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| *Exhibit No.:* | |
| *Issue(s):* | *Normal Weather* |
| *Witness:* | *Michael Stahlman* |
| *Sponsoring Party:* | *MoPSC Staff* |
| *Type of Exhibit:* | *Surrebuttal / Cross-Surrebuttal Testimony* |
| *Case No.:* | *GR-2025-0107* |
| *Date Testimony Prepared:* | *June 30, 2025* |

# MISSOURI PUBLIC SERVICE COMMISSION

## INDUSTRY ANALYSIS DIVISION

## TARIFF/RATE DESIGN DEPARTMENT

## SURREBUTTAL / CROSS-SURREBUTTAL TESTIMONY

## OF

**MICHAEL L. STAHLMAN**

## SPIRE MISSOURI INC.,
## d/b/a Spire

## CASE NO. GR-2025-0107

***Jefferson City, Missouri***
***June 2025***

**SURREBUTTAL / CROSS-SURREBUTTAL**

**TESTIMONY OF**

**MICHAEL L. STAHLMAN**

**SPIRE MISSOURI INC.,**
**d/b/a Spire**

**CASE NO. GR-2025-0107**

Q. Please state your name and business address.

A. My name is Michael L. Stahlman, and my business address is Missouri Public Service Commission, P.O. Box 360, Jefferson City, Missouri, 65102.

Q. Are you the same Michael L. Stahlman that filed direct and rebuttal testimony in this docket?

A. Yes.

Q. What is the purpose of your testimony?

A. I will respond to the Rebuttal Testimony of Spire Missouri Inc. d/b/a Spire ("Spire Missouri") witness David A. Yonce, and the Rebuttal Testimony of Office of Public Counsel ("OPC") witness Lena M. Mantle.

Q. Please summarize your testimony.

A. The proposals to deviate from Staff's ranked 30-year normal weather using Tier 1 weather stations highlights the importance of having one standard that applies to all utilities.

Q. Is it clear what weather, both normal and actual, Spire Missouri is supporting in this docket?

A. No. Spire Missouri's rebuttal workpapers show a 10-year period using a ranking method that, based on a quick review, is consistent with Staff's ranked method, but Spire Missouri has not provided any workpapers consistent with other recommendations in

David Yonce's rebuttal testimony. It is also my understanding from discussion with other Staff members that these results have not been carried forward into other Spire Missouri workpapers; the rebuttal Class Cost of Service ("CCOS") and Cost of Service ("COS") workpapers still reflect Spire Missouri's direct filed position.

Q. OPC witness Lena Mantle states, "The correct normal should reflect a 50% chance of weather being warmer and 50% chance it is cooler than the normal."[1] Would changing from a 30-year weather normal to a 15-year weather normal improve the 50% chance of weather being above or below the normal?

A. No. The difference between the normals is relatively small compared to the typical deviations from actual to normal weather. As stated in my rebuttal testimony, "But even with those [unusually mild] years, between 2010 and 2020 the majority of years had winters colder than the 30-year average." Thus, even Ms. Mantle's own logic would not support changing the climatic normal period.

Q. Mr. Yonce, on page 16, lines 1 through 3 of his rebuttal testimony, states, "…a 10-year weather pattern for calculating normal weather is the most appropriate and is more reflective of normal weather." Do you agree?

A. No. Mr. Yonce is making presumptions about future weather that cannot be determined with the current data. The purpose of climatic normals is to serve as a way to do comparative analysis, and typically they are poor at being predictive of specific future weather.[2] As discussed above and in rebuttal, the deviation from a year's actual weather has been much greater than the differences between specific normals. For St. Louis, three of Mr. Yonce's

[1] Rebuttal Testimony of Lena M. Mantle, p. 9, ll. 2-4.
[2] Guttman, Nathaniel B. (1989). Statistical Descriptors of Climate. 1520-0477_1989_070_0602_sdoc_2_0_co_2.pdf.

ten years appear to be outliers. There is no evidence that we should expect outliers to be more reflective of normal weather.

Q. Mr. Yonce states on page 16, lines 9 through 10 of his rebuttal that "2024 was a particularly warmer-than-normal year and should not be excluded from the [normal weather] dataset." Is this consistent with Staff's concerns expressed in rebuttal testimony?

