Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

December 15, 2023

Ms. Jeaneanne Gettle
Regional Administrator
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

RE: Ongoing Reporting Requirements for 2010 1-hour Sulfur Dioxide National Ambient Air Quality Standard

Dear Ms. Gettle:

On behalf of the Commonwealth of Kentucky, the Energy and Environment Cabinet's Division for Air Quality (Division) respectfully submits the following documentation to comply with the United States Environmental Protection Agency (EPA) Data Requirements Rule (DRR) ongoing reporting requirement for the 2010 1-hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR 51.1205(b), each state must submit an annual report to the EPA Regional Administrator that documents the annual SO_2 emissions of each source designated as unclassifiable/attainment, which utilized modeling as the basis for designation. The report must include a recommendation by the state regarding the need for additional modeling to assure that each area continues to meet the 2010 SO_2 NAAQS.

The attached report details the Division's review of the sources subject to the ongoing reporting requirements under the DRR. The Division recommends that no additional modeling is required at this time. The Division also requests the removal of the Owensboro Municipal Utilities – Elmer Smith facility from future reports. The facility has permanently closed and SO_2 emissions in the area have drastically decreased.

In accordance with 40 CFR 51.102, the annual report was available for public review and comment from October 4, 2023 to November 13, 2023. No comments were received. A copy of the public notice is included with the report.

If you have any questions or concerns, please contact Ms. Cassandra Jobe, Program Planning and Administrative Branch Manager, Division for Air Quality at (502) 782-6670 or cassandra.jobe@ky.gov.

Sincerely,

Recoverable Signature

X Michael Kennedy

Signed by: Michael Kennedy

Michael Kennedy
Director

Cc: Anthony Toney, Region 4 US EPA
Todd Rinck, Region 4 US EPA
Lynorae Benjamin, Region 4 US EPA

Kentucky
Sulfur Dioxide Ongoing Data Requirements Rule
2023 Annual Report for Modeled Sources

Prepared by the
Kentucky Division for Air Quality
Submitted by the
Kentucky Energy and Environment Cabinet

December 2023

Table of Contents

Tables

Figures

Appendices

Appendix A: Emissions Data

Appendix B: Monitor Data

Appendix C: Duke Energy – East Bend Response

Appendix D: LG&E – Trimble County Response

Appendix E: OMU – Elmer Smith Closure Letter

Appendix F: Public Notice

I. Introduction

The Kentucky Energy and Environment Cabinet (Cabinet) submits this report to the U.S. Environmental Protection Agency (EPA) for the Annual Ongoing Data Requirement Rule (DRR) for the 2010 1-hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS). This report is intended to fulfill the annual reporting requirements of 40 CFR Part 51 Subpart BB.

On August 21, 2015, the EPA promulgated the DRR for the 2010 1-hour SO_2 Primary NAAQS of 75 parts per billion (ppb).[1] The DRR requires areas that are in attainment to characterize ambient air quality for facilities that emit more than 2,000 tons per year (tpy) of SO_2. Characterization of air quality can occur by choosing one of three methods: (1) ambient air monitoring; (2) air dispersion modeling of either actual or allowable emissions; or (3) demonstration of enforceable emissions limitations that are below the 2,000 tpy threshold.

On January 6, 2017, the Cabinet submitted a letter and air dispersion modeling analyses to EPA characterizing nine sources subject to the DRR. The letter also detailed Kentucky sources that chose the monitoring or federally enforceable limitation options, as well as sources that permanently shut down. Two of the nine sources are not included in this report: Big Rivers – D. B. Wilson and TVA – Paradise. D. B. Wilson was designated unclassifiable and is not subject to ongoing verification. TVA – Paradise was modeled using potential to emit (PTE) emissions and is not subject to ongoing verification.

In accordance with 40 CFR 51.1205(b), areas designated as attainment/unclassifiable and characterized using air dispersion modeling of actual SO_2 emissions are subject to ongoing data requirements. Annual emissions reports for those areas must be submitted to EPA by July 1 of each year.

[1] 80 FR 51052

II. Emissions Data Summary

On January 9, 2018, EPA designated seven Kentucky counties containing the sources characterized by modeled actual emissions as attainment/unclassifiable.[2] The seven Kentucky counties and their respective DRR sources subject to ongoing emissions data verification are identified in Table 1.

Table 1
Sources Subject to the DRR

Source	County
Duke Energy - East Bend	Boone
East Kentucky Power Cooperative (EKPC) - Hugh L. Spurlock	Mason
Kentucky Utilities (KU) - Ghent	Carroll
Louisville Gas and Electric (LG&E) - Trimble County	Trimble
Tennessee Valley Authority (TVA) – Shawnee	McCracken
Century Aluminum - Hawesville	Hancock
Owensboro Municipal Utilities (OMU) - Elmer Smith	Daviess

The five electric generating units (EGUs) that chose to model actual SO_2 emissions for the model years 2012-2014 are displayed in Table 2. The SO_2 emissions modeled for 2012-2014 are compared to 2020-2022 actual SO_2 emissions. Emissions in Table 2 were pulled from the Clean Air Markets Program Data (CAMPD) database and are included in Appendix A. Three of the five facilities had a decrease in SO_2 emissions (EKPC – H. L. Spurlock, KU – Ghent, and TVA - Shawnee). Duke Energy – East Bend, and LG&E – Trimble County emissions increased from 2021 to 2022. Section III looks at East Bend and Trimble County emissions and monitoring data to determine whether additional modeling is required for either facility.

