

Five-Year Progress Report for the Indiana Regional Haze State Implementation Plan for the Second Implementation Period

Prepared By:
Indiana Department of Environmental Management
Office of Air Quality

March 4, 2025

This page intentionally left blank

EXECUTIVE SUMMARY

The Clean Air Act mandates requirements to protect visibility, especially in Class I Federal Areas. In 1999, the U.S. Environmental Protection Agency (U.S. EPA) finalized the Regional Haze Rule, 40 Code of Federal Regulations (CFR) 51.308. The rule requires states to develop and implement State Implementation Plan (SIP) revisions to reduce visibility impairment, known as regional haze, resulting from “manmade air pollution”. The Regional Haze Rule requires a comprehensive analysis of each State’s regional haze SIP generally every 10 years and a progress report generally every five years to evaluate the effectiveness of the State’s long-term strategies for regional haze.

Indiana initially submitted its Regional Haze SIP for the first implementation period to the U.S. EPA on January 14, 2011. The final corrected version was submitted on March 10, 2011. In developing its Regional Haze SIP, Indiana calculated baseline and natural visibility conditions for affected Class I areas outside the state, established reasonable progress goals (RPGs) for those areas, provided Best Available Retrofit Technology (BART) determinations, adopted a Long-Term Strategy supporting progress towards visibility goals, included a visibility monitoring strategy, and documented consultation with other states and Federal Land Managers (FLMs). The U.S. EPA finalized a limited approval and promulgation of Indiana’s Regional Haze SIP in the Federal Register on May 29, 2012. (77 FR 34218, June 11, 2012)

Indiana implemented the measures outlined in the RH SIP for the first implementation period by the date of the first 5-year progress report. On March 30, 2016, the Indiana RH Five-Year Progress Report State Implementation Plan was submitted in accordance with the RH Rule requirements in 40 CFR 51.308 (g), (h), and (i). The analyses conducted for the five-year progress report found that Class I Federal areas affected by emissions from Indiana were meeting or exceeding the RPGs for 2018. As such, the state determined that the state’s RH SIP was adequate to meet Indiana’s RPGs for the first implementation period and required no substantive revision at the time. This report was reviewed and approved by U.S. EPA on January 23, 2018, (83 FR 4847, February 2, 2018) as meeting the requirements of the Regional Haze Rule.

On November 27, 2017, Indiana submitted a revision to its 2011 Regional Haze SIP. On August 28, 2019, U.S. EPA converted its limited approval/limited disapproval of Indiana’s RH SIP to a full approval and withdrew the FIP provisions (84 FR 46889, September 6, 2019).

In January 2017, U.S. EPA issued a final rule updating the RH program (82 FR 3078, January 10, 2017) that extended the due date for the second implementation period RH SIPs, from July 31, 2018, to July 31, 2021. Pursuant to the requirements of 51.308(a) and (b), Indiana submitted its revised RH SIP for the second implementation period on December 29, 2021, to meet the requirements of U.S. EPA’s RH Rule and address core

requirements pursuant to 40 CFR 51.308(f).¹ U.S. EPA has not yet taken final action on Indiana's 2021 Regional Haze SIP submittal. U.S. EPA is required to act on Indiana's 2021 Regional Haze SIP submittal by August 1, 2025, in accordance with a Federal consent decree that was entered on July 12, 2024. See *Sierra Club, et al. v. United States Environmental Protection Agency, et al.*, No. 1:23-cv-01744-JDB (United States District Court for the District of Columbia).

Indiana submits this 5-year progress report in accordance with the Regional Haze Rule requirements in 40 CFR 51.308 (g), (h), and (i) for progress reports. This report evaluates the implementation status of control strategies and provides a summary of emission reductions achieved from emission management measures for the second planning period. Indiana has determined that its current Regional Haze SIP, which U.S. EPA approved on May 29, 2012, and August 28, 2019 (77 FR 34218, June 11, 2012, and 84 FR 46889, September 6, 2019), is adequate and requires no further substantive revision currently to achieve 2028 visibility goals beyond Indiana's 2021 Regional Haze SIP submittal.

Sulfur Dioxide (SO₂), nitrogen oxide (NO_x) and ammonia (NH₄) are some of the main precursors to the formation of ammonium sulfate, ammonium nitrate and organic carbon. SO₂ and NO_x were selected for Indiana's evaluation as speciated data from the Lake Michigan Air Directors Consortium (LADCO) shows that these two pollutants are the dominant contributors to visibility impairment impacting Class I areas within the LADCO states with electric generating units (EGUs) being the primary source of SO₂ and NO_x. For this reason, the discussion on emission reductions is focused on SO₂ and NO_x.

The 5-year period evaluated for the purpose of this progress report is 2018 – 2022 and 2023. During the time frame from 2018 - 2022, actual SO₂ emissions reported from all point sources decreased nearly 39%, while NO_x emissions decreased by 30% as documented in Table 2.8 and Graph 2.5. As a result, Indiana's contributions to visibility impairment in Class I areas in other states were significantly reduced and surpassed improvements predicted in 2028 by LADCO's photochemical modeling as listed in Table 1.1, which relied upon 2016 as a base year.

Although U.S. EPA has not yet taken final action on Indiana's 2021 Regional Haze SIP submittal, based on the evidence presented herein, the Indiana Department of Environmental Management (IDEM) submits a negative declaration to the U.S. EPA Administrator specifying that further revision is not needed at this time for its 2021 Regional Haze SIP that was submitted as a revision to its current Regional Haze SIP, which was approved by U.S. EPA in the Federal Register on May 29, 2012 (77 FR 34218, June 11, 2012) and August 28, 2019 (84 FR 46889, September 6, 2019).

¹ Indiana's 2021 Regional Haze SIP Submittal is available on IDEM's website at: <https://www.in.gov/idem/sips/regional-haze/>

TABLE OF CONTENTS

1.0 OVERVIEW	1
1.1 INTRODUCTION AND BACKGROUND	1
Figure 1.1 Regional Planning Organizations	2
1.2 INDIANA'S REGIONAL HAZE STATE IMPLEMENTATION PLAN	3
Table 1.1: Modeled Visibility Impacts of Indiana Emissions on Class I Areas	5
2.0 PROGRESS REPORT ELEMENTS.....	6
2.1 STATUS OF CONTROL STRATEGIES IN THE REGIONAL HAZE SIP	6
BART	7
Table 2.1: Alcoa Warrick Unit 4 NO_x and SO₂ Annual CAMPD Emissions, 2018-2023	9
Graph 2.1: Alcoa Warrick Unit 4 NO_x and SO₂ Annual CAMPD Emissions, 2018-2023	9
CAIR	9
CSAPR	10
Long Term Strategy (LTS)	11
2.1.2 <i>Federal On-the-Books Controls</i>	12
Tier 2 Vehicle Emissions and Gasoline Standards Rule	12
Tier 3 Vehicle Emission and Fuel Standards Program	13
Heavy-Duty Diesel Engine and Highway Diesel Fuel Rule	13
Non-road Engine and Diesel Fuel Rule (Tier 4)	13
MACT Programs	14
2010 SO ₂ NAAQS	14
Mercury and Air Toxics Standard Rule	16
2.1.3 <i>Additional Federal Control Measures Implemented after Indiana Submitted its 2021 Regional Haze SIP</i>	17
Good Neighbor Plan for 2015 Ozone NAAQS	17
EGU Power Plant Rule for GHG	17
Mercury and Air Toxics Standard Rule Update	18
Oil and Gas Methane Emissions	18
PM _{2.5} NAAQS	18
2.2 EMISSION REDUCTIONS FROM REGIONAL HAZE SIP STRATEGIES	18
2.2.1 <i>CSAPR Emission Reductions</i>	18
Table 2.2: Indiana Statewide EGU Emissions Reported to CAMPD, 2017-2023	19
2.2.2 <i>Long Term Strategy (LTS) Emission Reductions</i>	19
Sulfur Dioxide	19
Nitrogen Oxides	20

Table 2.3: Actual (Reported) SO₂ and NO_x Emissions from Point Sources in Indiana, 2016-2022	21
Graph 2.2: Actual (Reported) SO₂ and NO_x Emissions from Point Sources in Indiana, 2016-2022	21
Retirements and Control Measures	21
2.3 EMISSIONS PROGRESS	22
2.3.1 <i>National Emissions Inventory (NEI)</i>	22
2.3.2 <i>Reasonable Progress</i>	23
Table 2.4: Indiana’s Reasonable Progress Towards 2028 Goal by Pollutant & Sector, 2016, 2022, 2028	25
Table 2.5: Change in SO₂ and NO_x Emissions from Facilities reporting to U.S. EPA’s Clean Air Markets Program Data, 2019-2023	25
Graph 2.3: SO₂ and NO_x Emissions from Indiana Facilities reporting to CAMPD, 2005-2023	27
2.4 ASSESSMENT OF CHANGES IMPEDING VISIBILITY PROGRESS	27
2.5 ASSESSMENT OF CURRENT STRATEGY	28
2.5.1 <i>Affected Class I Areas</i>	28
Mammoth Cave National Park, KY	28
Sipsey National Wilderness Area, AL	29
James River Face Wilderness Area, and Shenandoah National Park, VA, & Dolly Sods/Otter Creek National Wilderness Areas, VA & WV	30
Great Smoky Mountains National Park, TN	30
Cohutta Wilderness Area, GA	30
Isle Royale National Park and Seney National Wilderness Area - Michigan	31
Swanquarter, Linville Gorge, & Shining Rock, NC	31
Brigantine Wilderness Area, NJ, & Lye Brook Wilderness Area, VT	32
Caney Creek & Upper Buffalo Wilderness Areas, AR, and Hercules-Glades & Mingo National Wilderness Areas, AR & MO	33
Voyageurs National Park & Boundary Waters Canoe Area National Wilderness Area, MN	33
2.5.2 <i>Future Activities</i>	34
2.6 DETERMINATION OF ADEQUACY	34
3.0 PROCEDURAL REQUIREMENTS	36
3.1 ADMINISTRATIVE PROCESS	36
3.2 CONSULT WITH FEDERAL LAND MANAGERS	36
3.3 PUBLIC PARTICIPATION 40 CFR 51.308(G)	36
3.4 CHECKLIST FOR PROGRESS REPORTS SUBMITTED UNDER 40 CFR 51.308(g) – (h) & 40 CFR 51.308(i)	37
Table 3.1: Regional Haze 5-Year Progress Report Regulation Checklist	37

LIST OF APPENDICES

APPENDIX A: INDIANA COAL-FIRED ELECTRIC GENERATING UNITS CONTROLS,
CONTROL EFFICIENCIES, AND SHUTDOWNS

APPENDIX B: STATE-WIDE NATIONAL EMISSIONS INVENTORY (NEI), SO₂ & NO_x
BY SECTOR, 2014-2020

APPENDIX C: 2022 LADCO MODELED SO₂ & NO_x EMISSIONS INVENTORY PER
SECTOR (DRAFT)

APPENDIX D: PUBLIC PROCESS DOCUMENTATION

APPENDIX E: FEDERAL LAND MANAGER COMMENTS & INDIANA'S RESPONSE

ACRONYMS/ABBREVIATION LIST

BART	Best Available Retrofit Technology
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMPD	Clean Air Markets Program Data
CEMS	Continuous Emissions Monitoring
CENRAP	Central Regional Air Planning Association
CFR	Code of Federal Regulations
CSAPR	Cross-State Air Pollution Rule
D.C.	District of Columbia
DRR	Data Requirements Rule
DSI	Dry Sorbent Injection
EGU	Electric Generating Unit
FGD	Flue Gas Desulfurization
FIP	Federal Implementation Plan
FLMs	Federal Land Managers
HCl	hydrochloric acid
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
LADCO	Lake Michigan Air Directors Consortium
MACT	Maximum Achievable Control Technology
MANE-VU	Mid-Atlantic / Northeast Visibility Union
MATS	Mercury and Air Toxics Standards Rule
NAAQS	National Ambient Air Quality Standard
NEI	National Emission Inventory
NH ₃	Ammonia
NO _x	nitrogen oxides
PM	particulate matter
PM ₁₀	course particulate matter with diameter of greater than 2.5 micrometers
PM _{2.5}	fine particulate matter with diameter of 2.5 micrometers or less
ppb	parts per billion
RPG	Reasonable Progress Goals
RPO	Regional Planning Organization
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO ₂	sulfur dioxide
U.S. EPA	United States Environmental Protection Agency
VISTAS	Visibility Improvement State and Tribal Association of the Southeast
VOC	volatile organic compounds
WRAP	Western Regional Air Partnership

1.0 OVERVIEW

1.1 INTRODUCTION AND BACKGROUND

In the 1977 amendments to the CAA, Congress added Section 169 (42 U.S.C. 7491) setting forth the following national visibility goal in Section 169A: “Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution.” There are 156 mandatory Class I Federal areas across the country, consisting of all international parks, national wilderness areas and national memorial parks exceeding 5,000 acres, as well as national parks exceeding 6,000 acres that were in existence on August 7, 1977, for which visibility was found to be an important value. CAA section 162(a) [42 U.S.C. 7472(a)]. These protected areas are called “mandatory Class I Federal areas” in the CAA but are referred to in this document as “Class I areas.”

Congress added section 169B as part of the 1990 Amendments to the CAA to focus attention on visibility impairment at these Class I areas known as regional haze. Regional haze is produced by a multitude of sources and activities, natural and manmade, which emit air pollution in the form of tiny particles that absorb and scatter sunlight, creating white and brown haze in the atmosphere over a broad geographic area. Section 169B called for the United States Environmental Protection Agency (U.S. EPA) to promulgate regulations under 169A to address regional haze. The Regional Haze (RH) Rule addresses the combined visibility effects of various pollution sources over a wide geographic region. This wide-reaching pollution net means that all states, even those without Class I areas, like Indiana, are required to participate in regional haze reduction efforts.