A. Yes. As I stated on page 7, lines 1 through 3 of my rebuttal, "as a climatic standard that NOAA has used for over a century, breaking away from the 30-year period precedent would lead to other utilities being able to choose periods of weather more favorable to their own revenue requirements in rate cases."

Most of Mr. Yonce recommendations work to achieve the warmest normal temperatures, which would benefit Spire Missouri. Warmer normal temperatures will substantially increase the underlying revenue requirement increase by reducing weather normalized sales to customers.

Q. Does Staff have an idea of the impact on the revenue requirement between Staff's 30-year normal and Spire Missouri's 10 year normal?

A. Yes. Based on numbers given to Staff from Spire Missouri, moving from the 30-year period to the 10-year period would increase the revenue requirement increase by approximately $19.2 million.

Q. Mr. Yonce states on page 16, line 7 of his rebuttal that "Staff only utilized weather data up through 2022 to calculate normal weather." Why did Staff only go through 2022?

A. A standard academic practice is to keep separation between the control group and test group. In this case, the test year included months from 2023 through 2024. Therefore, I selected January 1993 through December 2022 to act as the control.

Q. Would you have concerns of moving to 2024?

A. These concerns could be mitigated to an extent if the 30-year normal period is maintained, but I would be concerned that 2024 would become over-represented in a shorter normal period. Specifically, 2024 would become the test period baseline plus, on a ten year basis, be ten percent of the normal period. As Mr. Yonce stated, "2024 was a particularly warmer-than-normal year."[3]

Q. Mr. Yonce critiques Staff's ranking method on page 16, line 11 through page 18, line 7 of his rebuttal. Why does a single normal day not have a representative calendar date from each of the 30 years?

A. Selecting only the coldest day in a given month for each of the 30 years can still result in underestimating the peak coldest day in a given month. By selecting the coldest 30 days in a calendar month, it tends to preserve the peak coldest day of that calendar month. Staff's method of ranking in this way goes back to the 1990s as far as I can tell, and has been used for all natural gas utilities.[4]

Q. On page 18, lines 11 through 13 of his rebuttal testimony, Mr. Yonce recommends using the Kansas City Downtown Airport ("KCA"), contradicting Spire Missouri's direct filed position and Spire Witness Trisha E. Lavin's rebuttal position which also used the Kansas City International Airport ("MCI"). Do you agree that the KCA should be used?

A. No. His main reasoning seems to be that the majority of customers are more south of MCI, where the KCA is more central. However, as was discussed by Dr. Seoung Joun Won in Liberty Utilities' natural gas rate case (Case No. GR-2014-0152), the KCA weather station

[3] Rebuttal Testimony of David A. Yonce, p. 16, l. 9.
[4] The Direct Testimony of Dennis Patterson in GR-2004-0072 discusses Staff's ranking method, including his attached Schedule-1. https://efis.psc.mo.gov/Document/Display/90789.

is exposed to an Urban Heat Islands ("UHI") effect because of its location only 1 mile from downtown Kansas City, Missouri. The UHI effect alters the observed temperatures at KCA so that the relationship between weather and Spire West's natural gas sales would be distorted.

Q. What is a UHI effect?

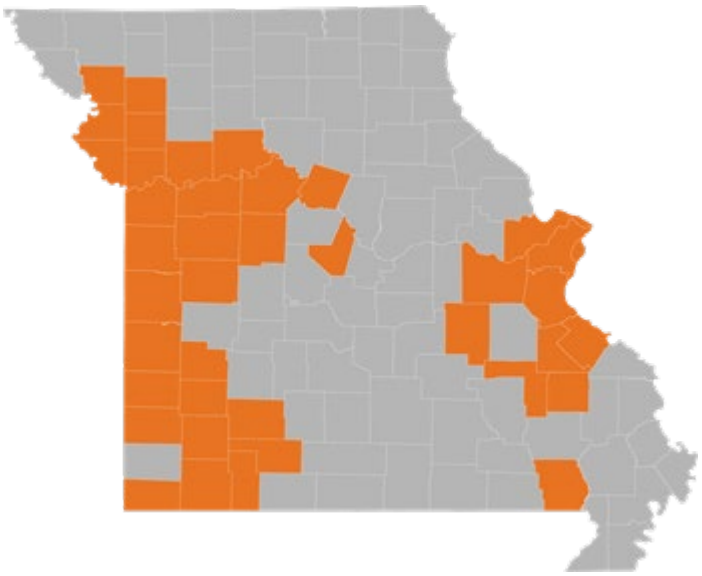
A. A UHI is the downtown of a metropolitan area which is significantly warmer than its surroundings. According to the United States Environmental Protection Agency ("EPA"), the annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F warmer than its surroundings, and in the evening, the difference can be as high as 22°F.[5] This temperature difference is usually larger at night than during the day and larger in winter than in summer.[6] The main causes are changes in the land surface by urban development along with waste heat generated by energy use. As population centers grow, they tend to change greater areas of land which then undergo a corresponding increase in average temperature.

