 annual SO_2 allowances under the Acid Rain Program for 2010. In addition, annual allowances are withheld from each facility for purpose of the EPA annual auction held each year in March. The proceeds from the sale of these allowances at auction, or any allowances not sold are returned to each facility. In 2010, the withheld annual SO_2

allowances for both Units were not returned but the Units received the proceeds from the sale.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Petition of Kansas City Power & Light Company ("KCP&L") for Determination of the Ratemaking Principles and Treatment that Will Apply to the Recovery in Rates of the Cost to be Incurred by KCP&L for Certain Electric Generation Facilities Under K.S.A. 2003 SUPP. 66-1239	)	**Docket No. 11-KCPE-____-PRE**

AFFIDAVIT OF PAUL LING

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Paul Ling, being first duly sworn on his oath, states:

1. My name is Paul Ling. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Manager of Environmental Services.

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 (30) pages, 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 swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereof, are true and accurate to the best of my knowledge, information and belief.

Paul Ling

Subscribed and sworn before me this 1st day of February 2011.

Notary Public

My commission expires: May 23, 2014

DONNA J. STOWAY
Notary Public, Notary Seal
State of Missouri
Clay County
Commission # 10889620
My Commission Expires May 23, 2014

Table 4. Emission Allowances

Facility	CAIR Annual NOx	CAIR Ozone Season NOx	Acid Rain Program Annual SO2	SO2 Allowances Withheld For Auction
Coal Units				
Hawthorn 5A	3,294	1,469	12,309	356
Iatan 1	3,990	1,314	16,236	470
Iatan 2	0	0	0	0
La Cygne 1	NA	NA	14,405	416
La Cygne 2	NA	NA	15,087	436
Montrose 1	911	408	3,194	90
Montrose Comb. Stack 2 – 3	1,889	849	7,897	224
Gas and Oil Units				
Hawthorn 6	31	25	0	0
Hawthorn 7	18	13	0	0
Hawthorn 8	16	11	0	0
Hawthorn 9	69	62	0	0
Osawatomie	NA	NA	0	0
West Gardner Units 1 – 4	NA	NA	0	0
Northeast Units 11 – 18	34	23	NA	NA

ATTACHMENT c-1

THIS DOCUMENT CONTAINS CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC ORIGINAL FILED UNDER SEAL

ATTACHMENT e-1

THIS DOCUMENT CONTAINS CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC ORIGINAL FILED UNDER SEAL

PUBLIC VERSION
Certain Schedules Attached to this Testimony
Contain "Confidential" or "Confidential-Restricted"
Information and Have Been Removed.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

DIRECT TESTIMONY OF

WM. EDWARD BLUNK

ON BEHALF OF
KANSAS CITY POWER & LIGHT COMPANY

IN THE MATTER OF THE PETITION OF
KANSAS CITY POWER & LIGHT COMPANY ("KCP&L")
FOR DETERMINATION OF THE RATEMAKING PRINCIPLES
AND TREATMENT THAT WILL APPLY TO THE RECOVERY
IN RATES OF THE COST TO BE INCURRED BY KCP&L FOR
CERTAIN ELECTRIC GENERATION FACILITIES
UNDER K.S.A. 66-1239

DOCKET NO. 11-KCPE-____-PRE

Q: Please state your name and business address.

A: My name is Wm. Edward Blunk. My business address is 1200 Main Street, Kansas City, Missouri 64105.

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

A: I am employed by Kansas City Power & Light Company ("KCP&L" or the "Company") as Supply Planning Manager.

Q: What are your responsibilities?

A: My primary responsibilities are to facilitate the development and implementation of fuel purchase and risk management strategies.

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 KCP&L 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 the position of Supervisor, Fuel Planning in 1984. In 2007, my position was changed to Manager, Fuel Planning. In 2009, my position was changed to Supply Planning Manager.

Q: Have you previously testified in a proceeding before the Kansas Corporation Commission or before any other utility regulatory agency?

A: I have previously testified before both the Kansas Corporation Commission ("KCC" or "Commission") and the Missouri Public Service Commission ("MPSC") in multiple cases on multiple issues regarding KCP&L's fuel prices, fuel price forecasts, strategies for managing fuel price risk, fuel-related costs, fuel inventory, and the management of KCP&L's sulfur dioxide ("SO_2") emission allowance inventory.

Q: On what subjects will you be testifying?

A: I will be testifying on (1) natural gas prices, market uncertainty, related costs and issues associated with long-term contracts for natural gas; and (2) forecasted carbon dioxide ("CO_2") market prices.

Q: Why will you be testifying on these issues?

A: As discussed in the Direct Testimony of Company witness Burton Crawford, natural gas prices and CO_2 prices are critical uncertainties in the analysis of any utility generation construction project including the La Cygne environmental upgrade project.

I. NATURAL GAS PRICES

A. Historical Prices

Q: How have natural gas prices changed in the past few years?

A: Schedule WEB2011-1 shows how natural gas prices have changed dramatically over the past few years. Natural gas has been demonstrating significant price movement. Natural gas in December 2004 was about $6.83 per million British thermal units ("MMBtu"). In December 2005 it reached a peak of $15.38/MMBtu then dropped to $4.20/MMBtu in September 2006. Those moves represented a climb of 125 percent followed by a decline of 73 percent. By July 2008 natural gas had returned to $13.58/MMBtu but then dropped 82 percent to $2.51/MMBtu, a price level it had not seen since March 2002. By the end of March 2010 natural gas was trading near $4.00/MMBtu. Today it is trading near $4.50/MMBtu.

Q: How do historical natural gas prices compare to historical coal prices?

A: Schedule WEB2011-2 compares Henry Hub natural gas prices with the cost of Powder River Basin ("PRB") low-sulfur coal delivered to La Cygne using the market price for coal and a freight rate estimate consistent with the current rail pricing paradigm. It shows that Btu-for-Btu natural gas is consistently more than twice as expensive as coal. Schedule WEB2011-3 takes this comparison one step further by comparing the $/MWh equivalent of the two fuels assuming a 7,000 Btu/kWh heat rate for natural gas and a 10,000 Btu/kWh heat rate for coal. Even giving natural gas the benefit of a combined cycle heat rate, there were only 29 days over the past ten years when the price of natural gas would have been less than the delivered price of coal at La Cygne. If we add transportation costs to the price of natural gas, it drops that 29 days to one week or less out of ten years.

B. <u>Forecast Prices</u>

Q: What are KCP&L's expectations regarding the future price of natural gas?

A: CONFIDENTIAL Schedule WEB2011-4 shows the natural gas price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station. Generally it shows that on a nominal basis, we expect a distribution of future prices that is consistent with what we have seen since 2000.

Q: What are KCP&L's expectations regarding the cost of PRB coal delivered to La Cygne?

A: CONFIDENTIAL Schedule WEB2011-5 shows the coal price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station. For every year of the forecast, the base and high prices for natural gas are projected to be more than double the high scenario for the delivered cost of PRB coal to La Cygne.

Q: **How does KCP&L develop long-term price forecasts for fuel and emissions?**

A: KCP&L uses composite price forecasts for fuel and emission allowance commodities. The various commodity price forecasts used in the composite price forecasts are obtained from independent consulting firms and/or government agencies that have expert knowledge and experience with the particular commodity. KCP&L also uses the set of commodity price forecasts to develop probability distributions around those composite forecasts.

Q: **Who were the independent consulting firms and/or government agencies that you used in developing your natural gas price forecasts?**

A: KCP&L used forecasts from Cambridge Energy Research Associates ("CERA"), Energy Ventures Analysis ("EVA"), Energy Information Administration ("EIA"), Global Insight, and PIRA Energy Group ("PIRA") to construct its composite price forecasts for natural gas.

Q: **Who were the independent consulting firms and/or government agencies that you used in developing your coal price forecasts?**

A: KCP&L used forecasts from EVA, EIA, JD Energy ("JDE") and Wood Mackenzie Limited to construct its composite price forecasts for long-term coal prices.

Q: **Why does KCP&L use composite forecasts for fuel and emission allowance commodities?**

A: KCP&L has determined that of the various forecasts it has reviewed, no single forecast provider always outperforms all others. On the other hand, the combination or composite of those various forecasts consistently is more accurate than most of the individual forecasts that it represents. In any one year, some forecasting services will do better than the composite in terms of predicting the correct outcome. These "top performers" will vary from year to year and are very difficult if not impossible to identify in advance.

Q: Does the academic research support KCP&L's finding regarding the accuracy of composite forecasts?

A: Yes. KCP&L's finding is consistent with academic research showing that forecast combinations have, on average, been found to produce better forecasts than methods based on the ex-ante best individual forecasting model.

II. <u>NATURAL GAS MARKET UNCERTAINTY</u>

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 natural gas markets.

A. <u>Uncertainty vs. Volatility</u>

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.

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

A: Volatility represents short-term risk. Uncertainty represents long-term risk. Schedule WEB2011-6 compares the NYMEX near-month settlement closing price with one standard deviation based on the 20-day volatility. It shows that since 2000 there have been eight (8) times when one standard deviation based on the 20-day volatility exceeded \$6.00/MMBtu. Since 2003, volatility has spiked about once a year. The levels of volatility that we see in the market for natural gas do not appear to change from typical patterns despite major changes in price trends and levels. For example, in the latter 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 latter part of December 2005, the average 20-day volatility was 76 percent but the settle price for the near month New York Mercantile Exchange ("NYMEX") contract was \$12.50/MMBtu. That 76 percent represented a standard deviation of \$9.50/MMBtu, which is almost three times the level we saw in June 2000.

Q: How does natural gas price volatility compare to volatility in the price of PRB coal?

A: Schedule WEB2011-7 compares the volatility of natural gas prices with the volatility of PRB coal prices. Since 2001, natural gas volatility has averaged 56 percent while coal has averaged 20 percent. In other words, natural gas is almost three times more volatile than PRB coal.

Q: What do you mean when you say uncertainty represents long-term risk?

A: Commodity prices tend to be mean-reverting. That is, over some period of time, prices come back to a mean level. The catch is the mean may also be moving. Schedule

WEB2011-8 illustrates this by overlaying an 18-month moving average line that has been shifted back 18 months in an effort to show the then-current mean. Where volatility is essentially price movement around some mean base line or long-term trend, I am defining uncertainty as that movement in the mean base line or long-term trend. This movement in the mean base line represents a shift in the market.

B. <u>Natural Gas Market Uncertainty</u>

Q: How do market shifts affect KCP&L's fuel costs?

A: Prices are higher in supply-limited markets than in supply-surplus markets. Prices also are more uncertain and volatile in supply-limited markets than in supply-surplus markets. Because of the relative price inelasticity of natural gas demand, we have seen some significant price spikes when the natural gas market is supply-limited.

Q: When has the natural gas market shifted from supply-surplus to supply-limited and what were the effects of these shifts on natural gas prices?

A: After many years of being in a supply-surplus market, the first revelation of the natural gas market being significantly supply-limited was in the winter of 2000/2001. As can be seen in Schedule WEB2011-9, which is a chart of population weighted winter heating degree days, the three winters preceding winter 2000/2001 were all warmer than normal with winters 1998/1999 and 1999/2000 being significantly warmer than average. Prior to the very cold winter of 2000/2001, the United States experienced a period of supply-surplus commonly referred to as the "gas bubble." As shown in Schedule WEB2011-10, 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. This increased drilling activity combined with the warmer than normal winter of 2001/2002 resulted in storage being filled to a new record level of 3,238 billion cubic feet ("Bcf") in December 2001.