The United States Environmental Protection Agency’s (U.S. EPA’s) RH Rule was adopted and published in the Federal Register (FR) on July 1, 1999 (64 FR 35714) and went into effect on August 30, 1999. U.S. EPA then revised the Regional Haze Rule, which was published and went into effect on January 10, 2017 (82 FR 3078). The RH Rule requires states to set reasonable progress goals (RPGs) toward meeting a national goal of natural visibility conditions in Class I areas by the year 2064. Section 51.308 of the RH Rule requires states to submit a series of state implementation plans (SIPs) to protect visibility in Class I areas. The RH Rule requires these states, in coordination with U.S. EPA, the FLMs consisting of the U.S. National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment in the Class I areas. States, tribes, and the five multi-jurisdictional regional planning organizations (RPOs) designated by U.S. EPA to assist with the coordination and cooperation needed to address the regional haze issue, worked together to develop the technical basis for these plans and comprehensive periodic revisions to the initial plans due in 2021, with additional revisions due in 2028 and generally every 10 years thereafter. Five-year progress reports are due five years after the last due date for the

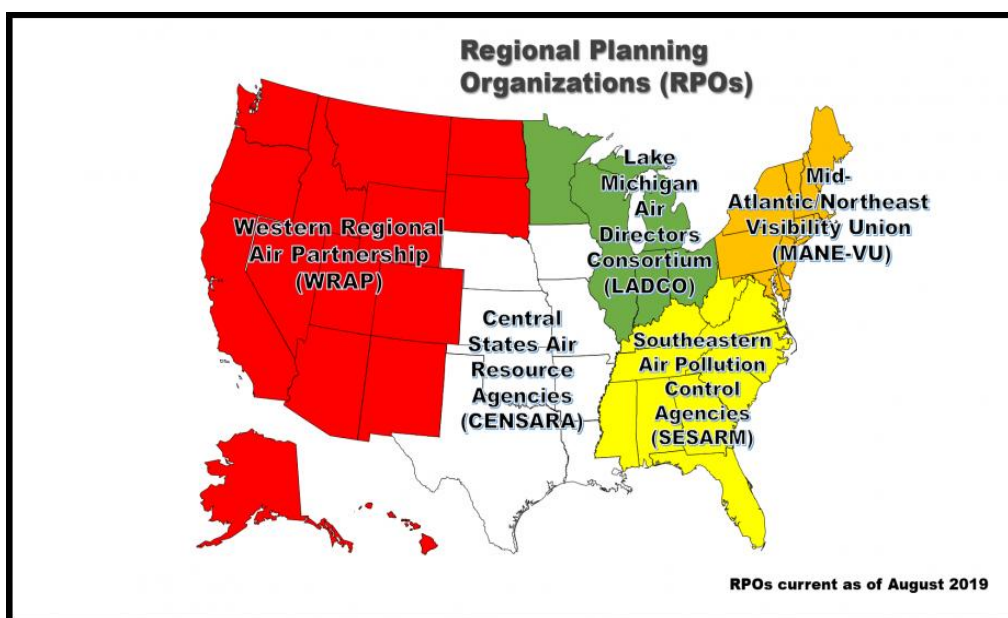
previous SIP update, i.e. July 31, 2021. This 5-year progress report is due January 31, 2025.

The Regional Haze Rule provides a regulatory framework within which states are required to develop and implement State Implementation Plan (SIP) revisions to improve and protect visibility in Class I areas and assure reasonable progress towards meeting the national goal. The States must address regional haze in each Class I area located within the state and in each Class I area located outside the state which may be affected by emissions from within the state. Regional Haze SIPs must include Class I area visibility improvement goals and emission management strategies needed to reach those goals.

The U.S. EPA designated five Regional Planning Organizations (RPOs) to assist with the coordination and cooperation needed to address the haze issue. Indiana's Regional Haze SIP was developed in consultation with Lake Michigan Air Directors Consortium (LADCO) as the Regional Planning Organization. Members of LADCO include five states: Illinois, Indiana, Michigan, Ohio, and Wisconsin, tribes located within the five states, Federal Land Managers (U.S. National Park Service, U.S. Fish & Wildlife Service, and U.S. Forest Service), and U.S. EPA. LADCO was designated as the RPO to receive federal grant funds through the states for air quality technical assessments and assistance.

The other RPOs established for this purpose are Mid-Atlantic/Northeast Visibility Union (MANE-VU), Central States Air Resource Agencies (CENSARA), Southeastern Air Pollution Control Agencies (SESARM) and Visibility Improvement State and Tribal Association of the Southeast (VISTAS), and Western Regional Air Partnership (WRAP). Figure 1.1 below shows a map of the regional planning organizations boundaries.

Figure 1.1 Regional Planning Organizations



1.2 INDIANA'S REGIONAL HAZE STATE IMPLEMENTATION PLAN

Indiana does not have any Class I areas; however, Indiana sources were determined to impact visibility in Class I areas in other states during the first planning period. The final version of Indiana's RH SIP for the first implementation period was submitted on January 15, 2011, and supplemented with additional information on March 10, 2011. This submittal addressed the initial 10-year implementation period (i.e., reasonable progress by the year 2018). SIP requirements [pursuant to 40 Code of Federal Regulations (CFR) 51.308(d)] included establishing reasonable progress goals, determining baseline conditions, determining natural conditions, providing a long-term control strategy, providing a monitoring strategy (air quality and emissions), and establishing Best Available Retrofit Technology (BART) emissions limitations and associated compliance schedule.

On January 9, 2009, the U.S. EPA signed a FR notice making a finding of failure to submit all or a portion of their Regional Haze SIPs for 37 states, the District of Columbia, and the Virgin Islands. U.S. EPA initiated a 2-year deadline to issue a Federal Implementation Plan (FIP). The FIP provided the basic program requirements for each state that had not completed an approved plan of their own by January 15, 2011.

U.S. EPA issued a limited disapproval of Indiana's original RH plan on June 7, 2012 (77 FR 33642), due to the plan's reliance on the Clean Air Interstate Rule (CAIR) for emission reductions that would reduce Indiana's visibility impacts at Class I areas. The District of Columbia Circuit Court remanded CAIR to U.S. EPA without vacatur on July 11, 2008. The court left CAIR because it found that "allowing CAIR to remain in effect until it is replaced by a rule consistent with the court's opinion would at least temporarily preserve the environmental values covered by CAIR." Therefore, CAIR requirements remained in place and CAIR's regional control programs continued operating while U.S. EPA developed replacement rules in response to the remand.

Indiana implemented the measures outlined in the RH SIP for the first implementation period by the date of the 5-year progress report. On March 30, 2016, the Indiana RH Five-Year Progress Report State Implementation Plan was submitted in accordance with the RH Rule requirements in 40 CFR 51.308 (g) and (h). The analyses conducted for the five-year progress report found that Class I Federal areas affected by emissions from Indiana were meeting or exceeding the RPGs for 2018. As such, the state determined that the state's RH SIP was adequate to meet Indiana's RPGs for the first implementation period and required no substantive revision at the time. This report was reviewed and approved by U.S. EPA on February 2, 2018, (83 FR 4847) as meeting the requirements of the Regional Haze Rule.

On August 28, 2019, U.S. EPA converted its limited approval/limited disapproval of Indiana's RH SIP to a full approval and withdrew the FIP provisions (84 FR 46889, September 6, 2019).

In December of 2021, pursuant to the requirements of 51.308(a) and (b), Indiana submitted its Second Planning Period RH SIP. U.S. EPA has not yet taken final action on Indiana's 2021 Regional Haze SIP submittal. U.S. EPA is required to act on Indiana's 2021 Regional Haze SIP submittal by August 1, 2025, in accordance with a Federal consent decree that was entered on July 12, 2024. See *Sierra Club, et al. v. United States Environmental Protection Agency, et al.*, No. 1:23-cv-01744-JDB (United States District Court for the District of Columbia).

For the Second Planning Period, the following Class I areas in other states were identified as possibly being impacted by Indiana sources:

Southeastern U.S. (SESARM/VISTAS) - Sipsey National Wilderness Area, AL; Cohutta Wilderness Area, GA; Mammoth Cave National Park, KY; Great Smoky Mountains National Park, NC, and TN; Linville Gorge Wilderness Area, NC; James River Face National Wilderness Area, VA; Shenandoah National Park, VA; and Dolly Sods / Otter Creek National Wilderness Areas, WV

Eastern U.S. (MANE-VU) - Acadia National Park, ME; Moosehorn National Wilderness Area, ME; Great Gulf National Wilderness Area, NH; Brigantine National Wilderness Area, NJ; and Lye Brook National Wilderness Area, VT

Northern U.S. (LADCO) - Isle Royale National Park, MI; Seney National Wildlife Refuge, MI; Boundary Waters Canoe Area National Wilderness Area, MN; and Voyageurs National Park, MN

South Central U.S. (CENRAP) - Hercules-Glades National Wilderness Area, MO; Mingo National Wilderness Area, MO; Caney Creek National Wilderness Area, AR; and Upper Buffalo National Wilderness Area, AR.

These Class I areas were identified through modeling performed by LADCO. LADCO used the Comprehensive Air Quality Model with Extensions (CAMx) Particulate Matter Source Apportionment Tool (PSAT). LADCO tagged States and regions as well as individual point sources and inventory source groups to apportion emissions. Then LADCO estimated visibility impacts in 2028 by projecting representative emissions inventories and known emission controls using 2016 as a base year. LADCO modeled the 2028 visibility impacts from the LADCO states on all the Class I areas and documented their analysis in the "Modeling and Analysis for Demonstrating Reasonable Progress for the Regional Haze Rule 2018-2028 Planning Period" Technical Support Document (TSD), June 17, 2021².

Based on LADCO's modeled projections of the 2028 visibility impacts, Table 1.1 (*Table 23-1 Modeled Visibility Impacts on Surrounding Class I Areas - Indiana*, from Indiana's

² [LADCO_RegionalHaze_Round2_TSD_17June2021_Final.pdf](#)

2021 RH SIP³), contains a list of those Class I areas for which Indiana sources have been determined to significantly impact. Table 1.1 lists the states where those Class I areas are located, the 2016-2028 light extinction value, Indiana's contribution to the light extinction in inverse mega meters (Mm^{-1}), and Indiana's percentage of light extinction at each of the Class I areas to demonstrate the potential modeled visibility impairment. These areas had a visibility impact of 1.5% or greater by emissions from Indiana sources, calculated from base year 2016 emissions. Additional Class I sites, located within the LADCO region or within a state that offered comments on Indiana's Regional Haze SIP for the 2nd Implementation Period, are included in the table.

Table 1.1: Modeled Visibility Impacts of Indiana Emissions on Class I Areas

Class I Area	State	2016-2028 Total Light Extinction (Mm^{-1})	Indiana's Projected Contribution to 2016-2028 Total Light Extinction (Mm^{-1})	Indiana's Impact of 2016-2028 Total Light Extinction (%)
Mammoth Cave	Kentucky	74.2	8.3	11.2 %
Sipsey	Alabama	61.0	3.6	5.90 %
Dolly Sods/ Otter Creek	West Virginia	54.0	3.0	5.56 %
Great Smoky Mountains/Joyce-Kilmer- Slickrock	Tennessee	51.0	2.7	5.29 %
Shenandoah	Virginia	50.6	2.6	5.14 %
Cohutta	Georgia	51.8	2.5	4.83 %
Mingo	Missouri	69.7	2.9	4.16 %
Seney	Michigan	57.4	2.3	4.01 %
James River	Virginia	53.4	2.0	3.75 %
Linville Gorge	North Carolina	45.7	1.3	2.84 %
Lye Brook	Vermont	42.9	1.0	2.33 %
Brigantine	New Jersey	69.4	1.6	2.30 %
Shining Rock	North Carolina	41.4	0.9	2.17 %
Upper Buffalo	Arkansas	54.4	1.1	2.02 %
Hercules-Glades	Missouri	59.4	1.2	2.02 %
Swanquarter	North Carolina	48.5	0.9	1.85 %
Isle Royale	Michigan	48.6	0.9	1.85 %
Caney Creek	Arkansas	54.4	0.6	1.10 %
Boundary Waters	Minnesota	40.5	0.3	0.74 %
Voyageurs	Minnesota	41.0	0.2	0.49 %

³ [IDEM: State Implementation Plans: Regional Haze \(in.gov\)](#)

IDEM addressed each of these Class I areas as well as requests from their host RPOs and states in Indiana's 2021 Regional Haze SIP, Appendix AA.⁴ Class I areas outside the areas listed above were not analyzed further, as there were no visibility impacts from Indiana sources shown in the modeling. Further, no impacts from Indiana were noted in the WRAP states, and no requests for controls were initiated by those states during the development of Indiana's 2021 Regional Haze SIP. Indiana continues to coordinate and consult with the FLMs in accordance with 40 CFR 51.308(i)(4) during plan development, plan revisions, as well as during the implementation of programs having the potential to contribute to visibility impairment in the Class I areas.

