STATE OF ARKANSAS
ASA HUTCHINSON
GOVERNOR

October 4, 2019

Ken McQueen
Regional Administrator
United States EPA Region VI

Submitted via SPeCS for SIPs

Re: Arkansas State Implementation Plan (SIP)

Dear Mr. McQueen:

The State of Arkansas hereby respectfully submits to the United States Environmental Protection Agency (EPA) Revisions to the Arkansas State Implementation Plan (SIP) including revisions to the Arkansas Pollution Control and Ecology Commission's ("Commission" or APC&EC) Regulation No. 19, *Regulations of the Arkansas Plan of Implementation for Air Pollution Control*, for approval.

On September 27, 2019, the Commission adopted changes to APC&EC Regulation No. 19, which includes adoption of revisions consistent with the national ambient air quality standard (NAAQS) for ozone in response to the following final rule promulgated by EPA:

- "National Ambient Air Quality Standards for Ozone" (80 FR 65292, October 26, 2015), which revised the primary and secondary standards for the eight-hour ozone NAAQS.

On October 3, 2018, the Division of Environmental Quality ("DEQ") proposed a SIP revision to address Clean Air Act § 110 requirements for the 2015 ozone NAAQS, which are referred to as infrastructure SIP requirements. On April 14, 2019, DEQ proposed a separate SIP revision to address transport obligations pursuant to Clean Air Act § 110(a)(2)(D) for the 2015 ozone NAAQS. This submittal finalizes both proposed SIP revisions. The SIP package accompanying this letter is summarized as follows:

- Infrastructure SIP Narrative
- Transport SIP Narrative
- Evidence of Adoption of the Revised Plan into Regulation No. 19

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- Legal Authority to Adopt and Implement the Plan
- Procedural Requirements, including evidence of public notice
- Compilation of public comments and state responses

This SIP package is being submitted electronically through the State Planning Electronic Collaboration System (SPeCS) for SIPs web-based system in accordance with 40 CFR § 51.103(a). Should questions arise, please contact the William Montgomery, the DEQ Office of Air Quality Policy and Planning Branch Manager, at (501) 682-0885, or by email at montgomery@adeq.state.ar.us. Thank you for your consideration of Arkansas's submission.

Sincerely,

Asa Hutchinson,

Enclosures

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Office of Air Quality

Arkansas State Implementation Plan Revision

2015 Ozone National Ambient Air Quality Standard – Infrastructure

Final
October 2019

Arkansas Department of Energy and Environment
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72113

Table of Contents

I. Introduction

A. Arkansas State Implementation Plan Revision

Arkansas has included revisions to adopt the 2015 ozone national ambient air quality standard (NAAQS) finalized by the United States Environmental Protection Agency (EPA) into Arkansas Pollution Control & Ecology Commission's ("Commission" or APC&EC) Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control, allowing the Arkansas Department of Energy and Environment Division of Environmental Quality (ADEQ), formerly the Arkansas Department of Environmental Quality, to retain permitting authority for each of the NAAQS, including the Prevention of Significant Deterioration (PSD) program. On October 26, 2015, EPA revised the eight-hour primary and secondary standards for ozone from seventy-five parts per billion (ppb) to seventy ppb. The enclosed state implementation plan (SIP) revision satisfies requirements for the revised ozone standard (80 FR 65292).

The primary and secondary ozone standard proposed in APC&EC Regulation No. 19 and included in this SIP is identical to federal standards; therefore, the demonstration required under Ark. Code. Ann. § 8-4-317(b)(1)(C)(i) is satisfied by reference to the applicable federal regulation: "National Ambient Air Quality Standards for Ozone" (80 FR 65292, October 26, 2015)

B. Arkansas SIP Components Included in this Revision

The following provisions in APC&EC Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control are being revised and are included in this SIP revision:

- Chapter 2 – *Definitions*
- Appendix B – *National Ambient Air Quality Standards List*

ADEQ filed APC&EC Regulation No. 19 with the Commission to initiate a rulemaking on September 14, 2018. The Commission initiated the rulemaking on September 28, 2018. ADEQ proposed this SIP concurrently with the regulatory components included in this SIP revision. The public hearing for APC&EC Regulation No. 19 and this SIP revision was held on November 16, 2018, and the public comment period expired on November 30, 2018. No comments were received on the regulatory amendments or the proposed SIP revision. ADEQ presented the regulatory amendments to the Arkansas Legislative Joint Public Health, Welfare, and Labor Committee on June 3, 2019 and the Arkansas Legislative Council Administrative Rules Subcommittee on July 19, 2019 prior to adoption by the Commission on September 27, 2019.

The changes to APC&EC Regulation No. 19 are consistent with and allowable under federal programs.

Sources affected by these program revisions are found throughout the State.

No substantive revisions have been made to the emission limitations, work practice standards or recordkeeping/reporting requirements portions of the program at this time.

Furthermore, ADEQ's existing compliance and enforcement strategies will remain in place.

C. Background

The Clean Air Act (CAA) § 109 requires EPA to set NAAQS for pollutants considered to be harmful to public health and the environment. EPA has set NAAQS for six principal pollutants—called "criteria" pollutants. Regulatory information about NAAQS is found in Code of Federal Regulations, Title 40, Part 50 (40 C.F.R. Part 50). EPA sets two types of NAAQS:

1. Primary NAAQS are limits set to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly.
2. Secondary NAAQS are limits set to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Table 1 lists the NAAQS that have been adopted into Regulation No. 19.

Table 1 National Ambient Air Quality Standards

Pollutant [final rule citation]	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]	primary	8-hour	9 parts per million (ppm)	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead [81 FR 71906, October 8, 2016]	primary and secondary	Rolling 3 month average	0.15 micrograms per cubic meter ($\mu g/m^3$)	Not to be exceeded
Nitrogen Dioxide [77 FR 20218, April 3, 2012]	primary	1-hour	100 parts per billion (ppb)	98th percentile of one-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	Annual	53 ppb	Annual Mean
Ozone [80 FR 65292, October 26, 2015]	primary and secondary	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years

Pollutant [final rule citation]		Primary/ Secondary	Averaging Time	Level	Form
Particle Pollution [78 FR 3086, Jan 15, 2013]	$PM_{2.5}$	primary	Annual	12.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		secondary	Annual	15.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [77 FR 20218, April 3, 2012]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Under CAA §§ 110(a)(1) and 110(a)(2), each state is required to submit a SIP that provides for the implementation, maintenance, and enforcement of a revised primary or secondary NAAQS within three years after EPA promulgates a new or revised NAAQS. These SIPs must demonstrate how the state will meet the applicable requirements for each new and revised NAAQS. This type of SIP submission is commonly referred to as an "infrastructure SIP."

The national and state infrastructure reports contain the status of the state submissions to meet the requirements and EPA's actions on the submissions.[1] The required infrastructure elements tracked for each state are labeled in the report as:

- Section 110(a)(2)(A) Emission limits and other control measures
- Section 110(a)(2)(B) Ambient air quality monitoring/data system
- Section 110(a)(2)(C) Program for enforcement of control measures
- Section 110(a)(2)(D)(i)(I) Prong 1: Interstate transport – significant contribution
- Section 110(a)(2)(D)(i)(I) Prong 2: Interstate transport – interfere with maintenance
- Section 110(a)(2)(D)(i)(II) Prong 3: Interstate transport – prevention of significant deterioration

[1] State Infrastructure Reports: https://www3.epa.gov/airquality/urbanair/sipstatus/reports/map_i.html
National Infrastructure Reports: https://www3.epa.gov/airquality/urbanair/sipstatus/reports/idx_in.html

- Section 110(a)(2)(D)(i)(II) Prong 4: Interstate transport – protect visibility
- Section 110(a)(2)(D)(ii) - Interstate and international pollution abatement
- Section 110(a)(2)(E) Adequate authority and resources
- Section 110(a)(2)(F) Stationary source monitoring system
- Section 110(a)(2)(G) Emergency power
- Section 110(a)(2)(H) Future SIP revisions
- Section 110(a)(2)(J) Consultation with government officials; Public notification; PSD and visibility protection
- Section 110(a)(2)(K) Air quality modeling/data
- Section 110(a)(2)(L) Permitting fees
- Section 110(a)(2)(M) Consultation/participation by affected local entities

II. Infrastructure SIP

The federally enforceable SIP for Arkansas is compiled in 40 C.F.R. Part 52 Subpart E § 52.170. The requirements of sections 110(a)(2)(A)–(M) of the CAA relevant to the 2015 ozone NAAQS are included in this SIP submittal. Table 2 summarizes where and how the requirements of sections 110(a)(2)(A)–(M) are addressed.

In this revision to the SIP, Arkansas demonstrates that it has adequate resources and authority to implement, maintain, and enforce the 2015 eight-hour ozone NAAQS.

