BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

IN THE MATTER OF BLACK HILLS/ NEBRASKA GAS UTILITY COMPANY, LLC D/B/A BLACK HILLS ENERGY, OMAHA, SEEKING A GENERAL RATE INCREASE FOR BLACK HILLS ENERGY'S RATE AREAS ONE, TWO AND THREE (CONSOLIDATED)	)))))))	**DOCKET NO. NG_____**

Direct Testimony and Exhibits of Thomas J. Sullivan

Weather Normalization, Class Cost of Service, and Rate Design

December 1, 2009

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EXHIBITS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. Thomas J. Sullivan, 11401 Lamar, Overland Park, Kansas 66211.

Q. WHAT IS YOUR OCCUPATION?

A. I am currently a Managing Director in the Rate and Regulatory Advisory Solution Set of the Enterprise Management Solutions Division of Black & Veatch Corporation.

Q. HOW LONG HAVE YOU BEEN ASSOCIATED WITH BLACK & VEATCH?

A. I have been employed with the firm since 1980.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I earned a Bachelor of Science Degree in Civil Engineering from the University of Missouri - Rolla in 1980, summa cum laude, and a Master of Business Administration degree from the University of Missouri - Kansas City in 1985.

Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?

A. Yes, I am a registered Professional Engineer in the State of Missouri.

Q. TO WHAT PROFESSIONAL ORGANIZATIONS DO YOU BELONG?

A. I am a member of the American Society of Civil Engineers and I am the sponsor for the Black & Veatch membership in the American Public Gas Association.

Q. WHAT IS YOUR PROFESSIONAL EXPERIENCE?

A. I have been responsible for the preparation and presentation of numerous studies for gas, electric, water, and wastewater utilities. Clients served include investor owned utilities, publicly owned utilities, and their customers. Studies have involved valuation and depreciation, cost of service, cost allocation, rate design, cost of capital, supply analysis,

load forecasting, economic and financial feasibility, cost recovery mechanisms, and other engineering and economic matters.

Prior to joining the Enterprise Management Solutions Division in 1982, I worked as a staff engineer in Black & Veatch's Energy and Water Divisions.

Q. HAVE YOU PREVIOUSLY APPEARED AS AN EXPERT WITNESS?

A. Yes, I have. In Exhibit___(TJS-1), I list cases where I have filed expert witness testimony and/or appeared as an expert witness. I filed testimony before this Commission on behalf of Aquila Networks in Docket Nos. NG-0001, NG-0002, NG-0003, and NG-0004 regarding the weather normalization adjustment proposed by Aquila in that case. I filed testimony before this Commission on behalf of Kinder Morgan, Inc. (the former owner of the jurisdictional assets now owned and operated in Nebraska by SourceGas Distribution, LLC) in Docket No. NG-0036 regarding the weather normalization adjustment, test year billing determinants and revenues under existing rates, customer and usage trends and rate design proposed by Kinder Morgan in that case. I filed testimony before this Commission on behalf of Aquila in Docket No. NG-0041 regarding the jurisdictional and class cost of service study, rate design, and revenue synchronization adjustment proposed by Aquila in that case. I filed testimony before this Commission on behalf of SourceGas Distribution LLC in Docket No. NG-0060 regarding customer and usage trends and adjustments; their proposed weather normalization adjustment, customer change adjustment, use per customer adjustment, and inflation adjustment riders; and competitive factors.

Q. FOR WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of Black Hills Energy ("Black Hills" or "Company").

Q. WHAT WORK DID YOU PERFORM IN CONNECTION WITH THE COMPMANY'S APPLICATION FOR A GENERAL RATE INCREASE IN THIS PROCEEDING?

A. The Company asked me to:

1. Develop and present the Company's proposed weather normalization adjustment to sales (throughput), revenues, and cost of gas.
2. Determine jurisdictional revenues under existing rates.
3. Prepare a jurisdictional class cost of service study.
4. Design the Company's proposed rates.

Q. HAVE YOU PREPARED ANY EXHIBITS OR SCHEDULES IN CONNECTION WITH YOUR TESTIMONY?

A. Yes, in addition to Exhibit___(TJS-1) previously discussed, I prepared the following exhibits:

Exhibit___(TJS-2) – Summary of Statistical Results from Heating Degree Day Regression Analysis

Exhibit___(TJS-3) – Calculation of Weather Normalization Adjustment

Exhibit___(TJS-4) – Summary of Synchronization Adjustment

Exhibit___(TJS-5) – Functional Classification of Rate Base and Cost of Service

Exhibit___(TJS-6) – Allocation of Rate Base and Cost of Service

Exhibit___(TJS-7) – Revenues Under Current and Proposed Rate Design

Exhibit___(TJS-8) – Summary of Competing Electric Utility Residential and Commercial Rates

Exhibit___(TJS-9) – Competing Electric Online Cost Calculators

These exhibits were prepared under my direction and supervision.

In addition, I sponsor Index No. 13, Sheet 1 of 3 of the Company's proposed tariff.

II. WEATHER NORMALIZATION

Q. PLEASE EXPLAIN THE CONCEPT OF WEATHER NORMALIZATION AND WHY IT IS IMPORTANT IN ESTABLISHING FAIR AND REASONABLE RATES FOR NATURAL GAS SERVICE.

A. Because proposed rates are based on gas usage, gas usage should be adjusted to reflect usage (volumes) that would have been expected in an otherwise "normal" (typical) year. If rates are based upon usage levels that are inflated due to colder than normal conditions, the rates might be set too low and might not recover costs during periods of normal conditions. Alternately, if rates are based on usage levels that are understated due to warmer than normal conditions, the rates may be set too high and over recover during periods of normal conditions. The most reasonable basis on which to set rates is on normal conditions. Over the long term, this eliminates a bias which may be introduced by using usage levels to establish rates that are higher or lower than what would normally be expected. Thus, in establishing rates, it is usually necessary to apply an adjustment to actual volumes to recognize what usage would have been if weather conditions were normal.

