

## **MEMORANDUM**

TO: Missouri Public Service Commission Official Case File  
Case No. GR-2016-0099, The Empire District Gas Company

FROM: Joshua Nash, Regulatory Auditor – Procurement Analysis  
Kwang Y. Choe, Ph.D., Regulatory Economist – Procurement Analysis  
Lesa Jenkins, P.E., Regulatory Engineer – Procurement Analysis

/s/ David M. Sommerer 12/14/16      /s/ Jeffrey A. Keevil 12/14/16  
Project Coordinator / Date                      Staff Counsel’s Office / Date

/s/ Derick Miles, P.E., 12/14/16  
Utility Regulatory Engineer II/ Date

SUBJECT: Staff Recommendation in Case No. GR-2016-0099,  
The Empire District Gas Company 2014-2015 Actual Cost Adjustment Filing

DATE: December 14, 2016

### **EXECUTIVE SUMMARY**

On October 30, 2015, The Empire District Gas Company (“Empire” or “Company”) filed its Actual Cost Adjustment (ACA) for the 2014-2015 period in Case No. GR-2016-0099. This filing revised the ACA rates based upon the Company’s calculations of the ACA balances for the 2014-2015 period.

The Procurement Analysis Unit (“Staff”) of the Missouri Public Service Commission has reviewed the Company’s ACA filing. A comparison of billed revenue recovery with actual gas costs will yield either an over-recovery or under-recovery of the ACA balance. An over-recovery, represented by a negative ACA balance, must be returned to the Company’s customers; an under-recovery, represented by a positive ACA balance, must be recovered from customers.

Staff conducted the following analyses:

- a review of billed revenue compared with actual gas costs;
- a reliability analysis including a review of estimated peak day requirements and the capacity levels needed to meet these requirements;
- a review of the Company’s gas purchasing practices to evaluate the prudence of the Company’s purchasing decisions for this ACA period; and,
- a hedging review to evaluate the reasonableness of the Company’s hedging practices for this ACA period.

\*\* Denotes Highly Confidential Information \*\*

**NP**  
**Appendix A**

Based on its review, Staff recommends the following adjustments to the Company's filed ACA balances:

<b>Description + Under-recovery (-) Over-recovery</b>	<b>8-31-15 Ending Balances Per Filing</b>	<b>Commission Approved Adjustments prior to 2014-2015 ACA</b>	<b>Staff Adjustments For 2014-2015 ACA</b>	<b>8-31-15 Staff Recommended Ending Balances</b>
<b>South System: Firm ACA</b>	<b>(\$471,476)</b>	<b>\$35,486</b>	<b>\$12,001</b>	<b>(\$423,989)</b>
<b>Interruptible ACA</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Take-or-Pay (TOP)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Transition Cost (TC)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Refund</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>North System: Firm ACA</b>	<b>\$323,977</b>	<b>(\$48,970)</b>	<b>(\$13,082)</b>	<b>\$261,925</b>
<b>Interruptible ACA</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Take-or-Pay (TOP)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Transition Cost (TC)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Refund</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Northwest System: Firm ACA</b>	<b>(\$51,256)</b>	<b>(\$789)</b>	<b>(\$8,397)</b>	<b>(\$60,442)</b>
<b>Interruptible ACA</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Take-or-Pay (TOP)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Transition Cost (TC)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Refund</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

The individual adjustments recommended by Staff are discussed in greater detail in the sections below. Additionally, Staff makes recommendations which are discussed in the Billed Revenue and Actual Gas Costs section, Reliability Analysis and Gas Supply Planning section, and the Hedging section of the memorandum.

### **STAFF'S TECHNICAL DISCUSSION AND ANALYSIS**

Staff's discussion of its findings is organized into the following five sections:

<b>Section No.</b>	<b>Topic</b>	<b>Page</b>
I	Overview	3
II	Billed Revenue and Actual Gas Costs	3
III	Reliability Analysis and Gas Supply Planning	6
IV	Hedging	9
V	Recommendations	10

Each section explains Staff's concerns and recommendations.

## **I. OVERVIEW**

Empire separates its gas operations into a South System, a North System, and a Northwest (NW) System.

The larger communities served on the South System include Sedalia, Marshall, Nevada, Clinton, Lexington, and Richmond in southwest and central Missouri and Platte City near Kansas City.

On the North System, the larger communities include Chillicothe, Brookfield, Marceline and Trenton in north-central Missouri.