Table 2 2015 Ozone NAAQS Infrastructure State Implementation Plan Elements

Section 110(a)(2) Element	Summary of Element (Statutory Language)	Provisions in the Current SIP or Recent SIP Revision Submittals
110(a)(2)(A) Emission limits and other control measures	*include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this Act;*	•Arkansas's enforceable emission limitations and other control measures are covered in Arkansas Water and Air Pollution Control Act, Arkansas Code Annotated (Ark. Code Ann.) § 8-4-101 *et seq.*, and those provisions of the Arkansas Pollution Control & Ecology Commission (APC&EC) Regulation No. 19, listed in 40 C.F.R. § 52.170. •The enforceable emission limitations, other control measures, and schedules for compliance necessary to implement the 2015 ozone NAAQS in APC&EC Regulation No. 19 have been duly adopted by APC&EC. No revisions to existing emission limits and other control measures were necessary to implement the 2015 ozone NAAQS. Where these provisions relate to CAA § 110 requirements, SIP revisions have been submitted to and approved by EPA. EPA-approved SIP revisions are codified at 40 C.F.R. Part 52, Subpart E. Arkansas has an EPA-approved air permitting program for both major and minor facilities, which ensures that all applicable requirements are included in the facility permit.
110(a)(2)(B)	*provide for*	•APC&EC Reg. 19.302 grants ADEQ responsibility for ambient air monitoring and

Ambient air quality monitoring and data analysis system	*establishment and operation of appropriate devices, methods, systems, and procedures necessary to- (i) monitor, compile, and analyze data on ambient air quality, and (ii) upon request, make such data available to the Administrator;*	computer modeling of federally regulated air pollutant emissions. •Ark. Code Ann. § 8-4-311(a)(3) empowers ADEQ to encourage and conduct studies, investigations, and research relating to air pollution and its causes, prevention, control, and abatement. •Ark. Code Ann. § 8-4-311(a)(4) grants ADEQ the ability to collect and disseminate information relative to air pollution and its prevention and control. •In conjunction with the references above, Arkansas monitors air quality for ozone at appropriate locations throughout the state using EPA-approved methods and submits ozone data to the EPA's Air Quality System (AQS) consistent with EPA regulations under 40 C.F.R. Part 58. •Ark. Code Ann. § 8-4-311(a)(2) gives ADEQ the ability to advise, consult, and cooperate with the federal government in furtherance of safeguarding the air resources of the state by controlling or abating air pollution and preventing new air pollution if it is in the interest of the public health and welfare of the people. See also Ark. Code Ann. § 8-4-301 and § 8-4-302. Under this authority, ADEQ submits annual monitoring network plans, consistent with EPA's ambient air monitoring regulations that describe how ADEQ has complied with monitoring requirements and explains proposed changes to the network, if any. •Ark. Code Ann. § 8-1-202 grants the ADEQ Director authority to retain the technical and legal expertise and assistance in the field of environmental protection.
110(a)(2)(C) Program to enforce control measures, regulate modification and	*include a program to provide for the enforcement of the measures described in subparagraph (A), and*	•Ark. Code Ann. § 8-4-203(a)(1) authorizes ADEQ to issue, continue in effect, revoke, modify, or deny permits to prevent, control, or abate pollution. Ark. Code Ann. § 8-4-311 (a)(1) empowers ADEQ to develop and effectuate a comprehensive program for the prevention and control of all sources of air pollution in the State of

construction of stationary sources and a permit program	*regulation of the modification and construction of any stationary source within the areas covered by the plan as necessary to assure that national ambient air quality standards are achieved, including a permit program as required in parts C and D;*	Arkansas. •Chapter 4 of APC&EC Regulation No. 19 describes the regulation and permitting of the operation, modification, and construction of minor stationary sources. •Chapter 9 of APC&EC Regulation No. 19 authorizes enforcement of regulations governing the prevention of significant deterioration (PSD) of air quality and regulations governing the protection of visibility in mandatory Federal Class I areas. •Ark. Code Ann. § 8-4-311(a)(10) empowers ADEQ to make, issue, modify, revoke, and enforce orders prohibiting, controlling, or abating air pollution and requiring the adoption of remedial measures to prevent, control, or abate air pollution. •Ark .Code Ann. § 8-4-311(a)(7) empowers ADEQ to administer and enforce all laws and regulations relating to pollution of the air. •ADEQ has a complete EPA-approved PSD permitting program in place covering the required elements for all regulated New Source Review (NSR) pollutants. No changes to the PSD program are necessary to implement the 2015 ozone NAAQS.
110(a)(2)(D)(i) Interstate transport provisions	*contain adequate provisions- (i) prohibiting, consistent with the provisions of this title, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will- (I) contribute significantly to*	•APC&EC Reg. 19.402 states the following: "No permit shall be granted or modified under this chapter unless the owner/operator demonstrates to the reasonable satisfaction of ADEQ that the stationary source will be constructed or modified to operate without resulting in a violation of applicable portions of this regulation or without interfering with the attainment or maintenance of a national ambient air quality standard." APC&EC Reg. 19.402 is consistent with these requirements as it is an Arkansas promulgated regulation that applies to all stationary sources in Arkansas. •All new major sources and major modifications are subject to a comprehensive EPA-approved prevention of significant deterioration permitting program. Chapter 9

	nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or (II) interfere with measures required to be included in the applicable implementation plan for any other State under part C to prevent significant deterioration of air quality or to protect visibility,	of APC&EC Regulation No. 19 authorizes enforcement of regulations governing the prevention of significant deterioration of air quality and regulations governing the protection of visibility in mandatory Federal Class I areas. •Arkansas is currently subject to the Regional Haze Rule, which addresses visibility-impairing pollutants. Arkansas's prevention of significant deterioration program is used to further protect visibility. •Other interstate transport obligations relevant to prong1 (significant contribution to nonattainment), prong 2 (interference with maintenance), and prong 4 (visibility transport) are addressed in a separate SIP narrative included with this submission.
110(a)(2)(D)(ii) Interstate and International pollution abatement	*contain adequate provisions- (ii) insuring compliance with the applicable requirements of sections 126 and 115 (relating to interstate and international pollution abatement)*	•Ark. Code Ann. § 8-4-311(a)(8) authorizes ADEQ to represent the State in all matters pertaining to the plans, procedures, or negotiations for interstate compacts in relation to air pollution control. •Based on information gathered from ADEQ's permit database, ADEQ concludes that the limited amount of point and area source ozone emissions do not preclude the State from ensuring compliance with CAA § 126 and § 115. There are no final findings under § 115 of the CAA against Arkansas with respect to the 2015 ozone NAAQS. •All new major sources and major modifications are subject to a comprehensive EPA-approved PSD permitting program. Chapter 9 of APC&EC Regulation No. 19

		authorizes enforcement of regulations governing the prevention of significant deterioration of air quality and regulations governing the protection of visibility in mandatory Federal Class I areas. •APC&EC Reg. 19.903 describes the notification required when dealing with a major new source or major modification.
110(a)(2)(E)(i) Adequate personnel, funding and authority to carry out plan, (ii) Comply with state boards, (iii) Oversee local and regional governments/ agencies	*provide (i) necessary assurances that the State (or, except were the Administrator deems inappropriate, the general purpose local government or governments, or a regional agency designated by the State or general purpose local government for such purpose) will have adequate personnel, funding, and authority under State (and, as appropriate, local) law to carry out such implementation plan (and is not prohibited by any provision of Federal or State law from carrying out such*	•Ark. Code Ann. § 8-1-103(1)(A) grants ADEQ and APC&EC the authority to establish by regulation, reasonable fees for initial issuance, annual review, and modification of permits. •Under Ark. Code Ann. § 8-1-103(3) and § 8-1-103(5), ADEQ is authorized to collect the fees established by APC&EC and shall deny the issuance of an initial permit, a renewal permit, or a modification permit if and when a facility fails or refuses to pay the fees after reasonable notice. •Ark. Code Ann. § 8-1-202(b)(2)(D) states that duties of the Director of ADEQ include the day-to-day administration of all activities that ADEQ is empowered by law to perform, including, but not limited to, the employment and supervision of such technical, legal, and administrative staff, within approved appropriations, as is necessary to carry out the responsibilities vested with ADEQ. •APC&EC Regulation No. 9, Fee Regulation, Chapter 5, contains the air permit fees applicable to non-part 70 permits, part 70 permits, and general permits. •APC&EC Reg. 19.301 gives ADEQ the responsibility of meeting all applicable regulations and requirements contained in the CAA, as amended, if any area of the State is determined to be in violation of the NAAQS. •APC&EC Reg. 19.410 gives ADEQ the authority to revoke, suspend, or modify any permit for cause.

	implementation plan or portion thereof), (ii)requirements that the State comply with the requirements respecting State boards under section 128, (iii) necessary assurances that where the State has relied on a local or regional government, agency, or instrumentality for the implementation of any plan provision, the State has responsibility for ensuring adequate implementation of such plan provision;	•The requirements of §110(a)(2)(E)(ii) are not entirely applicable because permit and enforcement orders are issued directly by ADEQ, not approved by state boards or commissioners. •Under APC&EC Reg. 8.202, the Director or the Director's delegate shall issue all permits with nothing in APC&EC Regulation No. 8 being construed to authorize APC&EC to issue a permit, including the power to reverse or affirm a permitting decision by the Director. •APC&EC Regulation No. 8, Chapter 4, highlights that APC&EC does not play a leading role in approving enforcement actions. •Under Ark. Code Ann. § 21-8-1001, no member of a state board or commission or board member of an entity receiving state funds shall participate in, vote on, influence or attempt to influence an official decision if the member has a pecuniary interest in the matter under consideration by the board, commission, or entity. In addition, no member of a state board or commission or board member of an entity receiving state funds shall participate in any discussion or vote on a rule or regulation that exclusively benefits the member. •Arkansas does not rely on local agencies for specific SIP implementation. The requirements of §110(a)(2)(E)(iii) are not applicable.
110(a)(2)(F) Stationary source emissions monitoring and reporting system	*require, as may be prescribed by the Administrator-- (i) the installation, maintenance, and replacement of equipment, and the implementation of other*	•Regulatory requirements pertaining to sampling, monitoring, and reporting are codified in APC&EC Regulation No. 19, Chapter 7. •APC&EC Reg. 19.705 provides the record keeping and reporting requirements for stationary sources subject to APC&EC Regulation No. 19. APC&EC Reg. 19.705 outlines how records of air emissions are to be maintained and how information and data should be submitted to ADEQ.