Q. WERE WEATHER CONDITIONS NORMAL DURINNG THE TEST YEAR IN THE COMPANY'S SERVICE TERRITORY?

A. No. The Company's service territory experienced colder weather than normal during the Test Year ended July 31, 2009. Based on a comparison of actual heating degree-days ("HDDs") to normal HDDs (based on the normals sponsored by Mr. Larry Loos in his direct testimony), conditions during the Test Year were colder than normal. The normals

sponsored by Mr. Loos are based on the 10-year average Optimum Climate Normals ("OCN") as defined in his testimony.

Q. PLEASE DEFINE WHAT YOU MEAN BY A HEATING DEGREE-DAY.

A. A heating degree-day is defined as 65 degrees less average daily temperature where average daily temperature equals the average of the high and low temperatures on each day. Sixty-five degrees is typically used as the base temperature. If the average daily temperature exceeds 65 degrees, the HDD for that day is set equal to zero. The sum of the daily HDDs for a particular month is the monthly HDDs.

Q. PLEASE SUMMARIZE THE WEATHER CONDITIONS FOR THE WEATHER STATIONS YOU USED IN YOUR ANALYSIS.

A. The data is shown in the following table:

Weather Station	Actual HDDs for 12 Months Ended 7/2009	Normal HDDs	% Colder Than Normal
Omaha	6,228	5,926	5.1
Lincoln	6,006	5,845	2.8
Norfolk	6,754	6,330	6.7

Q. WHEN YOU SAY TEMPERATURES WERE COLDER THAN NORMAL, IS THIS CONCLUSION BASED ON MR. LOOS' NORMAL HDDS?

A. Yes. My use of the 10-Year Average OCN HDDs is discussed later in my direct testimony. The difference between actual HDDs and Mr. Loos' HDDs are significant enough that I concluded a heating adjustment to reflect normal weather conditions is warranted in this Docket for Black Hill's Nebraska gas service territory.

Q. PLEASE OUTLINE YOUR DIRECT TESTIMONY CONCERNING WEATHER NORMALIZATION.

A. I will:

1. Describe the methodology I use to determine the relationship between gas usage and weather;

2. Describe the weather stations and weather data I use;

3. Describe the analyses I use to adjust temperature or heat sensitive usage to reflect normal weather conditions; and

4. Describe the results of the heating adjustment analyses.

Q. BEFORE DISCUSSING THE SPECIFIC ADJUSTMENTS YOU ARE PROPOSING, PLEASE SUMMARIZE THE METHODOLOGY YOU USE TO DETERMINE THE RELATIONSHIP BETWEEN USAGE AND WEATHER.

A. I use multiple linear regression analysis to define the relationship between volumes and variables that represent weather conditions. Multiple linear regression is a statistical approach commonly used to predict the value of a dependent variable (use per customer) using multiple independent variables (including current month HDDs, previous month HDDs, and trend). In this regard, the goal is to explain the dependent variable with reasonable accuracy using as few independent variables as possible.

Multiple regression yields an equation of the form:

$$Y = B + A1X1 + A2X2 + ... + AKXK$$

where

Y is the dependent variable

X1...XK are the independent variables

B is the y-intercept (or constant)

A1...AK are the regression coefficients

With respect to my use of multiple linear regression as a tool in developing adjustments to reflect normal weather conditions, the dependent variable (Y) is monthly use per customer, and I calculate it by dividing monthly volumes by monthly number of customers. I use monthly use per customer as the dependent variable instead of total monthly volumes because use per customer reduces the effect of growth or decline in total volumes due to changes in numbers of customers (particularly on a seasonal basis). Independent variables (X1...XK) are typically weather variables such as HDDs. The intercept (B) is a monthly constant. The constant represents usage that is not affected by the independent variables. This non-weather sensitive use is generally referred to as base use (and includes usage such as water heating, cooking, and clothes drying, which are not weather dependent). The coefficients (A1...AK) are developed from the regression analysis based on the best fit (least squares).

I calculate several statistics in connection with my regression analyses to assist in the evaluation of the significance (degree to which the independent variables explain the dependent variable) of the various variables in explaining use per customer. In this regard, I primarily focus on the coefficient of determination (R-squared) and the F statistic, which are commonly used to measure how well the independent variables (HDDs, for example) explain the dependent variable (usage).

Q. WHAT DATA DO YOU USE IN PERFORMING THE MULTIPLE LINEAR REGRESSION ANALYSIS DESCRIBED ABOVE?

A. I base my analysis on actual monthly use per customer (dependent variable), and actual monthly HDDs and a trend component (independent variables). In simple terms, my

regression analysis produces coefficients that I use to determine use per customer per HDD.

Q. WHAT USAGE ARE YOU PROPOSING TO ADJUST?

A. I am proposing to adjust volumes for those groups of customers where it can be demonstrated that their usage is sensitive to changes in winter temperature conditions. These groups of customers use natural gas primarily for space heating. The variation in monthly HDDs typically explains most of the variation in volumes used by customers who use gas in space heating applications. The customer groups I am proposing to adjust are the Company's Residential and Commercial (including Energy Options Firm) customer groups.

Q. WHAT VARIABLES DO YOU DETERMINE BEST EXPLAIN THE VARIATION IN HEAT SENSITIVE SALES AND WHAT IS THE BASIS FOR YOUR RECOMMENDATION REGARDING THESE VARIABLES?

A. The correlation between HDDs and sales to space heating customers is quite high. In others words, the colder the weather, the greater the space heating requirements. HDDs are typically used as a basis to predict a customer's natural gas space heating requirement. The results of my analyses demonstrate a very high correlation between HDDs and use per customer for the customer classes whose primary use is space heating.

In my regression analyses, I include current and previous months' HDDs and a trend factor as independent variables. Because volumes are based on the reading of customers' meters on a cycle that does not correspond to a calendar month, HDDs for both the current and the previous month are included as independent variables. The trend factor recognizes any long run change in use per customer that is not attributable to

changes in weather conditions (due to factors such as conservation or changes in typical home size, for example).