Table 2
Annual SO_2 Emissions for Sources Using MY 2012-2014 (tpy)

Source	Modeled Actual Emissions			Current Actual Emissions		
	2012	2013	2014	2020	2021	2022
Duke Energy – East Bend	1,496.63	2,197.72	2,102.71	1,932.15	1,755.68	1,823.71
EKPC – H. L. Spurlock	5,131.11	4,468.75	4,689.09	3,831.41	3,968.02	3,855.84
KU – Ghent	10,772.18	13,421.85	14,851.28	8,600.66	11,059.99	10,675.05
LG&E – Trimble County	2,895.83	3,521.39	3,056.20	3,747.99	2,900.79	3,511.55
TVA – Shawnee	27,114.87	27,210.73	29,834.54	9,024.44	14,696.44	14,325.61

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

Listed in Table 3 are the two facilities that chose to model actual SO_2 emissions for the model years 2014-2016. Emissions data for Century Aluminum – Hawesville were obtained from the Kentucky Division for Air Quality's Emissions Inventory database while OMU – Elmer Smith emissions were pulled from the CAMPD database. The SO_2 emissions for Century Aluminum – Hawesville decreased from 2021-2022. On August 12, 2020, the Cabinet received

[2] 83 FR 1098

a letter from OMU requesting the recension of the Title V permit due to the closure and decommissioning of the power plant. Section IV discusses the impact the closure of the OMU – Elmer Smith plant had on the modeled area, and ultimately requests that Elmer Smith be removed from ongoing reporting requirements for DRR annual reports.

Table 3
Annual SO_2 Emissions for Sources Using MY 2014-2016 (tpy)

Source	Modeled Actual Emissions			Current Actual Emissions		
	2014	2015	2016	2020	2021	2022
Century Aluminum – Hawesville*	2,223.56	1,604.46	507.04	1,575.96	1,495.06	820.14
OMU – Elmer Smith**	5,741.38	3,901.59	2,448.69	586.94	0	0

*Emissions data acquired from the Kentucky Division for Air Quality Emissions Inventory
** Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

The averaged actual emissions from the most recent three years of data, the averaged emissions of the modeled years, and the percent change between the two are compared in Table 4. Six of the seven facilities show a decrease in actual emissions when compared to the modeled year's emissions. LG&E – Trimble County's averaged SO_2 emissions increased by 7% between 2020-2022 and 2012-2014. Detailed information specific to the LG&E – Trimble County facility is provided in Section III.

Table 4
SO_2 Emissions Comparisons (tpy)

Source	Modeled Emissions Average	Current Emissions Average	Percent Change
	2012-2014	2020-2022	
Duke Energy – East Bend**	1,932.35	1,837.18	-5%
EKPC – H. L. Spurlock**	4,762.98	3,885.09	-18%
KU – Ghent**	13,015.10	10,111.90	-22%
LG&E – Trimble County**	3,157.81	3,386.77	7%
TVA – Shawnee**	28,053.38	12,682.16	-55%
Source	**Modeled Emissions Average**	**Current Emissions Average**	**Percent Change**
	2014-2016	**2020-2022**	
Century Aluminum – Hawesville*	1,445.02	1297.05	-10%
OMU – Elmer Smith**	4,030.55	195.65	-95%

*Emissions data acquired from the Kentucky Division for Air Quality Emissions Inventory
**Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

III. Facility Analysis to Determine Updated Modeling Recommendation

As part of the ongoing reporting, Kentucky must perform an annual review of SO_2 emissions for facilities and, if necessary, provide a recommendation for updated modeling due to increases in SO_2 emissions. As mentioned, Duke Energy – East Bend and LG&E – Trimble County SO_2 emissions increased from 2021 to 2022. SO_2 emissions at Duke Energy – East Bend increased by 68 tpy, LG&E – Trimble County increased by 611 tpy. The following sections show, despite the increase in annual emissions at the two facilities, the total SO_2 emissions in the modeled areas have decreased overall and the monitors are well below the 2010 SO_2 1-hour NAAQS.