	necessary steps, by owners or operators of stationary sources to monitor emissions from such sources, (ii) periodic reports on the nature and amounts of emissions and emissions-related data from such sources, and (iii) correlation of such reports by the State agency with any emission limitations or standards established pursuant to this Act, which reports shall be available at reasonable times for public inspection;	•APC&EC Reg. 19.702 provides guidelines and timelines for air emissions sampling necessary to enable Arkansas to determine whether the sources are in compliance. •Enforceable emission limitations and other control measures are covered in the Arkansas Water and Air Pollution Control Act and those provisions of Ark. Code Ann. §§ 8-4-310 and 8-4-311. Elements of the program for enforcement are found in the monitoring, recordkeeping, and reporting requirements for sources in these control measures as well as individual SIP permits. •APC&EC Reg. 19.703 requires any stationary source subject to this regulation to install, calibrate, operate, and maintain equipment to continuously monitor or determine federally regulated air pollutant emissions in accordance with federal specification and in accordance with any joint specifications outlined by ADEQ, with the concurrence of EPA. •APC&EC Reg. 19.701 states that ADEQ will use any credible evidence based on sampling, monitoring, and reporting, to determine violations of applicable emissions limitations. •Under Ark. Code Ann. § 8-4-311(a)(2), ADEQ has the power to advise, consult, and cooperate with the federal government, including EPA Region 6 administrator. Arkansas submits emission inventory data annually to EPA for inclusion in the National Emissions Inventory. •APC&EC Reg. 19.706 requires public availability of emissions data.
110(a)(2)(G) Authority to declare air pollution emergency and	*provide for authority comparable to that in section 303 and adequate contingency plans to implement such*	•Ark. Code Ann. § 8-1-202(b)(2)(C) empowers the Director of ADEQ to issue orders under circumstances that reasonably require emergency measures to be taken to protect the environment or the public health and safety. APC&EC Reg. 8.502 gives the Director the ability to issue an Emergency Order when necessary to meet an emergency or situation of imminent hazard. APC&EC Reg. 8.502 requires the

notify public	*authority;*	Director to publish a Notice of Emergency Order in a newspaper covering the affected area, or in a newspaper of statewide circulation. The notice must contain a description of the action, ADEQ's authority for taking the action, and other information appropriate to ensure the public is informed about the action. •Ark. Code Ann. § 8-4-202(e)(1) empowers APC&EC to declare an emergency and implement emergency rules, regulations, suspensions, or moratoria on categories or types of permits if APC&EC determines that imminent peril to the public health, safety, or welfare requires immediate change in the rules or immediate suspension or moratorium on categories or types of permits. •APC&EC Reg. 8.807 authorizes APC&EC to waive or reduce the notice requirements in cases involving emergency rulemaking. No emergency rule shall be effective for more than one hundred eighty (180) days unless allowed by law.
110(a)(2)(H) Future SIP revisions	*provide for revision of such plan- (i) from time to time as may be necessary to take account of revisions of such national primary or secondary ambient air quality standard or the availability of improved or more expeditious methods of attaining such standard, and (ii) except as provided in paragraph (3)(C), whenever the*	•APC&EC Regulation No. 19, Chapter 1, provides a clear delineation of those regulations that are promulgated by APC&EC in satisfaction of certain requirements of the CAA, including making ADEQ responsible for administering the attainment and maintenance of the NAAQS. •Ark. Code Ann. § 8-4-311(a)(7) empowers ADEQ to administer and enforce all laws and regulations relating to pollution of the air. •Ark. Code Ann. § 8-4-202(d)(4)(A)(ii) authorizes APC&EC to refer to the Code of Federal Regulations for any APC&EC standard or regulation that is identical to a regulation promulgated by EPA. •Under APC&EC Regulation No. 19, Chapter 3, ADEQ is charged with the protection of the NAAQS. According to APC&EC Reg. 19.301, if any area of the State is determined to be in violation of the NAAQS, all applicable requirements contained in the CAA, as amended, and all regulations promulgated thereto shall be

	Administrator finds on the basis of information available to the Administrator that the plan is substantially inadequate to attain the national ambient air quality standard which it implements or to otherwise comply with any additional requirements established under this Act;	met by ADEQ.
110(a)(2)(I) Nonattainment areas (interstate transport)	*in the case of a plan or plan revision for an area designated as a nonattainment area, meet the applicable requirements of part D (relating to nonattainment areas);*	•All Arkansas counties have been designated as attainment/unclassifiable for the 2015 ozone NAAQS (82 FR 54232). In addition, nonattainment area plans required under part D are on a different schedule from the section 110 infrastructure elements.
110(a)(2)(J) (§ 121 consultation), (§127 public notification), PSD and visibility	*meet the applicable requirements of section 121 (relating to consultation), meet the applicable requirements of section 127 (relating to public notification),*	•Ark. Code Ann. § 8-4-301(b) prescribes a method of utilizing the program for the control of air pollution. Under Ark. Code Ann. § 8-4-301(b), the program shall be undertaken in a progressive manner, and each of its successive objectives shall be sought to be accomplished by a maximum of cooperation and conciliation among all the parties concerned. In addition, Ark. Code Ann. § 8-4-302 reiterates Ark. Code Ann. § 8-4-301(b) by affirming that the purpose is to safeguard the air resources of the State by controlling or abating air pollution that exists and preventing new air

protection	*meet the applicable requirements of part C (relating to prevention of significant deterioration of air quality and visibility protection);*	pollution under a program which shall be consistent with the declaration of policy stated in Ark. Code Ann. § 8-4-301 and with Ark. Code Ann. Title 8, Chapter, 4, Subchapter 3. •All SIP revisions in Arkansas undergo public notice and provide the opportunity for a hearing. This provides for comment by the public. •Air quality data from Arkansas's monitoring network is published on ADEQ's website. Additionally, Arkansas is required to submit monitoring data to the Air Quality System in a timely manner. •Ark. Code Ann. § 8-4-311(a)(6) encourages voluntary cooperation by the people, municipalities, counties, industries, and others in preserving and restoring the purity of the air within the State. •The public is notified of concentrations that exceed the NAAQS from the ADEQ website (https://www.adeq.state.ar.us/techsvs/air_chem_lab/) that contains hourly concentrations taken from monitoring sites throughout the State and the Air Quality Index for the Little Rock and Springdale metropolitan areas. This index displays which sensitive groups are at greater risk from each pollutant. •These monitoring sites also upload data to EPA's AirNow website, which provides data to a broader section of the public and includes links to help the public understand what they can do to keep their air clean. •Under APC&EC Regulation No. 19, Chapter 9, Arkansas has incorporated by reference the requirements in 40 C.F.R. Part 52 for PSD in their entirety, with the exception of 40 C.F.R. §§ 52.21(b)(2)(iii)(a), 52.21(b)(49), 52.21(b)(50), 52.21(b)(55-58), 52.21(i) and 52.21(cc). These incorporated provisions were approved by EPA as part of the SIP. These incorporated provisions also provide for protection of visibility in Federal Class I areas.

		•All new major sources and major modifications are subject to a comprehensive EPA-approved PSD permitting program, including GHG PSD permitting approved on April 2, 2013 (78 FR 19596) and $PM_{2.5}$ PSD permitting approved on March 4, 2015 (80 FR 11573). Chapter 9 of APC&EC Regulation No. 19 authorizes enforcement of regulations governing the prevention of significant deterioration of air quality and regulations governing the protection of visibility in mandatory Federal Class I areas. •The visibility subelement of Element J is not being addressed because EPA stated in their September 13, 2013 "Guidance on Infrastructure State Implementation Plan (SIP Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2)"[2] that they believe that there are no newly applicable visibility protection obligations pursuant to Element J after the promulgation of a new or revised NAAQS.
110(a)(2)(K) Air quality modeling/data	*provide for- (i) the performance of such air quality modeling as the Administrator may prescribe for the purpose of predicting the effect on ambient air quality of any emissions of any air pollutant for which the Administrator has established a national ambient air quality standard, and (ii)*	•APC&EC Regulation No. 19, Chapter 3, outlines that ADEQ is responsible for ambient air monitoring and computer modeling of regulated air pollutant emissions in any area that can reasonably be expected to be in excess of the NAAQS and review of the ambient air impacts of any new or modified source of federally regulated air emission that is the subject of the requirements of this Plan. See APC&EC Reg. 19.302(A) and (B). Under APC&EC Reg. 19.302 (B), all computer modeling shall be performed using EPA-approved models, and using averaging times commensurate with averaging times stated in the NAAQS. •ADEQ has the ability to submit data related to air quality modeling to the Administrator under Ark. Code Ann. § 8-4-311 (a)(2) which gives ADEQ the power to advise, consult, and cooperate with the federal government.

[2] EPA Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 11(a)(2), September 13, 2013.

	the submission, upon request, of data related to such air quality modeling to the Administrator;	
110(a)(2)(L) Major Stationary source permitting fees	*require the owner or operator of each major stationary source to pay to the permitting authority, as a condition of any permit required under this Act, a fee sufficient to cover- (i) the reasonable costs of reviewing and acting upon any application for such a permit, and (ii) if the owner or operator receives a permit for such source, the reasonable costs of implementing and enforcing the terms and conditions of any such permit (not including any court costs or other costs associated with any enforcement action),*	•The fee requirements of APC&EC Regulation No. 26, Chapter 11, were approved by EPA as meeting the CAA requirements and were incorporated in Arkansas's SIP. Arkansas's Title V operating permit program was approved by EPA October 9, 2001 (66 FR 51313). •ADEQ has the authority to adjust the fee as necessary using its rulemaking authority. APC&EC Regulation No. 9, Chapter 5, contains the air permit fees applicable to non-part 70 permits, part 70 permits, and general permits. Revisions to air permitting fee in Chapter 5 were approved by EPA on April 30, 2015 (80 FR 24216).

	until such fee requirement is superseded with respect to such sources by the Administrator's approval of a fee program under title V; and	
110(a)(2)(M) Consultation/ Participation by affected local entities	*provide for consultation and participation by local political subdivisions affected by the plan.*	•Pursuant to APC&EC Regulation No. 8, Arkansas will continue to provide for consultation and participation from those affected by the SIP. Under APC&EC Regulation No. 8, those organizations affected by the SIP will be able to participate in developing the SIP via comments and potential public hearings. ADEQ is the sole state-level enforcer and implementer of the SIP. See APC&EC Reg. 8.205 *Public Notice of Permit Application*; APC&EC Reg. 8.206 *Request for Public Hearing on Application for Permit*; APC&EC Reg. 8.207 *Public Notice of Draft Permitting Decision*; APC&EC Reg. 8.208 *Public Comment on Draft Permitting Decision*; APC&EC Reg. 8.209 *Public Hearings*; APC&EC Reg. 8.405 *Public Notice of Notices of Violations and Consent Administrative Orders*; APC&EC Reg. 8.801 *Public Notice of Rulemaking.* •ADEQ participates in the Central States Air Resources Agencies, which is an organization of states, tribes, federal agencies, and other interested parties concerned with air quality. The interactions and public participation on rule and plan development play a role in satisfying the requirements of § 110(a)(2)(M).