2.0 PROGRESS REPORT ELEMENTS

Section 51.308(i), 51.308(g), and 51.308(h) of the Regional Haze Rule specifies the requirements for periodic reports describing progress towards the reasonable progress goals. U.S. EPA provided additional recommendations for states in preparing their 2nd Planning Period Regional Haze progress reports. These recommendations were released on July 30th, 2024. Periodic progress reports must contain, at a minimum, the following elements:

- 51.308(g) Public inspection and comment
 - (1) Status of control strategies in the Regional Haze SIP
 - (2) Emissions reductions from Regional Haze SIP Strategies
 - (3) Visibility progress (states with Class I areas only)
 - (4) Emissions progress
 - (5) Assessment of changes impeding visibility progress
 - (6) Assessment of current strategy
 - (7) Review of visibility monitoring strategy (states with C1As only)
 - (8) Long-term strategy containing a smoke management program
- 51.308(h) Determination of adequacy
- 51.308(i) Consultation with FLMs

2.1 STATUS OF CONTROL STRATEGIES IN THE REGIONAL HAZE SIP

Section 51.308(g)(1) of the Regional Haze Rule requires a description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for Class I areas both within and outside the state. This section includes a summary and status of control measures in Indiana's Regional Haze SIP relied upon to meet the requirements of the Regional Haze program. Control measures regulated explicitly for the purposes of the regional haze program, as well as additional control measures that have a blanket effect but were not specifically developed for the regional haze program, are identified.

⁴ [IDEM: State Implementation Plans: Regional Haze](#)

2.1.1 Regional Haze Controls

The Regional Haze Rule requires two specific approaches for reducing visibility-impairing pollutants, implementation of the revised CSAPR update rule (BART in the First Planning Period) and implementation of a Long Term Strategy (LTS) that includes enforceable measures designed to meet reasonable progress goals (RPGs). Both approaches are a part of Indiana's Regional Haze controls, and a detailed description and status of each approach are provided below.

BART

The process of establishing BART emission limitations included identification of those sources that meet the definition of "BART-eligible source", a determination of whether these sources are emitting any air pollutant that may be contributing to any impairment of visibility in a Class I area, and identification of the appropriate type and the level of control for reducing emissions. IDEM began the BART rulemaking process in August 2006. Following the due process of rulemaking which included notices of hearings and public comment periods, the Indiana Administrative Code (IAC) was amended on October 3, 2007, by adding 326 IAC 26-1, Best Available Retrofit Technology (effective on February 22, 2008). The rule required that sources subject to BART, upon notification from the department, submit to the department a BART analysis. The rule incorporated by reference the BART Guidelines codified in Appendix Y at 40 CFR 51.

The BART Guidelines stipulated that the analysis must address, at a minimum, SO₂, NO_x, and particulate matter (PM) and consider the following factors: (1) the cost of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any existing pollution control technology in use at the source, (4) the remaining useful life of the source, and (5) the degree of visibility improvement that may reasonably be anticipated from the use of BART. The BART Guidelines require states to consider, at a minimum, certain control alternatives in determining BART controls. These alternatives included: Best Available Control Technologies, Lowest Achievable Emission Rate, New Source Performance Standard, and Maximum Achievable Control Technology (MACT), as applicable, pollution prevention, use of retrofit controls, and, if available, improvement of existing controls.

In addition, the rule allowed sources to propose alternatives to source-specific BART, provided the alternative achieves greater reasonable progress towards improving visibility. The alternative could include emission controls at different locations of the same source, different sources, or at a source not subject to BART. The requirements for sources that choose an alternative to source-specific BART, in detail, are included in 326 IAC 26-1 and 40 CFR 51.308(e). The department was required to review the analyses for completeness and approvability in accordance with these regulations. The emission limits representing BART or an alternative to BART were to be included in the sources' Part 70 permits and submitted to the U.S. EPA for approval into the SIP. The sources were required to comply with these requirements within five years of the effective date of the state rule, i.e., in 2013.

BART for Electric Generating Units (EGUs)

Of the sources that met the definition of “BART-eligible”, modeling indicated that several EGU sources were subject to BART. IDEM also identified EGUs at fossil fuel-fired generating power plants having a capacity of more than 750 megawatts as sources subject to BART. Indiana relied on requirements established under the Clean Air Interstate Rule (CAIR) to satisfy certain regional haze requirements related to BART for EGUs because the U.S. EPA had determined at that time that CAIR achieved greater progress than BART and could be used by states as a BART substitute to source-specific BART determinations. However, CAIR was not applicable to emissions of PM; therefore, the PM impact on visibility in Class I areas was modeled for EGU sources subject to BART. One EGU, Boiler #4 at Alcoa Power Generating Inc. - Warrick Power Plant was determined to be subject to BART for PM.

BART for Alcoa

On June 11, 2012, the U.S. EPA finalized a limited approval of the revisions to the Indiana SIP addressing regional haze for the first implementation period. As part of this action, the U.S. EPA proposed to conclude that the emission reductions from 326 IAC 26-2 would suffice to address the BART requirements for Alcoa and approved regulation 326 IAC 26-2 for incorporation into Indiana’s SIP. Alcoa’s BART control strategy, emission limits, and compliance methods for its boilers and potlines were incorporated into Indiana’s Regional Haze SIP and BART Emission Limitations Rule, 326 IAC 26-2 as well as SO₂ emission limitations included in 326 IAC 7-4-10(a)(3). Alcoa’s BART control measures and emission limits have been implemented and incorporated into the source’s Part 70 Operating permit (Alcoa Power Generating, Inc. - Warrick Power Plant: 173-43492-00002).

Alcoa has demonstrated ongoing compliance with all BART control measures and emission limits. Unit 4’s continued operation as an EGU is uncertain, as noted in a recent publication “CenterPoint also plans to end its agreement with Alcoa to burn coal at Unit 4 of its Warrick coal plant in 2024.”⁵ As shown in Table 2.1 and Graph 2.1, NO_x emissions at Unit 4 have decreased since 2019 from 3,136 tons to 2,002 tons in 2023, ~36% decrease. Table 2.1 and Graph 2.1 also indicate a slight increase in SO₂ since 2019 but an overall decrease since 2018 from 1,234 tons down to 817 tons in 2022, a ~54% decrease.

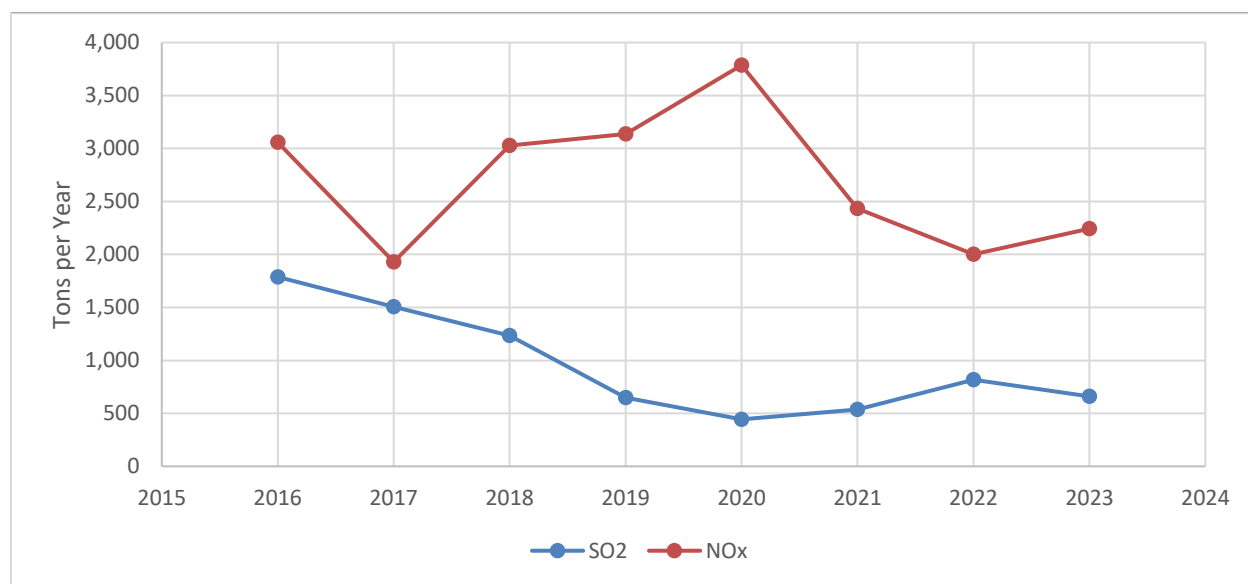
⁵ [CenterPoint Plan: Stop Burning Coal by 2027 \(wnin.org\)](https://www.wnin.org/story/centerpoint-plan-stop-burning-coal-by-2027/2023/08/23/centerpoint-plan-stop-burning-coal-by-2027/7611112002)

Table 2.1: Alcoa Warrick Unit 4 NO_x and SO₂ Annual CAMPD Emissions, 2018-2023

Year	SO ₂	NO _x
	(tpy)	(tpy)
2016	1787.9	3058.2
2017	1505.3	1929.5
2018	1233.6	3028.1
2019	648.3	3136.4
2020	443.6	3786.2
2021	535.8	2433.2
2022	817.4	2001.6
2023	660.2	2241.6

Source: U.S. EPA's Clean Air Markets Program Data (<https://campd.epa.gov/>)

Graph 2.1: Alcoa Warrick Unit 4 NO_x and SO₂ Annual CAMPD Emissions, 2018-2023



CAIR

The U.S. EPA signed CAIR on March 10, 2005. The rule required 28 states and the District of Columbia to submit SIP revisions to reduce emissions of SO₂ and NO_x from fossil-fuel-fired power plants. CAIR consisted of three cap and trade programs: an annual SO₂ trading rule that builds on the existing Acid Rain program; an ozone season NO_x trading rule that builds on the existing NO_x SIP Call program; and a new annual NO_x trading program. Reductions were required to take place in two phases: 2009 and 2015 for NO_x and 2010 and 2015 for SO₂.

On November 1, 2006, the Indiana Air Pollution Control Board adopted CAIR for the Indiana EGUs to participate in the cap-and-trade program. CAIR, therefore, was used

to satisfy the BART NO_x and SO₂ requirements for EGU sources in Indiana's Regional Haze SIP. However, on December 23, 2008, the District of Columbia (D.C.) Circuit Court remanded CAIR to the U.S. EPA without vacatur. CAIR requirements remained in place and CAIR's regional control programs continued operating while the U.S. EPA developed a replacement rule in response to the remand.

CSAPR

On July 6, 2011, the U.S. EPA finalized the CSAPR to replace CAIR and address power plant emissions that cross state lines and contribute to ozone and fine particle pollution in other states. In a separate, but related, regulatory action, U.S. EPA finalized a supplemental rulemaking on December 15, 2011, to require states to make summertime NO_x reductions under the CSAPR ozone season control program. To speed implementation, U.S. EPA adopted Federal Implementation Plans (FIPs) for each of the states covered by CSAPR and encouraged States to submit SIPs. CSAPR includes several emissions trading programs that require affected EGUs to hold emission allowances sufficient to cover their emissions of NO_x and/or SO₂ for each compliance period.

On December 23, 2011, the U.S. EPA proposed revisions to the rules that govern the regional haze program. In this action, the U.S. EPA proposed that the trading program under CSAPR, achieved greater reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas than source-specific BART in those states covered by the rule (76 FR 82219). These states relied on requirements of CAIR to satisfy certain regional haze requirements. To address deficiencies in all the CAIR-dependent regional haze SIPs, in this action, the U.S. EPA proposed FIPs to replace reliance on the CAIR requirements in these SIPs with reliance on CSAPR as an alternative to BART.

CSAPR was scheduled to replace CAIR starting January 1, 2012. However, the rule was challenged by several states, local governments, industry groups, and labor groups. On December 30, 2011, the U.S. Court of Appeals for the D.C. Circuit ordered a stay of CSAPR and ordered that CAIR be implemented until judicial review of CSAPR was completed. The same court ultimately vacated CSAPR on August 21, 2012, and ordered that CAIR be continued to be implemented until the rule was rewritten.

The United States government petitioned the U.S. Supreme Court asking the Court to review the D.C. Circuit Court's decision on CSAPR. On April 29, 2014, the Supreme Court upheld the U.S. EPA's authority to regulate cross-state air pollution by reversing the D.C. Circuit Court's ruling vacating CSAPR. A motion to lift the stay of CSAPR was filed with the U.S. Court of Appeals for the D.C. Circuit, which ordered that the U.S. EPA's motion be granted on October 23, 2014. CSAPR took effect January 1, 2015, for annual SO₂ and annual NO_x, and May 1, 2015, for ozone season NO_x. In July 2015 certain CSAPR budgets were remanded by the United States Court of Appeals for the D.C. Circuit.

On November 16, 2015, the U.S. EPA proposed an update to the CSAPR for the 2008 ozone NAAQS by issuing the proposed CSAPR Update Rule. This rule addressed the summertime (May – September) transport of ozone pollution in the eastern United States that crosses state lines to help downwind states and communities meet and maintain the 2008 ozone NAAQS.

On October 16, 2016, the U.S. EPA revised the CSAPR ozone season NO_x program by finalizing an update to CSAPR for the 2008 ozone NAAQS, known as the CSAPR Update. The CSAPR Update ozone season NO_x program largely replaced the original CSAPR ozone season NO_x program and the U.S. EPA issued FIPs in the CSAPR Update Rule. Emission budgets were also established for the annual NO_x and SO₂ trading programs. These were adopted into Indiana Rules for Nitrogen Oxides (NO_x) Annual Trading Program at 326 IAC (Indiana Administrative Code) 24-5 and Sulfur Dioxide (SO₂) Group 1 Trading Program at 326 IAC 24-7.

U.S. EPA published the revised CSAPR Update Rule on April 30, 2021, and the rule became effective June 29, 2021. The CSAPR Update rule revised state ozone emission budgets to reflect additional emission reductions from EGUs beginning with the 2021 ozone season. The rule reduces Indiana's budget for the 2021 NO_x Ozone Season to 13,051 tons with further NO_x emission budget reduction to 9,564 tons starting with the ozone season in 2024. It is necessary to operate the NO_x reducing control devices already installed for EGUs to meet the state budget.