Duke Energy – East Bend

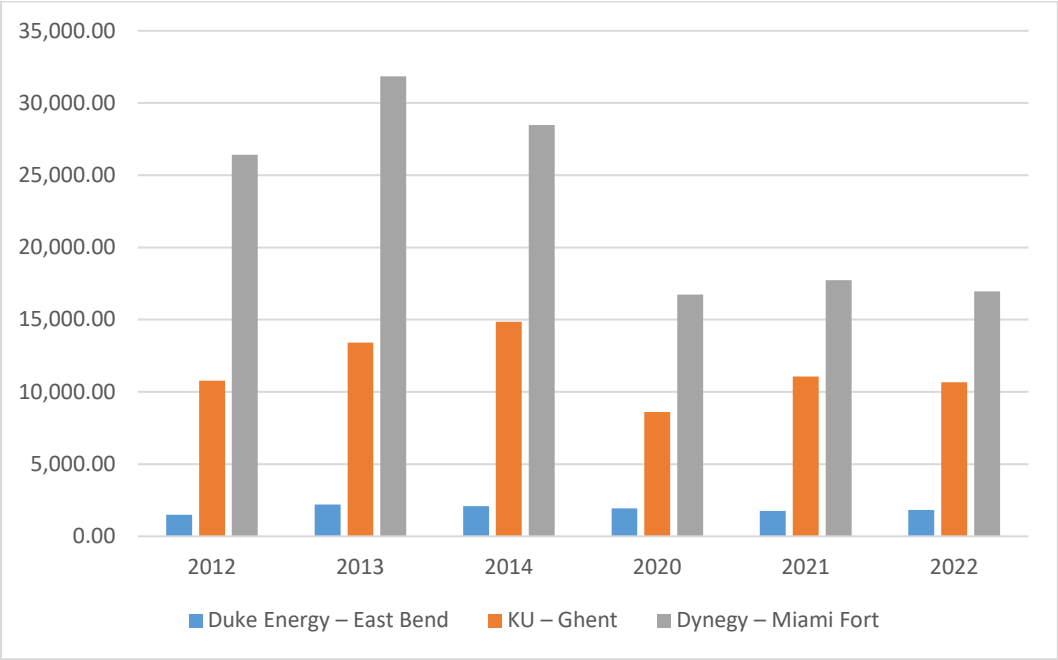
The initial modeling characterization for Duke Energy – East Bend includes KU – Ghent in Kentucky, and Dynegy – Miami Fort in Ohio. The resulting modeled emissions and actual emissions of SO_2 for the three facilities are shown in Table 5 and Figure 1. As seen in Table 5, SO_2 emissions at the Duke Energy – East Bend facility increased between 2021 and 2022. The Cabinet reached out to Duke Energy while compiling the 2023 annual report and requested that they identify the reason for the increase. The Duke Energy contact reported that the emissions increase between 2021 and 2022 could be attributed to a 19.97% increase in unit dispatch due to demand growth. Appendix C contains Duke Energy's explanation for the increase, which was submitted to the Cabinet for review.

Table 5
Duke Energy – East Bend, KU – Ghent, Dynegy – Miami Fort
Annual SO_2 Emissions (tpy)

Facility	Modeled Actual Emissions			Current Actual Emissions		
	2012	2013	2014	2020	2021	2022
Duke Energy – East Bend	1,496.63	2,197.72	2,102.71	1,932.15	1,755.68	1,823.71
KU – Ghent	10,772.18	13,421.85	14,851.28	8,600.66	11,059.99	10,675.05
Dynegy – Miami Fort	26,406.89	31,843.92	28,478.67	16,729.51	17,737.82	16,958.68
Area Total	**38,675.70**	**47,463.49**	**45,432.66**	**27,262.32**	**30,553.49**	**29,457.44**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

Figure 1
Duke Energy – East Bend; KU – Ghent; Dynegy – Miami Fort
Annual SO_2 Emissions (tpy)



Despite the annual increase of SO_2 emissions at the East Bend facility between 2021 and 2022, the average current emissions (2020-2022) are lower than the average modeled emissions (2012-2014), as seen in Table 6. Table 6 list each facility in the modeled area and the percent change between the current emissions (2020-2022) and the emissions used during the initial model (2012-2014). SO_2 emissions at KU – Ghent and Dynegy – Miami Fort have decreased by 22% and 41%, respectively. SO_2 emissions in the area have decreased by 34%.

Table 6
Duke Energy – East Bend, KU – Ghent, Dynegy – Miami Fort Modeled Area Percent Change in SO_2 Emissions (tpy)

Facility	Emissions Average 2012-2014	Emissions Average 2020-2022	Percent Change
Duke Energy – East Bend	1,932.35	1,837.18	-5%
KU – Ghent	13,015.10	10,111.90	-22%
Dynegy – Miami Fort	28,909.83	17,142.00	-41%
Area Total	**43,857.28**	**29,091.08**	**-34%**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 170 µg/m3, equivalent to 65 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentrations of SO_2. The model shows the highest concentrations occurred near the KU – Ghent facility. The concentrations modeled near Duke

Energy - East Bend were well below the 1-hour SO_2 NAAQS.[3] Table 7 highlights the improvement in air quality as a result of lower emissions in the modeled area.