The largest community on the NW System is Maryville, in northwestern Missouri.

Southern Star Central Gas Pipeline (SSCGP) serves customers on the South System. Panhandle Eastern Pipeline Company (“PEPL”) serves customers on the North System while ANR Pipeline (ANR) serves customers on the NW System. In addition, Cheyenne Plains Gas Pipeline Company (“CPGP”) delivers gas from the Cheyenne Hub located south of Cheyenne, Wyoming to Greensburg, Kansas. CPGP can deliver gas to each of the interstate pipelines systems (SSCGP, PEPL and ANR) that serve Empire’s customers.

During this ACA period there was an average of 28,007 firm sales customers on the South System, 9,127 on the North System, and 5,447 on the NW System. There were no interruptible sales customers during this ACA period.

## **II. BILLED REVENUE AND ACTUAL GAS COSTS**

### **PGA and ACA Revenue**

Staff reviewed the revenue that the Company purported to have received from its customers as a recovery of gas costs during the 2014/2015 ACA. In its review, Staff noted multiple issues in the documents provided from the Company concerning revenue amounts that were unusual considering the applicable rates at the time. After follow-up from Staff<sup>1</sup>, the Company acknowledged the existence of the issues and provided supporting documentation indicating that the discrepancies were misallocations between revenue classes within the same rate district which did not have an effect on the Company’s total recovered costs in the period. However, since the Company was unable to find the underlying cause of the misallocated revenue, Staff asks that the Company closely monitors the revenue to ensure that any recurrences of these problems are detected.

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<sup>1</sup> See Data Request (“DR”) 01.1

**Transportation Customer Charges**

**A. \*\* \_\_\_\_\_ \*\***

In the months of September 2014 through February 2015, the Company failed to credit customers in the North district for \*\* \_\_\_\_\_ \*\* cash-out charges. The Company provided Staff with \*\* \_\_\_\_\_ \*\* monthly bills during this period. Staff reviewed these bills and noted that all charges represent a credit to the Company and a reduction of the system’s gas costs. The total billed balances are calculated below:

	** Cash-Outs					
<b>Activity Month</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>	<b>Tier 5</b>	<b>Total</b>
September 2014	\$839.38	\$965.28	\$667.74	\$0.00	\$0.00	\$2,472.40
October 2014	\$864.54	\$994.22	\$1,123.90	\$1,086.97	\$0.00	\$4,069.63
November 2014	\$926.37	\$0.00	\$0.00	\$0.00	\$0.00	\$926.37
December 2014	\$822.35	\$354.08	\$0.00	\$0.00	\$0.00	\$1,176.43
January 2015	\$672.00	\$772.79	\$452.81	\$0.00	\$0.00	\$1,897.60
February 2015	\$626.32	\$720.27	\$814.22	\$876.85	\$14.68	\$3,052.34
					<b>Total</b>	<b>\$13,594.77</b>

Staff recalculated the bills based on the nominations, usage, and other pertinent data reported by the Company for \*\* \_\_\_\_\_ \*\* during the applicable periods. Staff’s calculations indicate that the billed cash-out amounts represent the appropriate charges based on \*\* \_\_\_\_\_ \*\* actual activity. Therefore, costs should be reduced by \$13,595 for firm sales customers on the Company’s North district.

**B. Cash-out Calculation Rates for South District**

The Company’s tariff states the following concerning its cash-out procedures for transportation customers<sup>2</sup>:

The difference between monthly confirmed Nomination volumes and actual consumption, including L&U will be charged to and/or credited to the Customer (cashed out)...The “spot” market prices on each pipeline shall be determined using the Natural Gas Week posting for Southern Star on the South, Panhandle Eastern on the North, and ANR on the Northwest. When Receipts exceed Deliveries, the lowest posting in Natural Gas Week for the applicable month shall be used as the “spot” price. When Deliveries exceed Receipts, the highest posting in Natural Gas Week for the applicable month shall be used as the “spot” price.