Q. PLEASE DESCRIBE THE WEATHER DATA YOU UTILIZE FOR YOUR ANALYSIS.

A. I use monthly actual heating degree-day data for weather stations in the following towns: Omaha, Lincoln, and Norfolk, Nebraska as published by the National Oceanographic and Atmospheric Administration ("NOAA"). The primary consideration in my selection of these weather stations is to select NOAA stations that are in close geographic proximity to the Company's load centers (the towns the Company serves). My intent is to group the towns around NOAA weather stations where I would expect weather conditions (HDDs) to be similar based on geographic proximity and elevation. The actual weather data I use is the same data used by Mr. Loos.

Q. WHAT IS THE SOURCE OF THE DATA YOU USED FOR NORMAL HDDS?

A. The monthly normal HDDs I use for each weather station are equal to the normal HDDs prepared by Mr. Loos using the 10-Year average OCN methodology. This data is contained in Exhibit___(LWL-7), and its derivation is explained in Mr. Loos' direct testimony.

Q. WHAT VOLUME AND CUSTOMER DATA DO YOU USE?

A. My source for monthly volume (usage) and customer data is the Company's detailed billing data records which are kept by town and customer class or rate schedule. I rely upon billing data for the period August 2001 through July 2009. My goals are to use a sufficiently long period of time such that the heating degree-days over that period include periods that are both warmer and colder than normal and aren't significantly biased

towards either being abnormally warm or cold. If practical, the time period should also be long enough to capture any underlying change in usage characteristics (due to such factors as conservation). I ran separate regression analyses on each Residential, Commercial, and Energy Options Firm customer group for each of the three weather stations.

Q. WHY IS IT NECESSARY TO PERFORM YOUR ANALYSIS OVER A PERIOD OF TIME THAT EXHIBITS BOTH WARMER AND COLDER THAN NORMAL WEATHER CONDITIONS?

A. In connection with studies that I have made over the years of the relationship between gas volumes and winter weather conditions, I have observed several anomalies. One of these anomalies is that for a specific customer group, the relationship between sales and HDDs can appear to change substantially from year-to-year. In studying this question, I found that significant changes in the relationship generally correspond to years where weather conditions are more abnormal. Therefore, it is important that I examine conditions over a long enough period to ensure that any weather adjustment I make reflects truly normal usage characteristics. For example, using only the test year of data for my analysis violates this principle because the weather during the test year (in this case) was colder than normal. It is unreasonable to assume that usage characteristics during one year which was colder than normal would be representative of normal usage characteristics.

Q. PLEASE DESCRIBE YOUR WEATHER NORMALIZATION REGRESSION RESULTS.

A. In order to identify anomalies in usage patterns over the five-year period for which I have sales data, I performed regression analyses in decreasing blocks of time (2002-2009,

2003-2009, 2004-2009, etc.) for each Residential, Commercial, and Energy Options Firm customer group. Exhibit___(TJS-2) summarizes the results of each of the regression analyses. I evaluated the results of each of these time periods using five criteria to determine which period should be used to define usage characteristics. These five criteria are:

1. Consistency of predicted normal use per customer;
2. Average annual HDDs for the period evaluated being near normal;
3. R squared – values in the high 90 percent range are common for the Residential and Commercial customer groups;
4. F statistic – higher values equate to higher level of significance;
5. Obvious changes in database as reflected in coefficients and statistics.

Exhibit___(TJS-2) also shows which regression analysis I use for each customer group and weather station that best meets these criteria. Based on these regression analyses, I find that it is reasonable to adjust all the customer groups previously identified in my testimony. I find that the trend variable is significant in most, but not all, cases.

Q. WHY ARE YOU NOT PROPOSING A WEATHER NORMALIZATON ADJUSTMENT FOR THE OTHER CUSTOMER GROUPS SERVED BY BLACK HILLS IN NEBRASKA?

A. The classes I did not weather normalize consist of interruptible and/or transportation customers who primarily use gas for industrial purposes, not space heating.

Q. HOW DID YOU DETERMINE THE HEATING VOLUME ADJUSTMENT APPLICABLE TO THE COMPANY'S RESIDENTIAL, COMMERCIAL, AND ENERGY OPTIONS FIRM CUSTOMER GROUPS?

A. I summarize this calculation in Exhibit___(TJS-3). The heating adjustment per customer is the difference between normal and actual HDDs multiplied by its respective HDD coefficients (current and prior months) for each month of the Test Year. As previously indicated, normal HDDs were provided to me by Mr. Loos. Using coefficients from Exhibit___(TJS-2) and the Normal HDD data shown in Exhibit___(LWL-7), I determine the heating adjustment per customer (Column (H)).

After I calculate the monthly heating adjustment per customer (therms/customer), I multiply each of these figures by the respective number of customers for each month of the test year to determine the total volumetric adjustment. As I show in Column (J) of Exhibit___(TJS-3), my heating adjustment represents a decrease in sales of 4,132,859 therms for the Residential class, 1,389,556 therms for the Commercial class, and 1,382,482 therms for the Energy Options Firm class. These adjustments result in a decrease in volumes which is consistent with actual conditions being colder than normal during the base year.

Q. HOW DID YOU DETERMINE THE WEATHER NORMALIZATON REVENUE ADJUSTMENTS?

A. For each location, I determine the margin adjustment by multiplying the margin rate (excluding gas cost) times the volumetric adjustment. I show the margin adjustments in Column (L) of Exhibit___(TJS-3) and I calculate them by multiplying Column (J) by Column (K). I show the cost of gas adjustment in Column (N) and I calculate it by

multiplying Column (J) by the cost of gas in Column (M). The cost of gas I use is the average test year cost of gas for each customer class. The total revenue adjustment, Column (O) is the sum of Columns (L) and (N).