The following winter 2001/2002 was very mild resulting in lower than normal demand. As shown by Schedule WEB2011-10, 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, fourth quarter 2001 was the last quarter with U.S. dry natural gas production of more than 4,900 Bcf until fourth quarter 2007. Production reached a low in fourth quarter 2005, which included some impact from Hurricanes Katrina and Rita, and was only 4,370 Bcf. U.S. dry production had not been that low since second quarter 1992. Moreover, dry production for September 2005 was only about 87 percent of the average for the preceding ten Septembers.

Schedule WEB2011-11 shows another trend. It shows that from May 1999 to October 2006 the number of rigs drilling for natural gas increased almost 300 percent while natural gas production essentially stayed flat. In brief, if the very high prices that were driving record drilling were not increasing production, then the United States was in a natural gas supply-limited environment. In a supply-limited environment for a commodity with price inelastic demand, prices can jump substantially during any supply disruption or surge in demand as prices search for a new demand/supply balance point.

Q: When has the natural gas market shifted from supply-limited to supply-surplus?

A: It appears the most recent shift occurred about 2005 or 2006. That is when it was first suspected the Marcellus Shale had potential to be a major gas resource. Moreover, this was a major resource in the eastern United States, close to high population centers in New England.

Q: How has shale changed the fundamental outlook for natural gas?

A: The main change has been the tremendous increase in natural gas reserves that are now perceived as economically recoverable. Natural gas proven reserves increased 12.6 percent from 2006 to 2007. Since 1950, that is double the next largest year-over-year increase of 6.3 percent in 1956. From 2004 to 2007 natural gas proven reserves increased 23.5 percent. That compares to the next largest three-year increase since 1950 of only 16.5 percent set from 1954 to 1957.

As recently as 2002, the United States Geological Survey in its Assessment of Undiscovered Oil and Gas Resources of the Appalachian Basin Province, calculated that the Marcellus Shale field contained an estimated undiscovered resource of about 1.9 trillion cubic feet ("Tcf") of gas. In early 2008, Terry Englander, a geoscience professor at Pennsylvania State University, and Gary Lash, a geology professor at the State University of New York at Fredonia, estimated that the Marcellus Shale field might contain more than 500 Tcf of natural gas. That is 250 times the 2002 estimate!

In June 2009, the Potential Gas Committee, a widely recognized and knowledgeable non-profit organization affiliated with the Colorado School of Mines, released the results of its latest biennial assessment of the nation's natural gas resources, indicating that the United States possesses a total resource base of 1,836 Tcf. That is a 39 percent increase over the 2006 assessment and is the highest resource evaluation in the Committee's 44-year history. Most of the increase from the previous assessment arose from re-evaluation of shale-gas plays in the Appalachian basin and in the Mid-Continent, Gulf Coast and Rocky Mountain areas. Shale now accounts for about 33 percent of the total resource base.

Q: How fast can the natural gas market swing from supply-surplus to being supply-limited?

A: Significant weather events can have major immediate impacts on the supply/demand balance for natural gas. Winter 2000/2001, which I discussed earlier, and summer 2005 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/demand imbalance was the loss of significant quantities of natural gas production due to hurricanes. Summer/fall 2005 was one of the most active hurricane seasons on record. Hurricanes Katrina and Rita demonstrated just how much impact hurricanes can have on natural gas supply when they hit "platform alley" in the Gulf of Mexico. Fortunately, Hurricanes Katrina and Rita did not transverse the most densely rig/platform populated section of "platform alley."

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 WEB2011-12 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 ("MMS") estimated that natural gas production in the Gulf of Mexico was about 10 Bcf per day. On June 21, 2006, MMS issued its final report on the effects of Hurricanes Katrina and Rita. MMS reported that "the cumulative shut-in gas production 8/26/05-6/19/06 is 803.604 BCF, which is equivalent to 22.017% of the yearly production of gas in the GOM [Gulf of Mexico]."

Q: What risk does the build-up of the gas generation fleet in the early 2000's present to the natural gas market?

A: Schedule WEB2011-13 shows that gas-fired generation summer capacity in the power industry has more than doubled since 1996. Moreover, natural gas summer capacity went from being about half of coal capacity in 1996 to where it stands today at almost 130 percent of coal capacity. Because of the decline in the economy, we have not yet seen what all of that new gas-fired capacity can do to demand for natural gas.

III. <u>OTHER NATURAL GAS ISSUES</u>

Q: Are there issues associated with long-term natural gas contracts?

A: Yes, there are several issues with long-term natural gas contracts. Some are issues with any long-term commodity supply contract. Generally, those issues can be divided into price and quantity. Other issues include transportation and the accounting treatment of long-term commodity contracts.

Q: How is price an issue in long-term natural gas contracts?

A: When parties enter a long-term contract they make that decision based on their expectations regarding price; both price of the commodity under the contract and market price for the commodity not under contract. If those two prices get very far apart, at least one of the parties will start to think the contract is not a good deal and may be tempted to look for a way out. Sometimes that issue is forced upon the parties. For example, if a seller locks into a price and the market price increases significantly above the contract price, the seller could find themselves in financial difficulty and unable to perform under the contract.

Q: When parties "lock in" to a price, what does that typically look like?

A: As I describe elsewhere, there tend to be problems for at least one of the parties whenever the spread between contract price and market price changes significantly. Market prices typically move over time making it very likely that a price fixed by a contract for 10 or 20 years will separate from the prevailing market price. Even prices that are only fixed for a few months can separate from the prevailing market price. Consequently, long-term contracts tend to have some form of price adjustment mechanism. For example, if someone reports they have a 20-year contract for natural gas at $6.00/MMBtu, unless they specifically state the price is fixed at $6.00/MMBtu for the term of the agreement, they are probably really saying the beginning or base price before adjustment is $6.00/MMBtu. The Year 2 price could be significantly different than $6.00/MMBtu.

Depending how the contract is structured, even the Year 1 price could be significantly different than the base price of $6.00/MMBtu.

Q: Does this potential for contract prices to separate from the prevailing market price create other issues?

A: Yes. It can create an issue regarding the value of the contract which is reflected in its "mark-to-market."

Q: How can "mark-to-market" cause issues with long-term natural gas contracts?

A: Various accounting rules can require commodity contracts be marked-to-market. As I have discussed elsewhere, natural gas prices are subject to significant volatility and uncertainty. All of that market price uncertainty would be reflected in the Company's accounting statements when the contracts are marked-to-market. That could have a significant financial consequence. For example, in 2010 La Cygne Units 1 and 2 burned about 47 million MMBtus of coal. If, for the sake of illustration, we assume KCP&L had a 20-year fixed price contract for a like amount of natural gas Btus, that contract would represent almost 950 million MMBtus. Historically, natural gas prices have averaged a 23 percent move from one quarter to the next. If the price for natural gas in our hypothetical contract was $6.00/MMBtu, a 20 percent swing would be $1.20/MMBtu. When applied to the 950 million MMBtus that would translate into a $1.14 billion quarter-to-quarter movement in the Company's financials. That average quarterly movement would be almost nine times KCP&L's 2009 net income.

Q: Can "mark-to-market" cause issues with long-term coal contracts?

A: Yes, but not to the degree it does for natural gas. Following the example I just gave for natural gas but using coal's lower quarter to quarter price swing and much lower commodity cost, the quarter-to-quarter movement in the Company's financials would be less than $100 million. Natural gas's billion dollar quarter-to-quarter swing was more than 10 times that.

Q: How is quantity an issue in long-term natural gas contracts?

A: The parties to a long-term contract are relying on certain assumptions about the future regarding their ability to provide natural gas or their need for natural gas. As I discuss elsewhere in this testimony, the main driver behind the current surplus of natural gas is the development of shale. A feature of shale gas production is the increasing steepness of its decline curves. With initial decline rates of 50 percent or more, it means half of all new wells must be replaced within one year just to stay even. In effect, the gas industry is caught on a treadmill where it is necessary to drill at certain levels just to maintain production levels. This treadmill likely will continue with declines in production occurring whenever declines in drilling activity occur.

Q: How is transportation an issue in long-term natural gas contracts?

A: To use natural gas one must transport it from the point of production to the point of consumption. In our region that involves inter-state natural gas pipelines. Neither of the major pipelines in our area have forward haul capacity sufficient to serve new gas-fired generation facilities. That means we would be required to pay for any pipeline expansion necessary to transport natural gas so we could meet the commodity contract volume obligations.

IV. <u>CO_2 PRICES</u>

Q: What are KCP&L's expectations regarding the future price of CO_2?

A: CONFIDENTIAL Schedule WEB2011-14 shows the CO_2 price forecast KCP&L used for its analysis regarding environmental retrofits at the La Cygne Generating Station.

Q: How does KCP&L develop long-term price forecasts for emissions allowances?

A: As I discussed with natural gas, KCP&L uses composite price forecasts for fuel and emission allowance commodities. The various commodity price forecasts used in the composite price forecasts are obtained from independent consulting firms and/or government agencies that have expert knowledge and experience with the particular commodity. KCP&L also uses the set of commodity price forecasts to develop probability distributions for each.

Q: What independent consulting firms and/or government agencies did you use in developing your CO_2 forecast?

A: The CO_2 composite price forecast was developed from forecasts by CERA, Synapse, PIRA, EVA, EIA, Environmental Protection Agency ("EPA"), and JD Energy.

V. <u>SUMMARY</u>

Q: How would you summarize your testimony?

A: My testimony has discussed how natural gas markets have demonstrated volatility and uncertainty. I created a simple example to show how the volatility in natural gas prices can create material financial risk. I then compared the natural gas market risks with similar risks for coal. My testimony went on to describe how KCP&L forecasts fuel and emission market prices. I also presented graphs illustrating key forecasts relevant to this case.

Q: What do you think is a key take-away from your testimony?

A: Placing a long-term bet on natural gas as a primary fuel source has greater market-related risk than a similar commitment to coal.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Petition of Kansas City Power & Light Company ("KCP&L") for Determination of the Ratemaking Principles and Treatment that Will Apply to the Recovery in Rates of the Cost to be Incurred by KCP&L for Certain Electric Generation Facilities Under K.S.A. 2003 SUPP. 66-1239	))))))))	**Docket No. 11-KCPE-____-PRE**

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 Supply Planning Manager.

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 Seventeen (17) pages, 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 thereof, are true and accurate to the best of my knowledge, information and belief.