Data from the NKU monitor (site ID 21-037-3002) was used to calculate background concentrations for East Bend. As stated above, the cumulative modeling analysis indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 65 ppb. Current ambient air data from the NKU monitor indicates a 2020-2022 design value of 10 ppb, which is well below 75 ppb. The latest complete three-year design value (2020-2022) shows an 86% decrease from the 2012-2014 design value. Therefore, the overall decrease in SO_2 emissions in the modeled area has improved air quality.

Table 7
NKU SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2020	2021	2022	2020-2022 Design Value	Percent Change
85	71	61	72	10	9	12	10	-86%

Data retrieved from EPA's Air Quality System Design Value Report

Duke Energy – East Bend SO_2 emissions increased between 2021 and 2022. However, emissions at all three facilities in the modeled area (Duke Energy – East Bend, KU – Ghent, and Dynegy – Miami Fort) have decreased by 34%. Considering current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb 1-hour SO_2 NAAQS, the Cabinet has determined that updated modeling is not needed at this time.

Louisville Gas & Electric - Trimble County

The initial modeling characterization for LG&E – Trimble County includes IKEC – Clifty Creek station and KU – Ghent. Table 8 and Figure 2 contain the area emissions from the modeled years (2012-2014) and the current actual emissions (2020-2022) of SO_2 for the three facilities. As seen in Table 8, SO_2 emissions at the LG&E – Trimble County facility increased between 2021 and 2022. The Cabinet reached out to LG&E while compiling the 2023 annual report and requested that they identify the reason for the increase. LG&E's response identified an increase in utilization at the Trimble County facility as the cause for the increase in SO_2 emissions. Appendix D contains LG&E's explanation for the increase, which was submitted to the Cabinet for review.

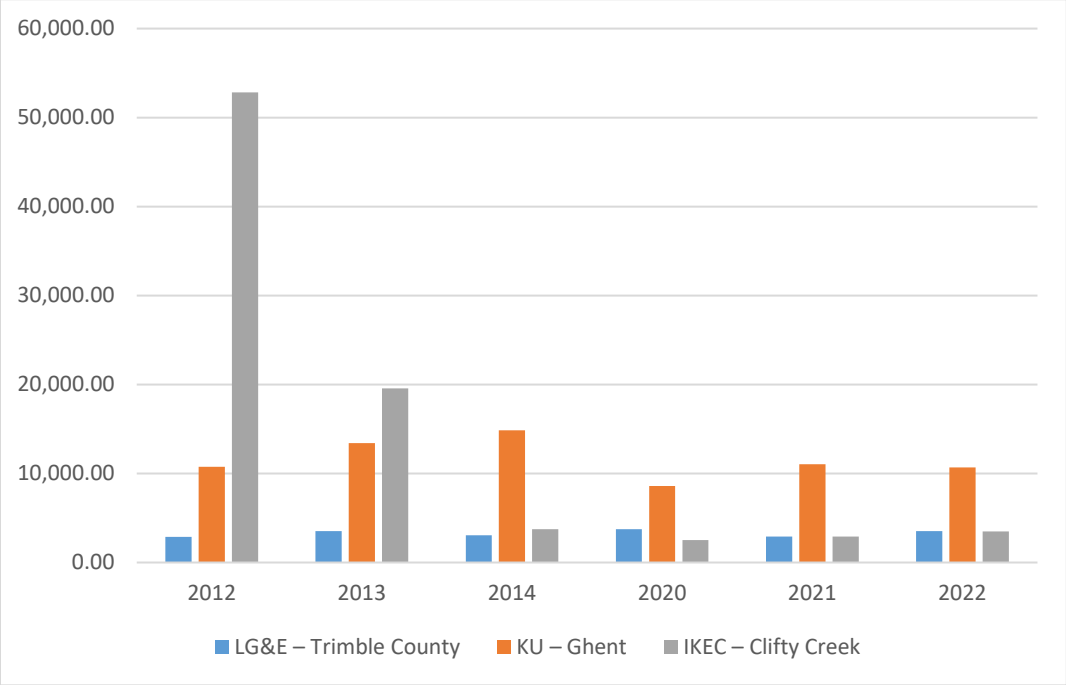
[3] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

Table 8
LG&E – Trimble County, KU – Ghent, IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)

Facility	Modeled Actual Emissions			Current Actual Emissions		
	2012	2013	2014	2020	2021	2022
LG&E – Trimble County	2,895.83	3,521.39	3,056.20	3,747.99	2,900.79	3,511.55
KU – Ghent	10,772.18	13,421.85	14,851.28	8,600.66	11,059.99	10,675.05
IKEC – Clifty Creek	52,838.93	19,562.58	3,731.23	2,537.01	2,906.51	3,506.61
Area Total	**66,506.94**	**36,505.82**	**21,638.71**	**14,885.66**	**16,867.29**	**17,693.21**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

Figure 2
LG&E – Trimble, KU – Ghent, and IKEC – Clifty Creek
Annual SO_2 Emissions (tpy)



There was a large decrease in SO_2 emissions, within the modeled area, due to the emissions limit established by IKEC – Clifty Creek. On February 1, 2016, Indiana issued Commissioner's Order 2016-02 to establish a combined emission limit for the six coal-fired boilers at Clifty Creek, which has resulted in the reduction of SO_2 concentrations in the area. The boilers were limited to a total of "2,624.5 lbs. of SO_2 per hour as a 720 operating hour rolling average when any of Units No.1 through No. 6, or any combination thereof, is operating."[4] In 2016, Clifty Creek took a limit of 11,495 tpy allowable emissions of SO_2. As seen in Table 14, the most recent actual emissions at Clifty Creek are significantly lower than the modeled PTE emissions.