Long Term Strategy (LTS)

Indiana consulted with neighboring states with Class I areas, listed in Table 1.1, and by means of participation in the LADCO Regional Haze Workgroup calls and other RPO discussions. Indiana consulted with these RPOs and other states and tribes to develop technical information for use in developing coordinated strategies. LTS development considered the impacts of Indiana's emissions on Class I areas outside of Indiana with the emission inventory and modeling used to calculate RPGs.

Indiana's EGU sources have undertaken many projects to reduce SO₂ and NO_x emissions because of BART, CAIR, CSAPR and the 2010 1-hour SO₂ National Ambient Air Quality Standard/Data Requirements Rule (DRR). As a result of these projects and advanced control devices installed to comply with these and federal requirements, SO₂ and NO_x emissions from EGUs have decreased significantly since 2018. Coal-fired EGUs also have less overall generating capacity due to shutdowns, as well as less pollution production due to the conversion of existing units to natural gas and replacement of existing units with new natural gas combined cycle units. Appendix A contains the most recent list of controls on each EGU as well as the associated control efficiencies and any projected fuel conversions or retirements.

In addition to the EGU emission reductions, Indiana has seen significant reductions from federal programs, such as the Tier 2 engine/low sulfur fuel standard, Tier 3 engine/fuel standard, 2007 diesel rule, non-road mobile source programs, revised SO₂,

PM_{2.5}, and 8-hour ozone NAAQS, and MACT programs. Other programs that have been considered but have yet to be implemented are the EGU Power Plant Rule for Green House Gas (GHG) Rule, updated MATS, Oil & Natural Gas Methane Rule, and the strengthening of the PM_{2.5} NAAQS to 9.0 micrograms per cubic meter. These programs are expected to provide residual emission reductions to and will further reduce Indiana's contribution to visibility impairment at Class I areas in other states into the future.

Included as part of Indiana's LTS are sections in the state's rules that apply specifically to visibility in Class I areas. These rules were designed to prevent air quality deterioration and support progress towards visibility goals in Class I areas. Indiana's Permit Review Rules, 326 IAC 2-2, Prevention of Significant Deterioration Requirements regulate sources that have the potential to cause an adverse impact on visibility in Class I areas. State rules for prescribed burning in Indiana prevent pollution problems from open burning. Under state law, prescribed burning must be conducted in accordance with Indiana Code 13-17-9 and regulations under 326 IAC 4-1. County or local ordinances may also apply in some parts of the state.

2.1.2 Federal On-the-Books Controls

As part of Indiana's LTS, the following Federal "on-the-books" control measures were implemented prior to the submittal of Indiana's Regional Haze SIP in December 2021 and factored into the future year (2028) emission inventory for regional haze modeling.

Tier 2 Vehicle Emissions and Gasoline Standards Rule

On February 10, 2000, the U.S. EPA published the final rule for the Tier 2 Vehicle Program, which set federal emission standards for passenger vehicles, including sport utility vehicles, minivans, vans, and pick-up trucks, as well as passenger cars. The program created fleet-averaging emission standards for NO_x, allowing manufacturers to produce vehicles with varying emissions, if the fleet of vehicles produced by a manufacturer had average NO_x emissions at or below the federal standards. The Tier 2 Vehicle Emissions and Gasoline Standards Rule reduced new vehicle NO_x emissions to an average of 0.07 grams per mile and was phased in from 2004 to 2009, beginning with the 2005 model year. The program continues to provide emission reductions from mobile sources as older sources in the fleet continue to be replaced with new sources.

Beginning in 2006, U.S. EPA began to phase-in more stringent regulations to lower the amount of sulfur in diesel fuel to 15 ppm. This fuel is known as ultra-low sulfur diesel (ULSD).

U.S. EPA's diesel standards target emissions from two different sources:

- On-road (or highway) vehicles; and
- Non-road engines and equipment.

Collectively, diesel standards have reduced harmful emissions from both on-road and non-road diesel sources by more than 90% since the U.S. EPA began regulating diesel fuel sulfur levels.⁶

Tier 3 Vehicle Emission and Fuel Standards Program

On April 28, 2014, the U.S. EPA published the final rule for the Tier 3 Vehicle Emission and Fuel Standards Program. The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality. The program considers the vehicle and its fuel as an integrated system, setting more stringent vehicle emissions standards and lowering the sulfur content of gasoline beginning in 2017. The vehicle emission standards will reduce tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The fuel standards will enable more stringent vehicle emission standards and make emission control systems more effective.

Heavy-Duty Diesel Engine and Highway Diesel Fuel Rule

The U.S. EPA finalized the Heavy-Duty Diesel Engine and Highway Diesel Fuel Rule, a program to reduce emissions from heavy-duty trucks and buses by more than 90%, on January 18, 2001. The program set emission standards for PM, NO_x, and non-methane hydrocarbons, for new heavy-duty diesel engines and required a 97% reduction in the sulfur content of highway diesel fuel to enable the use of more modern pollution-control technology on heavy-duty vehicles. The Heavy-Duty Diesel Engine and Highway Diesel Fuel Rule was phased in between 2007 and 2010.

After 2010, U.S. EPA's diesel standards required that:

- All highway diesel fuel supplied to the market be ULSD; and
- All highway diesel vehicles must use ULSD.

Non-road Engine and Diesel Fuel Rule (Tier 4)

On June 29, 2004, the U.S. EPA published the final Non-road Diesel Engine and Diesel Fuel Rule for diesel engines used in most construction, agricultural, industrial, and airport equipment. The program established NO_x and PM emission standards for non-road diesel engines and mandated the reduction of sulfur levels in diesel fuel for non-road diesel engines by more than 99%. Implementation of the Non-road Diesel Engine and Diesel Fuel Rule began in 2008 and was fully phased in by 2014.

From 2007 to 2014, low sulfur diesel fuel (specified at 500 ppm) and ULSD fuel was phased in for nonroad, locomotive, and marine (NRLM) diesel fuel.

⁶ <https://www.epa.gov/diesel-fuel-standards/diesel-fuel-standards-and-rulemakings#:~:text=Before%20EPA%20began%20regulating%20sulfur,emissions%20from%20two%20different%20sources>

After 2014, U.S. EPA's diesel standards require that:

- All nonroad, locomotive, and marine (NRLM) diesel fuel must be ULSD; and
- All NRLM engines and equipment must use this fuel (with some exceptions for older locomotive and marine engines).

MACT Programs

Indiana's Regional Haze 2021 SIP modeling also included controls on future year emissions resulting from certain MACT regulations for VOC, SO₂, NO_x, and PM. MACT standards modeled include the VOC 2-, 4-, 7-, and 10-year MACT; Combustion Turbines MACT; Industrial/Commercial/Institutional Boilers and Process Heaters MACT (Boiler MACT); and Reciprocating Internal Combustion Engines MACT.

2010 SO₂ NAAQS

On June 2, 2010, the U.S. EPA promulgated a new primary NAAQS for SO₂, replacing the two primary standards of 140 parts per billion (ppb) evaluated over 24-hours and 30 ppb evaluated over an entire year with the 1-hour standard of 75 ppb. The primary SO₂ NAAQS is met when the 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentration at any ambient air quality monitor in an area does not exceed 75 ppb.

The U.S. EPA published a notice announcing designated nonattainment areas under the 1-hour SO₂ standard on August 5, 2013. Designations were made based on monitored air quality data measured during 2009, 2010, and 2011. Parts of Daviess, Marion, Morgan, Pike, and Vigo counties in Indiana were designated nonattainment under subpart 1 of Section 107 of the CAA. Emission limitations for individual units were adopted and made permanent and enforceable in Indiana's revised Sulfur Dioxide Rules, 326 IAC 7, on September 30, 2015. The compliance deadline was January 1, 2017. All 1-hour SO₂ areas have been since been redesignated as attainment due to these emission limitations and subsequent emission reductions.

Implementation of the revised SO₂ NAAQS was delayed for areas not monitoring violations of the standard while the U.S. EPA reconsidered its approach to the designation process. Following the initial August 2013 designations (Round 1 Designations), three lawsuits were filed against the U.S. EPA in different U.S. Court Districts, alleging that the agency had failed to perform a nondiscretionary duty under the CAA by not designating all portions of the country by the June 2013 deadline.

In an effort intended to resolve the litigation in one of those cases, the plaintiffs (Sierra Club and the Natural Resources Defense Council) and the U.S. EPA filed with the U.S. District Court of the Northern District of California a proposed consent decree that specified a schedule for the U.S. EPA to complete the remaining designations for the rest of the country in three additional rounds. On March 2, 2015, the Court entered the

consent decree and issued an enforceable order for the U.S. EPA to complete the area designations according to the consent decree schedule.

Pursuant to the consent decree order, the U.S. EPA was required to complete the remaining designations on a schedule that contains three specific deadlines. By no later than July 2, 2016, the U.S. EPA must designate two groups of areas: (1) areas that have newly monitored violations of the 2010 SO₂ standard and (2) areas that contain any stationary source that according to the U.S. EPA's Air Markets Database either emitted more than 16,000 tons of SO₂ in 2012 or emitted more than 2,600 tons of SO₂ and had an annual average emission rate of at least 0.45 of SO₂/MMBtu in 2012 and has not announced retirement as of March 2, 2015 (Round 2 Designations).

There are five EGUs in Indiana that meet the criteria established in the court order for the July 2016 deadline. IDEM worked with these sources to provide the U.S. EPA the most recent information available for making designation and boundary decisions. Commissioner's orders were issued for A.B. Brown Generating Station (Commissioner's Order 2016-01) in Posey County and Clifty Creek (Commissioner's Order 2016-02) in Jefferson County to address the 1-hour SO₂ attainment status. SO₂ emissions limits were established to support attainment demonstrations to show the areas near both sources would attain the 1-hour SO₂ National Ambient Air Quality Standard.

U.S. EPA finalized approval of the Commissioner's orders for A.B. Brown Generating Station, located in Posey County, and Clifty Creek Generating Station in Jefferson County into Indiana's State Implementation Plan (SIP) on May 6, 2016. By approving these Commissioner's orders into the Indiana SIP, these SO₂ emissions limits and applicable reporting, recordkeeping, and compliance demonstration requirements contained in the orders become federally enforceable. Each of these areas continue to attain the 1-hour SO₂ standard.

The last two deadlines for completing the remaining 1-hour SO₂ designations were December 31, 2017, for Round 3 designations and December 31, 2020, for Round 4 designations.

On August 10, 2015, the U.S. EPA finalized the DRR which sets forth the requirements for each state air agency to monitor or model ambient SO₂ levels in areas with large sources of SO₂ emissions to help implement the 1-hour primary SO₂ NAAQS. This final rule establishes that, at a minimum, each state air agency must characterize air quality around sources that emit 2,000 tons per year or more of SO₂.

By January 15, 2016, the DRR required each air agency to submit a list to U.S. EPA that identified all sources within its jurisdiction around which SO₂ air quality must be characterized. On January 7, 2016, based on annual SO₂ emissions data for the year 2014, IDEM identified eleven facilities in Indiana as being subject to air quality characterization under Round 3 Designations. Emission limits, modeling and monitoring were used to characterize these facilities and determine the 1-hour SO₂ attainment status. It should be noted that the non-EGUs

were evaluated in the four factor analysis and all eleven sources were evaluated in the Q/d analysis for regional haze.

U.S. EPA added a twelfth facility which did not meet the 2,000 ton per year threshold for DRR, but U.S. EPA mandated Indiana address the SO₂ impacts on the new 1-hour SO₂ standard from the facility. By July 1, 2016, each air agency was required to notify U.S. EPA, for each source area identified on its list, the approach (ambient monitoring or air quality modeling) it will use to characterize air quality. Indiana was able to conduct dispersion modeling to address ten of the facilities and demonstrate attainment with the 1-hour SO₂ standard. The modeling and monitoring demonstrations have led to attainment/unclassifiable designations for 1-hour SO₂.

The final deadline for completing Round 4 designations was December 31, 2020. The eleventh facility was Cleveland Cliffs (formerly ArcelorMittal) – Burns Harbor, which opted for the ambient monitoring approach. A new SO₂ monitor was located near maximum modeled impact areas to evaluate the facility's impact on SO₂ concentrations in the area. Recent monitored design values at the Burns Harbor monitor have demonstrated compliance with the 1-hour SO₂ standard and continued compliance is anticipated.

The twelfth facility, as identified by U.S. EPA as contributing to SO₂ modeled violations of the 1-hour SO₂ standard, was designated as nonattainment. Isolatek, in Huntington County, established SO₂ emission limits through Commissioner's Order 2023-Air-02 and has completed an attainment demonstration for the 1-hour SO₂ standard. The Commissioner's order is currently under review with U.S. EPA – Region 5 and is expected to be final approved soon into the Indiana SIP. A redesignation request for the area has been submitted to U.S. EPA and is expected to be approved once the Indiana SIP is finalized.

The U.S. EPA issued a decision to retain the existing primary NAAQS for SO₂ on February 25, 2019, based on a review of the full body of scientific evidence and exposure/risk information available. The U.S. EPA's review determined that the existing NAAQS protects the public health with an adequate margin of safety.

Mercury and Air Toxics Standard Rule

On December 16, 2012, the U.S. EPA published a rule to reduce emissions of toxic air pollutants from power plants. The National Emission Standards for Hazardous Air Pollutants (NESHAP) from Coal- and Oil-Fired Electric Utility Steam Generating Units, also referred to as the Mercury and Air Toxics Standards (MATS) rule for power plants, will reduce toxic air pollutants from new and existing electric utility steam generating units larger than 25 MWe that burn coal or oil for the purpose of generating electricity for sale and distribution through the national electric grid to the public.