Office of Air Quality

Arkansas State Implementation Plan Revision

2015 Ozone National Ambient Air Quality Standard – Interstate Transport

Final

October 2019

Arkansas Department of Energy and Environment
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72113

Executive Summary

The purpose of this state implementation plan (SIP) revision is to meet the requirements of the Clean Air Act §110(a)(2)(D) regarding interstate transport for the 2015 seventy part per billion (ppb) ozone national ambient air quality standard (NAAQS). This SIP revision demonstrates that the Division of Environmental Quality (ADEQ) of the Arkansas Department of Energy and Environment has the authority to implement measures to meet the state's interstate transport obligations and includes a rigorous analysis of Arkansas's air quality impacts on downwind states with respect to both the 2015 ozone NAAQS and transport of visibility impairing pollutants.

ADEQ's analysis indicates that Arkansas is linked to one 2023 projected maintenance area for the 2015 ozone NAAQS—Allegan County, MI—and no 2023 projected nonattainment areas. An analysis of a decade of wind back-trajectories from Allegan County on elevated ozone days indicates that the linkage to Arkansas is neither consistent nor persistent. In addition, Arkansas's largest sources of the ozone precursor nitrogen oxides, power plants, have already installed cost-effective NOx controls. Arkansas has also reduced emissions of visibility-impairing pollutants in neighboring Class I areas to a greater extent than assumed in those states' Regional Haze SIPs. Thus, ADEQ concludes based on the results of the analysis included in this SIP revision that no new control measures are necessary to satisfy interstate transport obligations for the 2015 ozone NAAQS. Arkansas's Clean Air Act §110(a)(2)(D) obligations for the 2015 ozone NAAQS, as well as visibility transport obligations for all NAAQS are satisfied with existing State and federally enforceable measures.

Table of Contents

Tables

Figures

I. Introduction

A. Arkansas State Implementation Plan Revision

The Arkansas Division of Environmental Quality (ADEQ) of the Arkansas Department of Energy and Environment is submitting for EPA approval a demonstration that, with the changes to Regulation No. 19 included in this SIP Revision, Arkansas has fully addressed its interstate transport obligations with respect to the 2015 ozone NAAQS for Arkansas.

On October 26, 2015, EPA revised the eight-hour primary and secondary standards for ozone from seventy-five parts per billion (ppb) to seventy ppb. The enclosed state implementation plan (SIP) revision satisfies requirements under Clean Air Act §110(a)(2)(D)(i) for the revised ozone standard (80 FR 65292).

The primary and secondary ozone standards adopted in Arkansas Pollution Control Ecology Commission (APC&EC or "the Commission") Regulation No. 19 and included in this SIP submission are identical to federal standards; therefore, the demonstration required under Ark. Code. Ann. § 8-4-317(b)(1)(C)(i) is satisfied by reference to the applicable federal regulation: "National Ambient Air Quality Standards for Ozone" (80 FR 65292, October 26, 2015)

In addition, this SIP revision, if approved, addresses visibility transport obligations for the 2006 and 2012 $PM_{2.5}$ NAAQS; 2008 Ozone NAAQS, 2010 SO_2 NAAQS, and 2010 NO_2 NAAQS.

B. Arkansas SIP Components Included in this Revision

ADEQ requests that EPA approve revisions to the following provisions in APC&EC Regulation No. 19, into the SIP:

- Chapter 2 – *Definitions*
  - Definition of "National Ambient Air Quality Standard"
- Appendix B – *National Ambient Air Quality Standards List*

ADEQ filed amendments to APC&EC Regulation No. 19 with the Commission to initiate a rulemaking on September 14, 2018. The Commission initiated the rulemaking on the proposed amendments on September 28, 2018. Judge Charles Moulton conducted a public hearing on November 16, 2018, and written comments on the proposed amendments to Regulation No. 19 were accepted between October 3, 2018 and November 30, 2018. No written or oral comments regarding the proposed amendments to APC&EC Regulation No. 19 were received during the public comment period. The Commission adopted the amendments to APC&EC Regulation No. 19 on September 27, 2019.

ADEQ proposed this SIP revision on April 14, 2019. A public hearing was held on May 20, 2019, and written comments on the proposed SIP revision were accepted between April 14, 2019 and May 20, 2019. ADEQ received two comments on the proposed SIP. ADEQ made changes to this final SIP revision narrative in response to comments received and to correct typographical errors. No changes to control strategies or requirements for regulated emissions sources were made in response to comments received. The comments are addressed and the corresponding changes to the proposed SIP revision narrative are described in the "Responsive Summary for State Implementation Plan Revision: Arkansas State Implementation Plan Revision: 2015 Ozone National Ambient Air Quality Standard—Interstate Transport," which has been included with this submission.

The changes to SIP-approved provisions included in APC&EC Regulation No. 19 are consistent with and allowable under federal programs.

Sources affected by these program revisions are found throughout the State.

No substantive revisions have been made to the emission limitations, work practice standards, or the recordkeeping/reporting requirements portions of the program at this time.

Furthermore, ADEQ's existing compliance and enforcement strategies will remain in place.

C. Background

Clean Air Act § 109 requires EPA to set NAAQS for pollutants considered be harmful to public health and the environment. EPA has set NAAQS for six principal pollutants—called "criteria" pollutants. Regulatory information about the NAAQS is found in Code of Federal Regulations, Title 40, Part 50 (40 C.F.R. Part 50). Table 1 below provides the list of current NAAQS. EPA sets two types of NAAQS:

1. Primary NAAQS are limits set to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly.
2. Secondary NAAQS are limits set to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Table 1: Current National Ambient Air Quality Standards

Pollutant [final rule citation]	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]	primary	8-hour	9 parts per million (ppm)	Not to be exceeded more than once per year
		1-hour	35 ppm	

Pollutant [final rule citation]		**Primary/ Secondary**	**Averaging Time**	**Level**	**Form**
Lead [81 FR 71906, October 8, 2016]		primary and secondary	Rolling 3 month average	0.15 micrograms per cubic meter ($\mu g/m^3$)	Not to be exceeded
Nitrogen Dioxide [77 FR 20218, April 3, 2012]		primary	1-hour	100 parts per billion (ppb)	98th percentile of one-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual Mean
Ozone [80 FR 65292, October 26, 2015]		primary and secondary	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [78 FR 3086, Jan 15, 2013]	$PM_{2.5}$	primary	Annual	12.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		secondary	Annual	15.0 $\mu g/m^3$	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [77 FR 20218, April 3, 2012]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Under Clean Air Act §§ 110(a)(1) and 110(a)(2), each state is required to submit a SIP that provides for the implementation, maintenance, and enforcement of a revised primary or secondary NAAQS within three years after EPA promulgates a new or revised NAAQS. These SIPs must demonstrate how the state will meet the applicable requirements for each new and revised NAAQS. This type of SIP submission is commonly referred to as an "infrastructure SIP."

The national and state infrastructure reports contain the status of the state submissions to meet the requirements and EPA's actions on the submissions.[1] The required infrastructure elements tracked for each state are labeled in the report as:

- Section 110(a)(2)(A) Emission limits and other control measures
- Section 110(a)(2)(B) Ambient air quality monitoring/data system
- Section 110(a)(2)(C) Program for enforcement of control measures
- Section 110(a)(2)(D)(i)(I) Prong 1: Interstate transport – prohibiting significant contribution
- Section 110(a)(2)(D)(i)(I) Prong 2: Interstate transport – prohibiting interference with maintenance
- Section 110(a)(2)(D)(i)(II) Prong 3: Interstate transport – prevention of significant deterioration
- Section 110(a)(2)(D)(i)(II) Prong 4: Interstate transport – protect visibility
- Section 110(a)(2)(D)(ii) Interstate and international pollution abatement
- Section 110(a)(2)(E) Adequate authority and resources
- Section 110(a)(2)(F) Stationary source monitoring system
- Section 110(a)(2)(G) Emergency power
- Section 110(a)(2)(H) Future SIP revisions
- Section 110(a)(2)(J) Consultation with government officials; Public notification; PSD and visibility protection
- Section 110(a)(2)(K) Air quality modeling/data
- Section 110(a)(2)(L) Permitting fees
- Section 110(a)(2)(M) Consultation/participation by affected local entities

ADEQ is addressing Section 110(a)(2)(A)–110(a)(2)(C) and Section 110(A)(2)(D)(ii)–Section 110(a)(2)(M) in a separate narrative that is included with this SIP submission. This document addresses Section 110(A)(2)(D)(i)(I) and Section 110(A)(2)(D)(i)(II) requirements for interstate transport. Specifically, ADEQ demonstrates in this narrative that, if approved, Arkansas's SIP will contain adequate provisions that prohibit any source or other type of emissions activity within the State from emitting any air pollutant in amounts that will: (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to the 2015 ozone NAAQS, or (II) interfere with measures required to be included in the applicable implementation plan for any other state to prevent significant deterioration (PSD) of air quality or to protect visibility.