[4] 81 FR 27331

Despite the annual increase of SO_2 emissions at the Trimble County facility, overall SO_2 emissions in the area have decreased, as seen in Figure 2. Table 9 list each facility in the modeled area and the percent change between the current emissions (2020-2022) and the emissions used during the initial model (2012-2014). SO_2 emissions at KU – Ghent and IKEC – Clifty Creek have decreased by 22% and 88%, respectively. The decrease at these two facilities offsets the increase at Trimble County, resulting in a 60% decrease of SO_2 emissions in the area.

Table 9
LG&E – Trimble County Area Percent Change in SO_2 Emissions (tpy)

Facility	Emissions Average 2012-2014	Emissions Average 2020-2022	Percent Change
LG&E - Trimble County	3,157.81	3,386.77	7%
KU – Ghent	13,015.10	10,111.90	-22%
IKEC – Clifty Creek	25,377.58	2,983.37	-88%
Area Total	**41,550.49**	**16,482.04**	**-60%**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 188 µg/m3, equivalent to 72 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentration of SO_2. The model shows the highest concentrations occurred near the IKEC – Clifty Creek facility. The concentrations modeled near LG&E Trimble County were well below the 1-hour SO_2 NAAQS.[5]

The original modeling characterization used Indiana's Green Valley Rd/Green Valley Elementary School monitor (site ID 18-043-1004). As stated above, the cumulative modeling analysis indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 72 ppb. Current ambient air data from the NKU monitor indicates a 2020-2022 design value of 5 ppb, which is well below the 75 ppb. The latest complete three-year design value (2020-2022) shows an 84% decrease from the 2012-2014 design value. Therefore, the overall decrease in SO_2 emissions in the modeled area has improved air quality.

Table 10
Green Valley SO_2 Monitor 99th Percentile (ppb)

2012	2013	2014	2012-2014 Design Value	2020	2021	2022	2020-2022 Design Value	Percent Change
32	21	44	32	5	4	7	5	-84%

Data retrieved from EPA's Air Quality System Design Value Report

LG&E – Trimble Co SO_2 emissions increased between 2021 and 2022. Although emissions at KU – Ghent and IKEC – Clifty Creek have increased over the past few years, the total emissions for the area is 60% less than the emissions used for modeling. Considering

[5] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

current emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb standard, the Cabinet has determined that updated modeling is not needed at this time.

IV. Recommendation to Remove Owensboro Municipal Unit – Elmer Smith from Future DRR Annual Reports

The initial modeling characterization for OMU – Elmer Smith includes Owensboro Grain Company, Indiana Michigan & Power AEP, and Alcoa Warrick Power. Table 11 and Figure 3 contain the area emissions from the modeled years and the recent three-year actual emissions of SO_2 for the four facilities. On August 12, 2020, the Cabinet received a letter from OMU requesting the recension of the Title V permit due to the closure and decommissioning of the power plant. A copy of the letter is provided in Appendix E. The letter states that Units 1 and 2 were retired June 1, 2020. Table 11 shows a decline of SO_2 emissions in 2020 and zero emissions for 2021 and 2022.

