Exhibit No.:	
Issues:	Weather Normalized Sales
Witness:	James A. Gray
Sponsoring Party:	MO PSC Staff
Type of Exhibit:	Direct Testimony
Case No.:	GR-2006-0422
Date Testimony Prepared:	October 13, 2006

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

JAMES A. GRAY

MISSOURI GAS ENERGY

CASE NO. GR-2006-0422

Jefferson City, Missouri
October 2006

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the matter of Missouri Gas Energy's Tariff Sheets Designed to Increase Rates for Gas Service in the Company's Missouri Service Area	))))	Case No. GR-2006-0422

AFFIDAVIT OF JAMES A. GRAY

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

James A. Gray, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 8 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

James A. Gray
James A. Gray

Subscribed and sworn to before me this 6th day of October, 2006.

Susan L. Sundermeyer
Notary Public

My commission expires 9-21-10

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942086

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CASE NO. GR-2006-0422

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MISSOURI GAS ENERGY

CASE NO. GR-2006-0422

Q. Please state your name and business address.

A. My name is James A. Gray. My business address is P. O. Box 360, Jefferson City, Missouri 65102.

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

A. I am employed by the Missouri Public Service Commission (Commission) as a Regulatory Economist in the Tariffs/Rate Design Section of the Commission's Energy Department.

Q. How long have you been employed by the Commission?

A. I have been employed with the Commission over twenty-six years.

Q. Please state your educational background.

A. I received a degree of Bachelor of Science in Psychology as well as one in General Studies from Louisiana State University, and I received a degree of Master of Science in Special Education from the University of Tennessee. Additionally, I completed several courses in research and statistics at the University of Missouri - Columbia.

Q. Please state your professional qualifications.

A. Prior to being employed by the Commission, I was a Research Analyst for two and a half years with the Missouri Department of Mental Health where I conducted statistical analyses. In 1980, I began my employment with the Commission as a Statistician in the

Depreciation Department where I submitted testimony regarding depreciation rates, trended-original cost, and trended-original cost less depreciation.

Beginning in 1989, in the Economic Analysis Department, I submitted testimony on weather-normalized sales for natural gas, water, and electric utilities. I reviewed residential electric load forecasts with associated detailed end-use studies and marketing surveys in electric resource plans.

From December 1997 through June 2001, I was in the Tariffs/Rate Design Section of the Commission's Gas Department. Since July 2001, I have been in the Tariffs/Rate Design Section of the Commission's Energy Department. I have reviewed tariffs and applications of natural gas utilities. I have also submitted testimony concerning weather-normalized sales, complaints, certificates of convenience and necessity, and recommended minimum statistical sample sizes for natural gas residential customer billing reviews.

Q. Please list all the cases in which you have submitted prepared written testimony before this Commission.

A. The cases in which I have submitted prepared, written testimony are enumerated in Schedule 1, attached to my testimony.

EXECUTIVE SUMMARY

Q. What is the purpose of your testimony?

A. My testimony addresses the Commission Staff's (Staff) weather-normalization of natural gas sales for the firm residential natural gas and the general service customers of Missouri Gas Energy, a division of Southern Union Company (MGE or Company) for the

test year ending December 31, 2005. I then use the results of my weather-normalized sales studies to estimate weather-normalized coincident peak day demand.

WEATHER-NORMALIZED SALES

Q. Why is it important to adjust test-year natural gas sales to normal weather?

A. Since rates are based on natural gas usage during the test year, it is important to remove the influence of abnormal weather. Staff's weather-normalized adjustments to the amount of natural gas sales correct for deviations from normal weather conditions during the test year.

Q. Why are natural gas sales dependent upon weather conditions?

A. The predominate use of natural gas in Missouri is for space heating. Therefore, MGE's natural gas sales are very dependant on the duration and intensity of colder weather.

Q. How do Staff's analyses adjust test-year natural gas sales if the test year is warmer than normal?

A. Staff's studies would probably increase test year natural gas sales to adjust sales to the level that would be expected to occur under normal (colder) weather.

Q. How do Staff's analyses adjust test-year natural gas sales if the test year is colder than normal?

A. Staff's studies would probably decrease test year natural gas sales to adjust sales to the level that would be expected to occur under normal (warmer) weather.