The MATS rule establishes numeric emission limits for mercury, PM, and hydrochloric acid (HCl) emissions from coal-fired EGUs, and PM, HCl, and hydrofluoric acid

emissions from oil-fired EGUs. This includes numeric emission limits for SO₂ (as an alternative to HCl), individual non-mercury metal air toxics and total non-mercury metal air toxics (as alternatives to PM), and work practice standards, instead of numeric limits, to limit organic air toxics. Though the standards target toxic air pollutants, the controls needed for compliance are expected to provide significant SO₂ emission reductions.

The New Source Performance Standards for fossil-fuel-fired EGUs, also signed under the MATS rule, revises the standards new coal- and oil-fired power plants must meet for PM, SO₂, and NO_x. Existing sources generally will have up to 4 years to comply with MATS, if needed. Therefore, the compliance deadline was March 15, 2016. This includes the 3 years provided to new and existing sources by the CAA and an additional year state permitting authorities can grant under the CAA to existing sources as needed for technology installation.

2.1.3 Additional Federal Control Measures Implemented after Indiana Submitted its 2021 Regional Haze SIP

Federal control measures to be implemented during the second regional haze planning period (the period between the 2021 SIP submittal and the end of 2028) that are expected to result in emission reductions of visibility-impairing pollutants but were not relied upon in Indiana's Regional Haze SIP are described below.

Good Neighbor Plan for 2015 Ozone NAAQS

On March 15, 2023, the U.S. EPA issued its final Good Neighbor Plan, which secures significant reductions in ozone-forming emissions of NO_x from power plants and industrial facilities. As of September 21, 2023, the Good Neighbor Plan's "Group 3" ozone-season NO_x control program for power plants was implemented in Indiana. Currently, this rule is on hold in Indiana pending judicial review per a memo issue by U.S. EPA on August 5, 2024.⁷

EGU Power Plant Rule for GHG

On May 9, 2024, U.S. EPA finalized a rule addressing greenhouse gas emissions from existing fossil fuel-fired electric generating units, which include both coal-fired and oil/gas-fired steam generating units. The rule, along with a corresponding rule for new units, puts in place a best system of emission reduction (BSER) for the longest-running existing coal units and most heavily utilized new gas turbines based on carbon capture and sequestration/storage (CCS). For the existing coal-fired units, the federal rule calls for affected units not installing CCS to co-fire natural gas by 2030 or cease operations by 2032. States have until May of 2026 to submit approvable plans to U.S. EPA.

⁷ [gnp-stay-policy-memo-08-05-2024-signed.pdf \(epa.gov\)](https://www.epa.gov/gnp-stay-policy-memo-08-05-2024-signed.pdf)

Mercury and Air Toxics Standard Rule Update

On May 1, 2024, the Mercury and Air Toxics Standard (MATS) rule for coal-fired power plants was updated to tighten the emissions standards for toxics metals by 67% (all coal sources) and 70% for mercury (existing lignite-fired sources). These new limits will also reduce the emissions of fine particulate matter (PM_{2.5}) and nitrogen oxides (NO_x).

Oil and Gas Methane Emissions

On March 8, 2024, U.S. EPA finalized a rule that will reduce emissions of methane and other pollutants from oil and natural gas operations, including existing sources nationwide. The compliance date for existing sources is in 2029 with many low production wells discontinuing operations reducing the impact from VOCs on air quality.

PM_{2.5} NAAQS

On February 7, 2024, the U.S. EPA announced a final rule to strengthen the nation's National Ambient Air Quality Standards (NAAQS) for fine particulate matter (PM_{2.5}). This final rule lowered the annual PM_{2.5} NAAQS from 12.0 to 9.0 µg/m³. States will make designations recommendation to U.S. EPA by February 7, 2025, and U.S. EPA will make its final attainment designations by February of 2026.

2.2 EMISSION REDUCTIONS FROM REGIONAL HAZE SIP STRATEGIES

Section 51.308(g)(2) of the Regional Haze Rule requires a summary of the emission reductions achieved throughout the state through implementation of the measures described in Section 2.1 (Section 51.308(g)(1)). These controls vary with respect to their known or expected compliance deadlines and some of the relied-upon strategies have not yet been implemented. For this reason, it is difficult to describe specific emission reductions associated with each measure. Therefore, this section focuses on emission reductions from control measures designed to reduce SO₂ and NO_x emissions from certain source categories as they relate to Indiana's Regional Haze SIP strategies.

2.2.1 CSAPR Emission Reductions

Indiana's EGUs have made considerable progress toward reducing SO₂ and NO_x emissions. Based on emissions data from EGUs reporting to the U.S. EPA's Clean Air Markets Program Data (CAMPD⁸), Indiana's EGU emissions have remained below the state's SO₂ and annual NO_x emission budgets for 2017 in the final CSAPR published on October 16, 2016.

⁸ [Clean Air Markets Program Data \(CAMPD\) | US EPA](#)

Table 2.2 illustrates Indiana's SO₂ and NO_x progress towards achieving this goal. CSAPR 2017 annual emissions budget decreased to 166,449 tons for SO₂ and 108,424 tons for NO_x. Indiana's 2017 CAMPD emissions from EGUs were far below these budgets at 63,735 tons for SO₂ and 63,421 tons for NO_x. Therefore, Indiana achieved the emission levels required by its CSAPR strategy by 2017 according to the CSAPR SO₂ and annual NO_x emission budgets. In fact, Indiana's EGU emissions for 2023 were only ~15% of the SO₂ 2017 CSAPR budget and ~32% of the NO_x 2017 CSAPR budget.

Table 2.2: Indiana Statewide EGU Emissions Reported to CAMPD, 2017-2023

Year	SO ₂ (tons)	SO ₂ CSAPR Budget (tons)	NO _x (tons)	NO _x CSAPR Budget (tons)
2017	63,735	166,449	63,421	108,424
2018	68,509	166,449	67,775	108,424
2019	47,780	166,449	54,466	108,424
2020	37,381	166,449	46,183	108,424
2021	35,330	166,449	43,845	108,424
2022	33,303	166,449	41,484	108,424
2023	24,614	166,449	35,135	108,424

Source: Clean Air Markets Program Data (<https://campd.epa.gov/>)

2.2.2 Long Term Strategy (LTS) Emission Reductions

Indiana's EGUs have made considerable progress toward reducing SO₂ and NO_x emissions because of advanced control devices installed to comply with the requirements of CSAPR and in anticipation of other federal programs aimed at reducing SO₂ emissions from fossil fuel-fired EGUs to be phased in or implemented over the course of the next few years. In addition, coal-fired EGUs have less overall generating capacity due to shutdowns, and there is less pollution from coal-fired EGUs due to the conversion of existing units to natural gas and replacement of existing units with new natural gas combined cycle units. Since EGUs control programs to reduce SO₂ and NO_x emissions were determined to be most effective in reducing visibility impacts, significant reductions were expected and have been achieved.

Sulfur Dioxide

Indiana's inventory of actual emissions reported from contributing sources of SO₂ in 2016 through 2022 shows a definite downward trend as illustrated in Table 2.3 and Graph 2.2. State and federal control measures phased in and implemented over the course of the last 10 years has resulted in considerable SO₂ emission reductions. Actual SO₂ emissions reported from the major source categories decreased incrementally over the 5-year timeframe (2018-2022) by nearly 39% and about 50% since 2016.

These reductions are due primarily to regulations focused on reducing SO₂ emissions from coal-burning power plants and other large sources, such as various types of boilers and incinerators, which are the largest emitters of SO₂. Federal programs such as the Acid Rain Program, the Regional Haze Rule, CAIR, CSAPR, and the 2010 SO₂ NAAQS caused power plants to develop and implement control measures aimed at reducing SO₂ emissions to comply with the requirements set forth in these regulations continue to decrease SO₂ emissions. This resulted in better visibility improvement than anticipated. Additional reductions are expected because of federal regulations to be implemented over the next few years that will result in an even greater improvement in visibility than anticipated by 2028.

While there are no federal regulations that specifically target SO₂ emissions from electric services operations, the revised 2008 Ozone and 2010 one-hour primary SO₂ NAAQS updates have contributed to reductions in SO₂ emissions from the Cokenergy facility. Cokenergy is in Lake County, Indiana. On June 11, 2012, the U.S. EPA designated Lake County nonattainment, for the 8-hour ozone standard. SO₂ emissions are controlled by emission limitations established in Indiana's Sulfur Dioxide Rule 326 IAC 7, Lake County Sulfur Dioxide Emission Limitations (326 IAC 7-4.1-7).

In addition, a Consent Decree, Civil Action No. 18cv-35, issued January 25, 2018,⁹ between Indiana, U.S. EPA and Indiana Harbor Coke Company, SunCoke and Cokenergy established additional operating limitations and monitoring requirements related to SO₂ that were incorporated into the source's Title V Operating permit and currently remain in place. The Cokenergy emission limits have been incorporated into 326 IAC 7-4.1-7 and 7-4.1-8 (Indiana Harbor Coke Company sulfur dioxide emission limitations).

Nitrogen Oxides

As shown in Table 2.3 and the trend line for NO_x emissions in Graphs 2.2, significant reductions have occurred following the 2016 base year. This is due primarily to regulations focused on reducing NO_x emissions from coal-burning power plants and other large sources, such as various types of boilers and incinerators, which were the largest emitters of NO_x. Federal programs such as the NO_x SIP Call, the Regional Haze Rule, CAIR, and CSAPR caused power plants to develop and implement control measures aimed at reducing NO_x emissions to comply with the requirements set forth in these regulations.

State and federal control measures phased in and implemented over the course of the last 10 years has resulted in NO_x emission reductions that are consistent with the SO₂ trend line pattern but maintaining slightly higher levels since 2018. This is because EGUs emit more SO₂ than point, area, mobile, and non-road sources combined, while

⁹ <https://www.justice.gov/enrd/consent-decree/file/1028831/dl>

NO_x emissions from sources other than EGUs combined is much higher than NO_x emissions from EGUs alone.

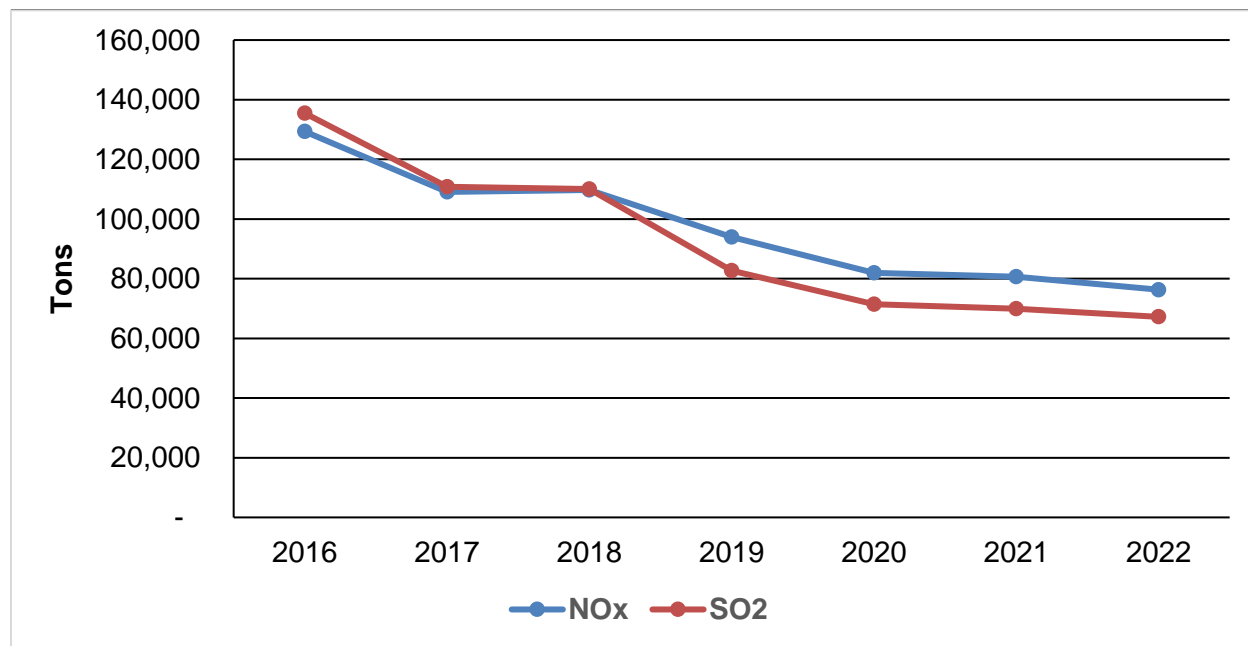
In addition, a series of federal programs adopted as comprehensive national programs to reduce emissions from vehicle, heavy duty diesel, and non-road diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions continue to contribute to reductions in NO_x emissions. Actual NO_x emissions reported from the major source categories decreased incrementally from 2018 - 2022 by ~30% and almost 41% since 2016.

Table 2.3: Actual (Reported) SO₂ and NO_x Emissions from Point Sources in Indiana, 2016-2022

	2016	2017	2018	2019	2020	2021	2022
SO ₂ (tons)	135,474	110,791	110,086	82,677	71,480	69,909	67,227
NO _x (tons)	129,334	109,075	109,751	94,002	81,918	80,694	76,332

Source: [IDEM: Air Quality: Emissions Summary Data \(in.gov\) Draft Inventory](#)

Graph 2.2: Actual (Reported) SO₂ and NO_x Emissions from Point Sources in Indiana, 2016-2022



Source: [IDEM: Air Quality: Emissions Summary Data \(in.gov\) Draft Inventory;](#)

Retirements and Control Measures

Companies with affected EGUs have developed control strategies to comply with CSAPR, the 2010 SO₂ NAAQS, and MATS. These strategies consist of one or a combination of two or more of the following types of control measures; the conversion of

an existing EGU from coal to natural gas; the installation of a single SO₂ emission control device or combination of more than one control device on an existing EGU; and the complete shutdown of an EGU and removal of the unit from the facility's Title V Operating permit.