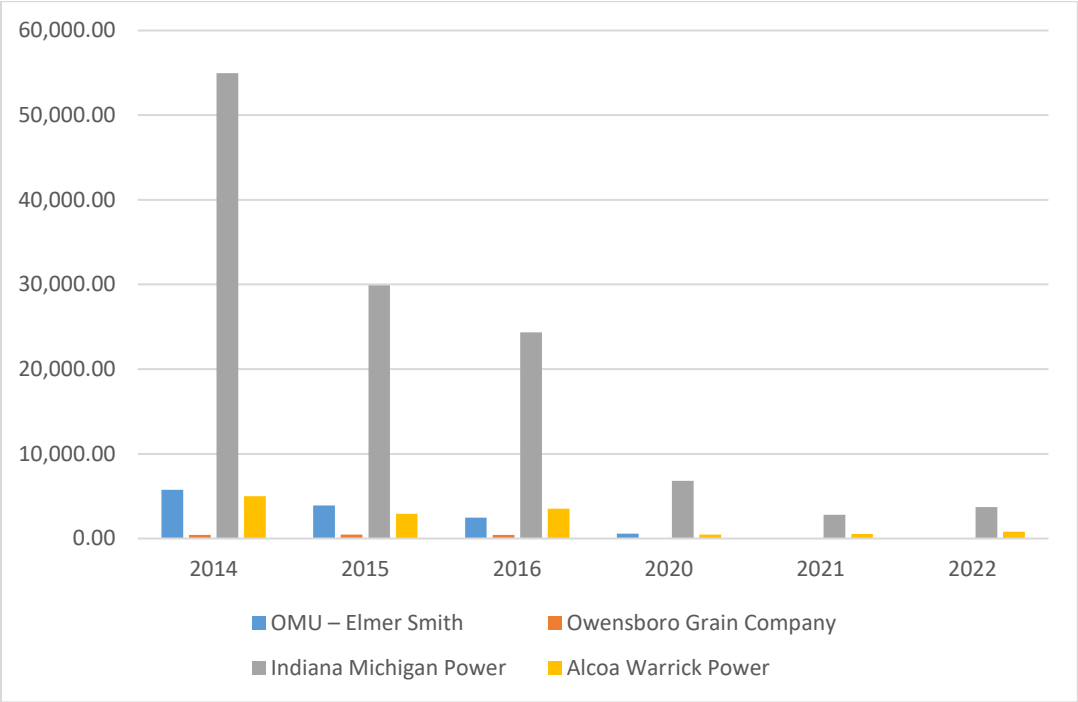
The other facilities included in the model have also had a significant decrease of SO_2 emissions, as seen in Table 11 and Figure 3. The Owensboro Grain Company discontinued utilization of a boiler in 2018 resulting in a significant decrease in SO_2 emissions. That boiler was removed from the permit in 2019. Indiana Michigan Power and the Alcoa Warrick Plant have also made modifications that resulted in the decrease of SO_2 emissions.

Table 11
OMU – Elmer Smith, Owensboro Grain Co, Indiana Michigan Power, Alcoa Warrick Power
Annual SO_2 Emissions (tpy)

Facility	Modeled Actual Emissions			Current Actual Emissions		
	2014	2015	2016	2020	2021	2022
OMU – Elmer Smith	5,741.38	3,901.59	2,448.69	586.94	0.00	0.00
Owensboro Grain Company	437.59	475.51	429.59	0.34	0.37	0.37
Indiana Michigan Power	54,978.64	29,889.06	24,341.10	6,813.23	2,812.01	3,725.88
Alcoa Warrick Power	4,992.91	2,907.04	3,542.00	443.56	535.82	817.42
Area Total	**66,150.52**	**37,173.20**	**30,761.38**	**7,844.07**	**3,348.20**	**4,543.67**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

Figure 3
OMU – Elmer Smith, Owensboro Grain Company, Indiana Michigan Power, and Alcoa Warrick Power
Annual SO_2 Emissions (tpy)



Each facility in the modeled area has had a significant reduction of SO_2 emissions since they were originally modeled. As seen in Table 12, the average current emissions (2020-2022) are lower than the average modeled emissions (2014-2016). The overall area has had an emissions reduction of 88%.

Table 12
OMU – Elmer Smith Area Percent Change in SO_2 Emissions (tpy)

Facility	Emissions Average 2014-2016	Emissions Average 2020-2022	Percent Change
OMU – Elmer Smith	4,030.55	195.65	-95%
Owensboro Grain Company	447.56	0.36	-100%
Indiana Michigan Power	36,402.93	4,450.37	-88%
Alcoa Warrick Power	3,813.98	598.93	-84%
Area Total	**44,695.02**	**5,245.31**	**-88%**

Emissions data acquired from the Air Markets Program Data database - https://campd.epa.gov/

The initial modeled inputs generated by the Cabinet indicated that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 140 µg/m3, equivalent to 54 ppb. The modeled concentrations include the actual emissions from the facilities and the background concentration of SO_2. The model shows the highest

concentrations occurred near the OMU – Elmer Smith facility. The concentrations modeled near OMU – Elmer Smith were well below the 1-hour SO_2 NAAQS.[6]

There were two monitors located in the area during original modeling characterization, Owensboro Primary monitor (site ID 21-059-0005) and the Baskett fire house monitor (site ID 21-101-0014). The Baskett monitor was used in the model due to its rural location which excluded the facilities already being modeled, and it was downwind to other facilities that likely had ambient impacts which could be considered in the background concentrations. The Basket monitor shut down on February 28, 2019. EPA's technical analysis for the Daviess County area mentions that the Owensboro Primary monitor's most recent data (2014-2016) was reviewed but was found to be missing one quarter of complete data in 2015 which resulted in an incomplete design value for 2014-2016. With the invalid design value, EPA was unable to support a designation in the area based on monitoring data. The Owensboro Primary SO_2 monitor is located 1.5 miles southwest of Elmer Smith Station. Table 13 shows between the 2012-2014 design value and the 2020-2022 design value, there was an 84% percent decrease at the Owensboro Primary monitor. This decrease can be attributed to the significant reduction of emissions in the area.