[1] State Infrastructure Reports: https://www3.epa.gov/airquality/urbanair/sipstatus/reports/map_i.html
National Infrastructure Reports: https://www3.epa.gov/airquality/urbanair/sipstatus/reports/idx_in.html

The following provisions of APC&EC Regulation No 19 form the basis of ADEQ's authority to satisfy interstate obligations for the 2015 Ozone NAAQS:

- APC&EC Reg. 19.402 states the following: "No permit shall be granted or modified under this chapter unless the owner/operator demonstrates to the reasonable satisfaction of ADEQ that the stationary source will be constructed or modified to operate without resulting in a violation of applicable portions of this regulation or without interfering with the attainment or maintenance of a national ambient air quality standard." Regulation No. 19, Chapter 11 incorporates by reference permit application process procedures for Part 70 sources contained in Regulation No. 26. All new major sources and major modifications are subject to a comprehensive EPA-approved PSD permitting program. Chapter 9 of APC&EC Regulation No. 19 authorizes enforcement of regulations governing the PSD of air quality and regulations governing the protection of visibility in mandatory Federal Class I areas.

In addition, ADEQ develops plans pursuant to the EPA Regional Haze Regulations to reduce visibility impairment in federal Class I areas in the State and plans for addressing the visibility impacts of sources in Arkansas impacting federal Class I areas in other states. Regional Haze SIPs are developed and submitted on a different schedule than NAAQS infrastructure and transport SIPs. Sections II–IV of this SIP revision, further explain how this SIP demonstrates how Arkansas's interstate transport obligations under Clean Air Act Section 110(a)(2)(D)(i) are satisfied for the 2015 Ozone NAAQS. In addition, ADEQ intends for Section IV to supersede the visibility transport element submittals included for the 2017 infrastructure SIP submittals for the 2006 and 2012 $PM_{2.5}$ NAAQS, 2008 ozone NAAQS, 2010 SO_2 NAAQS, and 2010 NO_2 NAAQS.

II. Prongs 1 and 2: Good Neighbor Provision

Clean Air Act Section 110(a)(2)(D)(i)(I), otherwise known as the Good Neighbor provision, requires that emissions in one state do not significantly contribute to nonattainment or interfere with maintenance of any NAAQS in any other state. Each state is required to develop and submit to the EPA a SIP that demonstrates that the state has adequate provisions in place to prohibit its own emissions from contributing to a NAAQS violation in any downwind state.

In, Sections II.A–D below, ADEQ explains the State's analysis of Arkansas's Good Neighbor obligations following a four-step framework consistent with EPA guidance and memoranda.[2,3,4,5,6] The four-step framework is as follows:

[2] Memorandum from Stephen D. Page, Director of the Office of Air Quality Planning and Standards, September 13, 2013, *Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2).* EPA Office of Air Quality Planning and Standards.

1) Identify downwind receptors that are expected to have problems attaining or maintaining the NAAQS;

2) Identify which upwind states contribute (or are "linked") to those downwind air quality problems to warrant further review and analysis;

3) Identifying air quality, cost, and emission reduction factors to be evaluated in a multifactor test to identify emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, if any; and,

4) Adopt permanent and enforceable measures needed to achieve the state's share of emission reductions necessary at downwind nonattainment or maintenance areas.

ADEQ bases its assessment of good neighbor obligations for Arkansas on the weight of evidence of photochemical modeling, wind parcel back-trajectories, air quality monitoring data, emissions, and control costs.

A. Identification of Downwind Air Quality Problems

In Sections II.A.1–3 of this narrative, ADEQ examines the results and performance statistics of photochemical modeling performed by EPA and other air quality agencies. Modeling typically forms the basis for identification of assessing potential contributions by upwind states to downwind air quality problems. These models use future emission estimates and historic meteorological data to project attainment status in 2023 of areas designated nonattainment for the 2015 ozone NAAQS. The results of these modeling efforts, particularly modeling by EPA, inform ADEQ's consideration of potential linkages between Arkansas and projected downwind nonattainment and maintenance areas discussed in Section II.B.

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https://www3.epa.gov/airquality/urbanair/sipstatus/docs/Guidance_on_Infrastructure_SIP_Elements_Multipollutant_FINAL_Sept_2013.pdf

[3] Memorandum from William T. Hartnett, Director of the Air Quality Policy Division, August 15, 2006, *Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-hour Ozone and PM2.s National Ambient Air Quality Standards*, EPA Office of Air Quality Planning and Standards. https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20060815_harnett_final_section_110(a)(2)(D)(i)_guidance.pdf

[4] Memorandum from Peter Tsirigotis , Director of the Office of Air Quality Planning and Standards, March 27, 2018, *Information on Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I).* EPA Office of Air Quality Planning and Standards. https://www.epa.gov/sites/production/files/2018-03/documents/transport_memo_03_27_18_1.pdf

[5] Memorandum from Peter Tsirigotis, Director of the Office of Air Quality planning and Standards, August 31, 2018, *Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards.* https://www.epa.gov/sites/production/files/2018-09/documents/contrib_thresholds_transport_sip_subm_2015_ozone_memo_08_31_18.pdf

[6] Memorandum from Stephen D. Page, Director, U.S. EPA Office of Air Quality Planning and Standards, to Regional Air Division Directors, Regions 1−10. October 27, 2017, *Supplemental Information on the Interstate Transport State Implementation Plan Submissions for the 2008 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I).* Available at https://www.epa.gov/sites/production/files/2017-10/documents/final_2008_o3_naaqs_transport_memo_10-27-17b.pdf

1. EPA 2023 Ozone NAAQS Projections

a. Model Assumptions and Resolution

EPA has provided photochemical modeling to help states address the requirements of Clean Air Act § 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS.[7] EPA's modeling used the Comprehensive Air Quality Model with extensions (CAMx) photochemical grid model at a 12-km grid resolution. For the base year, EPA used 2011 base year emissions inventory and meteorology for this modeling effort and 2009–2013 average and maximum ozone design values. For the future attainment year, EPA projected a 2023 emission inventory 2023 average and maximum ozone design values at individual ozone monitoring sites from state specific anthropogenic emissions and other contribution categories (i.e., Canada+Mexico, Offshore, Fire, and Biogenic). EPA used 2011 meteorology for modeling the 2023 future year. Based on this modeling, EPA provided source apportionment data indicating the relative contribution of each state to downwind receptors in the 2023 future year.

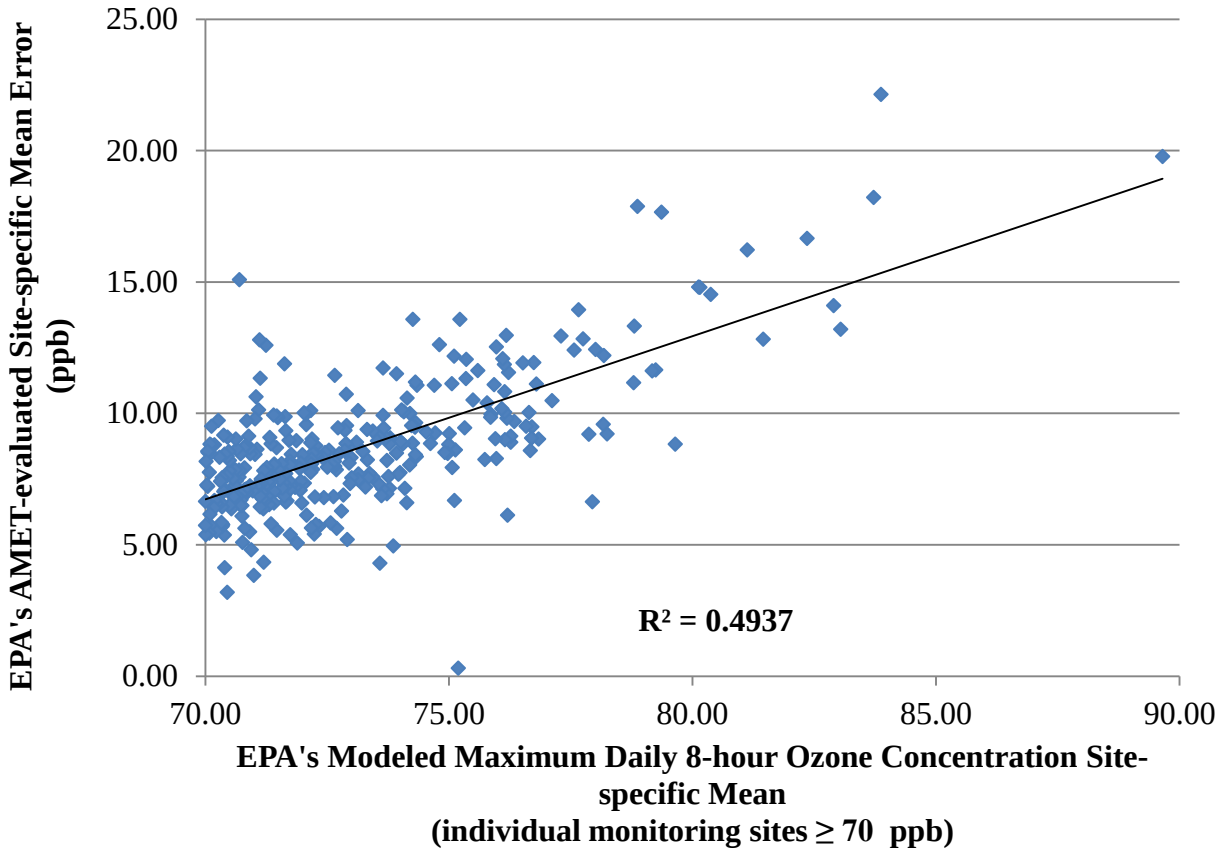
b. Model Performance

EPA used the Atmospheric Model Evaluation Tool (AMET) to statistically evaluate the ability of the CAMx v6.20 modeling system to simulate the 2011 measured ozone concentrations.[8] For the upper range of ozone concentrations (≥ 70 ppb), model mean error tends to increase with increasing ozone concentrations within the upper range of ozone concentrations as can be seen in EPA's statistical evaluation of their modeling simulation (Figure 1). ADEQ has taken the limitations noted above into consideration in its evaluation of ozone contribution along with the other evidence discussed in the sections below.