Since the submittal of Indiana's Regional Haze SIP for the 2nd implementation period, there has been two coal-fired EGUs (A.B. Brown and R Gallagher) as well as 4 additional units (1 & 2 at Petersburg and 14 & 15 at Schahfer) shut down; four more power plants will shut down by 2028 (Cayuga, F.B. Culley, Michigan City, and Rockport). Two EGUs have completely (or will soon convert) converted from coal to natural gas (F.B. Culley and AES Petersburg) and two more EGUs will convert from coal to natural gas before 2028 (Cayuga and R.M. Schahfer). See Appendix A for Indiana's existing and projected controls and shutdowns.

Control measures that will continue to be phased in or implemented over the course of the next few years will result in ever greater reductions in future SO₂ and NO_x emissions. These are the additional control measures listed in section 2.1.3 above aimed at reducing impacts on air quality. The control strategies that companies with affected sources use to comply with these federal programs will provide for sufficient SO₂ and NO_x emission reductions to not only meet but exceed the 2028 visibility improvement goals for Indiana.

2.3 EMISSIONS PROGRESS

Section 51.308(g)(4) of the Regional Haze Rule requires an analysis tracking the change over the past five years in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. This section identifies emission changes by type of source or activity based on U.S. EPA's most recent complete 2020 National Emissions Inventory (NEI)¹⁰, and reasonable progress that has been achieved based on 2022 emissions modeling performed by LADCO.

2.3.1 National Emissions Inventory (NEI)

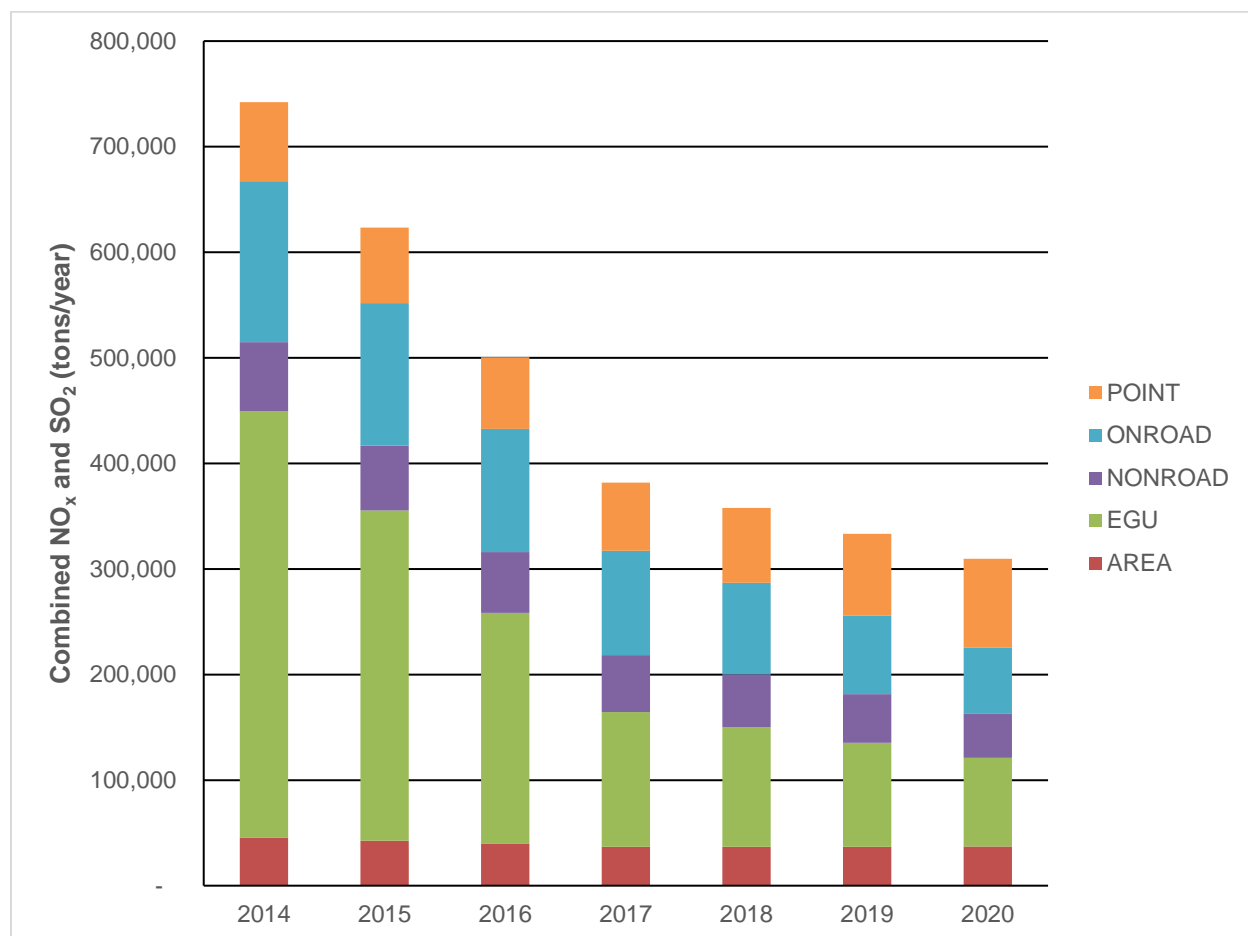
Emissions from all source categories including EGU's, on-road sources, non-road (off-road mobile vehicles) sources, point sources, and area sources not emitted through stacks (non-point), are calculated over a three-year cycle. They have all contributed to emission reductions achieved throughout the state. The inventories for the intervening years between NEI years (2014, 2017, and 2020) were interpolated to show the trend emissions are following over time. In the NEI database, the emission Tier "Fuel Comb - Electric Generation" selection was determined to identify the EGU sector.

As demonstrated in Graph 2.3, on-road, non-road, and EGU sources have shown steady annual decreases in total SO₂ and NO_x emissions since the 2016 base year for

¹⁰ [National Emissions Inventory \(NEI\) | US EPA.](#)

Indiana's 2021 Regional Haze SIP (see Appendix B for emissions inventory data). Slight increases in point and area sources are noticed beginning in 2018. Not enough, however, to impact the overall progress toward reducing the visibility impacts of SO₂ and NO_x emissions combined for the source categories included in developing Indiana's Long-Term Strategy.

Graph 2.3 Indiana's Combined SO₂ and NO_x Emissions by Sector, 2014-2020



* Inventory in Appendix C

2.3.2 Reasonable Progress

The reasonable progress goal is determined using base year and future year emission inventories. Emissions from the “base,” or known, year that represent the baseline period were developed for 2016 and projected using growth and control analyses to estimate emissions in 2028. The Regional Haze Rule requires States to measure interim progress toward reaching the projected emissions estimates. The 5-year period evaluated to determine progress made toward reaching Indiana's reasonable progress goals in this report is 2018 through 2022.

Required in 40 CFR 51.308(d)(4)(v) is a statewide emissions inventory of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area. The emissions inventory and contribution assessment performed by LADCO for member states demonstrated that NO_x and SO₂ emissions were the key contributors to visibility impairment at Class I areas in the Northern Midwest region and the focus of Indiana's RH SIP technical analyses, and actions to be pursued to reduce visibility impairment in out-of-state Class I areas. These determinations were made through the work of the LADCO Regional Haze workgroup and Project Team/Technical Oversight Committee, as mentioned in Section 5.1 of LADCO's "Modeling and Analysis for Demonstrating Reasonable Progress for the Regional Haze Rule 2018-2028 Planning Period" Technical Support Document (TSD), dated June 17, 2021, available at: [LADCO RegionalHaze Round2 TSD 17June2021 Final.pdf](#).

LADCO has provided emission inventories for 2022. These inventories were generated from U.S. EPA's 2022 version 1 draft emissions inventories⁴ to be evaluated by photochemical modeling. The inventories include emissions data related to PM_{2.5} and ozone broken down into emission sectors and pollutants. Emission sectors include biogenics and fires, nonpoint, nonroad, onroad and point and are summarized for NO_x and SO₂. See Appendix C for the 2022 NO_x and SO₂ inventories for Indiana.

Table 2.4 shows a comparison of the modeled 2016 base-year with the current 2022 modeled emission estimates and 2028 projections. The base-year emission for 2016 and the projections for 2028 were taken from the 2021 Indiana Regional Haze SIP¹¹. The 2022 estimates compared to the 2028 projections illustrate that Indiana has achieved much of the needed emission reductions in most of the source categories. Total modeled emissions in 2022 for SO₂ have decreased 39,552 tons and have achieved ~89% of the 2028 goal. Total modeled emissions in 2022 for NO_x have decreased 95,069 tons and have achieved ~73% of the 2028 goal. These reductions have exceeded the half-way benchmark of 2022. Indiana's overall contributions to visibility impairment in Class I areas in other states has significantly declined and will result in even more improvement in visibility as anticipated by the end of the second Regional Haze 10-year planning period.

⁴ <https://gaftp.epa.gov/Air/emismod/2022/v1/reports/>

¹¹ [IDEM: State Implementation Plans: Regional Haze \(in.gov\)](#)

Table 2.4: Indiana's Reasonable Progress Towards 2028 Goal by Pollutant & Sector, 2016, 2022, 2028

Source Category	SO ₂ (tons/year)			NO _x (tons/year)		
	2016	2022	2028	2016	2022	2028
Biogenics	---	---	---	21,381	25,115	21,381
Fires		251	359	697	539	697
Non-Point	1,142	1,732	359	34,816	17,567	30,049
Non-Road	66	152	54	36,791	39,169	18,170
On-Road	616	228	321	103,694	57,678	36,034
Point	127,145	87,413	82,983	129,763	92,005	90,558
TOTAL	129,328	89,776	84,814	327,142	232,073	196,889

Source: **2022** Inventory: Appendix C: 2022 MODELED NO_x & SO₂ EMISSIONS INVENTORY PER SECTOR - DRAFT. **2016 & 2028** Inventory: https://www.in.gov/idem/sips/files/regional_haze_2021.zip: pgs. 26 & 32.

“Reductions in emissions (especially SO₂ and NO_x) from point sources in the Second Planning Period are generally critical elements of each state’s regional haze long-term strategy, the progress reports should identify sources reporting to the CAMPD and discuss emission trends for the state using the latest information available from the CAMPD ‘Clean Air Markets Program Data’ website: <https://campd.epa.gov/>.” Table 2.5 below shows the change in SO₂ and NO_x emissions from 2019 to 2023 for Indiana EGUs reporting to U.S. EPA’s CAMPD. During the five-year period from 2019 to 2023, overall SO₂ emissions decreased 48% (23,166 tons/year) and NO_x emissions decreased 35% (19,331 tons per year).

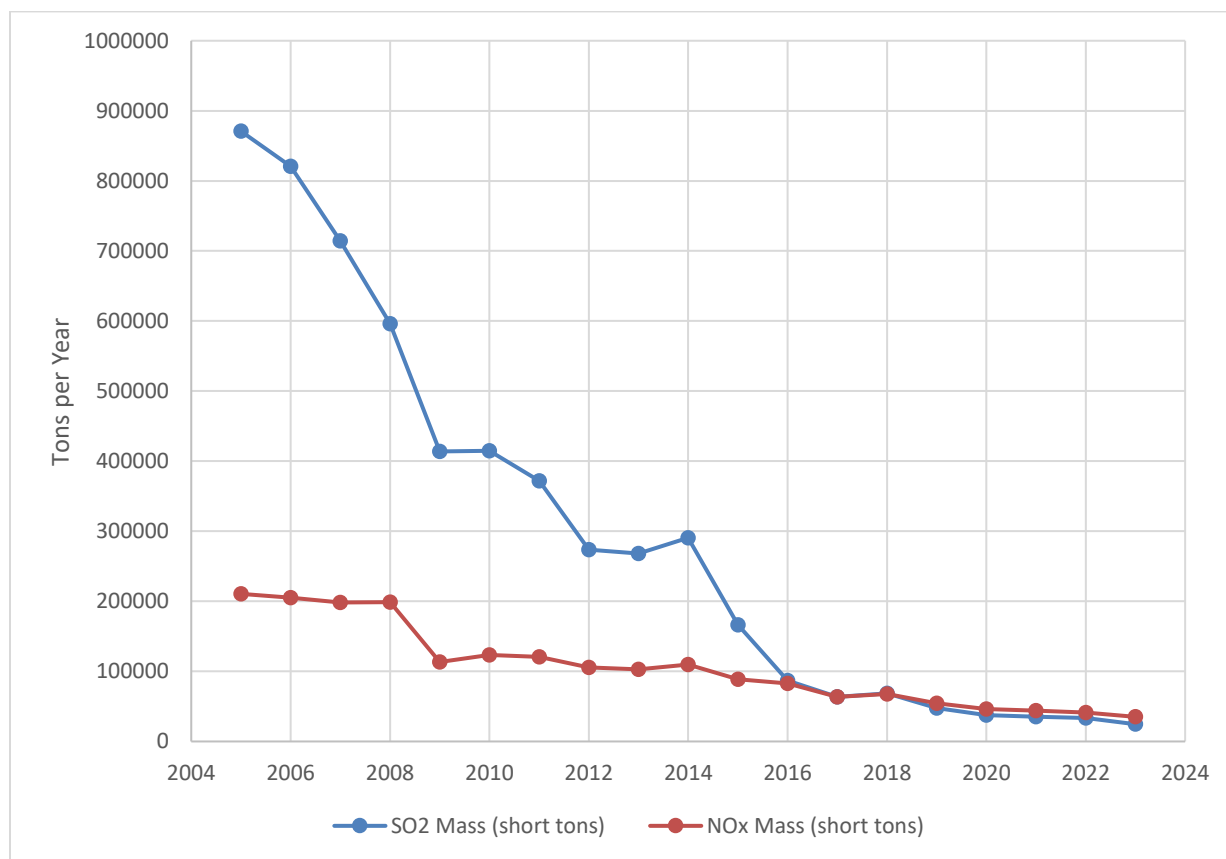
Table 2.5: Change in SO₂ and NO_x Emissions from Facilities reporting to U.S. EPA’s Clean Air Markets Program Data, 2019-2023