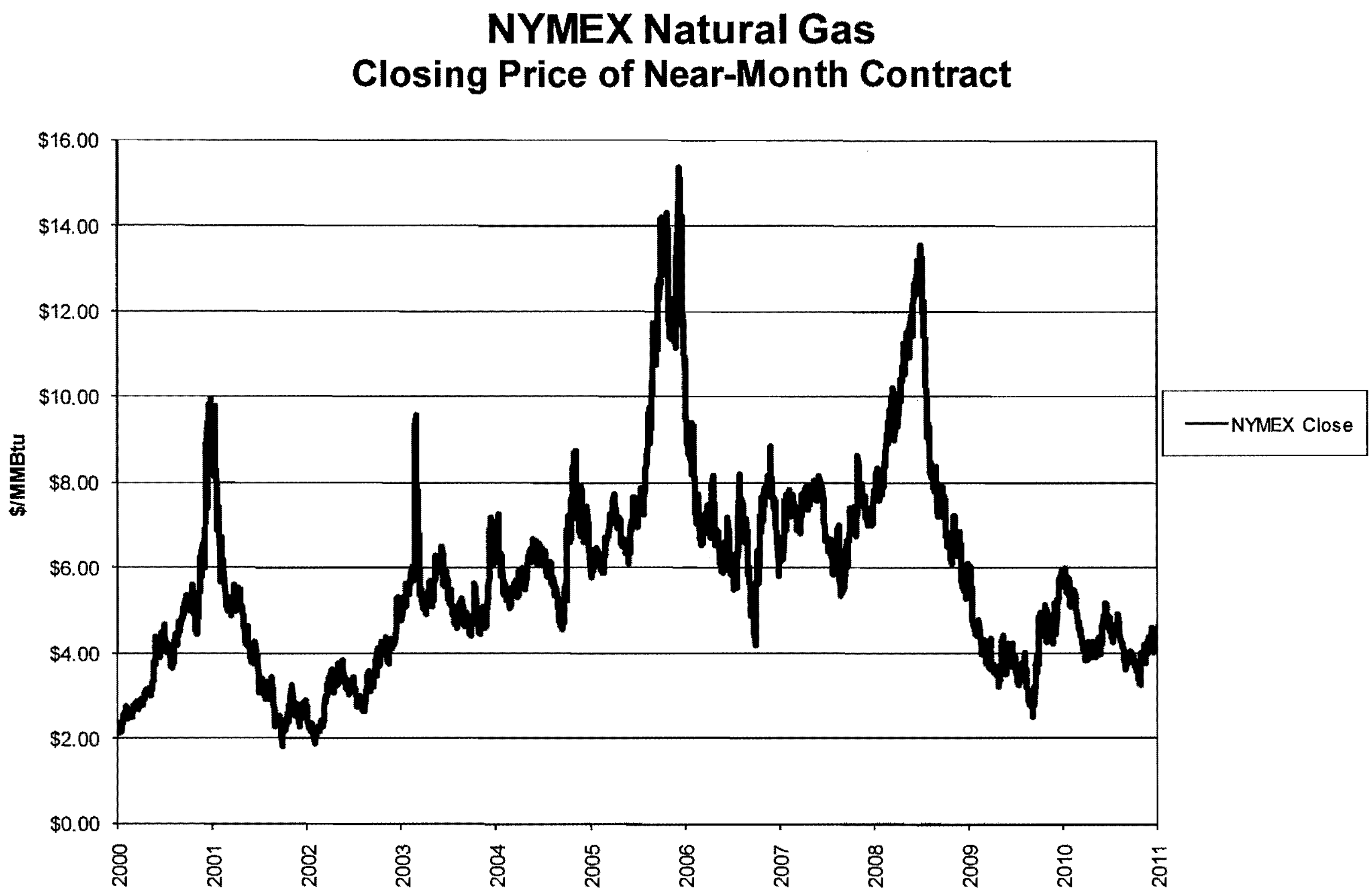
____
William Edward Blunk

Subscribed and affirmed before me this 1st day of February 2011.

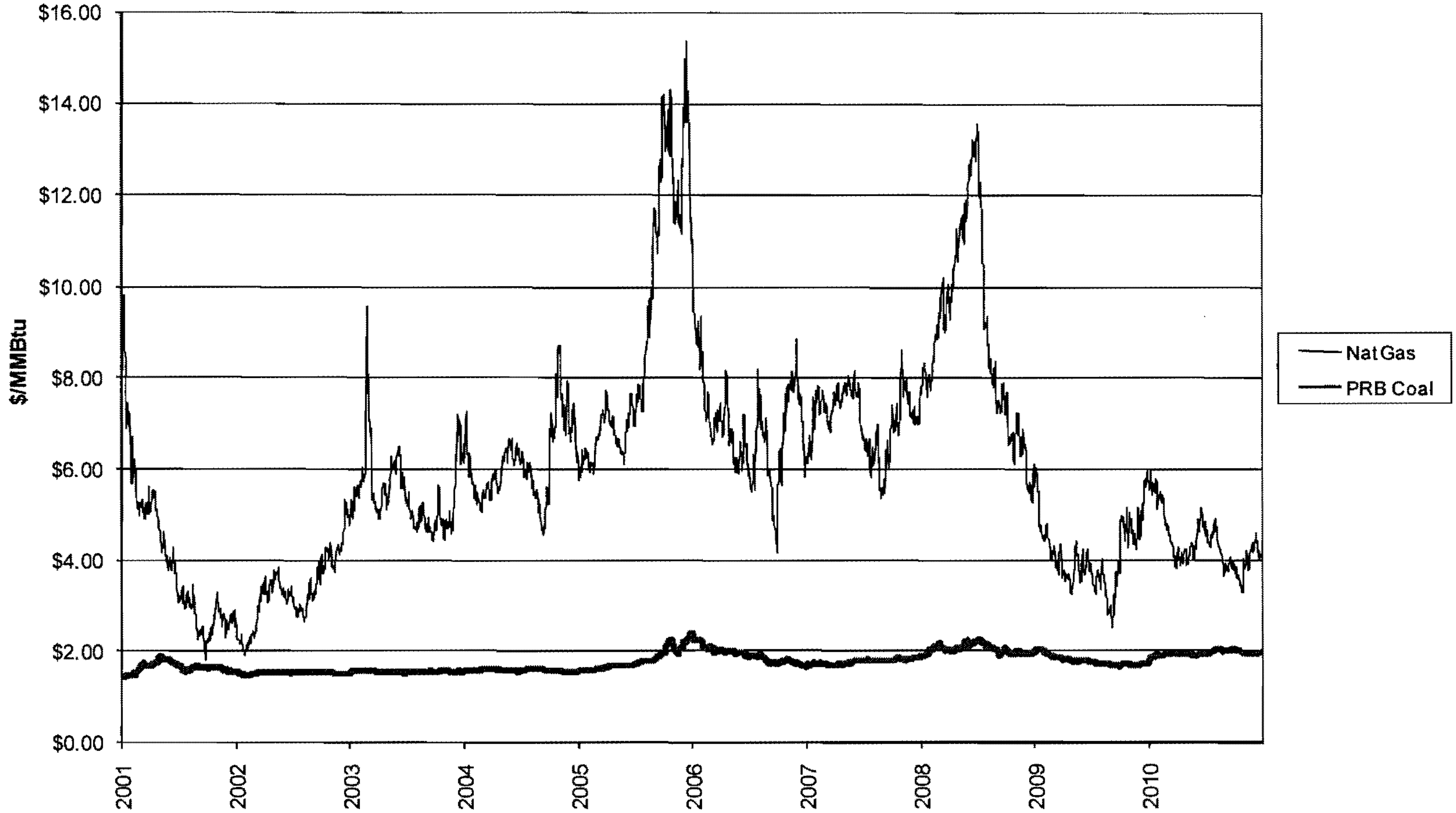
____
Notary Public

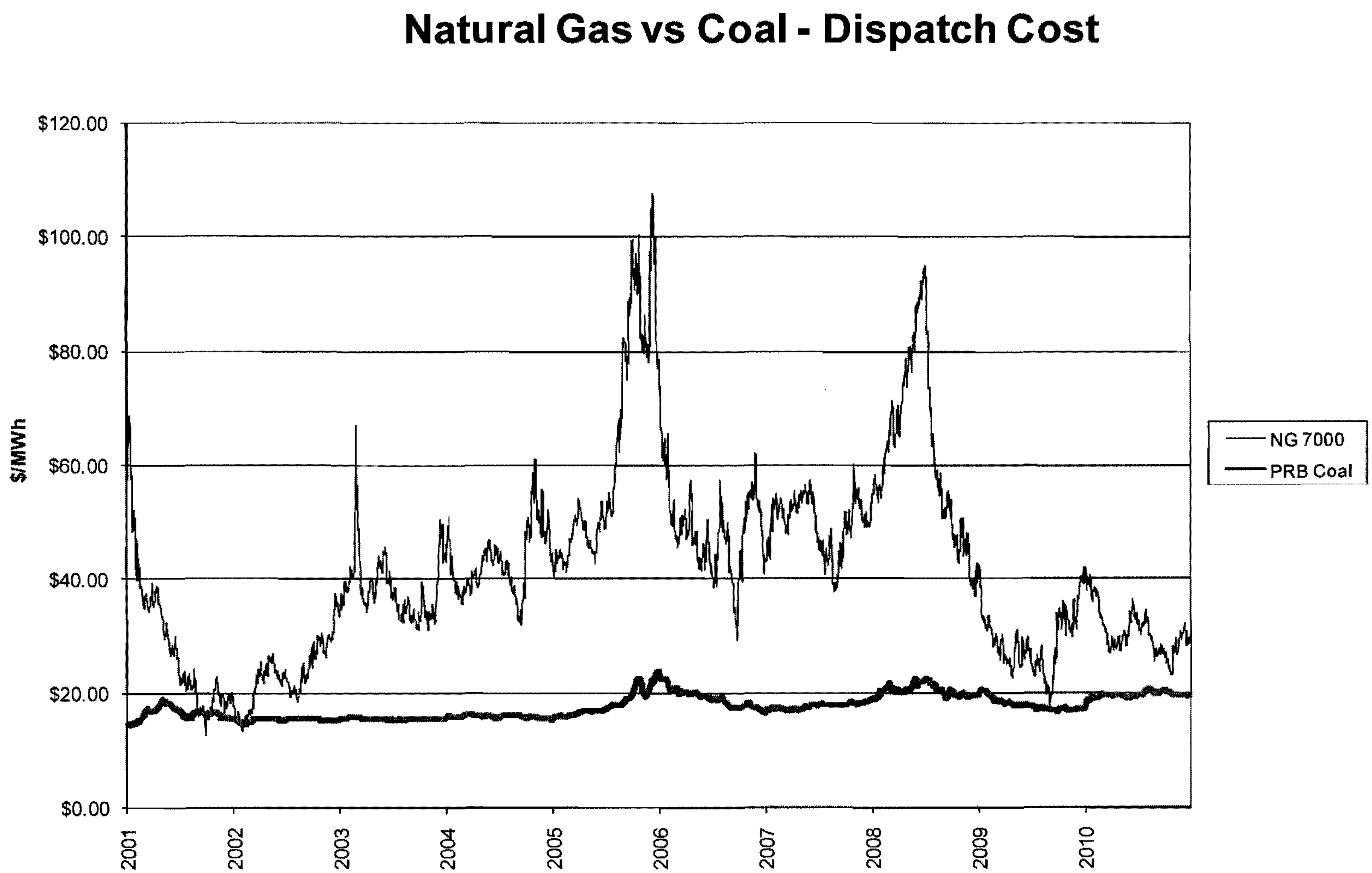
My commission expires: May 23, 2014

DONNA J. STOWAY
Notary Public, Notary Seal
State of Missouri
Clay County
Commission # 10889620
My Commission Expires May 23, 2014


NYMEX Natural Gas
Closing Price of Near-Month Contract
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
$/MMBtu
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
NYMEX Close