[7] Memorandum from Peter Tsirigotis , Director of the Office of Air Quality Planning and Standards, March 27, 2018, *Information on Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I).* EPA Office of Air Quality Planning and Standards. https://www.epa.gov/sites/production/files/2018-03/documents/transport_memo_03_27_18_1.pdf

[8] AQ Modeling TSD for the Final CSAPR Update

Figure 1: EPA updated 2011 CAMx model performance statistic: individual monitoring site-specific mean error[9]



2. Alternative 2023 Ozone NAAQS Projections

   a. Texas Commission on Environmental Quality

The Texas Commission on Environmental Quality (TCEQ) conducted photochemical modeling using some different assumptions than the EPA modeling for their Texas' 2015 ozone NAAQS transport SIP.[10] TCEQ's used a 2012 base year instead of 2011. TCEQ used the same 2023 future year. TCEQ explains the basis for their selection of 2012 as a base year on the existence of a robust modeling platform for the May 1 through September 30, 2012 time period that TCEQ developed as part of the Houston-Galveston Brazoria Attainment Demonstration SIP for the

[9] Data is from an EPA file (http://www.epa.gov/sites/production/files/2015-11/updated_2011_camx_performance_stats.xlsx.) that contains air quality model performance statistics for 8-hour daily maximum ozone for individual monitoring sites from the 2011eh base year model simulation performed by EPA in support of the updated ozone transport modeling for the 2008 ozone NAAQS.

[10] https://www.tceq.texas.gov/assets/public/comm_exec/agendas/comm/backup/Agendas/2018/03-07-2018/1762SIP.pdf

2008 eight-hour ozone NAAQS. In addition, TCEQ provided meteorological data suggesting that 2011 was a meteorologically anomalous year for Texas and surrounding states. At the time of TCEQ's analysis for their 2015 ozone infrastructure SIP submission, 2011 was the hottest year on record and the worst drought year recorded in Texas since 1895. As a result, Texas experienced unusually high ozone-inducing meteorological conditions in 2011. TCEQ argued that 2012 was a more meteorologically representative year, although most of the United States experienced higher-than-normal temperatures. This was true for Arkansas and for all but a few states in the southeastern U.S. as well. The results of the Texas modeling analysis indicated different linkages for Texas than the EPA modeling. The TCEQ modeling illustrates that choice of base year can result in a considerable difference in design value projections and ozone contribution calculations.

TCEQ used a weight of evidence approach to demonstrate that emissions from Texas do not significantly contribute to the monitors tagged by EPA's ozone contribution modeling for further analysis. Some of the factors considered, in addition to choice of a different base year for modeling, included examination of design value trends at linked monitors, current attainment status at those monitors, and variations in meteorological conditions that contribute to high ozone values at specific monitors. The conclusions drawn by TCEQ based on the analysis make it clear that a number of factors can influence whether or not model-simulated emissions indicate a significant contribution to ozone problems at downwind receptors.

b. Midwest Ozone Group

The Midwest Ozone Group (MOG) developed a technical support document[11] (MOG TSD) based on modeling performed by Alpine Geophysics that was intended to help inform states as they develop good neighbor SIPs for the 2015 ozone NAAQS. Alpine Geophysics used a 2011 base year and a 12-km grid resolution, supplemented by a 4-km modeling domain for two regions, the Mid-Atlantic region and the Lake Michigan region. The results projected attainment at all the monitors in 2023 with the exception of the Harford, Maryland monitor. Alpine Geophysics also used Ozone Source Apportionment Technology (OSAT) to provide information regarding expected 2023 NOx and VOC contributions from each emission source category (e.g, point sources, area sources, on-road sources, non-road sources, etc.) within the Mid-Atlantic region. The information presented in the MOG TSD suggests that the use of alternative modeling simulations, ozone apportionment tools, and/or significance levels may eliminate many projected downwind air quality "problems." The MOG TSD also suggests that existing regulations may address emission reduction obligations for many linkages.

[11] "Good Neighbor" Modeling Technical Support Document for 8-Hour Ozone State Implementation Plans, http://www.midwestozonegroup.com/files/FinalTSD-OzoneModelingSupportingGNSIPObligationsJune2018.pdf

3. Modeling Summary

ADEQ evaluated three separate modeling simulations with a different approach for each. Although ADEQ most heavily considered EPA's modeling, the varied approaches demonstrate that the use of alternative modeling protocols, including base year and grid resolution, can cause differences in design value projections and ozone concentration contributions. Table 2 below lists several monitoring sites in the Northeast and in Texas where different modeling protocols resulted in variations in future year average design values (DV_F). Therefore, ADEQ finds that further consideration of other evidence is necessary to support ADEQ's determination of interstate obligations for the 2015 ozone NAAQS.

Table 2: Average Future Year Design Values Resulting From Varying Modeling Protocols

AQS ID	County, State	2023 DV_F EPA modeling (ppb) Based on 2011 meteorology 12 km grid	2023 DV_F TCEQ modeling (ppb) Based on 2012 meteorology 12 km grid	2023 DV_F Midwest Ozone Group modeling (ppb) Based on 2011 meteorology 4 km grid
260050003	Allegan, MI	69.0	71	70.3
240251001	Harford, MD	70.9	65	71.1
360850067	Richmond, NY	67.1	62	69.6
361030002	Suffolk, NY	74.0	67	70.7
480391004	Brazoria, TX	74.0	78	*
484392003	Tarrant, TX	72.5	66	*

*Not included in data set

B. Identification of Arkansas Linkages to Downwind Air Quality Problems

1. Contribution Threshold

States use a contribution threshold in NAAQS transport plans to identify whether an upwind state contributes to downwind air quality problems in other states in amounts that warrant further review and analysis. Upwind states that impact a downwind receptor at or above the threshold are considered "linked" to that receptor. Whereas, upwind states with an impact at a downwind receptor below the threshold require no further analysis to demonstrate that the sources in the upwind state do not significantly contribute to nonattainment or interfere with maintenance at the downwind receptor. In the following sections, ADEQ describes its evaluation and adoption of an appropriate contribution threshold and, after applying that threshold, ADEQ then evaluates any potential linkages to Arkansas that exceed that threshold.

EPA historically used one percent of the NAAQS as the threshold to determine whether upwind sources potentially affect downwind receptors. In the case of the 2015 ozone NAAQS, a one percent threshold corresponds to 0.7 ppb. Many states, including Arkansas, Tennessee, North Carolina, Georgia, Texas, Utah, Wyoming, West Virginia and other groups, including the

Association of Air Pollution Control Agencies, have argued that the one percent of the NAAQS threshold is not an appropriate level to trigger linkage to downwind receptors.

In the "Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the Ozone 2015 National Ambient Air Quality Standards" [12] (Contributions Threshold Memo), EPA discusses the use of various contribution thresholds to determine whether emissions in upwind states contribute to nonattainment or interfere with maintenance at downwind receptors to such an extent as to warrant further analysis. The contribution analysis compares contribution thresholds of one percent of the NAAQS (0.7 ppb), one ppb, and two ppb. Results of the analysis indicate that using a one percent threshold captures about seventy-seven percent of all upwind contributions when summed across all receptors. Using a one ppb threshold captures approximately seventy percent of the total upwind contributions. Using a two ppb threshold captures about fifty-five percent of upwind contributions, which is a substantially lower amount than the one percent and one ppb thresholds. EPA concludes that it may be appropriate for States to use the one ppb threshold in determining whether the States potentially contribute significantly to downwind nonattainment and/or maintenance receptors because the contributions captured at the one percent and one ppb thresholds are generally comparable.

ADEQ also finds that a one ppb contribution threshold is appropriate for other reasons. First, EPA has recommended that states use a significant impact level (SIL) value of one ppb for determining whether a proposed PSD source causes or contributes to a violation of the corresponding NAAQS or PSD increments.[13] EPA and the states consider any impact below a SIL threshold insignificant. A contribution threshold is not the same as a significance level, but is sufficiently analogous for consideration. If a one ppb significance level is appropriate for evaluating whether a specific source is potentially contributing to nonattainment or interfering with maintenance of the NAAQS in nearby areas, application of the same threshold to an entire State is more conservative. Therefore, a SIL should be an appropriate screening threshold for interstate transport SIPs. Second, a one ppb threshold is consistent with the manufacturer-reported precision of federal reference monitors for ozone; whereas, a one percent threshold is lower than the listed accuracy.[14] Third, 40 CFR Part 50 Appendix U, "Interpretation of the

[12] Memorandum from Peter Tsirigotis, Director of the Office of Air Quality planning and Standards, August 31, 2018, Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards. https://www.epa.gov/sites/production/files/2018-09/documents/contrib_thresholds_transport_sip_subm_2015_ozone_memo_08_31_18.pdf

[13] Memorandum from Peter Tsirigotis, Director of the Office of Air Quality planning and Standards, April 17, 2018, Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program.