Q. What firm sales customer classes were studied?

A. They were the residential, small general service, and large general service customer classes of MGE.

Q. Were MGE's billing records for the residential, small general service and large general service classes subdivided further for the studies?

A. Yes, MGE's Missouri billing records were subdivided into three geographic regions. They are the Joplin, Kansas City, and St. Joseph, Missouri, regions. Staff witness Curt Wells provided the daily actual and daily normal heating degree days (HDD) for each of the three geographic regions. Mr. Well's testimony discusses the calculation of HDD.

Q. Please identify the Staff witnesses who rely upon the results of the weather-normalization studies.

A. Staff witness Paul R. Harrison of the Commission's Auditing Department uses the results of the weather normalization studies for Staff's customer growth annualization and revenue calculations. Staff witness Henry E. Warren, PhD of the Commission's Energy Tariffs/Rate Design Department, uses the results of the weather normalization studies for the Staff's allocation of the weather-normalized sales to the block rates of the small general service classes. (MGE's small general service class has different unit charges for natural gas volumes falling within blocks of consumption.)

Q. What was your source for the billed natural gas usage data?

A. MGE provided Staff with monthly natural gas sales in hundreds of cubic feet (Ccf) and monthly numbers of customers for each billing cycle by firm customer class and geographic region for the test year.

Q. What are billing cycles?

A. The Company schedules groups of natural gas accounts into billing cycles that are to be read throughout a month. Next, the Company bills the accounts based on the meter reading. Since there are approximately twenty-one working days in a month, customers'

accounts are usually grouped into one of the approximately twenty-one billing cycles. Staggering the billing of customers' accounts over the billing month spreads the amount of work necessary to bill MGE's customers.

Q. How did Staff analyze space heating natural gas volumes?

A. Staff calculated two sets of twelve billing month averages by customer class for the residential, small general service, and large general service classes in the three geographic regions. One set of these averages was the daily average natural gas usage in Ccf and another set was the daily average HDD. These billing month averages were calculated from the data on numbers of customers, natural gas usage in Ccf, and summed HDD from approximately twenty billing cycles for each billing month by customer class.

Q. Do the twelve billing month HDD customer-weighted averages reflect different customer levels among the different billing cycles?

A. Yes, each billing month's daily average HDD in each billing cycle were weighted by the percentage of customers in that billing cycle. Thus, the billing cycles with the most customers are given more weight in computing the billing month daily average HDD.

Q. How did Staff average billing month usage in Ccf?

A. Staff calculated twelve simple monthly average-usage-per-customer amounts across the approximately twenty-one billing cycles to calculate one month's daily average usage in Ccf.

Q. How did Staff quantify the relationship of natural gas sales to HDD?

A. Staff's studies estimate the change in usage in Ccf related to a change in HDD based on the two sets of twelve monthly billing month averages of average daily usage in Ccf

per customer and the customer-weighted average daily HDD. These two sets of billing month averages (usage and weather) were used to study the relationship between space-heating natural gas usage in Ccf and colder weather.

Staff used regression analysis to estimate the relationship for each of the residential, small general service, and large general service customers in the three geographic regions.

Q. What are the advantages of using regression analysis?

A. The regression equation develops quantitative measures that describe the relationship between daily space-heating sales per customer in Ccf to the daily HDD. The regression equation estimates a change in the daily natural gas usage per customer whenever the daily average weather changes one HDD.

Q. What were the results of Staff's weather-normalized sales studies for the test year?

A. Staff's analyses resulted in increases to natural gas sales because the weather during the test year was warmer than normal. Staff's analyses resulted in an approximate 7.7 percent increase from actual natural gas sales for the residential customer class, an approximate 8.0 percent increase for the small general service class, and an approximate 6.7 percent increase for the large general service class. These increases do not include the Staff's customer growth annualization.

Q. What results were provided to Staff witness Harrison for Staff's customer growth annualization and revenue calculations?

A. Staff provided monthly, normalized natural gas usage in Ccf per customer for each customer class for MGE's Joplin, Kansas City, and St. Joseph, Missouri, regions. These

results are contained in Schedule 2, attached to my testimony. Schedule 2 demonstrates the higher natural gas usage per customer in the colder, winter months because of space heating requirements.