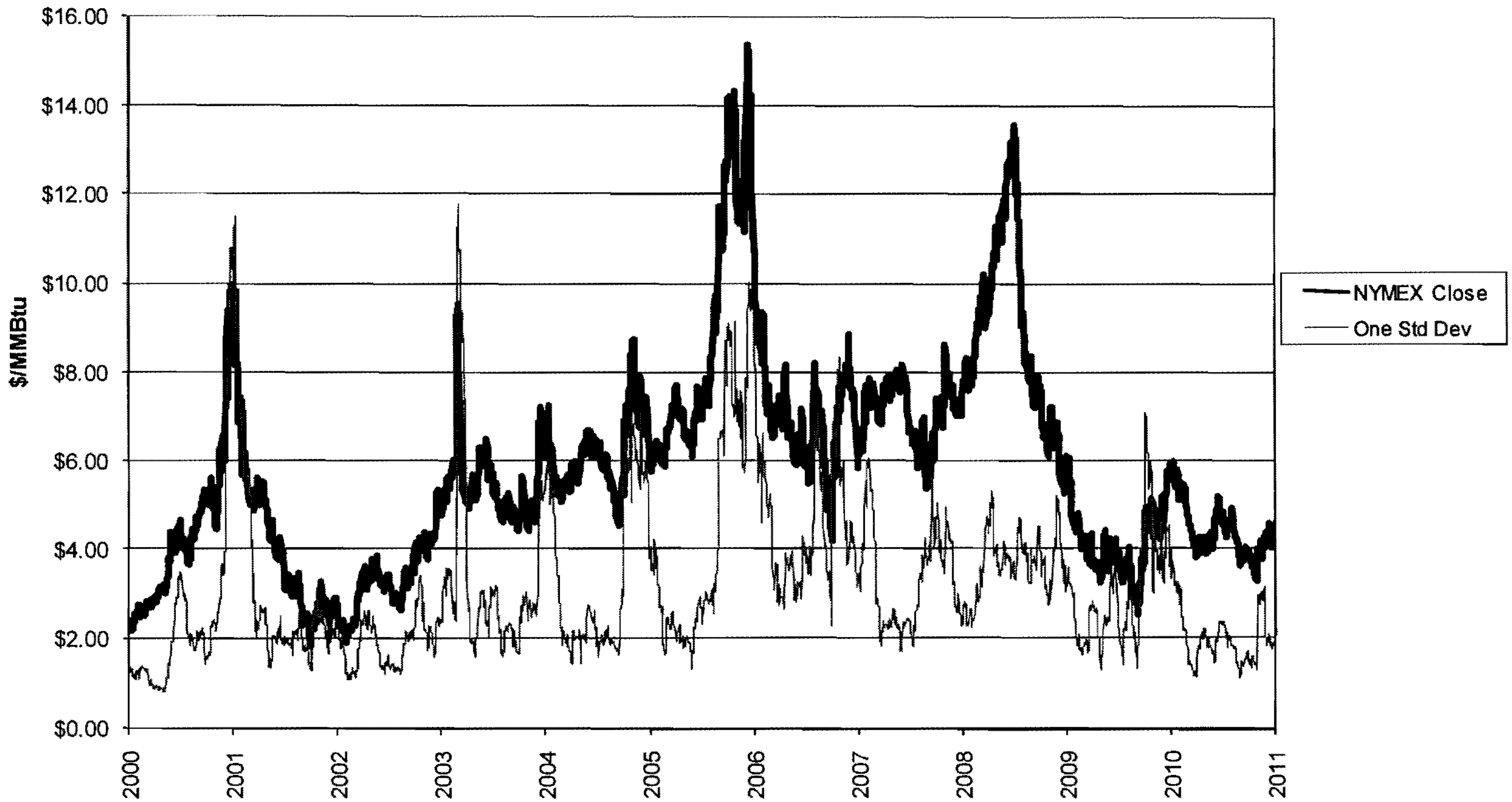
Natural Gas vs Delivered Coal Price



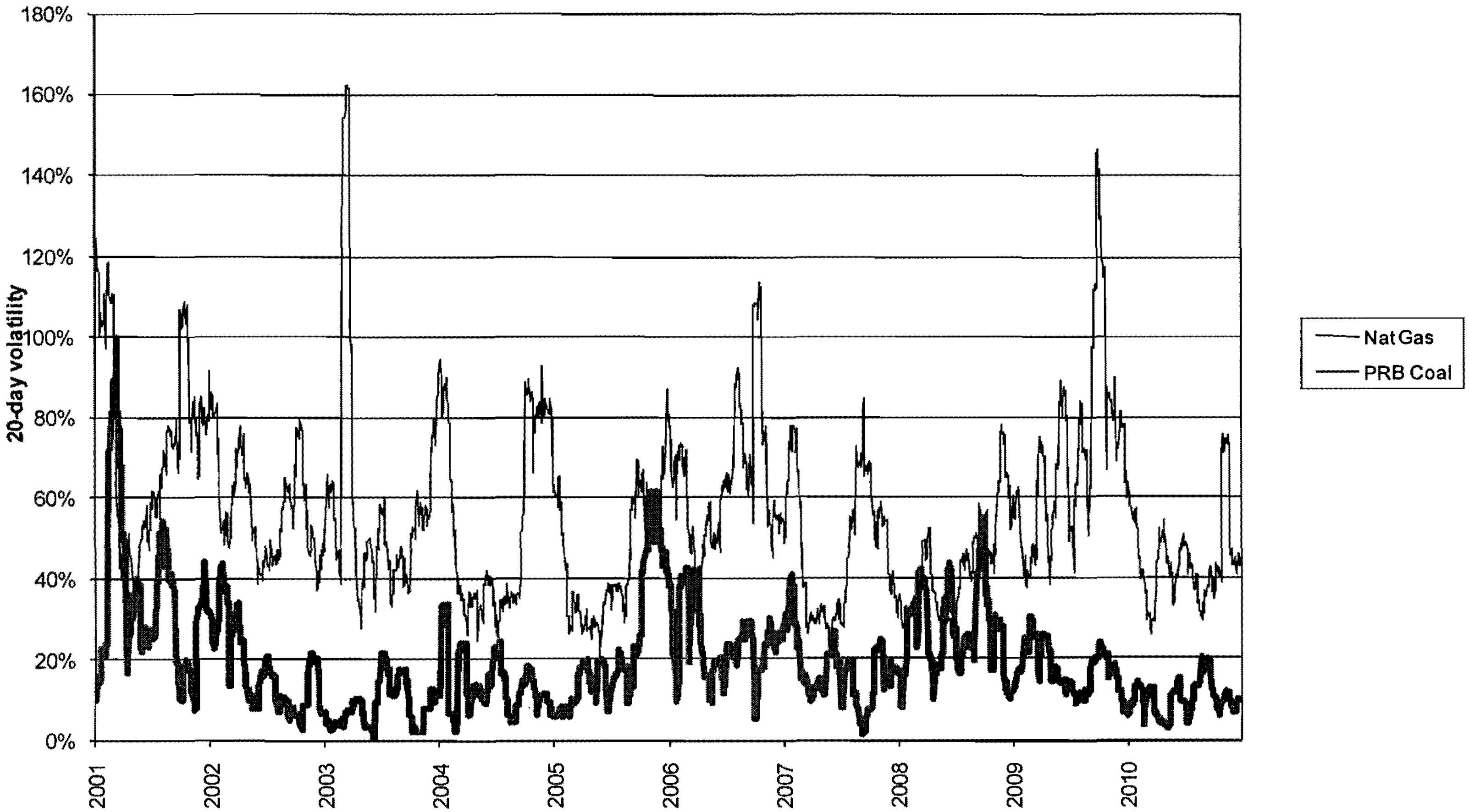

Natural Gas vs Coal - Dispatch Cost
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$0.00
$/MWh
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
NG 7000
PRB Coal

SCHEDULES WEB2011-4 THROUGH WEB2011-5 THESE DOCUMENTS CONTAIN CONFIDENTIAL OR CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC ORIGINAL FILED UNDER SEAL

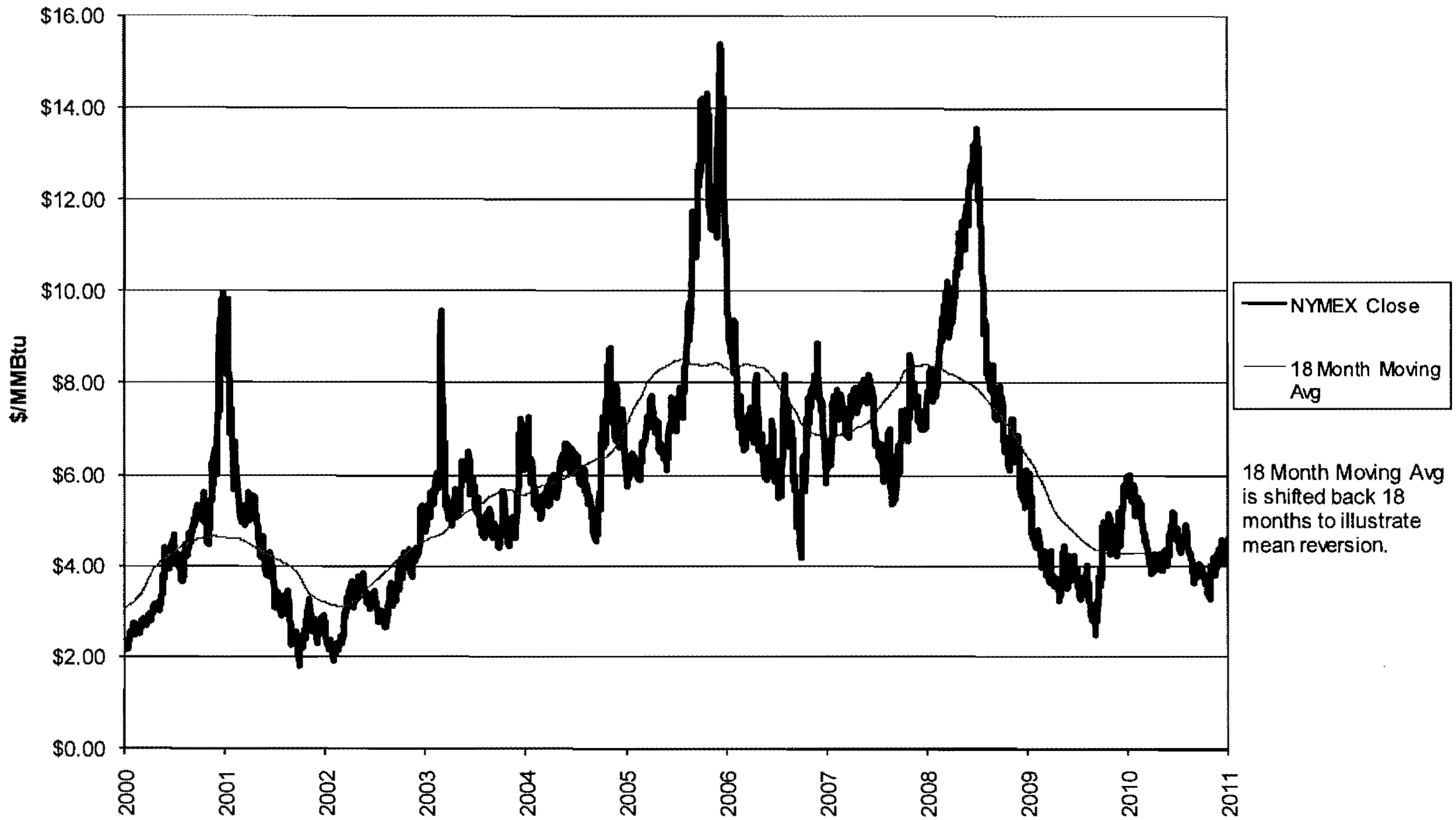
NYMEX Natural Gas
Closing Price vs. One Standard Deviation (20-day volatility)