[14] The precision of the 2Btech 205 FRM ozone monitors have a listed accuracy of 1.0 ppb or 2% of the reading, whichever is greater, http://twobtech.com/model-205-ozone-monitor.html. The precision of the Thermo Scientific 49i ozone monitor is one ppb. https://tools.thermofisher.com/content/sfs/brochures/EPM-49i-Datasheet.pdf

Primary and Secondary National Ambient Air Quality Standards for Ozone" requires that average hourly ozone concentrations be reported in parts per million (ppm) with digits to the right of the third decimal place truncated.[15] Therefore, states would report a monitor value of 0.7 ppb (0.0007 ppm) as 0 ppb.

Based on EPA's Contribution Threshold Memo, the recommended SIL, and the requirements of Appendix U, ADEQ finds that a one ppb threshold is an appropriate contribution threshold to use to identify potential linkages that warrant further analysis.

2. Identification of Potential Linkages between Arkansas and Projected Nonattainment and Maintenance Sites based on EPA modeling

ADEQ's approach to identifying potential linkages is to apply the one ppb contribution threshold to sites that EPA projected to be nonattainment or maintenance in 2023 based on their modeling. Table 3 lists all sites that EPA identified as projected to have a 2023 average DV or 2023 maximum DV greater than 70.9 ppb. EPA considers sites matching these criteria to be projected nonattainment areas and projected maintenance areas, respectively. ADEQ ranked these sites by Arkansas' potential contribution, which EPA determined based on the daily eight-hour average contributions on the top ten concentration days in 2023. Based on a one ppb contribution threshold, ADEQ finds that there is one 2023 projected maintenance area—Allegan County, MI—and no 2023 projected nonattainment areas potentially linked to Arkansas.

Table 3: Downwind Receptors Identified in EPA's Modeling to Have Potential Future Ozone NAAQS Attainment or Maintenance Issues[16]

Site ID	State	County	2023 Avg DV_F	2023 Max DV_F	AR
260050003	Michigan	Allegan	69	71.7	1.64
482011039	Texas	Harris	71.8	73.5	0.99
480391004	Texas	Brazoria	74	74.9	0.90
484392003	Texas	Tarrant	72.5	74.8	0.78
481210034	Texas	Denton	69.7	72	0.58
482011034	Texas	Harris	70.8	71.6	0.54
551170006	Wisconsin	Sheboygan	72.8	75.1	0.51
550790085	Wisconsin	Milwaukee	71.2	73	0.40
482010024	Texas	Harris	70.4	72.8	0.29
261630019	Michigan	Wayne	69	71	0.27

[15] Appendix U to Part 50—Interpretation of the Primary and Secondary National Ambient Air Quality Standards for Ozone, https://www.ecfr.gov/cgibin/retrieveECFR?gp=&SID=a76aa3d5469629f1117c5e975fda1b0e&mc=true&n=pt40.2.50&r=PART&ty=HTML# ap40.2.50_119.u

[16] https://www.epa.gov/airmarkets/memo-and-supplemental-information-regarding-interstate-transport-sips-2015-ozone-naaqs

240251001	Maryland	Harford	70.9	73.3	0.17
90019003	Connecticut	Fairfield	73	75.9	0.13
90013007	Connecticut	Fairfield	71	75	0.13
361030002	New York	Suffolk	74	75.5	0.12
360810124	New York	Queens	70.2	72	0.09
90099002	Connecticut	New Haven	69.9	72.6	0.08
90010017	Connecticut	Fairfield	68.9	71.2	0.07
80590006	Colorado	Jefferson	71.3	73.7	0.03
80590011	Colorado	Jefferson	70.9	73.9	0.02
81230009	Colorado	Weld	70.2	71.4	0.02
80350004	Colorado	Douglas	71.1	73.2	0.01

At the Allegan County, MI ozone monitor site, EPA modeling predicted six days in 2023 where the ozone concentration would be greater than 70.9 ppb and Arkansas' contribution is equal to or greater than one ppb (Table 4). For comparison, Allegan County, MI experienced an annual average of 9.3 elevated ozone days per year during the period of 2008–2017.

Table 4: EPA's Model-predicted 2023 Maximum Daily Average 8-hour Ozone Contributions for Arkansas

Site ID	State	County	Month	Day	Year	2023 Modeled Maximum Daily Average 8-hour Ozone (> 70.9 ppb)	Arkansas Modeled Linked Contribution (≥ 1 ppb)
260050003	MI	Allegan	6	8	2023	78.84	6.91
260050003	MI	Allegan	7	2	2023	74.27	1.86
260050003	MI	Allegan	7	11	2023	71.38	1.14
260050003	MI	Allegan	7	18	2023	74.14	1.63
260050003	MI	Allegan	7	20	2023	72.45	1.00
260050003	MI	Allegan	7	24	2023	86.77	1.59

Based on EPA's 2023 projected maximum design value for Allegan County and Arkansas's predicted contribution, ADEQ finds that further analysis of the potential linkage between Arkansas and the Allegan County, MI ozone monitor site is warranted. In the sections below, ADEQ further assesses Arkansas's potential linkage to Allegan County, MI, including an assessment of the degree of certainty in the EPA's modeling relative to Arkansas's modeled contribution and wind patterns over a ten year period.

3. Modeled Linkage Performance Statistics for Allegan County, MI

Table 5 provides the EPA's CAMx model performance evaluation for eight-hour average ozone at the at the Allegan County, MI monitor.[17] At the Allegan County, MI ozone monitor site, EPA modeling suggests that Arkansas's contribution is 1.64 ppb, while the estimated mean error for this site is 8.39 ppb. While the mean error for the Allegan County, MI ozone monitor observations was higher than Arkansas's modeled contribution, the performance statistics are within acceptable ranges.

Table 5: 2011 CAMx Performance Statistics for Allegan County, MI Monitor (Site ID 260050003)

Statistical Measure	Value
Number of Observations ≥ 60 ppb	33
Observations Mean (ppb)	69.33
Model Mean (ppb)	69.84
Observations Median (ppb)	64.75
Model Median (ppb)	65.09
Mean Bias (ppb)	0.51
Mean Error (ppb)	8.39
Normalized Mean Bias	0.73
Normalized Mean Error	12.10
Fractional Bias	-0.2
Fractional Error	11.8
Correlation	0.56
R Squared	0.32
Standard Deviation Observations (ppb)	10.72
Standard Deviation Model (ppb)	14.58
Coefficient of Variation Observations	0.16
Coefficient of Variation Model	0.21
Index of Agreement	0.74
Root Mean Square Error (ppb)	12.15
Root Mean Square Error systematic (ppb)	2.55
Root Mean Square Error unsystematic (ppb)	11.88
Skewness Observations	0.93
Skewness Model	0.93

4. HYSPLIT Back-Trajectories

To further evaluate the potential linkage of Arkansas to Allegan County, MI, ADEQ assessed wind patterns on elevated ozone days—days with a maximum daily average eight-hour (MDA8)

[17] To download the 8-Hour Ozone Model Performance Statistics by Monitoring Site for the 2011 Base Year CAMx Model Simulation for the Final CSAPR Update: https://www.epa.gov/airmarkets/final-cross-state-air-pollution-rule-update

greater than 70.9 ppb—in Allegan County, MI. ADEQ used the National Oceanic and Atmospheric Administration (NOAA) Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model to evaluate wind back-trajectories from Allegan County, MI over a ten year period. The rationale for looking at an extended period of time is to gain a more complete picture of how Arkansas emissions might contribute to elevated ozone in Allegan County, MI, rather than relying entirely on EPA's modeling simulation, which is based on a single base year.

a. HYSPLIT Methods

ADEQ identified ninety-five elevated ozone days (MDA8 > 70.9 ppb) over the course of ten years (2008–2017) for the Allegan County, MI monitor.[18] Next, ADEQ identified the maximum eight-hour value within these elevated ozone days.[19] Using HYSPLIT, ADEQ ran seventy-two-hour back trajectories using the hour of the maximum eight-hour value for each elevated day as the back-trajectory start time. To consider the effects of vertical variations in wind flows on transport patterns, ADEQ used the following starting heights above ground level: 100m, 500m, 1000m, and 1500m. ADEQ obtained 40 km grid meteorological data for the back-trajectory analysis using Eta Data Assimilation System (EDAS) data.[20] In total, ADEQ ran 152 back-trajectories for each mixing height[21].

ADEQ filtered the back-trajectories to determine whether further analysis is warranted using two criteria. First, HYSPLIT calculates the mixing height for each hour along the trajectory and ADEQ filtered out back-trajectories that had a starting hour mixing height below the back-trajectory height of the HYSPLIT run because these air parcels would not have reached ambient air[22] at the Allegan County, MI monitor site. Second, ADEQ filtered out any back-trajectory that did not have a path through any portion of Arkansas

b. Evaluation of HYSPLIT-Linked Back-Trajectories

Table 6 summarizes the number of trajectories run, the trajectories that did not meet the filter criteria, and the remaining trajectories. After ADEQ applied the filter criteria, forty-one out of 608 back-trajectories (6.74%) remained from twenty-two out of the 95 elevated ozone days (23%) examined.

[18] https://www.airnowtech.org/

[19] If the same maximum eight-hour value occurred multiple times a day, ADEQ evaluated all incidences of the value for that day.

[20] EDAS is an intermittent data assimilation system that uses successive three-hour model forecasts to generate gridded meteorological fields that reflect observations covering the continental United States. EDAS is accessible at http://ready.arl.noaa.gov/edas40.php

[21] Mixing heights (m), defined as the height above ground level of the layer adjacent to the ground over which an emitted or entrained inert non-buoyant tracer will be mixed by turbulence.