For the Residential class, the total margin adjustment is a negative $636,708, the cost of gas adjustment is negative $3,121,355 and the total revenue adjustment is negative $3,758,063. For the Commercial class, the total margin adjustment is a negative $244,020, the cost of gas adjustment is negative $992,870 and the total revenue adjustment is negative $1,236,890. For the Energy Options Firm class, the total margin and total revenue adjustments are negative $242,778; there is no gas cost applicable to the Energy Options customers. The Total Company margin adjustment is negative $1,123,506, the cost of gas adjustment is negative $4,114,224 and the total revenue adjustment is negative $5,237,730. All of these adjustments result in a decrease in base year revenues, which is consistent with actual conditions being colder than normal during the base year.

Q. DOES THIS CONCLUDE YOUR PERPARED DIRECT TESTIMONY REGARDING YOUR PROPOSED WEATHER NORMALIZATION ADJUSTMENT?

A. Yes, it does.

III. REVENUE SYNCHRONIZATION - TEST YEAR BILLING DETERMINANTS AND REVENUES UNDER EXISTING RATES

Q. PLEASE EXPLAIN THE REVENUE SYNCHRONIZATION ADJUSTMENT YOU ARE PROPOSING.

A. The adjustment I am proposing synchronizes test year jurisdictional margin revenues with per books billing units. The adjustment is summarized on Page 1 of Exhibit_(TJS-4).

Q. WHY ARE YOU PROPOSING TO SYNCHRONIZE JURISDICTIONAL MARGINS?

A. The primary reason is to provide a consistent basis with which to compare margin revenues under existing and proposed rates. The revenue synchronization adjustment I am proposing results in test year revenues that are equal to test year billing units times the applicable existing rates. I can therefore take the same test year billing units times the proposed rates and accurately measure the revenue impact of the proposed rates I discuss later in my testimony.

Q. HAVE YOU PREPARED AN EXHIBIT SHOWING HOW THIS ADJUSTMENT IS CALCULATED?

A. Yes, the detailed calculation of this adjustment is shown on Page 2 of Exhibit___(TJS-4). As shown in this exhibit, total margin equals test year average annual number of customers (in other words the number of bills rendered during the test year) times existing customer charges times 12, plus total test year annual throughput times the existing commodity charge (exclusive of gas cost), plus annual demand times the existing

demand charge. This is synchronized margin, or, in other words, the amount of margin the Company should realize based on test year billing units and existing rates.

I then compare the synchronized margin to per books margin (total per books revenues less per books purchased cost of gas). The difference between these two is the synchronization adjustment required such that the test year margin revenues represent the amount of margin revenues that the Company's tariff is intended to collect. I net out the purchased cost of gas in my calculation because the cost of gas and cost of gas revenues are accounted for separately in the Company's GCA. Over- and under- recovery mechanisms in the GCA insure that the Company collects 100 percent of its prudently incurred gas costs. Separate GCA proceedings or reviews deal with the gas cost and gas cost revenues.

Q. WHAT GAS COST ARE YOU USING FOR THE TEST YEAR?

A. I am using per books costs for the period ended July 31, 2009. The unit gas cost is equal to per books gas cost divided by per books volumes. The resulting unit cost of gas for Residential service is $0.75525 per therm. For the Commercial service the units cost of gas is $0.71452 per therm. The difference is primarily due to differences in the customers seasonal load profile combined with changes in the GCA through the year.

Q. WHAT RESULTS ARE SHOWN ON EXHIBIT___(TJS-4)?

A. As shown on Page 1 of Exhibit___(TJS-4), the revenue synchronization adjustment to sales margin I am proposing increases sales margin by $209,132

Q. HOW DOES EXHIBIT___(TJS-4) RELATE TO YOUR PROPOSED WEATHER NORMALIZATION ADJUSTMENT?

A. The revenues, cost of gas, and units of service (number of customers and volumes) contained in Exhibit___(TJS-4) represent test year figures prior to any other pro forma adjustments. I summarize my proposed weather normalization adjustment to revenues, cost of gas, and sales volumes in Exhibit___(TJS-3). I use the same unit gas costs in Exhibit___(TJS-3) as I do in Exhibit___(TJS-4). Lines 1 through 18 of Exhibit___(TJS-7) show test year billing determinants and revenues under existing rates including both the weather normalization and revenue synchronization adjustments I am proposing. Exhibit___(TJS-7) reflects the summation of the figures in Exhibit___(TJS-3) and Exhibit___(TJS-4).

As shown on Line 18 of Exhibit___(TJS-7), total test year jurisdictional revenues under existing rates including all of the pro forma adjustments I am recommending equal $184,357,200 consisting of $60,083,723 in margin revenues and $124,273,477 in gas cost revenues. Total test year average number of customers shown on Line 7 equal 195,731. Total test year throughput shown on Line 8 equals 189,959,883 therms.

Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY WITH REGARDS TO TEST YEAR REVENUES UNDER EXISTING RATES?

A. Yes, it does.

IV. JURISDICTIONAL CLASS COST OF SERVICE

Q. PLEASE DESCRIBE THE JURISDICTIONAL CLASS COST OF SERVICE STUDY YOU SPONSOR IN THIS MATTER.

A. The jurisdictional class cost of service study is based upon Black Hills' Nebraska operations for the twelve month Test Year ended July 31, 2009. Test period figures applicable to Nebraska operations were provided to me by Black Hills personnel.

The jurisdictional class cost of service study that I sponsor is contained in Exhibits___(TJS-5) and ___(TJS-6). There are two significant changes to the class cost of service study I am sponsoring in this case compared to the class cost of service study I sponsored in the Company's last rate case in Docket No. NG-0041.

Q. PLEASE DESCRIBE THESE DIFFERENCES.

A. In Docket No. NG-0041, I sponsored separate cost of service studies for each of the Company's three jurisdictional rate areas. In the rate design that was approved in Docket No. NG-0041, the three jurisdictional rate areas were consolidated into one Residential and one Commercial rate. The Energy Options Firm customers have the same rate as the Commercial customers. Therefore, I am sponsoring one consolidated jurisdictional class cost of service study in this case.

In its order in Docket No. NG-0041 on Pages 28 and 29, the Commission ordered the following:

> "In the next Aquila rate case, we order that the rate filing schedules used to determine the utility's revenue requirement include both total Nebraska amounts and the Commission's jurisdictional amount."