Facility Name	SO ₂ Mass (Short Tons)		NO _x Mass (Short Tons)	
	2019	2023	2019	2023
A B Brown Generating Station	3957.5	2718.3	2423.5	1117.0
Alcoa Allowance Management Inc	648.3	660.2	8444.0	6852.1
Anderson	0.7	0.2	4.1	21.0
ArcelorMittal USA - Indiana Harbor East			828.5	
Bailly Generating Station				70.9
BP Whiting Business Unit			49.7	
C. C. Perry K Steam Plant			349.2	223.8
Cayuga	1802.1	2424.2	4408.5	4588.7
Clifty Creek: Indiana-Kentucky Electric Corporation (IKEC)	4191.1	2692.6	5375.4	5430.7

Facility Name	SO ₂ Mass (Short Tons)		NO _x Mass (Short Tons)	
	2019	2023	2019	2023
Edwardsport Generating Station	55.0	71.6	769.2	704.0
F B Culley Generating Station	1050.2	1333.2	1002.9	1257.6
Georgetown Substation	0.5	1.3	20.4	57.4
Gibson	9666.3	4513.6	8120.7	3571.2
Grain Processing Corporation			26.4	25.9
Henry County Generating Station	0.8	0.8	108.2	110.2
Hoosier Energy Lawrence Co Station	0.1	0.1	20.4	20.5
IPL - Eagle Valley Generating Station	10.3	10.3	115.0	86.2
IPL - Harding Street Station (EW Stout)	3.6	9.5	491.7	972.1
IPL - Petersburg Generating Station	6586.0	3656.8	6946.5	3561.4
Lawrenceburg Energy Facility	17.4	19.0	282.8	291.2
Merom	2897.9	2838.3	1475.6	1368.4
Michigan City Generating Station	485.3	639.6	534.1	683.8
Montpelier Electric Gen Station	1.6	5.0	122.4	143.2
Noblesville	3.2	2.9	59.9	88.2
Portside Energy			29.4	23.9
Primient				131.3
Purdue University-Wade Utility			288.8	156.2
R Gallagher	170.2		84.1	
R M Schahfer Generating Station	1167.6	464.3	4985.7	1357.3
Richmond (IN)	0.1	0.1	2.0	11.3
Rockport	14341.4	2008.3	6097.1	1149.4
St. Joseph Energy Center LLC	11.3	10.1	115.6	117.7
Sugar Creek Generating Station	7.8	6.6	114.9	83.3
US Steel Corp - Gary Works			364.2	355.1
Vermillion Generating Station	0.4	2.2	23.6	116.3
Wabash River Highland Plant	0.3	1.4	19.0	102.0
Wheatland Generating Facility LLC	0.5	0.4	133.7	103.3
Whitewater Valley	694.4	515.6	101.9	48.2
Whiting Clean Energy, Inc.	7.3	8.0	99.1	106.5
Worthington Generation	0.2	0.2	28.3	27.5
TOTAL OVERALL	47,780	24,614	54,466	35,135

Source: U.S. EPA's Clean Air Markets Program Data (<https://campd.epa.gov/>)

Graph 2.3: SO₂ and NO_x Emissions from Indiana Facilities reporting to CAMPD, 2005-2023



Source: U.S. EPA's Clean Air Markets Program Data (<https://campd.epa.gov/>)

2.4 ASSESSMENT OF CHANGES IMPEDING VISIBILITY PROGRESS

Section 51.308(g)(5) and 51.309(d)(10)(i)(E) of the Regional Haze Rule requires an assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred over the applicable five-year period that have limited or impeded progress in reducing pollutant emissions and improving visibility. This section acknowledges that the NEI data from 2018-2020 in Graph 2.6 shows increases in total NO_x and SO₂ emissions in the point and area sectors. There are also increases that can be seen in Table 2.5 from the modeled 2016-base year to 2022. These sectors are non-point and non-road for SO₂, and biogenics and non-road for NO_x.

While this is an issue that may merit further investigation, Indiana does not consider this a problem that has or will impede visibility progress in the future in states with Class I areas identified as being potentially impacted by Indiana sources. These slight increases had no actual impact on the overall progress made from 2014 through 2022. Indiana has clearly demonstrated significant emission reductions throughout the state and its contributions to visibility impacts on Class I areas are diminishing every year.

2.5 ASSESSMENT OF CURRENT STRATEGY

Section 51.308(g)(6) of the Regional Haze Rule requires an assessment of whether the current implementation plan elements and strategies are sufficient to enable the State, or other states with mandatory Federal Class I areas affected by emissions from the State, to meet all established reasonable progress goals for the period covered by the most recent plan required under 40 CFR 51.308(f).

This section contains a summary of the information used and decisions made to establish reasonable progress goals for each of the Class I areas identified as being potentially impacted by Indiana sources in Table 1.1. As described in the Section 2.1 Status of Control Strategies in the Regional Haze SIP, controls relied upon in Indiana's Regional Haze SIP have either been implemented already or are expected to be implemented by 2028.

2.5.1 Affected Class I Areas

Indiana opted to determine its visibility impacts based on photochemical modeling provided by LADCO. Based on LADCO's source apportionment modeling results for 2028, Indiana selected those Class I areas where visibility was impacted by emissions from Indiana sources. This modeling predicted the 2028 visibility levels, in both inverse megameters and deciviews, at Class I areas throughout the United States on the 20% most anthropogenically impaired days. In Table 1.1 above, Indiana identified Class I areas which had a visibility impact of 1.5% or greater by emissions from Indiana sources were selected as areas that were significantly impacted, based on base year 2016 emissions.

This threshold proves to be an excellent threshold as it maintains adequate geographic coverage of potential visibility impacts from Indiana sources on surrounding Class I areas. This geographic coverage ensures that Class I areas closer to Indiana that are captured in the modeling will be representative of Class I areas further from the State. If Indiana's total light extinction (measured in inverse megameters) modeled 1.5% or more of the total light extinction at the Class I area on the 20% most anthropogenically impaired days, then the Class I area was determined to be significantly impacted by Indiana emissions. This resulted in 20 Class I areas being impacted significantly by Indiana emissions as discussed below.

Mammoth Cave National Park, KY

At the time Kentucky's Regional Haze SIP was developed, EGU sources in Kentucky and Indiana were required to comply with the requirements of the final CSAPR/CAIR. Kentucky determined that these controls were sufficient to address visibility in this area. Further, VISTAS modeling¹² showed that Mammoth Cave was more than meeting its

¹² <https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

uniform rate of progress and determined that no additional reductions were needed from Indiana (Appendix AA from Indiana's 2021 RH SIP).¹³ However, an Indiana source, Alcoa, was determined to significantly impact this area and is the subject of the Indiana BART rule.

In addition, three Indiana facilities (Indiana Michigan Power Rockport Power Generating Station, Indianapolis Power & Light – Petersburg and SIGECO AB Brown) were identified as possibly impacting Kentucky's Class I area, with a 1% or more contribution to the Mammoth Cave area of influence according to the "Kentucky Regional Haze State Implementation Plan (SIP) Revision dated June 4, 2024. (See <https://eec.ky.gov/Environmental-Protection/Air/Pages/Regional-Haze-SIP.aspx> .)

- Indiana Michigan Power Rockport Power Generating Station- Selective catalytic reduction units were installed in addition to the new dry sorbent injection (DSI) units on the two EGUs at Rockport. SO₂ and NO_x emissions from Rockport have been reduced, thereby reducing its visibility impact on Class I areas.
- Indianapolis Power & Light – Petersburg has shut down its coal-fired Units 1 & 2 and has been permitted to convert Units 3 & 4 from coal to natural gas (Permit #125-46357-00002).
- SIGECO AB Brown - Coal-fired units 1 & 2 have been retired.

SESARM modeling¹⁴ has shown that Mammoth Cave is more than meeting its uniform rate of progress (glidepath) and has determined that current controls are sufficient to address visibility in this area and no additional reductions are needed from Indiana currently. Indiana concurs that this is the best approach for addressing visibility impairment at Mammoth Cave currently as substantial emission reductions have occurred over the past decade and additional emission reductions are anticipated throughout the second implementation period for the RH Rule (Appendix AA from Indiana's 2021 RH SIP)¹⁵.

Sipsey National Wilderness Area, AL

There have been substantial emission reductions from several control programs implemented during the first planning period from controls currently in place (CSAPR, BART, MATS, etc.). As such, additional controls both considered in Alabama's Regional Haze SIP¹⁶ as well as controls not considered (CSAPR Update) will continue to support progress in reducing emissions and improving visibility. SESARM conducted modeling analyses to assist in developing RPGs for the second implementation period.¹⁷ Indiana has not been contacted by Alabama regarding consultations for this

¹³ [IDEM: State Implementation Plans: Regional Haze](#)

¹⁴ <https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

¹⁵ [IDEM: State Implementation Plans: Regional Haze](#)

¹⁶ 83 FR 64797, December 18, 2018.

¹⁷ <https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

area and believes that no further analysis for an LTS is necessary at this time. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently.

James River Face Wilderness Area, and Shenandoah National Park, VA, & Dolly Sods/Otter Creek National Wilderness Areas, VA & WV

Virginia reported that visibility at the James River Face Wilderness Area and Shenandoah National Park had significantly improved since 2000. In the LADCO summary of Class I areas impacted by sources from within LADCO, Indiana was determined to contribute to visibility impairment in these more distant Class I areas. Since that time, SESARM has conducted several analyses¹⁸ to assist in developing reasonable progress goals for the second implementation period (Appendix AA from Indiana's 2021 RH SIP).¹⁹ The results of the LTS developed by the states and SESARM provide anticipated visibility improvements below the glidepath. Neither Virginia nor West Virginia contacted IDEM to participate in consultations for these areas. The four-factor analyses performed by the SESARM states and resulting LTS indicate that controls closer to the Class I areas provide the most effective reductions at this time. Additionally, the long-term strategies provide anticipated visibility improvements below the glidepaths. Indiana concurs with these conclusions. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently.

Great Smoky Mountains National Park, TN

In LADCO's summary of Class I areas impacted by sources from within the LADCO region, Indiana was determined to contribute to visibility impairment in this Class I area. SESARM has conducted modeling analyses²⁰ to assist in developing RPGs for the second implementation period. The monitoring and modeling clearly show that visibility impairment at Great Smoky Mountains and Joyce Kilmer - Slickrock Class I areas are adequately addressed currently. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently.

Cohutta Wilderness Area, GA

These areas were identified in early LADCO modeling and other analyses as being impacted by Indiana sources. Indiana was invited to participate in the consultation process for these areas and attended the conference phone calls. Metro 4/SESARM notified IDEM that they had identified three of Indiana's EGUs (Duke Gibson, AEP Rockport, and AES Petersburg) as having possible visibility impacts.

¹⁸ <https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

¹⁹ IDEM: State Implementation Plans: Regional Haze

²⁰ <https://www.metro4-sesarm.org/content/vistas-regional-haze-program>

Rockport has installed DSI on its units, and two coal-fired units were retired at Petersburg, thereby reducing their visibility impacts. Duke Gibson continues to comply with its emissions limitations and control requirements. Indiana has not been contacted by Georgia regarding consultations for this area and believes that no further analysis for a long-term control strategy is necessary at this time.

Isle Royale National Park and Seney National Wilderness Area - Michigan

In its State Implementation Plan Submittal for Regional Haze Second Planning Period, dated May 2021,²¹ Michigan determined that existing and on-the-books controls (those controls scheduled in response to regulatory actions within the first implementation period timeframe), combined with reductions necessary to meet the new 2024 annual fine particulates standard and the current 2015 ozone standard would be sufficient to meet their RPGs. Michigan states “it is unreasonable to EGLE (Department of Environment, Great Lakes and Energy) to require additional emission reductions from the potentially impacting sources identified with the Q/D analysis” as visibility at the Class I areas are showing visibility below the level needed to demonstrate reasonable progress in meeting the natural condition goal in 2064. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently. Indiana participated in monthly from 2018 to October of 2021 and then switched to bimonthly calls with Michigan and the other LADCO states. These calls also include U.S. EPA – Region 5 staff, Federal Land Managers, and Tribes to discuss regional haze issues in the region. Indiana will continue to work with Michigan and LADCO to evaluate the reasonable progress at these Class I areas.

Swanquarter, Linville Gorge, & Shining Rock, NC

North Carolina’s Regional Haze State Implementation Plan for Class I areas (2019 – 2028 Planning Period) dated April 4, 2022, reviewed visibility impacts from states.²² North Carolina identified several Indiana sources has having significant visibility impacts on its Class I areas. Among the photochemical modeling analysis conducted to determine nitrate and sulfate contributions on the Class I areas for reasonable progress analysis, Indiana Michigan Power – Rockport and Duke – Gibson Generating Station were identified as being significant for visibility impacts on North Carolina’s Class I areas. It should be noted that the percent impacts on visibility at all modeled Class I areas was at or just above the 1% significance threshold for visibility impairment.