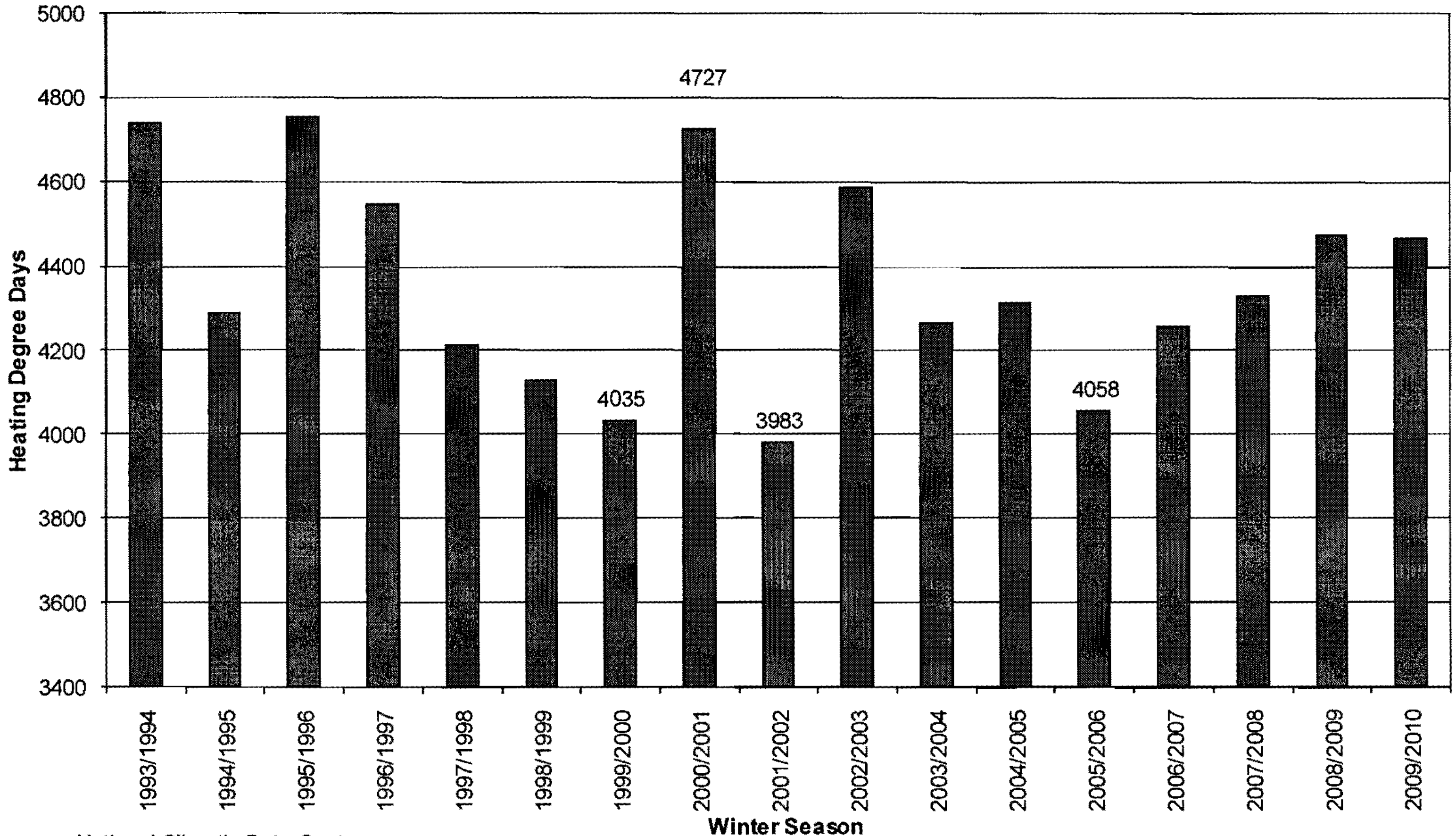
Natural Gas vs. Coal Price Volatility



Mean Reversion of Natural Gas Prices

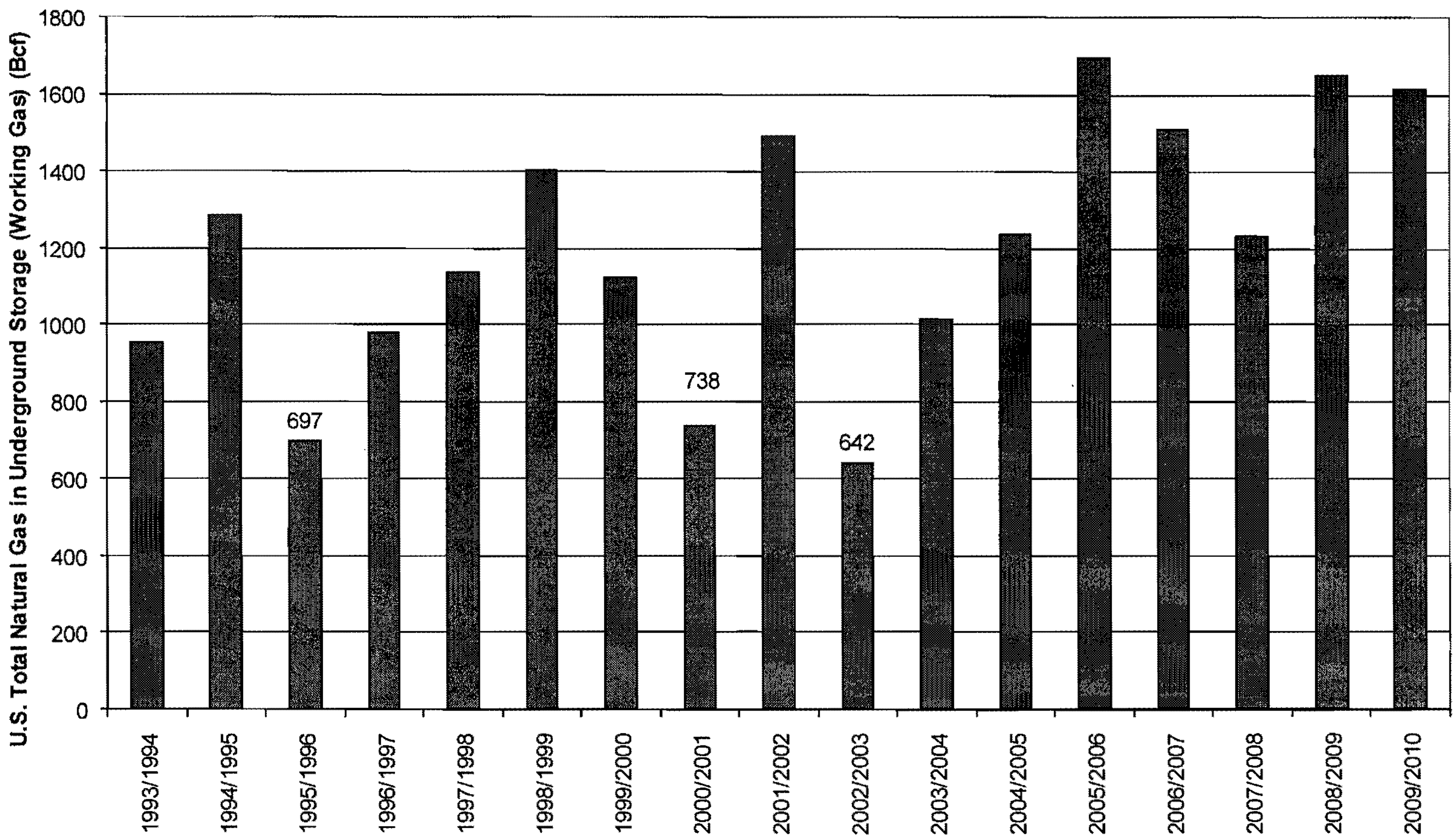


Population Weighted Heating Degree Days



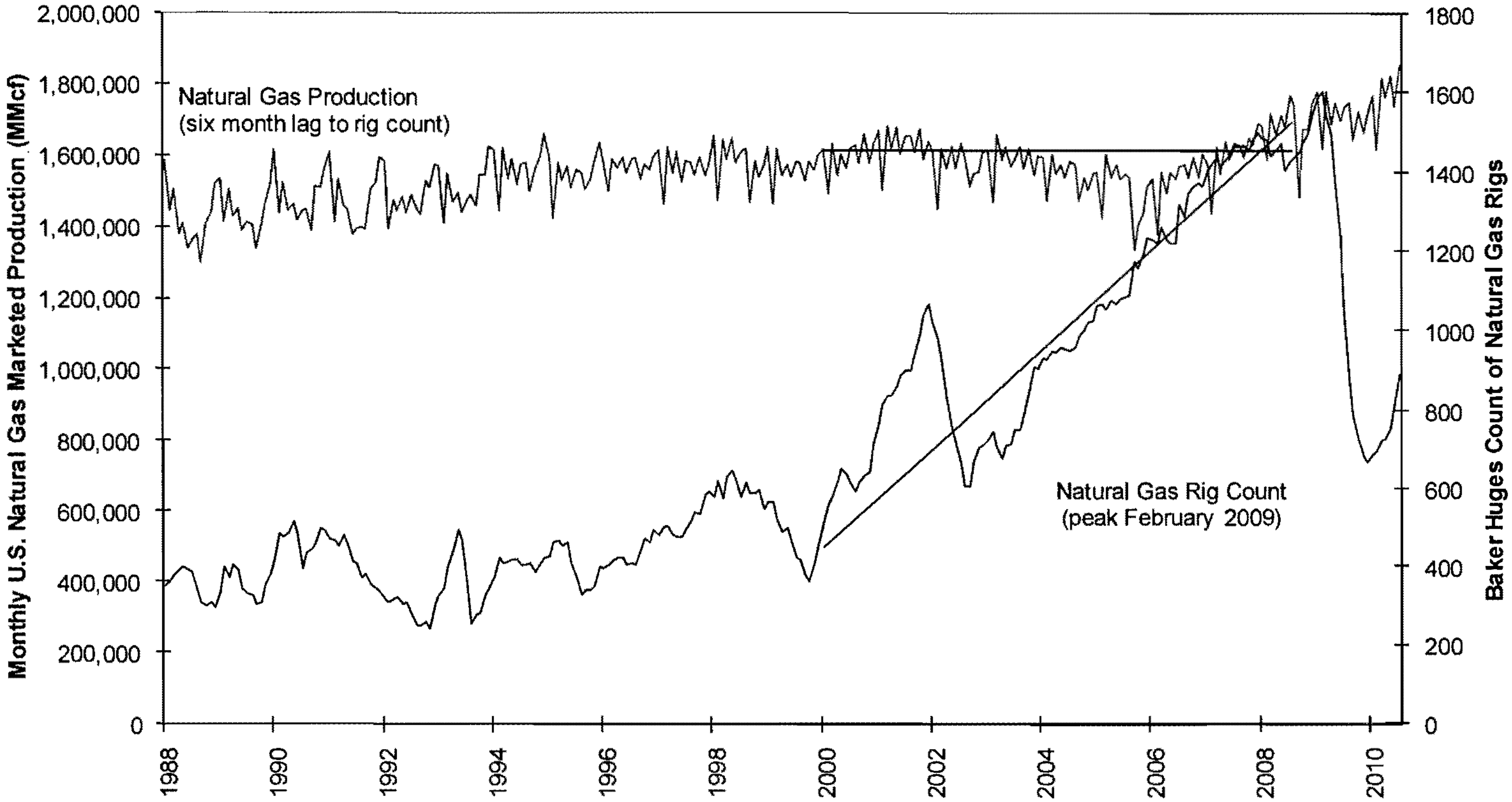
Source: National Climatic Data Center

Natural Gas Storage - Winter Low



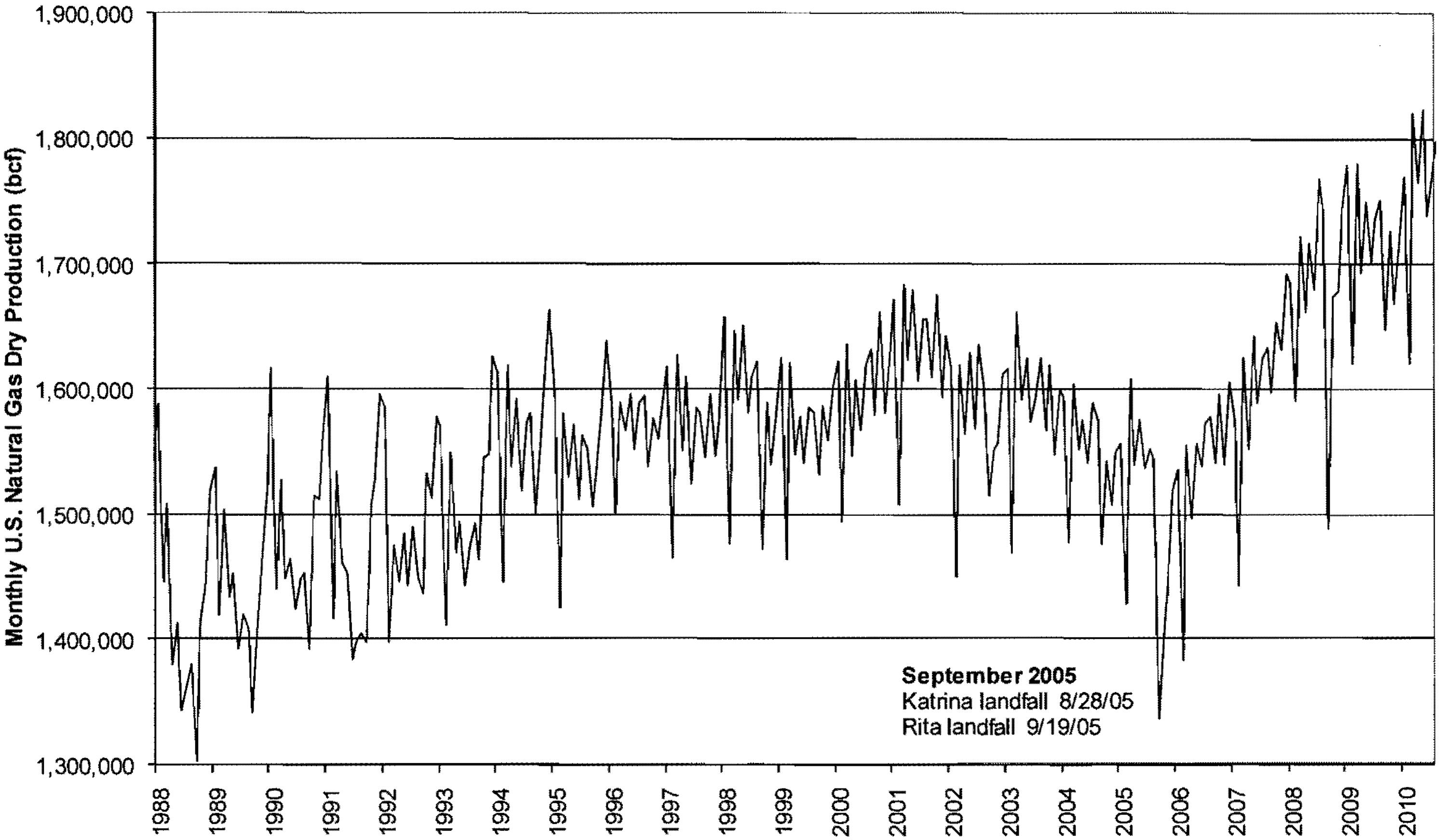
Source: Energy Information Administration

Natural Gas Production vs. Rig Count

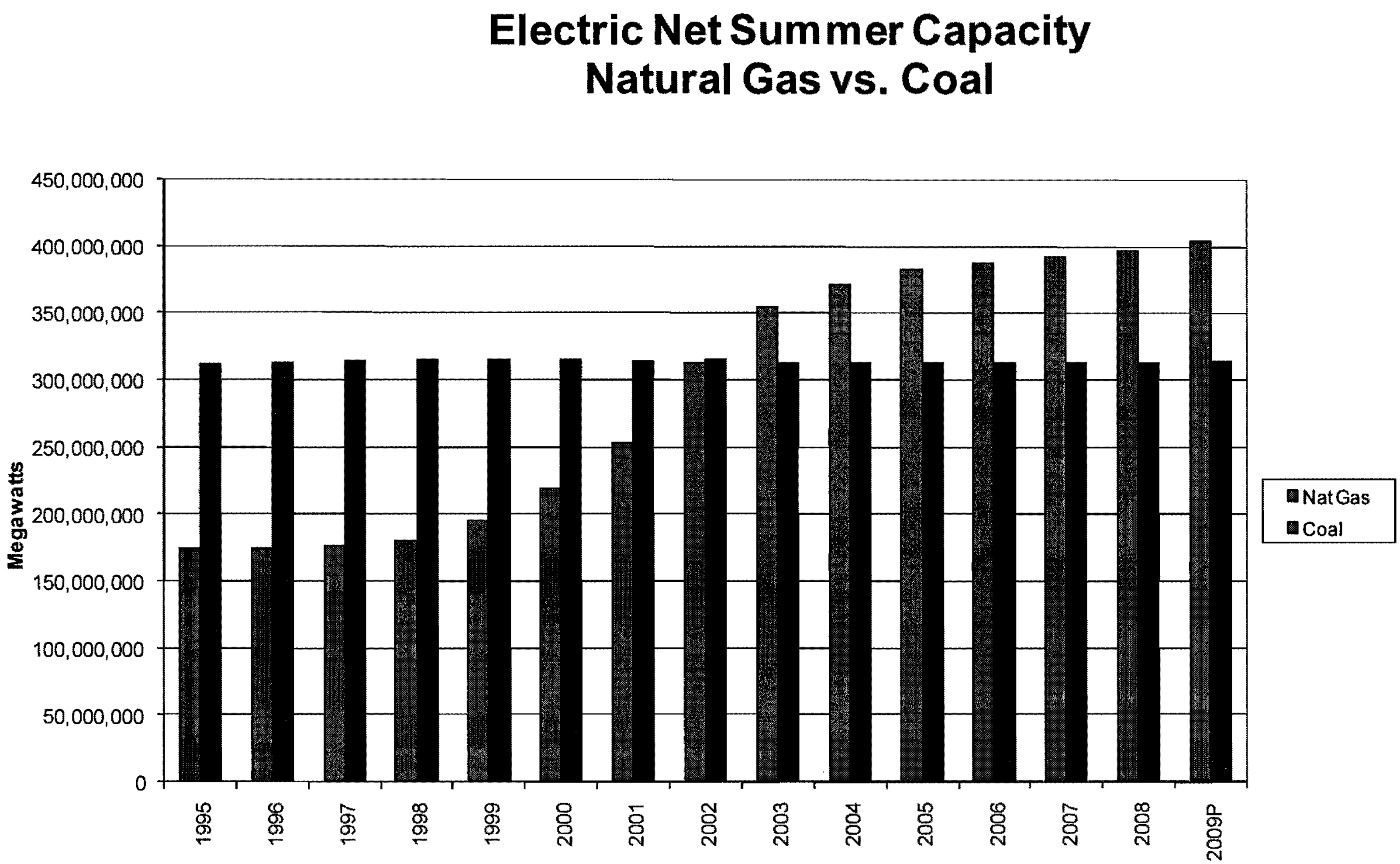


Sources: Energy Information Administration and Baker Hughes

U.S. Natural Gas - Dry Production



Source: Energy Information Administration


Electric Net Summer Capacity
Natural Gas vs. Coal
450,000,000
400,000,000
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Megawatts
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009P
Nat Gas
Coal

SCHEDULES WEB2011-14
THIS DOCUMENT CONTAINS CONFIDENTIAL OR CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC
ORIGINAL FILED UNDER SEAL

PUBLIC VERSION
Certain Schedules Attached to this Testimony
Contain "Confidential" or "Confidential-Restricted"
Information and Have Been Removed.

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

DIRECT TESTIMONY OF

BURTON L. CRAWFORD

ON BEHALF OF
KANSAS CITY POWER & LIGHT COMPANY

IN THE MATTER OF THE PETITION OF
KANSAS CITY POWER & LIGHT COMPANY ("KCP&L")
FOR DETERMINATION OF THE RATEMAKING PRINCIPLES
AND TREATMENT THAT WILL APPLY TO THE RECOVERY
IN RATES OF THE COST TO BE INCURRED BY KCP&L FOR
CERTAIN ELECTRIC GENERATION FACILITIES
UNDER K.S.A. 66-1239

DOCKET NO. 11-KCPE-____-PRE

Q: Please state your name and business address.

A: My name is Burton L. Crawford. My business address is 1200 Main Street, Kansas City, Missouri 64105.

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

A: I am employed by Kansas City Power & Light Company ("KCP&L" or the "Company") as Senior Manager, Energy Resource Management.

Q: What are your responsibilities?

A: I am responsible for managing the Energy Resource Management ("ERM") department. Activities of ERM include resource planning, wholesale energy purchase and sales evaluations, energy portfolio management, and capital project evaluations.

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

A: I hold a Master of Business Administration from Rockhurst College and a Bachelor of Science in Mechanical Engineering from the University of Missouri. Within KCP&L, I have served in various areas including regulatory, economic research, and power engineering since 1988.

Q: Have you previously testified in a proceeding before the Kansas Corporation Commission ("KCC" or "Commission") or before any other utility regulatory agency?

A: Yes, I have. I provided testimony to the Missouri Public Service Commission ("MPSC") in Case No. EO-2006-0142, which pertains to KCP&L's application to join the Southwest Power Pool Regional Transmission Organization. I also provided testimony before the MPSC in Case Nos. ER-2006-0314, ER-2007-0291, ER-2009-0090, ER-2009-0089, ER-2010-355 and ER-2010-356.