Exhibit___(TJS-5) presents the functional classification of Total Nebraska rate base and cost of service (revenue requirement). Exhibit___(TJS-6) shows the allocation of the Total Nebraska rate base and cost of service to jurisdictional customer classes.

By comparison, the jurisdictional class cost of service study I am sponsoring in this case is much less complex and more straightforward than the class cost of service study I sponsored in Docket No. NG-0041.

Q. PLEASE DESCRIBE EXHIBIT___(TJS-5).

A. Exhibit___(TJS-5) shows how I classify test period Total Nebraska costs into functional categories as the first step in my class cost of service study. Exhibit___(TJS-5) consists of four tables. Table 1 shows a summary of rate base and total cost of service by functional classification. Table 2 shows the functional classification of rate base. Table 3 shows the functional classification of operation and maintenance expenses. Table 4 shows the functional classification of depreciation expenses, taxes other than income taxes, interest charges, and other operating revenues.

I classify costs in Exhibit___(TJS-5) into twelve functions: Supply, Peaking, Transmission – Demand, Transmission – Commodity, Distribution – Demand, Distribution – Commodity, Distribution – Customer, Services (or service lines), Meters and Regulators, Customer Accounts, Jurisdictional Direct, and Non-jurisdictional Direct.

Peaking costs include manufactured gas plant costs and underground gas storage inventory. Supply costs include purchased gas commodity related costs included in cash working capital.

I classify 50 percent of transmission mains related costs as Transmission – Demand related, and 50 percent as Transmission – Commodity related. I directly assign

$784,445 of plant Account 367 – Transmission Mains to Non-jurisdictional Direct because this represents the plant investment specifically built to serve Cargill (a non-jurisdictional customer).

I classify 50 percent of distribution measuring and regulating related costs (Accounts 374, 375, and 378) to Distribution – Demand related cost and 50 percent as Distribution – Commodity related cost. I classify distribution mains related costs as 32.93 percent Distribution – Demand related, 5.99 percent Distribution – Commodity related, and 61.08 percent Distribution - Customer related based on the mains allocation and customer weighting factor analyses contained in my workpapers.

I classify costs associated with the services (service lines) as Services related costs.

I classify costs associated with meters and regulators as Meters and Regulators related costs.

I classify customer accounting expenses as Customer Accounts related costs. I classify one-third of customer service and information expenses, as well as sales expenses, as Distribution - Commodity. I classify the remaining two-thirds as Customer Accounts related costs.

I classify regulatory commission expense (Account 928) to Direct – Jurisdictional. I classify revenues from forfeited discounts (Account 487) to Direct – Jurisdictional (then directly to the Residential class). Because the Company calculates a separate cash working capital allowance in their lead lag study between jurisdictional and non-jurisdictional, I classify cash working capital to Jurisdictional Direct and Non-

jurisdictional Direct based on the Company's calculation. As indicate earlier, I classify the mains investment attributable to Cargill to Non-jurisdictional Direct.

Column (P) of Exhibit___(TJS-5) provides the specific classification bases for all rate base and revenue requirement (cost of service) components.

Q. PLEASE DISCUSS THE CONTENTS OF EXHIBIT___(TJS-6).

A. Exhibit___(TJS-6) consists of five tables which show the results of allocating the Total Nebraska functional costs I determine in Exhibit___(TJS-5) to jurisdictional customer classes. Table 1 shows the development of class rates of return under both current and proposed rates. Table 2 shows the allocation of Total Nebraska cost of service to jurisdictional customer classes. Table 3 shows the allocation of Total Nebraska rate base to jurisdictional customer classes. Table 4 shows the allocation bases I use to allocate Total Nebraska functional cost of service and rate base to jurisdictional customer classes. Table 5 shows the unit ($/therm or $/bill) functionalized cost of service by jurisdictional customer class.

Q. HOW DO YOU DEFINE JURISDICTIONAL CUSTOMER CLASSES IN YOUR COST OF SERVICE STUDY?

A. I define the customer classes in my cost of service study based on the Company's existing rate categories: Residential, Commercial and Energy Options – Firm.

Q. IN EXHIBIT__(TJS-6), PLEASE EXPLAIN THE DIFFERENCE BETWEEN TOTAL NEBRASKA AND TOTAL JURISDICTIONAL.

A. The difference between Total Nebraska (Column [B]) and Total Jurisdictional (Column [F]) represent the rate base and cost of service allocated to Non-jurisdictional customers.

Q. PLEASE DISCUSS THE PRINCIPAL ALLOCATION BASES YOU USE IN YOUR CLASS COST OF SERVICE STUDY.

A. Table 4 of Exhibit___(TJS-6) shows the allocation factors I use to allocate functionally classified costs to customer classes (jurisdictional and non-jurisdictional).

Cost of Gas is the purchased gas cost applicable to each customer class.

Winter Period Peak Demand represents estimated class Peak Day demand requirements. The Peak Day demand requirements for the Residential, Commercial, and Energy Options Firm are estimated based on load factors developed from regression analyses of monthly sales and heating degree-days ("HDDs"). The Peak Day requirements for the Non-jurisdictional Firm customer classes are based on analyses of winter peak month throughput to average throughput. The Peak Day requirements for the Non-jurisdictional Interruptible customers are based on setting their load factor equal to 100 percent.

Firm Winter Period Sales represents firm sales volumes made during the winter period of November through March.

The Commodity allocation basis is equal to adjusted test year Annual Throughput and equals the throughput used to determine revenues under existing and proposed rates.

I develop the Services (service lines), Meters and Regulators, and Customer Accounting allocation bases by weighting average number of customers. I weight the number of customers by factors that represent the relative cost or investment associated with service to each class. The development of the customer weighting factors is provided in my workpapers.

Q. HOW DO YOU ALLOCATE FUNCTIONALLY CLASSIFIED COSTS TO CUSTOMER CLASSES?

A. I allocate Supply related costs on the basis of annual Cost of Gas.

I allocate Peaking related costs to classes on the basis of Firm Winter Period Sales.

