Exhibit No.:____
Issues: Economic Benefit
Witness: J. Neil Copeland
Sponsoring Party: Grain Belt Express
Clean Line LLC
Type of Exhibit: Surrebuttal Testimony
Case No.: EA-2016-0358
Date of Testimony: February 21, 2017

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2016-0358

SURREBUTTAL DIRECT TESTIMONY OF

J. NEIL COPELAND

ON BEHALF OF

GRAIN BELT EXPRESS CLEAN LINE LLC

February 21, 2017

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I. INTRODUCTION

Q. Please state your name, present position and business address.

A. My name is Neil Copeland. My business address is 1850 Parkway Place, Suite 800, Marietta, GA 30067.

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

A. I am currently employed by GDS Associates, Inc., and I am a Managing Director in the Power Supply Group.

Q. Have you previously submitted testimony and exhibits in this proceeding?

A. Yes, I submitted direct testimony on August 29, 2016.

Q. What is the purpose of your surrebuttal testimony?

A. The purpose of my surrebuttal testimony is to address comments made in the Missouri Public Service Commission Staff Rebuttal Report (the "Report") dated January 24, 2017.

Q. Please summarize your surrebuttal testimony.

A. First, my surrebuttal testimony corrects Staff's assertion that the analysis presented in my direct testimony did not include utility off-system sales. Off-system sales were included in the results presented in my direct testimony.

Second, my surrebuttal testimony responds to Staff's argument that "all renewables are equal" to the wholesale power market, regardless of power generation or delivery location or transmission access.

Third, my surrebuttal testimony responds to Staff's claim that additional ancillary services for wind energy could offset the emission reductions resulting from the Project.

Lastly, my surrebuttal testimony responds to Staff comments regarding the "basis differential", or difference in locational prices, between the Project's MISO converter station and the ultimate sink within MISO.

II. RESPONSES TO STAFF REBUTTAL REPORT

Q. On page 38 of the Report, Ms. Kliethermes argues that a wholesale power market analysis for Missouri utilities should incorporate off-system sales. Do you agree?

A. Yes, I agree that off-system sales should be incorporated into a wholesale power market analysis.

Q. Did your analysis take off-system sales into account when you performed your economic assessment?

A. Yes, my analysis did take them into account. Adjusted Production Cost ("APC") savings are calculated as the difference in total production costs of a generation fleet, adjusted for import costs and off-system sales. As explained on pages 4 and 16 of my direct testimony, I used the APC as one of the three key metrics for calculating the economic benefits. SPP, MISO and other transmission planners also utilize APC savings to measure the economic benefits of potential transmission upgrade options. To be clear, the APC metric I presented in my direct testimony already includes the fact that off-system sales revenue is a benefit to cost-based utilities.

Q. On Page 38 of the Report, Ms. Kliethermes states "Similar changes to generation dispatch in the eastern interconnection would be expected based on the addition of renewable energy anywhere in that footprint, which induce the modeled changes to

both the cost of wholesale energy and the environmental benefits Grain Belt discusses". Do you agree with this statement?

A. No. All renewables are not created equal. While the addition of renewable energy into the eastern interconnection should, in general, lower the wholesale cost and emissions, the impact on a specific region or state would vary greatly depending on where this renewable energy is located on the transmission system. Wind generation displaces other, more expensive generation in the geographic vicinity of its point of delivery and in the areas to which the wind generation has good transmission access. For example, a large amount of renewable energy delivered to a coal-centric region will have a greater emissions impact than the same amount of wind energy delivered to a less coal-centric region with more natural gas generation. The physical characteristics of the transmission system affects the distribution of the renewable energy. Only where adequate transmission links exist can wind energy reach a region and load within that region.

The Grain Belt Express HVDC converter station in Missouri provides for direct delivery of wind power to Missouri. It is incorrect to assume that any wind generation, regardless of its transmission links to the state, would create the same benefits for Missouri. Without a transmission link to Missouri, wind generation would be unable to displace more expensive generation or reach load within Missouri, and therefore could not convey the same benefits. More specifically, MJMEUC would not be able to receive the same benefits it has under the transmission service agreement with Grain Belt Express by purchasing wind power elsewhere absent a direct transmission link. Without transmission access, the wind energy could not actually reach the markets in which

MJMEUC buys power and could not reach MJMEUC's customers. Ms. Kliethermes' suggestion that "all renewables are equal" regardless of generation location, transmission path, and delivery point is incorrect.