Q: What is the purpose of your testimony?

A: This testimony supports the process for obtaining predetermination for La Cygne environmental retrofit investments. It includes a description of KCP&L's long-term generation planning process, a description of the alternative resource plans that were considered to meet KCP&L's load requirements, and a discussion of the analysis of those alternatives. It also discusses responses to several of the questions posed by the

Commission in its January 27, 2011 Order (the "492 Order") in Docket No. 11-GIME-492-GIE (the "492 Docket") including:

From paragraph 8 of the 492 Order:

> (c) What are KCP&L's expected capacity and/or energy needs over the appropriate investment planning horizons (e.g., 10, 15, 25 years) given the Company's existing generation portfolios?
>
> (d) If capacity and/or energy is not needed, then how should non-compliant plants be treated?
>
> (e) If capacity and/or energy is needed, should KCP&L retrofit existing non-compliant plants or build new plants?
>
> (f) What criteria should be employed to determine optimal retrofit configurations to meet regulatory requirements? Has this analysis been performed for individual plants? Which plants?
>
> (g) Do the environmental retrofit projects that are currently installed, under construction or planned represent the end of the upgrading process for their corresponding generating units, or will the environmental retrofit projects, in turn, require additional improvements to these units? (I respond to this question from the perspective of how this fits into the modeling process only. Company witness, Mr. Scott Heidtbrink, addresses this question, also.)
>
> (h) For any planned but incomplete environmental upgrades, has analysis been performed on how the planned upgrades may impact the expected life of the plant at the completion of the upgrades? If so, what criteria for analysis was used? (I respond to this question from the perspective of how this fits into the modeling process only. See Mr. Heidtbrink's Direct Testimony for this question, also.)
>
> (i) If replacement of a plant is considered as an option, what criteria should be used to determine the size and type of the generation plant to be built?
>
> (j) What factors were considered in any hypothetical resource portfolio scenarios which have been run?
>
> (k) How does KCP&L plan to regulate the wind and other renewable generation that is required by the Renewable Energy Standards Act (K.S.A. 66-1256 through 66-1262)? If KCP&L plans to add generation to regulate wind and other renewable generation, how much generation and what fuel sources are planned to be used at these new plants used for regulation?