Second, Staff witness Harrison's revenue calculations were provided monthly weather-normalized volumes for the same firm classes and geographic regions. Schedule 3, attached to my testimony, contains the monthly weather-normalized volumes.

WEATHER-NORMALIZED COINCIDENT PEAK DAY DEMAND

Q. What are estimates of weather-normalized coincident peak day demand by customer class?

A. Briefly, it is the estimated usage per customer by firm customer class on Staff witness Well's normally occurring coldest days. The daily peak is the highest daily load or draw of natural gas on a system and the demand is the rate or amount of natural gas used on that day. My estimates of residential, small general service and large general service customers' natural gas peak usage are at the time (coincident) of a utility's system daily peak.

Q. Why are estimates of weather-normalized coincident peak day demands important?

A. These estimates of weather-normalized coincident peak day demands quantify the relative contributions towards that estimated single-day system peak by the residential, small general service, and large general service customers. For cost-of-service studies, it is important to determine each class' contribution to the peak day responsibility.

Q. Please identify the Staff witness who relies upon the results of the weather-normalization studies.

A. Schedule 4, attached to this testimony, shows the estimated weather-normalized coincident peak day natural gas usage in Ccf per customer by billing month and customer class for MGE's Joplin, Kansas City, and St. Joseph geographic regions. This information was provided to Staff witness Daniel I. Beck of the Commission's Energy Engineering Analysis department for his calculation of total peak day demand across MGE's firm customer classes.

Q. Would you please summarize Staff's recommendations?

A. I recommend that the Commission utilize the results of Staff's weather-normalized usage per customer shown in Schedule 2 and weather-normalized total sales volumes shown in Schedule 3, attached to this testimony.

Q. Does this conclude your direct testimony?

A. Yes, it does.

MISSOURI GAS ENERGY

CASE NO. GR-2007-0003

Testimonies Submitted by James A. Gray

COMPANY	CASE NO.
Missouri Public Service Company	GR-81-312
Missouri Public Service Company	ER-82-39
Missouri Public Service Company	GR-82-194
Laclede Gas Company	GR-82-200
St. Louis County Water Company	WR-82-249
Missouri Public Service Company	ER-83-40
Kansas City Power & Light Company	ER-83-49
Osage Natural Gas Company	GR-83-156
Missouri Public Service Company	GR-83-186
The Gas Service Company	GR-83-225
Laclede Gas Company	GR-83-233
Missouri Water Company	WR-83-352
Missouri Cities Water Company	WR-84-51
Le-Ru Telephone Company	TR-84-132
Union Electric Company	ER-84-168
Union Electric Company	EO-85-17
Kansas City Power & Light Company	ER-85-128
Great River Gas Company	GR-85-136

Missouri Cities Water Company	WR-85-157	
Missouri Cities Water Company	SR-85-158	
United Telephone Company of Missouri	TR-85-179	
Osage Natural Gas Company	GR-85-183	
Kansas City Power & Light Company	EO-85-185	
ALLTEL Missouri, Inc.	TR-86-14	
Sho-Me Power Corporation	ER-86-27	
Missouri-American Water Company, Inc.	WR-89-265	**
The Empire District Electric Company	ER-90-138	**
Associated Natural Gas Company	GR-90-152	
Missouri-American Water Company, Inc.	WR-91-211	**
United Cities Gas Company	GR-91-249	**
Laclede Gas Company	GR-92-165	**
St. Joseph Light & Power Company	GR-93-42	**
United Cities Gas Company	GR-93-47	**
Missouri Public Service Company	GR-93-172	**
Western Resources, Inc.	GR-93-240	**
Laclede Gas Company	GR-94-220	**
United Cities Gas Company	GR-95-160	**
The Empire District Electric Company	ER-95-279	**
Laclede Gas Company	GR-96-193	**
Missouri Gas Energy	GR-96-285	**
Associated Natural Gas Company	GR-97-272	**