Q. Are Spire West's customers impacted by the UHI effect?

A. While some of Spire West's customers live in the Kansas City metropolitan area and would be impacted by the UHI effect, Spire West's service territory covers a much larger area that is primarily classified as rural. Figure 1 below is from Spire Missouri's website and shows the counties in which Spire Missouri operates.

Figure 1. Spire Missouri's Service Territory.

[5] U.S. Environmental Protection Agency. 2008. "Urban Heat Island Basics." In: Reducing Urban Heat Islands: Compendium of Strategies. Draft. https://www.epa.gov/heat-islands/ heat-island-compendium.
[6] Rizwan, Ahmed Memon, Leung YC Dennis, and Chunho Liu. "A review on the generation, determination and mitigation of Urban Heat Island." Journal of Environmental Sciences 20, no. 1 (2008): 120-128.



Based on 2020 Census Data, Jackson County, where Kansas City is located, is 44% urban by surface area. KCA lies just across the Missouri River from Jackson County in Clay County, which is 28% urban. Platte County, where MCI is located, is only 15% urban. Other large population areas of Spire West include Jasper and Buchanan counties, which have the cities of Joplin and St. Joseph, are only approximately 10% urban. Spire West also operates in Greene County, which is 18% urban, but does not operate in Springfield, the primary city in that county. Thus, while Spire West's customers may even lie in the urban centers of the rural counties, they will not be impacted by the UHI effect quite like customers in the downtown portion of Kansas City.

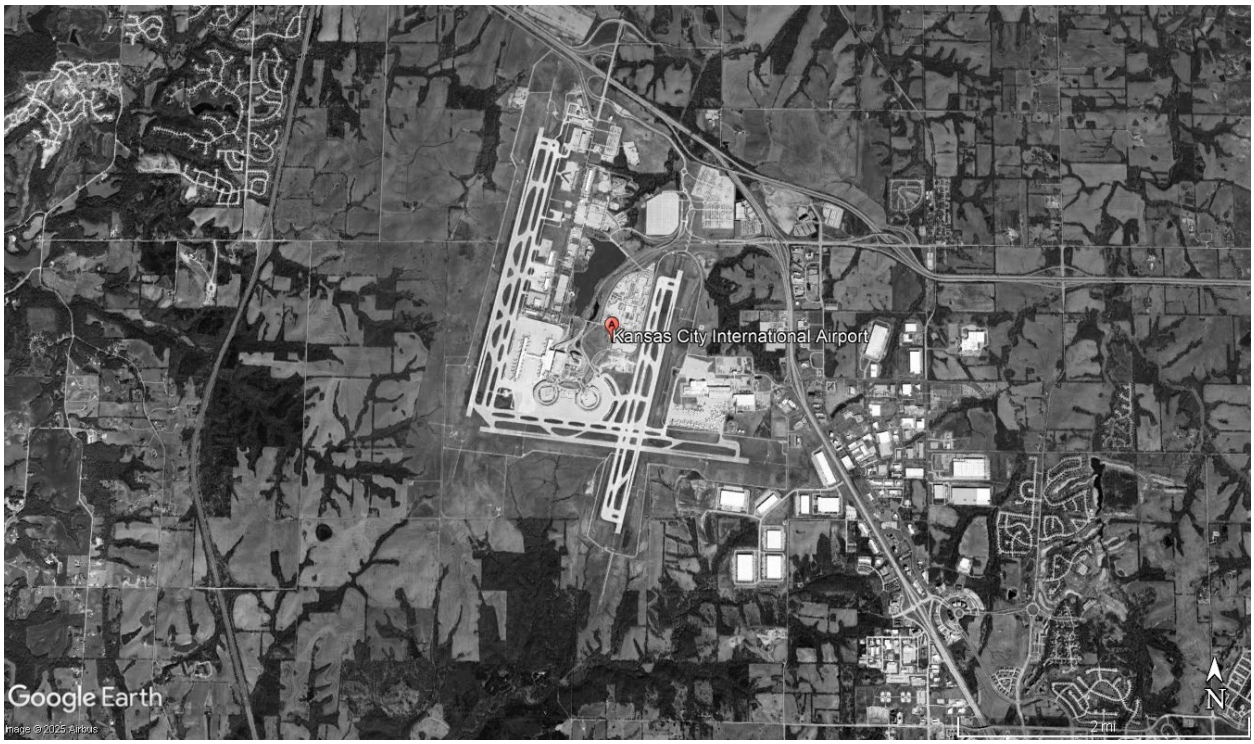
Q. Is KCA affected by the UHI effect?