<sup>2</sup> See Sheet No. 42 of the Company’s tariffs, effective April 1, 2010

Staff reviewed the *Natural Gas Week* publication prices for the 2014/2015 ACA in accordance with the Company's tariff. Staff identified two separate months in which the Company's methodology for calculating the "spot" market prices for its customers in the South district was incorrectly applied, according to their tariff. In September 2014, the Company calculated its "spot" market prices as \$3.72/MCF<sup>3</sup> for transportation customers whose consumption exceeded their nominations ("under nominated") and \$3.68/MCF for customers whose nominations exceeded their consumption ("over nominated"). Staff calculated that actual price should have been \$3.77/MCF for under nominated volumes and \$3.65/MCF for over nominated volumes. As a result, actual gas cost should have been \$585 lower. In December 2014, the Company calculated a "spot" market price of \$3.68/MCF for under nominated volumes in the Company's South district. Staff calculated that the actual price should have been \$3.35/MCF for under nominated volumes. As a result, actual gas cost should have been \$4,703 higher for firm sales customers on the South district in December 2014. To reflect the adjustments for both instances where the "spot" market price was misapplied, the cost of gas should be increased by \$4,118 (\$4,703 - \$585) for firm sales customers on the South district.

### **C. Cash-out Records**

The Company provided Staff with multiple documents providing details concerning cash-out costs for transportation customers, charged in accordance with Sheet No. 42 of the Company's tariffs. Despite indicating that they represent the same charges in the same period, Staff noted multiple discrepancies in the cash-out totals among the documents provided by the Company as well as those costs as they were shown as part of the Company's total cost of gas in the 2014/2015 ACA. After follow-up and discussions with Staff, the Company determined that the discrepancies resulted from a combination of factors including billing adjustments that were not reflected in the cash-out documentation given to Staff, billing errors to transportation customers, and miscommunication between the Company's departments concerning the proper intracompany document to use in recording gas costs for ACA purposes. The Company provided additional documentation to Staff in support of their explanations for these discrepancies. Staff recommends that the Company revises its method for tracking the cash-out costs of its transportation customers in a manner that is accurate, uniform, and transparent to promote clarity with Staff and within the Company.

### **D. Transportation Customer Bills**

In the course of reviewing their cash-outs in response to Staff's concerns regarding the discrepancies among the Company's separate cash-out calculations, the Company identified multiple unresolved billing errors involving their transportation customers. Specific examples of these bills are as follows:

- \*\* \_\_\_\_\_ \*\*, served by the Company's South system, was incorrectly billed for its activity in December 2014. The original bill understated

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<sup>3</sup> The amount actually applied to customers on a per-unit basis for cash-outs is adjusted by additional costs, including tiers/multipliers

nominations by 2,914 MCF. The Company calculated that this resulted in the transportation customer being overcharged by \$15,159.

- \*\* \_\_\_\_\_ \*\*, served by the Company's South system, was incorrectly billed for its activity in December 2014 and August 2015. On both occasions, the bills failed to properly allocate the cashed out quantities in accordance with the transportation customer's contract with the Company. The Company calculated that this resulted in the transportation customer being overcharged \$692.
- \*\* \_\_\_\_\_ \*\*, served by the Company's South system, was incorrectly billed for its activity in October 2014. The transportation customer's bill did not reflect the actual difference in the customer's nominations and receipts. The Company determined that the error resulted in the transportation customer being undercharged \$1,117.

Staff asks that the Company properly adjust the bills of each transportation customer whose bill was determined to be incorrectly calculated as a result of the cash-out review. In addition, it is asked that the Company provide Staff with a copy of each bill showing the proper adjustment in the next 45 days.

### **III. RELIABILITY ANALYSIS AND GAS SUPPLY PLANNING**

As a gas corporation providing natural gas service to Missouri customers, Empire is responsible for conducting reasonable long-range supply planning to meet its customer needs. Empire must make prudent decisions based on that planning. One purpose of the ACA process is to examine the reliability of the Local Distribution Company's (LDC) gas supply, transportation, and storage capabilities. For this analysis, Staff reviews the LDCs' plans and decisions regarding estimated peak day requirements and the LDC's pipeline capacity levels to meet those requirements, the peak day reserve margin, and the rationale for this reserve margin, and the natural gas supply plans for various weather conditions.

Staff has the following comments and concerns regarding the reliability analysis:

#### **1. Cheyenne Plains Gas Pipeline Company Contract- Allocation of Reservation Charges**

Empire has transportation and storage contracts specific to each system. SSCGP contracts are applicable to the South System, PEPL contracts are applicable to the North System and ANR contracts are applicable to the Northwest System. Empire also has a transportation contract on Cheyenne Plains Gas Pipeline (CPGP) that provides Empire with the flexibility to deliver natural gas supply into any of the three interstate pipeline systems (SSCGP, PEPL and ANR) that feed its South, North and NW Systems respectively.