From paragraph 15 of the 492 Order:

> (a) If a utility has selected a specific option (i.e., mothball, retrofit, decommission, and/or build new plant), why were other options rejected, not just why the option chosen was appropriate?

I. KCP&L'S LONG-TERM GENERATION PLANNING PROCESS AND ANALYSIS OF ALTERNATIVES CONSIDERED.

Q: Why are these retrofits needed?

A: The retrofits are needed to meet the Best Available Retrofit Technology ("BART") Section of the State of Kansas Air Quality State Implementation Plan - Regional Haze as discussed in the Direct Testimony of KCP&L witness Paul Ling. Furthermore, the Company will likely be required to meet Transport Rule emissions requirements that are expected to be finalized later this year. The final Transport Rule may or may not result in the need to retrofit LaCygne. Details concerning the requirements of these environmental rules are provided in Mr. Ling's testimony.

Q: Please describe the planning process.

A: The process used in evaluating long-term resource plan alternatives is based on the electric integrated resource plan ("ERP") procedures required by Missouri Rule CSR 240 Chapter 22. Copies of past Missouri ERP filings have been shared with the Kansas Corporation Commission Staff ("Staff"). Although the process is based on the requirements of Missouri ERP rules, conceptually the process represents a standard approach within the electric utility industry.

In the initial step, the Company reviews and screens a number of preliminary options for environmental compliance, system generation and demand side management/energy efficiency programs ("DSM/EE"). This step reduces the number of options to include in the evaluation of alternative resource plans. From these resource options, alternative resource plans are assembled. Each alternative resource plan is developed to meet the Company's reserve obligations and requirements of state(s) renewable portfolio standards.

The plans developed in the previous step are then evaluated in a production cost model called MIDAS™ in order to calculate each plan's expected total revenue requirement over a number of years. These calculations are performed for each alternative resource plan under a variety of potential market futures (*i.e.*, scenarios) to determine the level of risk each alternative plan faces. These risks are defined by varying levels of critical uncertain factors such as natural gas prices, retail customer load growth, carbon dioxide ("CO_2") costs, etc. Sixty-four (64) scenarios were devised to gauge the risk associated with identified critical uncertain factors. A list of these scenarios is included in Confidential Schedule BLC2011-10.

The end result of this process is a series of alternative long-term resource plans, each with an expected 25-year net present value of revenue requirement ("NPVRR") that takes into account the risk associated with critical uncertain factors in the industry.

Q: Please detail the resource option screening process.

A: The resource screening process reduces the number of supply options to a manageable number. Each alternative is compared on an average cost of total operation. A limited number of alternatives are then passed forward for further consideration in the analysis. Options that are more expensive to operate are barred from further consideration. This greatly improves the speed of the analyses that follow.

Q: Please describe the DSM/EE screening process.

A: The Company retains the service of several consultants to identify DSM/EE end-use measure potential. These measures are subjected to a benefit/cost screening analysis. Once screened, the load impact and costs of the remaining programs are treated as a single DSM/EE program in the analysis.

Q: Describe the MIDAS™ model.

A: MIDAS™ is a product of ABB-Ventyx and has been an industry standard production and financial cost model for over 20 years. The modeler inputs a resource expansion plan that can include different assumptions of environmental retrofits, plant retirements or system generation expansion. This expansion plan is added to the Company's existing portfolio of assets. Operation of the resulting asset portfolio is then simulated for 20+ years on an hourly basis to calculate the portfolio's production cost under given economic and market price assumptions. This production cost model is repeated for a large number of future scenarios of critical uncertain factors. The model outputs an annual revenue requirement using the results of the production cost model and the financial position of the Company to develop a complete view of Company costs. This annual revenue requirement is discounted to calculate the plan's NPVRR.

Q: How is the MIDAS™ model used in this analysis?

A: The MIDAS™ model takes each alternative expansion plan and calculates its financial performance under a large number of future scenarios. This set of future scenarios is referred to as the "Risk Tree" in MIDAS™. Each branch of the Risk Tree represents a different future scenario. Each scenario is made up of varying combination of uncertain market forecasts described below. The Risk Tree used in this analysis contains

64 different scenarios or branches. This Risk Tree is graphically represented in Confidential Schedule BLC2011-10.

Each expansion plan that is run through MIDAS™ has 64 separate NPVRR results. These separate results are probability weighted over the 64 scenarios to calculate an expected value of NPVRR for each expansion plan. The plan that has the lowest expected NPVRR therefore shows the greatest potential of cost effectiveness over a wide range of future risks. Furthermore, the results can be evaluated scenario-by-scenario to determine if there exist any future risks that will cause another plan to perform better than the plan with the lowest expected NPVRR.

Q: What sort of information is collected and used in the planning process?

A: The Company uses a wide range of information to conduct this analysis. Data is collected on potential resource options including supply resources (coal, natural gas, nuclear, renewable, etc.) and DSM/EE measures. Along with these options, the Company collects information for environmental retrofit costs.

Additionally, the Company develops forecasts of critical uncertainties. These include, but are not limited to natural gas prices, CO_2 emission allowance prices, load growth rates, interest rates and costs to acquire capital, coal prices, construction costs, etc. These forecasts include a mid, high and low case for each critical driver.

Other information used in the analysis relate to current issues and events that may drive resource acquisition decisions such as the impact of state-based renewable standards or federal mandates.

Lastly, the Company uses its existing financial structure as a starting point for all trends of financial measures such as interest coverage ratio and debt to total capital ratio.

Q: With regard to uncertainties, what are your major assumptions and their sources?

A: Major assumptions sourced from the KCP&L ERM Department include:

- All uncontrolled coal plants will be environmentally retrofitted (scrubbers, SCR, bag house) or retired/mothballed by 2016.
- State renewable portfolio standards ("RPS") for Missouri and Kansas will be met with constructed generation. The Company does not assume that it will rely on purchased RECs for long-term compliance.

Major assumptions sourced from the KCP&L Fuels Department:

- Natural Gas Prices. See attached Confidential-Restricted Schedule BLC2011-1.
- CO_2 Allowance Prices. See attached Confidential-Restricted Schedule BLC2011-2.

Support for these assumptions can be found in the Direct Testimony of Company Witness Mr. Wm. Edward Blunk.

Major assumptions sourced from the KCP&L Load Forecasting Department:

- Annual Retail Load Growth – Energy. See attached Confidential Schedule BLC2011-3.
- Annual Retail Load Growth – Peak Demand. See attached Confidential Schedule BLC2011-4.

Please note that a complete discussion of the method of developing this load forecast is included in the Direct Testimony of Company witness Mr. George McCollister.

Major assumptions sourced from the KCP&L Energy Solutions Department:

- DSM/EE Resources. See attached Confidential Schedule BLC2011-5 and BLC2011-6.

Major assumptions sourced from the KCP&L Corporate Finance Department:

- Financial Returns and Interest Rates. See attached Confidential-Restricted Schedule BLC2011-7.

Q: What alternative plans were analyzed?

A: The analysis considered fourteen (14) different resource plans with four (4) additional sensitivity plans. These plans are described in detail in attached Confidential-Restricted Schedule BLC2011-13.

II. QUESTIONS FROM COMMISSION DOCKET NO. 11-GIME-492-GIE

Q: The KCC recently issued an Order opening a new docket, the 492 Docket, which is designed to address issues regarding evaluation of retrofit decisions. Would the analysis performed by KCP&L regarding the La Cygne environmental retrofits answer the questions raised in the 492 Docket?

A: It addresses most of these issues on behalf of KCP&L. In paragraph 8 of the 492 Order, information was requested regarding a) applicable regulatory programs, b) emissions allowances, c) capacity and energy needs over the investment horizon, d) treatment of non-needed capacity assets, e) possible capacity expansion, f) optimal retrofit analysis criteria, g) continuing required retrofits, h) expected life impact from proposed environmental retrofits, i) size and type of replacement power capacity, j) factors considered in portfolio scenarios, and k) plans to regulate additional wind generation. In the analysis conducted for this filing, most of the listed information requirements have been addressed in some form. I will discuss issues c through k set forth in paragraph 8 of the 492 Order. I will also address the first issue set forth in paragraph 15 of the 492 Order. As to each item I discuss, I will note whether it is contained in the resource plan analysis or elsewhere in the testimony and exhibits in this docket.

Q: What are KCP&L's expected capacity and/or energy needs over the appropriate investment horizons given the Company's existing generation portfolio? (Item c in paragraph 8 of the 492 Order.)

A: Capacity and Load Balance for KCP&L both with and without the La Cygne units are shown in Confidential-Restricted Schedule BLC2011-11.

Q: If capacity and/or energy are not needed, then how should non-compliant plants be treated? (Item d in paragraph 8 of the 492 Order.)

A: As shown in Confidential-Restricted Schedule BLC2011-12, the capacity of La Cygne Units 1 and 2 is needed therefore this question does not apply in this case.

Q: If capacity and/or energy are needed, should KCP&L retrofit existing non-compliant plants or build new plants? (Item e in paragraph 8 of the 492 Order.)

A: A generic, one-size-fits-all-situations answer to this question does not exist. Each decision should be based upon appropriate analysis of the alternatives. In the case of La Cygne Units 1 and 2, KCP&L has shown that the capacity and energy from these units is needed. Based on the Company's resource plan analysis and the NPVRR results shown in Confidential-Restricted Schedule BLC2011-12, retrofit of the existing La Cygne Units 1 and 2 is the least cost option to continue to supply the capacity and energy needs of our customers.

Q: What criteria should be employed to determine optimal retrofit configurations to meet regulatory requirements? Has this analysis been performed for individual KCP&L plants? Which plants? (Item f in paragraph 8 of the 492 Order.)

A: In general, the criteria to be employed are the minimization of NPVRR. Once the retrofit has been completed for La Cygne Units 1 and 2, the only KCP&L plants that generally do not meet best available retrofit technology are the three Montrose units. Based on current assumptions and analysis, it is least cost to continue to run these plants absent environmental retrofits until required to do otherwise. Although NPVRR is the primary basis for evaluation of resource alternatives, other factors are relevant to the decision making process. For instance, it is important to maintain a balanced portfolio of generation resources. KCP&L anticipates, of the two existing generation sites that have not yet been retrofitted to BART – namely Montrose Station and La Cygne Station, Montrose would be the first existing generation site to retire rather than be retrofit. Given this, it is important to retain operation of the La Cygne site to maintain a balanced portfolio of coal, gas, nuclear, and renewable generation. The least cost alternative to retrofitting existing units to meet BART is combined cycle gas generation ("CC"). Retiring La Cygne generating station and replacing it with CC generation, followed by retirement of Montrose station generation with CC replacement would result in a significant reliance on the relatively more volatile natural gas market. NPVRR is based on the long-term economics of resource alternatives. It does not reflect shorter-term variations in fuel cost that can impact customers immediately. For instance, even if the NPVRR was lowest for CC, which it is not in the case of La Cygne, one still needs to consider that customers would be exposed in the shorter-term to larger variability in their bills attributable to the volatile gas market. Many customers already use natural gas for some portion of their space/water heating and cooking. With a generation portfolio more dependent on gas, the currently less volatile electric bill will become more volatile in line with gas price variability. This would result in increased customer dissatisfaction. (See Mr. Blunk's testimony for further discussion of natural gas market volatility.)