A. Yes. KCA is located in downtown Kansas City. The distance between KCA and the downtown business area of Kansas City is around 1 mile. Figure 2 is a Google Earth image of KCA and the surrounding regions and shows that KCA is surrounded by urban areas.

Figure 2. Google Earth Image of KCA and Surrounding Area


In contrast, MCI, the weather station both Staff and Spire Missouri used in direct and rebuttal testimony, is located in a more rural area.

Figure 3. Google Earth image of MCI and Surrounding Area




MCI is a first-order weather station.[7] Because MCI is not located in the urban area of Kansas City, the UHI effect is weaker than that of KCA. The distance between MCI and KCA is only around 15 miles.

Q. Is it important that the MCI weather station is generally cooler than what the typical Spire West customer would experience?

A. No. It is more important that the weather trends at MCI are more consistent with the weather trends that typical Spire West customers experience. The regression analysis can account for a shift in the temperature as long as the temperature trends remain consistent. However, the UHI effect will distort the temperature trends by mitigating the winter nightly lows, as discussed above.

[7] First–Order refers to weather stations that are professionally maintained, primarily through the National Weather Service or Federal Aviation Administration.

Q. Are there other considerations that would impact the decision of which weather station should be selected?

A. Yes. Because Spire Missouri currently has a Weather Normalization Adjustment Rider ("WNAR"), it is important that daily weather data be provided to minimize disputes on the calculation of the WNAR rate. Since January 1, 2000, the KCA weather station has 68 days of missing temperature data, most recently in 2018, while MCI has no missing days.

Q. Is Staff open to consider changes in weather stations or other factors in determining normal weather?

A. Yes. However, it is difficult to work through various nuances of certain weather stations in the time span of a rate case, especially the limited time between rebuttal and surrebuttal testimony. I would encourage Mr. Yonce to continue discussing these issues to hopefully come to a resolution prior to Spire Missouri's next general rate case proceedings.

Q. Please summarize your testimony.

A. Staff's method of calculating normal weather has been fairly consistent across time and utilities. The method of determining normal weather should remain consistent across utilities to mitigate disputes and prevent parties from selecting weather that is most favorable to their positions.

Q. Does this conclude your testimony?

A. Yes, it does.

**BEFORE THE PUBLIC SERVICE COMMISSION**

**OF THE STATE OF MISSOURI**

| | | |
|---|---|---|
| In the Matter of Spire Missouri Inc. d/b/a Spire's Request for Authority to Implement a General Rate Increase for Natural Gas Service Provided in the Company's Missouri Service Areas | ) ) ) ) | Case No. GR-2025-0107 |

**AFFIDAVIT OF MICHAEL L. STAHLMAN**

STATE OF MISSOURI )
) ss.
COUNTY OF COLE )

**COMES NOW MICHAEL L. STAHLMAN** and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Surrebuttal / Cross-Surrebuttal Testimony of Michael L. Stahlman*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

**MICHAEL L. STAHLMAN**

**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 26th day of June 2025.

Notary Public

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2029
Commission Number: 12412070