Staff recommended an adjustment to reallocate the CPGP reservation and volumetric charges in the 2011/2012 ACA (Case GR-2013-0250), the 2012/2013 ACA (Case GR-2014-0108), and the 2013/2014 ACA (Case GR-2015-0109). There is a similar issue in the 2014/2015 ACA. Empire provided its allocation of the CPGP charges, and states the allocation used the previous year's numbers and did not get updated to include the 2014-2015 applicable monthly budget percentages. Staff's process to reallocate CPGP charges is

similar to those of the prior three ACA cases. Based on Staff's analysis, there is no change to the overall cost, but Staff recommends that the Company make a reallocation to each service area as shown below.

<b>Cheyenne Plains Reservation Allocation</b>	South	North	Northwest	Total
Total Actual Invoice Allocation	\$776,435.14	\$259,624.31	\$182,834.05	\$1,218,893.50
Total Budget Allocation	\$787,743.42	\$258,484.67	\$172,665.41	\$1,218,893.50
Difference (Budget-Actual)	\$11,308.28	-\$1,139.64	-\$10,168.64	\$0.00
Amount to add (reduce) from EDG allocation	\$11,308.28	(\$1,139.64)	(\$10,168.64)	\$0.00
Number Customers	28,593	9,409	5,560	43,562
Average Cost Per Customer	\$0.40	(\$0.12)	(\$1.83)	\$0.00

## **2. Concerns with Peak Day Estimates**

The Company's transportation contracts with SSCGP and PEPL, serving respectively the Company's South and North Systems, are due to expire in 2018. In case GR-2013-0250<sup>4</sup>, Staff's recommendation stated that:

Empire's peak day estimates for each system do not include any estimate for variability such as standard error or estimates based on the upper 95% confidence interval factors that would result in a larger peak day estimate. Consideration of variability in the peak day estimate is appropriate because actual usage varies around the line predicted by a regression equation.

The peak day estimate and estimates of customer growth are used by the Company when planning for future transportation capacity requirements. The Company peak day estimate and contracted capacity are not concerns for this ACA period. However, as Empire considers the peak day estimates and appropriate transportation contract volumes moving forward, especially when it is planning for extension or revision of expiring contracts, Staff recommends Empire consider variability in its peak day estimates.

Empire's response<sup>5</sup> stated that:

The Company agrees to continue to refine its peak day requirement forecasts for all three operating systems in advance of the expiration of the pipeline contracts it currently has in place to serve the systems.

In the peak day analyses provided for the 2013/2014 ACA (Case No GR-2015-0109) and 2014/2015 ACA, the Company has not yet included consideration of variability in its peak day estimates. Staff again reminds the Company that it should consider the variability of the peak day estimates in advance of the expiration of the pipeline contracts.

<sup>4</sup> File date December 18, 2013.

<sup>5</sup> File date January 29, 2014.

It does not appear that Empire eliminated any data points in its analysis for estimating peak day. Staff recommends Empire plot the usage data versus heating degree days (HDD) and review for potential data problems such as inclusion of incorrect HDD data or for anomalies that may be due to meter recording problems or other identifiable events causing usage for certain dates to be skewed.

Staff and Empire had discussions and exchanged emails in May through July 2016 regarding Empire’s peak day estimates. Empire is reviewing the peak day methodology and peak day estimates prior to its discussions with SSCGP and PEPL for the contracts that expire in fall of 2018.

**3. Gas Supply Options Contract – Allocation of Demand Charges**

The Company had a gas supply option contract for the months of December 2014 – February 2015 that could be nominated to flow from zero up to the contract maximum daily quantity on any day of these three months and it could flow to one system or be split between all three systems. The Company allocated the demand charges for the options contract to the South System, but the Company required the option contract for: (1) all three service areas for its cold month requirements and (2) the South system for its peak day requirements.

The Company explains in response to DR30.2 that, “The demand charge for the option gas was allocated in its entirety to the South System. It should have been allocated based on budget like we do the Cheyenne Plains fees.” It also states the option contract was not to be used by the electric side of its business.

Based on Staff’s analysis, there is no change to the overall cost, but Staff recommends that the Company reallocate the charges to each service area as shown below.