Table 13
Owensboro Primary SO_2 Monitor 99th Percentile (ppb)

2014	2015	2016	2014-2016 Design Value	2020	2021	2022	2020-2022 Design Value	Percent Change
48	27	25	33	12	7	8	9	-84%

Data retrieved from EPA's Air Quality System Design Value Report

Since initial modeling of the area, OMU – Elmer Smith has closed, and the other facilities that were modeled with Elmer Smith have reduced SO_2 emissions drastically. The emissions decrease is reflected positively at the Owensboro Primary monitor with a design value of 9 ppb for 2020-2022. Considering the closure of Elmer Smith, current area emissions are below the modeled emissions and the area continues to maintain the 1-hour SO_2 NAAQS with a design value that is well below 75 ppb, the Cabinet request that OMU – Elmer Smith be removed from future reporting requirements.

V. Conclusion

The Cabinet has thoroughly reviewed SO_2 emissions trends and air monitoring data for the DRR sources that chose modeling to characterize ambient air quality. Although SO_2 emissions at Duke Energy – East Bend and LG&E – Trimble County have increased between 2021 and 2022, those increases are offset by the significant SO_2 emissions reductions of the other modeled sources within the respective modeling areas. Additionally, air quality monitors located near both facilities are significantly below the 1-hour SO_2 NAAQS. The remaining facilities (EKPC – H.L. Spurlock, KU – Ghent, TVA – Shawnee, and Century Aluminum –

[6] https://www.epa.gov/sites/default/files/2017-08/documents/19_ky_so2_rd3-final.pdf. TSD: Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky

Hawesville) had a decrease in SO_2 emissions between 2021 and 2022, and current emissions are well below the emissions used in the initial models. Therefore, the Cabinet determines that none of the six sources require additional modeling to characterize ambient air quality. Further, the Cabinet request that OMU – Elmer Smith be removed from future DRR reporting requirements due to its closure.

VI. Public Notice

In accordance with 40 CFR 51.102, the report was made available for public inspection and comment from October 4, 2023, through November 13, 2023. The Division did not receive any comments. A copy of the public notice is available in the Appendix F.

Appendix A

Emissions Data

Emissions data is available in a separate electronic Excel spreadsheet

Appendix B

Monitor Data

Pollutant: Sulfur dioxide(42401)
Standard Units: Parts per billion(008)
NAAQS Standard: SO2 1-hour 2010
Statistic: Annual 99th Percentile **Level:** 75

Design Value Year: 2022

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

State Name: Kentucky

		2022			2021			2020			3-Year	
Site ID	STREET ADDRESS	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Design Value	Valid Ind.
21-037-3002	524A JOHN'S HILL ROAD	4	11.5		4	9.0	Y	4	10.0	Y	10	Y

Notes:
1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

Pollutant: Sulfur dioxide(42401)
Standard Units: Parts per billion(008)
NAAQS Standard: SO2 1-hour 2010
Statistic: Annual 99th Percentile **Level:** 75

Design Value Year: 2022

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

State Name: Indiana

		2022			2021			2020			3-Year	
Site ID	STREET ADDRESS	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Design Value	Valid Ind.
18-043-1004	2230 GREEN VALLEY ROAD/GREE	4	7.0		4	3.8	Y	4	4.5	Y	5	Y

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

Pollutant: Sulfur dioxide(42401)
Standard Units: Parts per billion(008)
NAAQS Standard: SO2 1-hour 2010
Statistic: Annual 99th Percentile **Level:** 75

Design Value Year: 2022

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

State Name: Kentucky

		2022			2021			2020			3-Year	
Site ID	STREET ADDRESS	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Comp. Qrtrs	99th Percentile	Cert& Eval	Design Value	Valid Ind.
21-059-0005	716 PLEASANT VALLEY ROAD	4	8.4		4	7.0	Y	4	12.0	Y	9	Y

Notes:
1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

CERTIFICATION EVALUATION AND CONCURRENCE FLAG MEANINGS

FLAG	MEANING
M	The monitoring organization has revised data from this monitor since the most recent certification letter received from the state.
N	The certifying agency has submitted the certification letter and required summary reports, but the certifying agency and/or EPA has determined that issues regarding the quality of the ambient concentration data cannot be resolved due to data completeness, the lack of performed quality assurance checks or the results of uncertainty statistics shown in the AMP255 report or the certification and quality assurance report.
S	The certifying agency has submitted the certification letter and required summary reports. A value of "S" conveys no Regional assessment regarding data quality per se. This flag will remain until the Region provides an "N" or "Y" concurrence flag.
U	Uncertified. The certifying agency did not submit a required certification letter and summary reports for this monitor even though the due date has passed, or the state's certification letter specifically did not apply the certification to this monitor.
X	Certification is not required by 40 CFR 58.15 and no conditions apply to be the basis for assigning another flag value
Y	The certifying agency has submitted a certification letter, and EPA has no unresolved reservations about data quality (after reviewing the letter, the attached summary reports, the amount of quality assurance data submitted to AQS, the quality statistics, and the highest reported concentrations).