I allocate Transmission and Distribution - Demand related costs to classes on the basis of Winter Peak Day Demand. I allocate Transmission and Distribution - Commodity related costs to customer classes on the basis of Annual Throughput.

I allocate Distribution – Customer, Services, Meters and Regulators, and Customer Accounting related costs to classes on the basis of Weighted Number of Customers. Weighting factors are used for each functional classification in order to recognize the relative difference in costs of these functions in serving the various jurisdictional and non-jurisdictional customer classes.

Q. HOW DO YOU TREAT OTHER OPERATING REVENUES IN YOUR CLASS COST OF SERVICE STUDY?

A. In my class cost of service study, I credit other operating revenues to cost of service. The other operating revenues I credit to cost of service include: forfeited discounts, miscellaneous service revenues, and Rents from Gas Property.

Q. WHAT IS THE PRINCIPAL FINDING OF YOUR STUDY?

A. The principal finding is that, under current rates, the overall rate of return on the Company's Nebraska jurisdictional gas utility operations amounts to 5.35 percent based on the Nebraska jurisdictional rate base of $163,800,857. I summarize the rates of return under current rates for Nebraska jurisdictional sales customer classes in the table below.

Customer Class	Rate of Return
Residential	4.14%
Commercial	7.38%
Energy Options - Firm	13.71%

As indicated by the rates of return under current rates, current rate revenues associated with the Company's service to Nebraska jurisdictional customers are insufficient to cover cost, including an opportunity for the Company to earn a reasonable return on its investment devoted to providing utility service. In order for the Company to earn the 9.84 percent rate of return requested by the Company on jurisdictional rate base, jurisdictional Nebraska rate revenues must be increased by $12.091 million.

Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY REGARDING YOUR CLASS COST OF SERVICE STUDY?

A. Yes, it does.

V. RATE DESIGN

Q. WHAT GUIDELINES DID YOU FOLLOW IN THE DESIGN OF PROPOSED RATES?

A. The guidelines that I used to design the proposed rates are as follows:

1. The overall increase in jurisdictional rates should produce approximately $12.1 million in additional annual revenues.
2. The commodity charges for the Residential, Commercial, and Energy Options Firm rates should be equal.
3. The customer charges for the Residential, Commercial, and Energy Options Firm rates should be increased to move in the direction of recognizing the fixed nature of the Company's non-gas costs.
4. A declining block rate structure should be established for the commodity portion of the rates.
5. Consistent with the above goals, rates should be designed as near to class cost of service as practical.

The above guidelines only apply to the non-gas cost portions of the rates.

Q. HAVE YOU PREPARED AN EXHIBIT SUMMARIZING YOUR PROPOSED RATE DESIGN?

A. Yes. Exhibit___(TJS-7) summarizes my proposed rates and revenues under proposed rates. Lines 1 through 18 summarize the development of revenues under existing rates and Lines 19 through 36 summarize the development of revenues under proposed rates. Lines 37 through 46 show the differences between revenues under existing and proposed rates.

Q. PLEASE EXPLAIN THE CUSTOMER CHARGES YOU ARE PROPOSING.

A. I am proposing the following customer charges:

Residential	$ 15.00 per month
Commercial	$ 20.00 per month
Energy Options - Firm	$ 20.00 per month

The customer charges I am proposing for the Residential, Commercial, and Energy Option - Firm rates represent a balance between these factors:

1. The primarily fixed nature of cost of service.
2. The existing relationships between the Residential, Commercial, and Energy Options - Firm customer charges.
3. Customer related cost of service.

Q. WHY SHOULD THE COMMODITY CHARGES FOR RESIDENTIAL, COMMERCIAL, AND ENERGY OPTIONS - FIRM RATES BE THE SAME?

A. There are two primary reasons. First and foremost, there is no difference in commodity related costs between these classes. And, as will be discussed more fully in my discussion of my proposed block rate structure, if rates are designed as near to class cost of service as practical, then the resulting rates should be the same.

Second, historically, the commodity rates for these classes were the same until the last rate case. The differences that resulted from the last rate case were the result of the Commission ordering rates that diverged significantly from cost of service. On Page 29 of its order in Docket No. NG-0041,the Commission stated:

> "The Public Advocate's recommended gradualism constraint is to limit the percent increase to the residential class to 1% above the total average increase for all customers. We accept the PA's gradualism recommendation."

Limiting the Residential increase to 1% above the total average increase was a much too narrow constraint than is necessary in the spirit of gradualism, especially since this 1 percent applied only to the change in the margin component of the rate. Such a narrow limitation will make it difficult to ever eliminate the commercial class subsidization of the residential class. As will be shown in my testimony below, the Residential increase I am recommending is 8.5 percent compared to an overall jurisdictional increase of 6.6 percent. This difference is not disruptive and the rates I am recommending will eliminate the current subsidization of the residential customers by the commercial customers.

Q. PLEASE DISCUSS THE BLOCK RATE STRUCTURES YOU ARE RECOMMENDING.

A. I recommend a two block rate structure for the Residential, Commercial, and Energy Options Firm rates. For the Residential rate, I am recommending a first block rate that would apply to the first 20 therms and a second block rate that would apply to all therms in excess of 20 therms. For the Commercial and Energy Options Firm rates, I am recommending a first block rate that would apply to the first 40 therms and a second block rate that would apply to all therms in excess of 40 therms.

Q. WHY ARE YOU RECOMMENDING THESE BLOCK RATES?

A. There are two principal reasons. First, a declining block rate structure can be established that recognizes the fixed nature of some of the Company's costs that are not recovered fully by the customer charge. Second, a declining block rate structure can also be effectively used to establish rate levels in the second block that are more competitive with electric rates that target heat-sensitive usage.