<b>Supply Option Contract Demand Charge Allocation</b>	South	North	Northwest	Total
Dec 2014 Invoice	\$4,650	\$0	\$0	\$4,650
Jan 2015 Invoice	\$4,650	\$0	\$0	\$4,650
Feb 2015 Invoice	\$4,200	\$0	\$0	\$4,200
Invoice Total	\$13,500	\$0	\$0	\$13,500
Percentage of Option Contract Needed for: Higher of Cold Month Average/Day or Peak Day Requirement	74.6%	12.2%	13.1%	100.0%
Allocation based on higher of: avg/day for cold month or Peak Day Requirements	\$10,075	\$1,653	\$1,772	\$13,500
Difference	(\$3,425)	\$1,653	\$1,772	\$0
Amount to add (reduce) from EDG allocation	(\$3,425)	\$1,653	\$1,772	\$0
Number Customers	28,593	9,409	5,560	43,562
Average Cost Per Customer	\$ (0.12)	\$ 0.18	\$ 0.32	\$ -



#### **IV. HEDGING**

Empire has individual gas supply portfolios for each of its three service areas. Staff's comments are provided for each.

Empire's hedging planned target was at 70% - 90% of normal winter requirements while actual overall coverage was 82% based on the 2014/2015 normal winter volumes.

For the South System, Empire hedged about 76% of the normal winter requirements through a combination of storage (37%), and financial instruments (39%). Empire purchased the financial instruments between June 2014 and September 2014.

For the North and NW Systems, Empire depended on storage for its hedging strategies. For the North System, Empire hedged all of the normal winter requirements by using storage, while about 83% of the NW System's normal winter requirements came from storage.

The Staff reviews the prudence of a Company's decision-making based on what the Company knew, or reasonable could have known, at the time it made its hedging decisions. The Company's hedging planning should be flexible enough to incorporate changing market circumstances. The Company should continue to evaluate its hedging strategy in response to changing market dynamics as to how much the existing hedging strategy actually benefits its customers while balancing market price risk. For example, the Company should evaluate more cost-effective financial instruments under the current market where the market prices have become relatively less volatile.

Recently Empire started incorporating call options in its hedging program to supplement the use of swap instruments, though the Company utilized swaps for this ACA period. Financial swaps are a type of financial instrument that allow the conversion of a floating or variable gas price arrangement into a fixed price arrangement. Since many of Empire's supply contracts are tied to a floating or variable index price, a swap allows Empire to set a known price for a particular quantity of gas. Call options put a ceiling on prices while allowing participation in downward price movements albeit at the cost of a premium for the option. For example, out-of-the-money calls may have a strike price that still affords significant protection near current market prices but at a reduced premium cost. The Company should continue to evaluate the appropriate volumes associated with them going forward.

Finally, the Staff recommends the Company continue to assess and document the effectiveness of its hedges for the 2015-2016 ACA period and beyond. The analysis should include identifying the benefits/costs based on the outcomes from the hedging strategy; and evaluating any potential improvements on the future hedging plan and its implementation. For example, the Company should provide a summary of how the Company's financial hedges have performed against market pricing. This would be useful for understanding the impact of purchases without the hedges. This hedge performance or mark-to-market summary conducted over an extensive historical period is helpful in seeing the long term financial impact of the hedge program. Because of the need to better understand the impact of the hedging program, the Staff recommends that Empire develop this summary in future ACA periods.

**V. RECOMMENDATIONS**

The Staff recommends that the Commission issue an order directing Empire to:

1. Establish the following ACA account balance shown in the table below to reflect the Staff recommended balances as of August 31, 2015. An under-recovery is an amount that is owed to the Company by its customers and is shown in the table as a positive number. An over-recovery reflects an amount that is owed to the customer by the Company and would be shown as a negative number.

**TABLE 1**

<b>Description + Under-recovery (-) Over-recovery</b>	<b>8-31-15 Ending Balances Per Filing (A)</b>	<b>Commission Approved Adjustments prior to 2014-2015 ACA (A-1)</b>	<b>Staff Adjustments For 2014-2015 ACA</b>	<b>8-31-15 Staff Recommended Ending Balances</b>
South System: Firm ACA	<b>(\$471,476)</b>	<b>\$35,486</b>	<b>(C) \$4,118 (D) \$11,308 (E) (\$3,425)</b>	<b>(\$423,989)</b>
Interruptible ACA	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Take-or-Pay (TOP)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Transition Cost (TC)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Refund	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
North System: Firm ACA	<b>\$323,977</b>	<b>(\$48,970)</b>	<b>(B) (\$13,595) (D) (\$1,140) (E) \$1,653</b>	<b>\$261,925</b>
Interruptible ACA	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Take-or-Pay (TOP)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Transition Cost (TC)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Refund	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Northwest System: Firm ACA	<b>(\$51,256)</b>	<b>(\$789)</b>	<b>(D) (\$10,169) (E) \$1,772</b>	<b>(\$60,442)</b>
Interruptible ACA	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Take-or-Pay (TOP)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Transition Cost (TC)	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Refund	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