**Concerns Weather-Normalized Sales

Union Electric Company	GR-97-393	**
Missouri Gas Energy	GR-98-140	**
Laclede Gas Company	GR-98-374	**
St. Joseph Light & Power Company	GR-99-42	**
AmerenUE	GA-99-107	
Laclede Gas Company	GA-99-236	
Laclede Gas Company	GR-99-315	**
AmerenUE	GR-2000-512	**
Missouri Gas Energy	GR-2001-292	**
Gateway Pipeline Company, Inc., et al.	GM-2001-585	
Missouri Gas Energy, et al	GC-2001-593	
Laclede Gas Company	GR-2002-356	**
Laclede Gas Company	GA-2002-429	
Southern Missouri Gas Company, L.P.	GT-2003-0031	
Laclede Gas Company	GT-2003-0032	
Missouri Gas Energy	GT-2003-0033	
AmerenUE	GT-2003-0034	
Fidelity Natural Gas, Inc.	GT-2003-0036	
Atmos Energy Corporation	GT-2003-0037	
Aquila Networks- L&P	GT-2003-0038	
Aquila Networks- MPS	GT-2003-0039	
AmerenUE	GR-2003-0517	**
Aquila Networks – MPS and L&P	GR-2004-0072	**

**Concerns Weather-Normalized Sales

Missouri Gas Energy	GR-2004-0209 **
Atmos Energy Corporation	GR-2006-0387 **

Atmos Energy Corporation
Case No. GR-2006-0387

Weather Normalized Billing Month Usage in Mcf per Customer
For the Test Year of October 1, 2004 - September 30, 2005

Greeley + Butler Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	2.1437	6.8519
Oct	5.0462	12.7483
Nov	11.5099	30.5566
Dec	17.1072	47.2107
Jan	14.8489	40.3586
Feb	10.4847	27.9510
Mar	7.3297	17.4667
Apr	2.8888	7.8301
May	1.7067	5.8922
Jun	1.2110	4.4304
Jul	1.0136	21.4094
Aug	1.2466	4.1788
Annual	76.5371	226.8845

Southeast Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	1.8611	9.2064
Oct	4.3082	15.4463
Nov	9.1515	30.1902
Dec	13.8404	45.7574
Jan	12.4150	40.9147
Feb	9.0282	29.0707
Mar	6.1317	19.9531
Apr	2.3570	7.8736
May	1.5043	6.4679
Jun	1.3066	5.9419
Jul	1.1397	5.9265
Aug	1.2825	8.0003
Annual	64.3263	224.7491

Northeast Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	2.4644	13.3481
Oct	5.2298	24.5899
Nov	11.3934	46.5920
Dec	17.9290	64.6071
Jan	15.2001	54.7993
Feb	11.8771	42.9639
Mar	8.4707	27.4066
Apr	3.5425	11.5366
May	2.0285	9.1216
Jun	1.3811	7.2532
Jul	1.1311	6.4674
Aug	1.3763	8.7100
Annual	82.0239	317.3957

Atmos Energy Corporation
Case No. GR-2006-0387

Weather Normalized Billing Month Usage in Mcf
For the Test Year of October 1, 2004 - September 30, 2005

Greeley + Butler Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	7,610	3,666
Oct	18,242	6,973
Nov	42,402	17,020
Dec	63,776	26,249
Jan	55,386	22,762
Feb	39,286	15,681
Mar	27,465	9,677
Apr	10,657	4,322
May	6,153	3,199
Jun	4,288	2,392
Jul	3,569	11,604
Aug	4,366	2,261
Total	283,199	125,806

Southeast Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	56,411	38,326
Oct	132,037	64,936
Nov	286,040	128,671
Dec	437,150	196,162
Jan	395,008	176,629
Feb	289,030	125,353
Mar	193,848	85,140
Apr	72,958	33,376
May	46,054	27,036
Jun	39,398	24,730
Jul	34,312	24,637
Aug	38,230	33,025
Total	2,020,477	958,021

Northeast Region

	Residential Gas Service Customers	Small General Gas Service Customers
Sep	42,656	34,291
Oct	92,385	64,327
Nov	205,127	122,350
Dec	325,106	170,498
Jan	276,277	145,547
Feb	219,276	113,210
Mar	155,166	72,436
Apr	64,040	30,168
May	35,553	23,588
Jun	23,900	18,554
Jul	19,437	16,660
Aug	23,619	22,298
Total	1,482,543	833,928