

## APPENDIX A

Duke Energy is providing this response to KDAQ's inquiry into the relative increase in SO<sub>2</sub> emissions from East Bend Generating Station between the model base year of 2012-2014 and 2017-2019.

The 22% increase in SO<sub>2</sub> emissions at East Bend Generating Station can be attributed to the following factors:

- An increase in the unit dispatch due to demand growth during 2017-2019. The increase in unit dispatch is reflected in a 3% increase in the Gross Megawatt output between 2012-2014 and 2017-2019.
- A lower SO<sub>2</sub> emissions rate during 2012, the first year of baseline modeling. The SO<sub>2</sub> emission rate during 2012 averaged 0.09 lbs/MMBtu, but was 0.12 and 0.13 lbs/MMBtu in 2013 and 2014. The annual average SO<sub>2</sub> lbs/MMBtu emissions rate has remained relatively consistent between years 2013 to 2019 with a range between 0.11 and 0.13 lb/MMBtu.
- Flow data is used to calculate the SO<sub>2</sub> mass emissions. A review of the flow data shows a step change in the flow rate occurred in 2014. In 2014, the CEMS flow monitor was replaced with a new monitoring device intended to provide more reliable and accurate flow measurement. While both the old monitor and the new monitor have been demonstrated to meet all EPA certification and operational requirements under 40 CFR 75 and 40 CFR 60, some of the apparent increase in emissions may be attributed to a step change in reported flow values after installation and certification of the new monitoring system.

Duke Energy does not believe the increase in the SO<sub>2</sub> emissions between 2012-2014 compared to 2017-2019 should trigger remodeling due to following modeled impacts:

- East Bend's contribution to the modeled design value, used to demonstrate attainment with the SO<sub>2</sub> NAAQS of 196.5 ug/m<sup>3</sup>, was negligible. The modeled design value was 169.84 ug/m<sup>3</sup>, which includes background concentrations and impacts from Ghent, Miami Fort and East Bend Generating Stations. East Bend's contribution to the modeled design value was only 0.05 ug/m<sup>3</sup>.
- East Bend's impacts over the modeling domain was not significant. East Bend's 4th high daily max concentration, averaged over 3 years, at any one receptor, was only 23.707 ug/m<sup>3</sup>.
- The background concentrations used in the initial modeling analysis were significantly impacted by nearby sources, resulting in overly conservative impacts. The SO<sub>2</sub> modeling analysis included background concentrations from the Northern Kentucky SO<sub>2</sub> monitoring site over the period from 2013-2015. The average background concentrations reflected in the annual 4th high daily max concentration, averaged over 3 years, was 86 ug/m<sup>3</sup>. The 2017-2019 design value for the Northern Kentucky SO<sub>2</sub> monitor is 28.8 ug/m<sup>3</sup> or 11 ppb.

Let me know if you have any questions or concerns.

Thanks

*Patrick Coughlin*