Q. Beginning with the last sentence on Page 38 of the Report, Ms. Kliethermes states "the manner in which the production modeling was done does not account for any increase in emissions that will result from the ancillary service activities such as regulating reserves necessary to integrate any increase in wind generation. Did your analysis assess changes in emissions based on ancillary services?

A. Yes. The software I used, PROMOD IV, is an hourly chronological model that inherently accounts for rapid changes in the generation portfolio. Such rapid changes include existing wind and solar generation going higher or lower, and random forced outages on thermal generators. PROMOD IV must adjust for these rapid changes due to the simultaneous requirements to serve load and maintain operating reserves. Any changes in generation to maintain reserve levels would likely be met with thermal generation, and any associated emissions increases would be accounted for in the overall emission results from PROMOD IV.

In discussions with Staff on June 16, 2016, Staff recommended the PROMOD IV analysis test the effect of additional wind variability from the Grain Belt Express Project on the production cost analysis. I performed this analysis and found there to be very little change in the amount of emissions discharged between three wind delivery scenarios; base wind delivery, high wind volatility delivery, and low wind volatility delivery. Any change in thermal generator efficiency from balancing wind variability would be picked

up in the PROMOD IV analysis. However, based on my modeling results, the effect of wind variability on emissions is very minor compared to the much larger effect of adding pollution-free wind energy to the generation portfolio. Schedule JNC-2 to my direct testimony provides the emissions released under each wind delivery scenario.

Q. On Page 31 of the Report, Ms. Kliethermes states "Grain Belt ignores a calculation of the basis differential between the MISO converter station and the ultimate sink within MISO". Does your production cost modeling include the effects of basis differential?

A. Yes, it does. Basis differential is the difference in two locational marginal prices ("LMP") at different points on the grid. In this case, Ms. Kliethermes is referring to the difference between the LMP at the Project's point of delivery and the LMP at the location of the load served by Grain Belt Express' delivered energy. The primary component of the APC calculation is the production cost of generation, and this generation is optimized based on the congestion that is caused by the physical characteristics of the transmission system. In an ideal world, with no congestion and losses, there will be no power price (basis) difference at any location in the system. Therefore, congestion drives nodal differences in LMPs, causing the basis differential. Hour by hour, the production cost analysis is optimizing the generation and transmission to lower the total cost to serve energy demand by effectively reducing the difference between the injection of generation, such as by the Grain Belt Express Project, and the removal of this generation at load points within the system. The smaller the difference between these points, the lower the cost to serve energy demand.

An analysis of the hourly LMPs that result from the PROMOD simulations suggests that the basis differential between the Grain Belt Express Missouri converter station node (Maywood) and the Missouri Load Hub actually decreases with the Grain Belt Express line included. In the Business as Usual scenario, without the Project, the average basis difference between these two nodes was $0.64/MWh, with the Missouri Load Hub being more expensive. With the Grain Belt Express Project, the average basis difference decreases to $0.16/MWh, with the Missouri Load Hub being more expensive. The Project therefore lowers the cost to serve Missouri load.

Q. Does this conclude your prepared surrebuttal testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express Clean Line LLC for a Certificate of Convenience and Necessity Authorizing it to Construct, Own, Control, Manage, Operate and Maintain a High Voltage, Direct Current Transmission Line and an Associated Converter Station Providing an Interconnection on the Maywood-Montgomery 345 kV Transmission Line	)	Case No. EA-2016-0358

AFFIDAVIT OF J. NEIL COPELAND

STATE OF Georgia)
) **ss**
COUNTY OF Cobb)

J. Neil Copeland, being first duly sworn on his oath, states:

1. My name is J Neil Copeland. I am a Managing Director in the Power Supply Group at GDS Associates, Inc.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Grain Belt Express Clean Line LLC consisting of 8 pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

J. Neil Copeland

Subscribed and sworn before me this 20th day of February 2017.

Faye H. Culpepper
Notary Public

My commission expires: March 3, 2018

FAYE H. CULPEPPER NOTARY PUBLIC COBB COUNTY GEORGIA EXPIRES MARCH 3, 2018