Q. HOW DID YOU DETERMINE THAT THE RESIDENTIAL FIRST BLOCK SHOULD BE SET AT 20 THERMS?

A. Based on my analysis of all Residential bills rendered by the Company over the last three years, I determined that consumption levels below 20 therms represent base use that does not vary significantly with changes in heating degree-days. In other words, the total consumption captured by a block based on the first 20 therms of consumption is not weather sensitive. Because, this consumption does not vary significantly with heating degree-days, the customer's bill and the Company's revenue stream associated with the first block will not vary significantly from year to year. It will vary from month to month to the extent that a customer has bills that are less than 20 therms, but this portion of the bill will not vary significantly year over year.

Q. HOW DID YOU DERTERMINE THAT THE COMMERCIAL AND ENERGY OPTIONS – FIRM FIRST BLOCK SHOULD BE SET AT 40 THERMS?

A. In analyzing the Commercial and Energy Options Firm bills rendered by the Company over the last three years, I found a wider range of consumption levels where base use did not vary significantly with changes in heating degree-days, between about 20 and 80 therms. I determined that the 40 therms break point would be more fair to the smaller commercial customers. The Commercial and Energy Options Firm classes are not as homogeneous (usage characteristics are more varied) as the Residential class. Setting the break-point at 40 therms will meet the goals of reflecting consumption that does not vary with weather and not over-burdening the smaller commercial customers.

Q. HOW WOULD ESTABLISHING A BLOCK RATE STRUCTURE FOR BLACK HILLS MAKE THE COMPANY MORE COMPETITIVE WITH ELECTRIC UTILITIES?

A. I will discuss that in the last section of my prepared direct testimony.

Q. ARE THERE OTHER NATURAL GAS LOCAL DISTRIBUTION COMPANIES IN NEBRASKA WITH A SIMILAR BLOCK RATE STRUCTURE?

A. Yes, both of the other investor owned systems in Nebraska have similar block rate structures. SourceGas has the same block rate structure for its jurisdictional customers as the block rate structure I recommending. Also, Northwestern Corporation has a similar two block declining rate structure for its Residential rate, except that the first block covers the first 30 therms.

Q. HOW DID YOU DETERMINE HOW MUCH CONSUMPTION OCCURS IN EACH OF THE BLOCKS YOU ARE RECOMMENDING?

A. The level of consumption for the first blocks are show on Line 23 of Exhibit___(TJS-7). The 34,960,597 therms for the Residential class is the per books amount of consumption for all bills with consumption of less than or equal to 20 therms plus the first 20 therms of consumption of all bills that exceeded 20 therms for the twelve month period ended July 31, 2009. In my bill frequency analysis, I combined the Commercial and Energy Options-Firm customers and 5,589,342 therms is the consumption of all bills with consumption of less than or equal to 40 therms plus the first 40 therms of consumption of all bills that exceeded 40 therms for the twelve months ended July 31, 2009. Because I explicitly selected break points for the blocks that were not affected by weather, all of the weather normalization adjustment, by definition, would apply only to the second blocks.

The consumption for the second blocks are shown on Lines 24 of Exhibit___(TJS-7) and are equal to test year throughput minus the consumption in the first block.

Q. PLEASE EXPLAIN HOW YOU DETERMINED THE COMMODITY CHARGES YOU ARE PROPOSING.

A. The second block I am proposing for the Residential, Commercial, and Energy Options-Firm rates of $0.1629 per therm produces approximately the same amount of revenues as the existing rates of $0.15406 per therm and $0.17561 per therm for the Residential and Commercial rates, respectively. The first block I am proposing of $0.282 per therm is the level necessary to recover the remainder of the revenue requirement not recovered through the proposed customer charges.

Q. PLEASE DISCUSS THE IMPACT OF YOUR PROPOSED RATES BY RATE SCHEDULE.

A. As shown on Line 46 of Exhibit___(TJS-7), the rates I am recommending result in an 8.5 percent increase to the Residential customers. 1.1 percent increase to the Commercial customers, and a 0.4 percent increase to the Energy Option-Firm.

Q. HOW DO REVENUES UNDER YOUR PROPOSED RATES COMPARE TO COST OF SERVICE?

A. As shown in Table 1 of Exhibit___(TJS-6), the rates of return under proposed rates for each of the classes is as follows:

Residential	9.84 %
Commercial	7.38%
Energy Options - Firm	13.71%

When the Commercial and Energy Options – Firm classes are viewed in total, the rate of return under proposed rates is equal to 9.84 percent.

Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY REGARDING THE RATE DESIGN?

A. Yes, it does.

VI. COMPETITIVE FACTORS

Q. PLEASE EXPLAIN THE NATURE OF THE COMPETITION THE COMPANY IS FACING FROM ELECTRIC UTILITIES.

A. The Company faces competition in the form of prices, cash incentives, and advertising. Electric utilities in Nebraska are using all three means to attract traditional natural gas space heating, water heating, and other loads (cooking and clothes drying) from Residential and Commercial customers. In my testimony, I will focus on how residential and commercial electric rates are being designed to promote electric space heating.

Q. WHICH ELECTRIC UTILITIES DOES THE COMPANY COMPETE WITH IN NEBRASKA?

A. The electric utility industry in Nebraska is comprised of numerous publicly-owned electric utilities. However, the prices generally offered to residential and commercial customers are very similar in structure. In Exhibit___(TJS-8), I summarize the Residential and Commercial rates offered by 5 of these electric utilities. A cursory examination of these rates reveals how similar they are in structure and pricing. Omaha Public Power District ("OPPD"), Nebraska Public Power District ("NPPD"), and the Lincoln Electric Service ("LES") are the three largest electric utilities in the state of Nebraska and all three provide service within the Company's Nebraska service territory. Therefore, I will focus on characteristics specific to these three utilities. I have provided copies of their residential and commercial electric rate schedules in Exhibit___(TJS-8).

Q. DO YOU HAVE ANY OBSERVATIONS WITH REGARDS TO OPPD'S PRICING STRUCTURE?

A. Yes, I do. My observations include:

1. The customer charge for service to Residential customers is $8.05 per month, but there is also a minimum bill of $10.18 per month.

2. The customer charges for service to Commercial customers is $11.45, but there is also a minimum bill of $14.58 per month.