Indiana concurs that substantial emission reductions have occurred over the past decade and additional emission reductions are anticipated throughout the second

²¹ <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Reports/AQD/state-implementation-plan/2021-05-sip-submittal-regional-haze.pdf?rev=4a9ec4b34d854d9b8857cd9d0cd4b91b&hash=F7C99EB58EDDE62E1AFEEDA9DE71E383>

²² 89 FR 92573, November 22, 2024.

implementation period. Therefore, relying on current and anticipated emission reductions and reduced visibility impairment from Indiana sources, as determined by LADCO's source apportionment modeling, this represents the best approach for addressing visibility impairment in these VISTAS Class I areas. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently.

Brigantine Wilderness Area, NJ, & Lye Brook Wilderness Area, VT

Mid-Atlantic/Northeast Visibility Union (MANE-VU) consists of Mid-Atlantic and Northeast states, including the District of Columbia. MANE-VU coordinated regional haze planning and conducted photochemical modeling to determine visibility impairment at the Northeast U.S. Class I areas. Twelve industrial sources in Indiana (among a list of 82 sources throughout the country) were identified to contribute the most to visibility impacts at Class I areas in the northeast, according to MANE-VU's 2011 Q/d analysis.²³ Due to the outdated nature in evaluating source emissions from 2011 instead of more recent emissions evaluations that would consider emissions controls from recent national, regional and state control measures, Indiana does not agree with this list of Indiana sources identified by MANE-VU as contributing to significant visibility impacts.

LADCO conducted modeling to evaluate the various levels of controls in place or planned between 2018 and 2028. These results showed that for the northeastern Class I areas, controls already implemented, and on-the-books measures will result in achievement of reasonable progress goals. These controls along with federal programs implemented over the first implementation period, such as the 2010 SO₂ NAAQS, MATS, Boiler MACT, Tier 3 Program, etc., meet the requirements for control strategies of NO_x and SO₂ emissions and therefore do not impede these areas in meeting their 2028 reasonable progress goals.

LADCO modeling has shown low visibility impacts from Indiana sources on the MANE-VU Class I areas. Indiana concurs that this is the best approach for addressing visibility impairment at the MANE-VU Class I areas as substantial emission reductions have occurred over the past decade and additional emission reductions are anticipated throughout the second implementation period. LADCO RH modeling confirms that all sources in Indiana have visibility impacts that total less than 2.5% of the total visibility impacts at either of the Class I areas in New Jersey and Vermont. Therefore, Indiana

²³ "Statement of the Mid-Atlantic/Northeast Visibility Union (MANE-VU) States Concerning a Course of Action within MANE-VU toward Assuring Reasonable Progress for the Second Regional Haze Implementation Period (2018 -2019)" for Indiana, Kentucky, Michigan, North Carolina, Ohio, Virginia, and West Virginia, August 25, 2017; <https://otcair.org/manevuUpload/Publication/Formal%20Actions/MANE-VU%20Inter-Regional%20Ask%20Final%208-25-2017.pdf>

MANE-VU Regional Haze Consultation Report, MANE-VU Technical Support Committee. July 27, 2018; https://otcair.org/manevuUpload/Publication/Correspondence/MANE-VU_RH_ConsultationReport_Appendices_ThankYouLetters_08302018.pdf

does not believe at this time that it can commit to any course of action until it is determined, through the above work and further discussions, what actions may be appropriate to meet reasonable progress goals, given Indiana's marginal impact on those areas.

Caney Creek & Upper Buffalo Wilderness Areas, AR, and Hercules-Glades & Mingo National Wilderness Areas, AR & MO

In their Regional Haze SIPs for the 2nd implementation period, Arkansas²⁴ and Missouri²⁵ identified two of Indiana's EGUs (Duke Gibson and AEP Rockport) as potentially impacting visibility at Class I areas within their state for the second implementation period for regional haze. These areas were identified in LADCO modeling for the second implementation period as being impacted by Indiana sources. Indiana participated in the consultation process for these areas by email and attended conference phone calls.

Based on the current and projected emissions reductions from the Indiana EGUs specified by Arkansas and Missouri and LADCO's source apportionment modeling results for Duke Gibson and AEP Rockport on visibility impacts on Class I areas, Indiana believes that substantial emission reductions have occurred over the past decade and additional emission reductions are anticipated throughout the second implementation period. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary currently.

Voyageurs National Park & Boundary Waters Canoe Area National Wilderness Area, MN

The approach taken by Minnesota assessed those reductions for Indiana BART sources (and other states) resulting from new settlements, committed controls, current controls, and CSAPR would be sufficient to meet their reasonable progress goals. While Indiana sources have shown an impact on these Class I areas through modeling studies conducted for the RH SIP second implementation period, Minnesota has chosen a 3.5% contribution threshold for determining significant contributions to visibility impacts at each of its Class I areas. Indiana was determined through photochemical modeling to have contributions well below those thresholds to visibility impairment for the second implementation period.

Indiana participated in monthly calls from 2018 to October of 2021 then switched to bimonthly calls with Minnesota and the other LADCO states. These calls also include U.S. EPA – Region 5 staff, Federal Land Managers, and Tribes to discuss regional haze issues in the region. Indiana will continue to work with Minnesota and LADCO to evaluate the progress in these Class I areas and believes that substantial emission

²⁴ <https://www.adeg.state.ar.us/air/planning/sip/regional-haze.aspx>

²⁵ <https://dnr.mo.gov/air/what-were-doing/state-planning/other-plans>

reductions have occurred over the past decade and additional emission reductions are anticipated throughout the second implementation period. Therefore, Indiana believes that no further analysis for long-term control strategies is necessary at this time.

2.5.2 Future Activities

Reductions in Indiana emissions from the BART rule and other programs identified as part of Indiana's LTS in addition to revisions to the health-based standards for precursor emissions that contribute to regional haze are sufficient to meet the reasonable progress goals in other states. However, to continue to assist those states in meeting their reasonable progress goals and to minimize its contribution to those states, Indiana continues to commit to the following actions:

1. Effectively enforce the existing control measures.
2. Work with the U.S. EPA and other states and regional planning organizations to address multipollutant air quality problems in the eastern and northeastern U.S.
3. Continue consultation with states with Class I areas to monitor their progress in meeting their reasonable progress goals and develop coordinated strategies, as and when needed, to mitigate visibility impacts in those areas.

2.6 DETERMINATION OF ADEQUACY

Section 51.308(h) of the Regional Haze Rule requires a determination of the adequacy of the existing implementation plan. At the same time the State is required to submit any five-year progress report to the U.S. EPA in accordance with paragraph (g) of this section, the State must also take one of the following actions based upon the information presented in the progress report:

- (1) If the State determines that the existing implementation plan requires no further substantive revision at this time in order to achieve established goals for visibility improvement and emissions reductions, the State must provide to the Administrator a negative declaration that further revision of the existing implementation plan is not needed at this time.
- (2) If the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in other state(s) which participated in a regional planning process, the State must provide notification to the Administrator and to the other state(s) which participated in the regional planning process with the states. The State must also collaborate with the other State (s) through the regional planning process for the purpose of developing additional strategies to address the plan's deficiencies.

- (3) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator.
- (4) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources within the state, the State shall revise its implementation plan to address the plan's deficiencies within one year.

Although U.S. EPA has not yet taken final action on Indiana's 2021 Regional Haze SIP submittal, based on the analyses presented in previous sections, Indiana has determined that its 2021 Regional Haze SIP submittal is adequate to meet the requirements of the Regional Haze Rule and to support reasonable progress goals at all Class I areas impacted by emissions from Indiana as a revision to its current Regional Haze SIP, which was approved by U.S. EPA in the Federal Register on May 29, 2012 (77 FR 34218, June 11, 2012) and August 28, 2019 (84 FR 46889, September 6, 2019). Although no specific requirements for emission reductions were established for Indiana sources outside of BART and state and federal on-the-books control measures included in Indiana's LTS, Indiana's emission reductions have far exceeded any requests made from other states for emission reductions from Indiana sources. The 5-year period evaluated for the purpose of this progress report was 2018 – 2022 as well as 2023 for EGUs reporting to U.S. EPA's CAMPD. During this time frame, actual SO₂ emissions reported from the major source categories decreased by nearly 39%, while NO_x emissions decreased by ~30%. As a result, Indiana's contributions to visibility impairment in Class I areas in other states were significantly reduced and surpassed improvements predicted by the modeling for 2028. The steady decline of visibility impacts at the Class I areas from anthropogenic emissions are significant and indicate that states are taking the necessary steps to remain ahead of the schedule in the glidepaths and are projected to approach natural visibility conditions ahead of 2064.

In addition, the results of this 5-year progress report evaluation prove that air quality in Indiana has improved considerably and that SO₂ and NO_x emissions from contributing sources in Indiana have continued to decrease for both pollutants since 2018. In fact, the downward trend for both SO₂ and NO_x emissions are on target for producing greater visibility improvements than anticipated in 2028, as well. Therefore, Indiana's existing Regional Haze SIP requires no further substantive revision to assist other states with established reasonable progress goals. Indiana will continue to implement the measures of its existing SIP and begin preparation for the next scheduled Regional Haze SIP revision.

The State submits this negative declaration that further revision is not needed currently for Indiana's Regional Haze State Implementation Plan submittal dated December 2021 as a revision to its current Regional Haze SIP, which was approved by U.S. EPA in the Federal Register on May 29, 2012. (77 FR 34218, June 11, 2012) and August 28, 2019 (84 FR 46889, September 6, 2019).

3.0 PROCEDURAL REQUIREMENTS

3.1 ADMINISTRATIVE PROCESS

Section 51.308(g) of the Regional Haze rule requires the State to provide progress reports evaluating progress towards the reasonable progress goal for each mandatory Class I Federal area located within the State and in each mandatory Class I Federal area located outside the State that may be affected by emissions from within the State.

3.2 CONSULT WITH FEDERAL LAND MANAGERS

Sections 51.308(i)(2) and (3) of the Regional Haze rule requires the State to provide the following for Federal Land Managers:

51.308(i)

- (2) The opportunity for consultation on an implementation plan (or plan revision) or on a progress report must be provided no less than 60 days prior to said public hearing or public comment opportunity. This consultation must include the opportunity for the affected Federal Land Managers to discuss their:
 - (i) Assessment of impairment of visibility in any mandatory Class I Federal area; and
 - (ii) Recommendations on the development and implementation of strategies to address visibility impairment.
- (3) In developing any implementation plan (or plan revision) or progress report, the State must include a description of how it addressed any comments provided by the Federal Land Managers.

On October 17, 2024, IDEM shared with FLMs a draft of this five-year Regional Haze progress report for the second implementation period, providing at least 60 days before announcing a public comment opportunity as required under 40 CFR 51.308(i)(2). On November 20, 2024, IDEM received comments from the U.S. Forest Service on the draft five-year Regional Haze progress report. National Parks Service and U.S. Fish and Wildlife Service received the draft report for review but indicated by email they would not offer comments. The U.S. Forest Service comments and IDEM's response are included in Appendix E.

3.3 PUBLIC PARTICIPATION 40 CFR 51.308(G)

40 CFR § 51.308(g) provides:

Subsequent progress reports must be made available for public inspection and comment for at least 30 days prior to submission to U.S. EPA and all comments received from the public must be submitted to U.S. EPA along with the subsequent

progress report, along with an explanation of any changes to the progress report made in response to these comments.

A notice of availability of IDEM's proposed Five-Year Progress Report for the Regional Haze Second Implementation Period was published on IDEM's website [IDEM: Public Notices: Statewide](#) on January 30, 2025, providing a 30-day public comment period. This period concluded on March 1, 2025, with no comments received.

3.4 CHECKLIST FOR PROGRESS REPORTS SUBMITTED UNDER 40 CFR 51.308(g) – (h) & 40 CFR 51.308(i)

Table 3.1: Regional Haze 5-Year Progress Report Regulation Checklist

Required (Y/N)	Regulation Citation	Regulation Summary	Location in Report	Comments
Y	51.308(g)(1) 51.309(d)(10)(i)(A)	Status of Control Strategies in the Regional Haze SIP: Does the report include a list of measures the state relied upon? (<i>all states</i>)	Section 2.1	On track
Y	51.308(g)(2) 51.309(d)(10)(i)(B)	Emissions Reductions from Regional Haze SIP Strategies: Does the report include estimated reduction estimates for these measures? (<i>all states</i>)	Section 2.2	On track
N	51.308(g)(3) 51.309(d)(10)(i)(C)	Visibility Progress: Does the report include the summaries of monitored visibility data as required by the Regional Haze Rule? (<i>states with Class I areas only</i>)	N/A	N/A
Y	51.308(g)(4) 51.309(d)(10)(i)(D)	Emissions Progress: Does the report provide emissions trends across the entire inventory for a 5-year period as required by the Regional Haze Rule? (<i>all states</i>)	Section 2.3	On track

Y	51.308(g)(5) 51.309(d)(10)(i)(E)	Assessment of Changes Impeding Progress: Does the report include an explicit statement of whether there are anthropogenic emissions changes impeding progress? (<i>all states</i>)	Section 2.4	On track
Y	51.308(g)(6) 51.309(d)(10)(i)(F)	Assessment of Current Strategy: Does the report include an assessment of whether the state's haze plan is on track to meet reasonable progress goals? (<i>all states</i>)	Section 2.5	On track
N	51.308(g)(7) 51.309(d)(10)(i)(G)	Review of Monitoring Strategy: Does the report review the monitoring plan including any non-IMPROVE monitors the state is using? (<i>states with Class I areas only</i>)	N/A	N/A
Y	51.308(h) 51.309(d)(10)(ii)	Determination of Adequacy: Does the report (or the transmittal materials) provide the explicit determination required by the Regional Haze Rule? (<i>all states</i>)	Section 2.6	On track