Q: Do the environmental retrofit projects that are currently installed, under construction or planned represent the end of the upgrading process for their corresponding KCP&L generating units, or will the environmental retrofit projects, in turn, require additional improvements to these KCP&L units? (Item g in paragraph 8 of the 492 Order.)

A: From an analysis perspective, KCP&L takes into account potential regulation changes to the extent that they are in place or proposed. To the extent they are probable, KCP&L models them. For example, KCP&L expects that cooling towers will need to be added to its coal plants. These costs have been included in this analysis. (See also the Direct Testimony of Company witness Mr. Scott Heidtbrink regarding this question.)

Q: For any planned but incomplete environmental upgrades, has analysis been performed on how the planned upgrades may impact the expected life of the plant at the completion of the upgrades? If so what criteria for analysis were used? (Item h in paragraph 8 of the 492 Order.)

A: The equipment to be installed at La Cygne Units 1 and 2 will not impact the useful life of the units. KCP&L has modeled continuation of La Cygne Units 1 and 2 throughout the planning period by incorporating normal maintenance activities and overlaid the cost of a long-range asset management plan. (Mr. Heidtbrink provides more detail on this question in his testimony.)

Q: If replacement of a KCP&L plant is considered as an option, what criteria should be used to determine the size and type of the generation plant to be built? (Item i in paragraph 8 of the 492 Order.)

A: The primary criteria employed are the same as that used to analyze the retrofits; that is, minimization of NPVRR. However, in some cases it may be prudent to select a resource plan that has a higher NPVRR if in doing so the risk associated with changes in critical uncertainties, environmental regulations, or other factors is mitigated.

Q: What factors were considered in any hypothetical resource portfolio scenarios which have been run? (Item j in paragraph 8 of the 492 Order.)

A: The major factors included in the scenarios are described earlier in this testimony.

Q: How does KCP&L plan to regulate the wind and other renewable generation that is required by the Renewable Energy Standards Act (K.S.A. 66-1256 through 66-1262? (Item k in paragraph 8 of the 492 Order.)

A: Wind resources required by the Renewable Energy Standards Act (K.S.A. 66-1256 through 66-1262) will cause additional demands for load regulation and other ancillary services. In the near-term, KCP&L will use its existing resources for regulation. Once the Southwest Power Pool consolidates Balancing Authorities (anticipated in 2014), KCP&L will no longer be required to regulate for its load directly. However, KCP&L will be required to either purchase regulating reserve or supply its share based on whatever SPP rules are ultimately approved. These rules are currently under development.

Q: If a utility has selected a specific option (*i.e.*, mothball, retrofit, decommission, and/or build a new plant) why were other options rejected, not just why the option chosen was appropriate? (Item (a) in paragraph 15 of the 492 Order.)

A: In this case, KCP&L has chosen to retrofit the La Cygne station with the equipment necessary to meet BART. All other options were rejected because they resulted in higher expected costs for retail customers over the next 20 years. The expected value of NPVRR for each alternative plan is detailed in Confidential-Restricted Schedule BLC2011-12. However, as I previously indicated in response to item f of paragraph 8, there are other reasons to reject replacement of La Cygne generation with new gas-fired generation. As for replacing La Cygne coal-fired generation with new coal-fired generation, the results of the NPVRR analysis places new coal-fired generation behind new gas-fired generation as an alternative to retrofitting La Cygne generation. In addition, new coal has all of the same risk related to future environmental regulations as retrofitting existing generation in addition to the uncertainty surrounding the ability to obtain air and other permits for new coal generation.

Q: What are the results of the analysis the Company prepared for evaluation of the La Cygne environmental retrofit decision?

A: The results of the planning process indicate that the La Cygne retrofits are part of the low cost plan in about 73% of the 64 scenarios analyzed. The scenarios where the retrofits were not selected generally include both the low gas price scenarios and the high CO_2 price scenarios.

Q: What are your recommendations resulting from the planning process?

A: La Cygne must meet BART requirements by June 1, 2015 or be retired/mothballed. Our recommendation is to move forward with the retrofit of La Cygne Unit 1 and La Cygne Unit 2. This recommendation is supported by the results of the resource planning process conducted for this filing which indicates that the retrofit of La Cygne Unit 1 and La Cygne Unit 2 is currently the appropriate least cost option. The present plan to retrofit La Cygne Unit 1 is consistent with the plan presented as part of the Settlement Agreement in the 04-KCPE-1025-GIE docket (the "1025 docket" and the "1025 S&A") which the Commission found to be in the public interest at that time.

Q: In the intervening time since the Commission's approval of the retrofits in the 1025 Docket, have the circumstances concerning La Cygne Unit 1 changed in a way that would make the underlying rationale for finding the project to be in the public interest no longer applicable?

A: No, they have not. As demonstrated by this planning analysis, the La Cygne retrofits result in minimizing expected NPVRR.

Q: Do you have any schedules which support your testimony?

A: Yes, I have included the following schedules which support the evaluation as part of my testimony:

- Confidential-Restricted Schedule BLC2011-1 reflects 20-year assumptions for gas prices.
- Confidential-Restricted Schedule BLC2011-2 reflects 20-year assumptions for CO_2 emission allowance costs.

- Confidential Schedule BLC2011-3 reflects the 20-year KCP&L energy forecasts.
- Confidential Schedule BLC2011-4 reflects the 20-year KCP&L gross peak load forecasts.
- Confidential Schedule BLC2011-5 reflects 20-year assumptions for annual demand side management ("DSM") megawatts ("MWs") for the base scenarios.
- Confidential Schedule BLC2011-6 reflects 20-year assumptions for annual DSM MWs for the sensitivity scenarios.
- Confidential Schedule BLC2011-7 reflects financial assumptions for debt ratio, debt rate and return on equity for various levels of future uncertainty.
- Confidential Schedule BLC2011-8 reflects utility nominal cost rankings for 54 different technologies.
- Common Schedule BLC2011-9 reflects details of the Company's existing generation resources.
- Confidential Schedule BLC2011-10 details the 64 scenarios of the analysis Risk Tree.
- Confidential-Restricted Schedule BLC2001-11 details the capacity and load balance of KCPL with its existing fleet and under the assumption that the La Cygne station is removed from KCP&L's generation mix.
- Confidential-Restricted Schedule BLC2011-12 details the results of the analysis and list the expected NPVRR of each alternative.

- Confidential-Restricted Schedule BLC2011-13 details the fourteen alternative expansion plans and the four sensitivity plans used in the analysis.

Q: Do you submit this information to address the requirements of K.S.A. 66-1239 (c)?

A: Yes, my testimony addresses the items listed in K.S.A. 66-1239 (c)(2)(C) and (D).

Q: Does that conclude your testimony?

A: Yes, it does.

**BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

In the Matter of the Petition of Kansas City Power & Light Company ("KCP&L") for Determination of the Ratemaking Principles and Treatment that Will Apply to the Recovery in Rates of the Cost to be Incurred by KCP&L for Certain Electric Generation Facilities Under K.S.A. 2003 SUPP. 66-1239	)	**Docket No. 11-KCPE-____-PRE**

AFFIDAVIT OF BURTON L. CRAWFORD

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

Burton L. Crawford, being first duly sworn on his oath, states:

1. My name is Burton L. Crawford. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Senior Manager, Energy Resource Management.

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 Seventeen (17) pages, 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 swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereof, are true and accurate to the best of my knowledge, information and belief.

____
Burton L. Crawford

Subscribed and sworn before me this 1st day of February 2011.

____
Notary Public

My commission expires: May 23, 2014

DONNA J. STOWAY
Notary Public, Notary Seal
State of Missouri
Clay County
Commission # 10889620
My Commission Expires May 23, 2014

SCHEDULES BLC2011-1 THROUGH BLC2011-8 THESE DOCUMENTS CONTAIN CONFIDENTIAL OR CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC ORIGINAL FILED UNDER SEAL

Location	OEM	Rating	Fuel	Environmental Equipment	Commissioned
Hawthorn 5	GE/B&W	565 MW	Coal	SCR, Scrubber, Baghouse, LNB, OFA	1969 (2001)
Iatan 1: 70%KCPL/18%GMO/12%EDE	GE/B&W	706 MW	Coal	SCR, Scrubber, Baghouse, LNB, OFA, Mercury	1980
Iatan 2: 54.71%KCPL/18%GMO/11.76%MJMUEC3.53%KEPCO	Toshiba/Alstom	850 MW	Coal	SCR, Scrubber, Baghouse, LNB, OFA Mercury	2010
LaCygne 1: 50%KCPL/50%Westar	Westinghouse/B&W	736 MW	Coal	SCR, Scrubber, OFA	1973
LaCygne 2: 50%KCPL/50%Westar	GE/B&W	682 MW	Coal	Precipitator	1977
Montrose 1	GE/CE	170 MW	Coal	Precipitator,	1958
Montrose 2	GE/CE	164 MW	Coal	Precipitator	1960
Montrose 3	Westinghouse/CE	176 MW	Coal	Precipitator	1963
Hawthorn 6/9 CC	Siemens V84.3A1 – W	136 MW / 130 MW	Gas		1997/2000
Hawthorn 7 & 8	GE Frame 7EA	75 MW each	Gas		1999
Osawatomie	GE Frame 7EA	76 MW	Gas		2002
Northeast	GE Frame 7B (8)	45 MW (2) / 53 MW (6)	Oil		1972 - 1977
West Gardner	GE Frame 7EA (4)	77 MW each	Gas		2002
Wolf Creek: 47%KCPL/47%Westar/6% KEPCo	Westinghouse	1200 MW	Nuclear		2003
Spearville 1	GE Wind Turbines	100.5 MW	Wind		2006
Spearville 2	GE Wind Turbines	48 MW	Wind		2010

SCHEDULES BLC2011-10 THROUGH BLC2011-13 THESE DOCUMENTS CONTAIN CONFIDENTIAL OR CONFIDENTIAL-RESTRICTED INFORMATION NOT AVAILABLE TO THE PUBLIC ORIGINAL FILED UNDER SEAL

VERIFICATION

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

The undersigned, Mary Britt Turner, upon oath first duly sworn, states that she is the Director, Regulatory Affairs of Kansas City Power & Light Company, that she has reviewed the foregoing Response, that she is familiar with the contents thereof, and that the statements contained therein are true and correct to the best of her knowledge and belief.

Mary Britt Turner

Mary Britt Turner
Director, Regulatory Affairs
Kansas City Power & Light Company

Subscribed and sworn to before me this 25th day of February, 2011.

ANNETTE G. CARTER
Notary Public - Notary Seal
Comm. Number 09779753
STATE OF MISSOURI
Jackson County
My Commission Expires: Oct. 6, 2013

Annette G Carter

Notary public

My commission expires:

October 6, 2013

CERTIFICATE OF SERVICE

I hereby certify that a copy of the above Initial Comments of KCPL was hand-delivered or mailed, postage prepaid, this 25th day of February, 2011 to:

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