3. OPPD prices residential service a flat rate of 8.66 cents per kilowatt-hour during the Summer and under a three block declining rate during the winter with the last block at 4.24 cents per kWh.

4. OPPD's block structure for commercial service is similar to the structure it offers for residential service.

Q. DO YOU HAVE ANY OBSERVATIONS REGARDING NPPD'S PRICING STURCTURE?

A. Yes, I do. My observations include:

1. The customer charge for service to Residential customers is $14.25 per month.

2. The customer charges for service to Commercial customers are $15.50 and $19.00 per month.

3. NPPD prices residential service under two blocks and charges seasonally differentiated prices. NPPD set the second block for service in the winter 4.14 cents per kWh which is substantially below the other energy charges.

4. NPPD's block structure for commercial service is similar (albeit at a higher level) to their residential rate.

Q. DO YOU HAVE ANY OBSERVATIONS REGARDING LES'S PRICING STRUCTURE?

A. Yes, I do. My observations include:

1. The customer charge for service to Residential customers is $8.95 per month.
2. The customer charges for service to Commercial customers are $12.55 and $36.56 per month.
3. LES prices residential service a flat rate of 9.37 cents per kilowatt-hour during the summer and under a two block declining rate during the winter with the last block at 4.57 cents per kWh.
4. LES prices commercial service at a flat rate of 8.98 cents per kWh during the summer and at flat rate of 5.18 cents per kWh during the winter.

Q. WHAT IS THE COMMON THREAD IN ALL THREE OF THESE SETS OF RATES?

A. All three utilities price winter service substantially below summer service. All three utilities have block rates for Residential service where the last blocks are at prices that are less than half the price they charge for service during the summer.

Q. ARE THERE OTHER WAYS IN WHICH THESE THREE UTILITIES PROMOTE ELECTRIC USAGE TO COMPETE WITH NATURAL GAS SERVICE?

A. Yes. There are at least two. First, on OPPD's, NPPD's, and LES' websites they each include heating cost calculators. I have included copies of the website screens for each of three utilities as they come up on the Internet in Exhibit___(TJS-9). In other words, I

have not changed any of the default inputs in the calculators. My intent in the following discussion is not to "rebut" what is in the electric utility websites, but rather point out that natural gas rates, and especially how they are used, are a critical input into how these electric utilities market electric appliances versus gas appliances.

Page 2 of Exhibit___(TJS-9) is taken from OPPD's website. On its face, this screen claims substantial cost saving associated with an electric heat pump with gas backup versus a "conventional" 80 percent efficient gas furnace. The underlying assumptions in this table are based on Rate 110 for the conventional furnace and Rate 115 for customers who have an electric heat pump. Rate 115 which is shown on Page 3 of Exhibit___(TJS-9) is a modified version of Rate 110 which is shown on Page 2 of Exhibit___(TJS-8). The most significant difference in Rate 115 is that threshold for the lowest third block rate is reduced from 1,000 kWh to 880 kWh and the rate is reduced from 4.24 cents per kWh to 3.42 cents per kWh. Clearly, OPPD is using its rate tariff, and more specifically a declining block rate, to promote electric heat pumps versus natural gas heating.

Pages 5 through 8 of Exhibit___(TJS-9) show similar heating cost calculators taken from NPPD's website. On Page 5, the default electric rate for the heating cost calculator is 4.51 cents per kWh (close to but slightly different from the last block Residential electric rate shown in their tariff and shown on Page 6 of Exhibit___(TJS-8)). The default natural gas rate is $1.10 per therm. Similar to OPPD, NPPD is using its rates and rate structure to promote electric heat pumps versus natural gas heating.

Pages 11 through 16 of Exhibit___(TJS-9) show the website screens for LES. While the rates are not as explicitly identified, it is still clear from these screens that the

rates that LES charges are a key component of the claimed cost savings and LES' rates include declining block rates with a substantially lower rate in the last block of the winter rates as shown on Page 12 of Exhibit___(TJS-8).

A second way in which Nebraska municipal electric utilities promote electric appliances versus natural gas appliances is by offering rebates for the purchase of certain electric appliances. On Page 9 of Exhibit___(TJS-9), I show the current rebate program offered by NPPD for electric heat pumps. Whereas, OPPD offers a special lower rate for customers installing an electric heat pump, NPPD, offers cash incentive and low interest loans. Similarly, as shown on Pages 14 through 16 of Exhibit___(TJS-9), I show the current rebate program offered by LES for electric heat pumps where cash incentives are offered for the installation of electric heat pumps.

Q. IN YOUR OPINION, HOW SHOULD THE COMPANY'S RATES BE STRUCTURED AND WHY?

A. It is my opinion that the Company's current rate structure be changed and that the block rates I propose in the prior section of my testimony should be implemented so that Black Hills rate structures are as comparable as practical to those being offered by the competing electric systems in Nebraska. Rates are one of several tools used by the electric utilities that provide service in the Company's territory to directly compete with the Company. Implementing block rates will provide the Company with one of these tools that can be used to improve their competitive position.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

IN THE MATTER OF BLACK HILLS/ NEBRASKA GAS UTILITY COMPANY, LLC D/B/A BLACK HILLS ENERGY, OMAHA, SEEKING A GENERAL RATE INCREASE FOR BLACK HILLS ENERGY'S RATE AREAS ONE TWO AND THREE (CONSOLIDATED) UTILITY COMPANY, LLC d/b/a BLACK HILLS ENERGY,	)	APPLICATION NO. NG____

VERIFICATION

STATE OF MISSOURI)
) ss.
COUNTY OF RAY)

Thomas J. Sullivan, of lawful age, being first duly sworn, deposes and says that he is a Managing Director for Black & Veatch Corporation, that he has read the foregoing testimony, knows the contents thereof, and that the statements and allegations therein contained, including the information provided herewith pursuant to the State Natural Gas Regulation Act, are true to the best of his information, knowledge, and belief.

Thomas J. Sullivan

SUBSCRIBED AND SWORN TO before me this 20th day of November, 2009.

Notary Public