- A) Includes 2012-2013 ACA adjustments per Commission order.  
 A-1) Commission order issued February 24, 2016 on Case GR-2015-0109 approving adjusted amounts from 2013-2014 ACA. Due to the timing of Commission's order, Empire has not included these adjustments in its 2014-2015 ACA filing.  
 B) \*\* \_\_\_\_\_ \*\*  
 C) "Spot" Market Price Adjustment  
 D) Cheyenne Plains Pipeline Reservation Charges Re-Allocation  
 E) Demand Charge Allocation

2. Respond to Staff's recommendations in the Billed Revenue and Actual Gas Costs section.
3. Respond to Staff's recommendations in the Hedging section.
4. Respond to Staff's recommendations in the Reliability Analysis and Gas Supply Planning section.
5. Respond to recommendations included herein within 45 days.

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

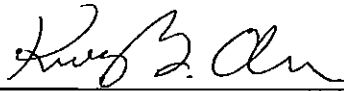
In the Matter of The Empire District Gas            )  
Company's Purchased Gas Adjustment            )     Case No. GR-2016-0099  
Tariff Filing

**AFFIDAVIT**

State of Missouri    )  
                                  ) ss.  
County of Cole        )

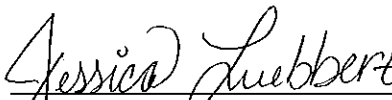
**COMES NOW** Kwang Y. Choe and on his oath declares that he is of sound mind and lawful age; that he contributed to the attached Staff Memorandum; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

  
\_\_\_\_\_  
Kwang Y. Choe, Ph.D.

**JURAT**

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 12<sup>th</sup> day of December, 2016.

  
\_\_\_\_\_  
NOTARY PUBLIC

JESSICA LUEBBERT  
Notary Public - Notary Seal  
State of Missouri  
Commissioned for Cole County  
My Commission Expires: February 19, 2019  
Commission Number: 15633434

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

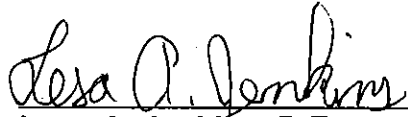
In the Matter of The Empire District Gas            )  
Company's Purchased Gas Adjustment            )     Case No. GR-2016-0099  
Tariff Filing

**AFFIDAVIT**

State of Missouri    )  
                                  ) ss.  
County of Cole        )

**COMES NOW** Lesa A. Jenkins and on her oath declares that she is of sound mind and lawful age; that she contributed to the attached Staff Memorandum; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

  
\_\_\_\_\_  
Lesa A. Jenkins, P.E.

**JURAT**

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 13<sup>th</sup> day of December, 2016.

  
\_\_\_\_\_  
NOTARY PUBLIC

JESSICA LUEBBERT Notary Public - Notary Seal State of Missouri Commissioned for Cole County My Commission Expires: February 19, 2019 Commission Number: 15633434
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**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

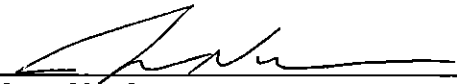
In the Matter of The Empire District Gas            )  
Company's Purchased Gas Adjustment            )     **Case No. GR-2016-0099**  
Tariff Filing

**AFFIDAVIT**

State of Missouri    )  
                                  ) ss.  
County of Cole        )

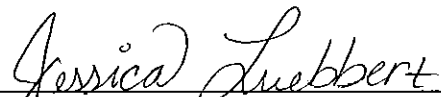
**COMES NOW** Joshua Nash and on his oath declares that he is of sound mind and lawful age; that he contributed to the attached Staff Memorandum; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

  
\_\_\_\_\_  
Joshua Nash

**JURAT**

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 12<sup>th</sup> day of December, 2016.

  
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NOTARY PUBLIC

JESSICA LUEBBERT Notary Public - Notary Seal State of Missouri Commissioned for Cole County My Commission Expires: February 19, 2019 Commission Number: 15633434
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