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

Appendix C

Duke Energy Response

Leslie

The increase in SO_2 emissions between 2021 and 2022 can be attributed to a 19.97% increase in unit dispatch due to demand growth. During this same period, the annual average SO_2 emission rate decreased from 0.117 lbs/MMBtu in 2021 to 0.106 lbs/MMBtu in 2022. The annual average SO_2 emission rate during 2022 is less than the annual SO_2 emissions rates in the baseline model years for 2013 and 2014.

Let me know if you need any additional information.

Thanks,

Patrick Coughlin
Duke Energy Corporation
MW Permits/Compliance Group
Office: 317-838-2108
Mobile: 317-225-9963

Appendix D

LG&E Response

Ms. Poff,

Louisville Gas & Electric (LG&E) Trimble County Generating Station's variation in SO_2 emissions can be attributed to an increase in utilization. Individual unit utilization varies annually based on electricity usage rates, fuel costs, planned outages, etc. Trimble County Unit 1 saw the increase in utilization between 2021 and 2022 since Trimble County Unit 2 is historically a base load unit with a higher utilization rate and is ahead of Trimble County Unit 1 in the dispatch order.

In addition, the submitted modeling results also included contributions from the Kentucky Utilities (KU) Ghent Generating Station. In the time periods specified below, the Ghent SO_2 emissions decreased by 22.3%. Combining emissions from both LG&E and KU sources, data shows there is a 16.53% decrease in SO_2 emissions from the LG&E and KU sources when comparing the 2012-2014 modeled time period to the 2020-2022 time period. Thus, further validating the modeled results in demonstrating attainment with the 1 hr SO_2 NAAQS.

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2020	2021	2022
KU - Ghent	10772.4	13421.9	14851.2	8600.66	11059.99	10,675.05

Source	Average 2012-2014 (tpy)	Average 2020-2022 (tpy)	Average Percent Change
KU – Ghent	13015.17	10,111.9	-22.30%

Source	Modeled Years (tpy)			Subsequent Years (tpy)		
	2012	2013	2014	2020	2021	2022
Ghent & Trimble	13668.23	16943.29	17907.4	12348.64	13960.77	14186.59

Source	Average 2012-2014 (tpy)	Average 2020-2022 (tpy)	Average Percent Change
Ghent & Trimble	16172.97	13498.67	-16.53%

Brandan Burfict

Appendix E

OMU – Elmer Smith Closure Letter

August 12, 2020

Division for Air Quality
Owensboro Regional Office
3032 Alvey Park Drive West, Suite 700
Owensboro, KY 42303

Attn: Mac Cann

Subject: Request to Rescind Permit No. V-18-020; Owensboro Municipal Utilities; AI 942

Dear Mr. Cann:

Owensboro Municipal Utilities- Elmer Smith Station (AI 942) by this letter requests that the active Title V Permit be rescinded. Elmer Smith Unit 1 and Unit 2 have been retired effective June 1, 2020. Therefore, the facility no longer has any active emission points due to the closure and decommissioning of the power plant.

OMU submitted the Retired Unit Exemption for Unit 1 and Unit 2 to USEPA and the Division on July 23, 2020.

Please contact me or Alex Conn at 270-926-3200 ext. 4322 if there are any questions.

Sincerely,

Kevin D. Frizzell, P.E.
General Manager

cc: Zachary Bittner
Alex Conn

Appendix F

Public Notice

KENTUCKY DIVISION FOR AIR QUALITY
PUBLIC NOTICE FOR
THE SULFUR DIOXIDE DATA REQUIREMENTS RULE 2023 ANNUAL REPORT

The Kentucky Energy and Environment Cabinet (Cabinet) is proposing this annual report for the Sulfur Dioxide (SO_2) Data Requirements Rule (DRR) for the 2010 1-Hour SO_2 National Ambient Air Quality Standards (NAAQS). The United States Environmental Protection Agency (EPA) established this rule for air agencies to annually characterize current air quality in areas with large sources of SO_2 emissions.

In accordance with 40 CFR 51.102, the Cabinet is making this proposed plan available for public inspection and provides the opportunity for public comment. The proposed plan can be found at **https://eec.ky.gov/Environmental-Protection/Air/Pages/Public-Notices.aspx.** The public comment period will be open from September 25, 2023 through November 1, 2023. Comments should be submitted in writing to the contact person by either mail or email.

CONTACT PERSON: Leslie Poff, Environmental Scientist Consultant, Program Planning & Administrative Branch, Division for Air Quality, 300 Sower Boulevard, Frankfort, Kentucky 40601. Phone: (502) 782-6735; Email: lesliem.poff@ky.gov.

The Energy and Environment Cabinet does not discriminate on the basis of race, color, national origin, sex, age, religion or disability and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in all services, programs and activities.