[22] Ambient air is the "portion of the atmosphere, external to buildings, to which the general public has access." 40 CFR 50.1(e)

Table 6: 2008–2017 HYSPLIT Back-Trajectories from the Allegan County, MI Monitor on Elevated Ozone Days

2008–2017 HYSPLIT Back-Trajectories					
Monitor Site	**Total Elevated MDA8 Hours (≥ 71 ppb)[23]**	**Total Trajectories (152x4 Heights)**	**Step 1: Trajectories Filtered Out Based on Mixing Height < Starting Height**	**Step 2: Remaining Trajectories Filtered Out Based on Non-Arkansas Path**	**Remaining Linked Back-Trajectories**
Allegan Co., MI (ID 260050003)	152	608	335	232	41
			100m = 1	100m = 125	100m = 26
			500m = 51	500m = 87	500m = 14
			1000m = 135	1000m = 16	1000m = 1
			1500m = 148	1500m = 4	1500m = 0

ADEQ converted the remaining back-trajectories to geographic files that can be read by programs such as Google Earth or ArcGIS. These files enabled the characterization of the geographic location of each back-trajectory. Figures 2–37 display the back-trajectories that met the criteria for further analysis. Hereinafter, ADEQ refers to these back-trajectories as linked-backed trajectories.

[23] Some elevated days had more than one occurrence of the same maximum daily average eight-hour (MDA8) concentration, requiring multiple back-trajectory start times at each starting height to be simulated for a single day. For each start time, four back-trajectories starting heights were simulated (100m, 500m, 1000m, and 1500m).

Figure 2: Linked Back-Trajectory (100 m) (July 17, 2008 17:00 hours UTC)

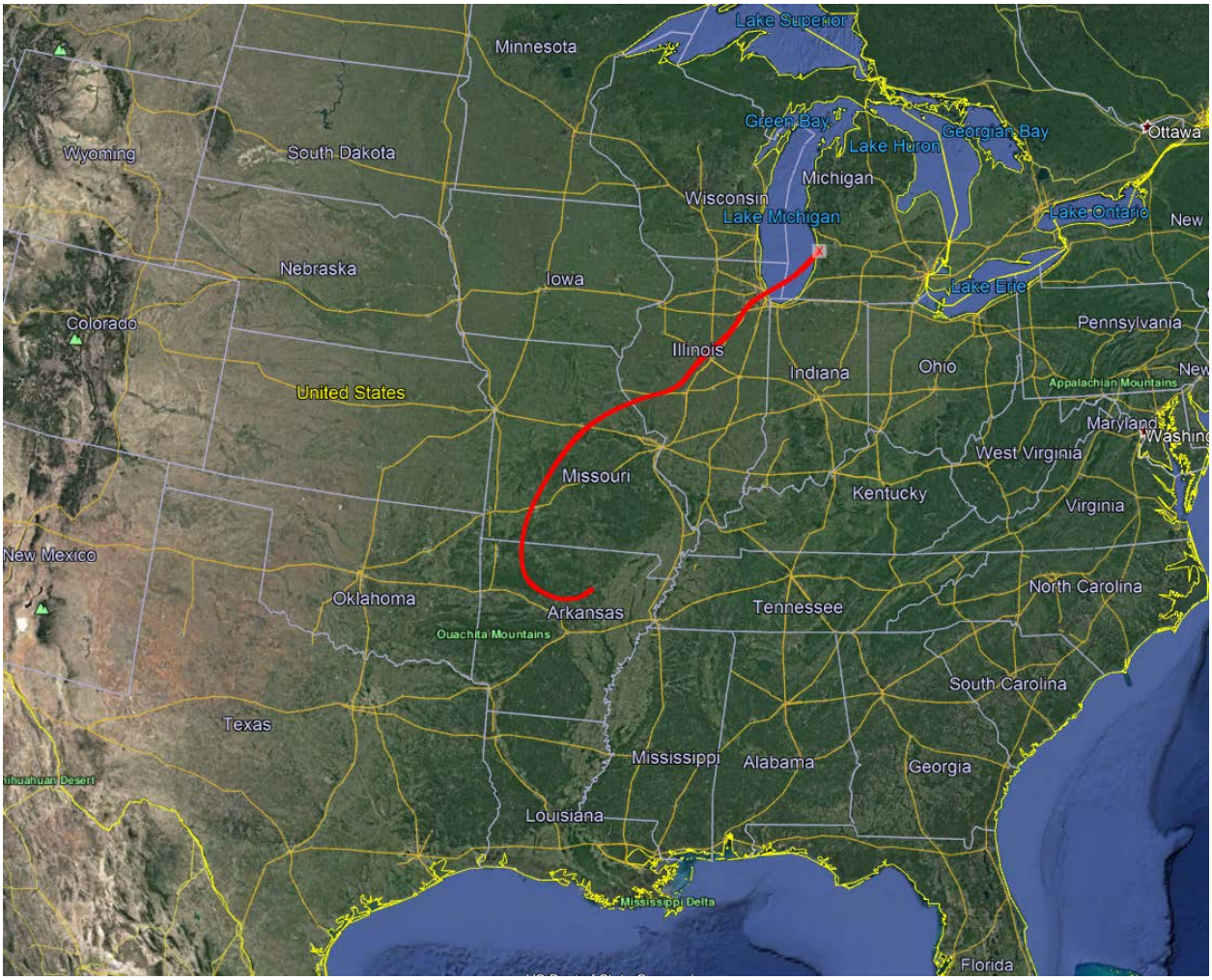


Figure 2 above depicts the seventy-two-hour trajectory of an air parcel where hour seventy-two began in northern Arkansas on July 14, 2008 and arrived at the Allegan County, MI ozone monitor on July 17, 2008. The air parcel had a residence time through Arkansas of nineteen out of the seventy-two hours included in the back-trajectory. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 3: Linked Back-Trajectory (500 m) (May 21, 2009 18:00 hours UTC)

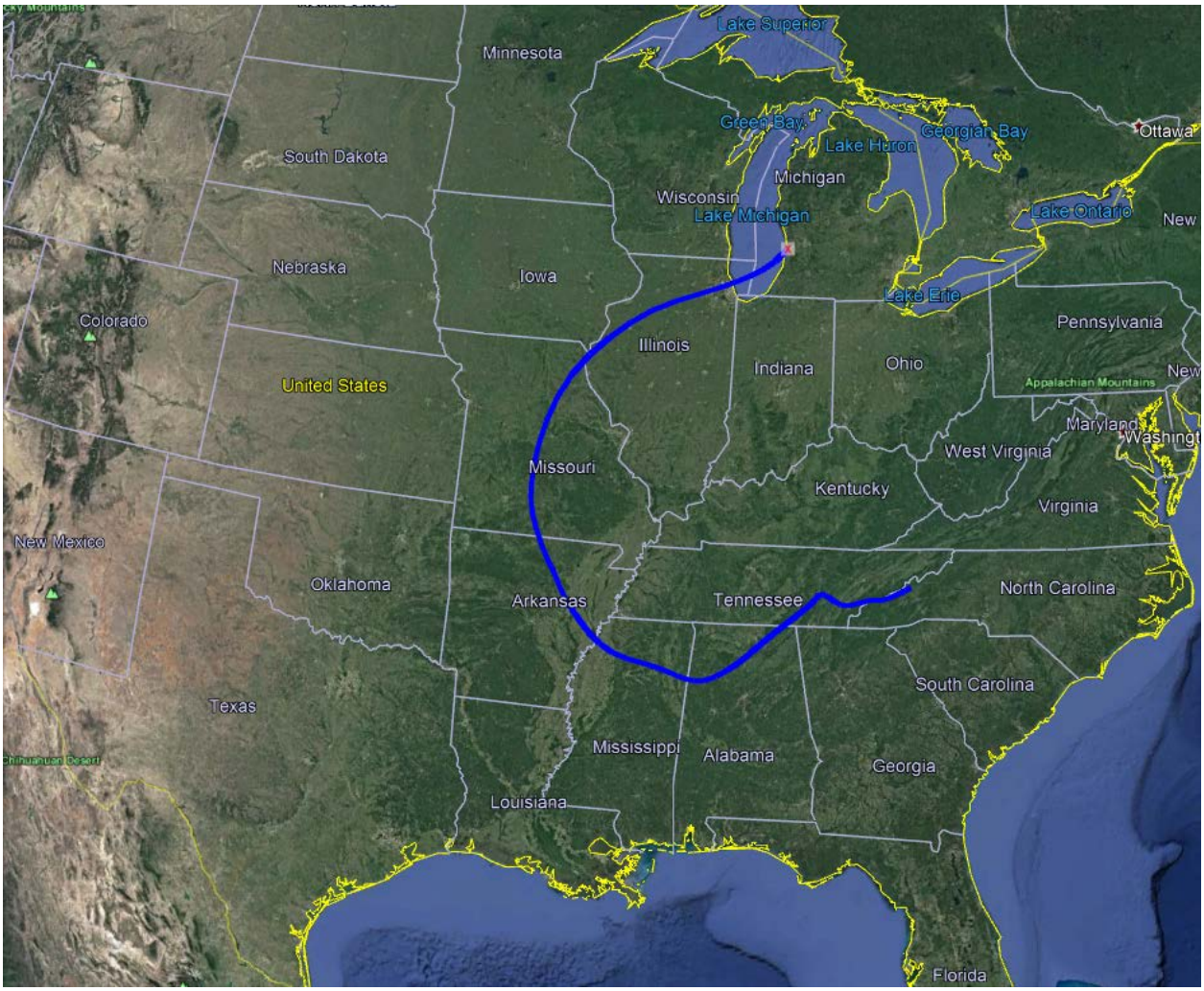


Figure 3 above depicts the trajectory of an air parcel that passed through northeastern Arkansas on May 20, 2009 and arrived at the Allegan County, MI ozone monitor on May 21, 2009. The air parcel had a residence time through Arkansas of fourteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through four other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two states, the Columbia, MO MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 4: Linked Back-Trajectory (500 m) (May 21, 2009 19:00 hours UTC)

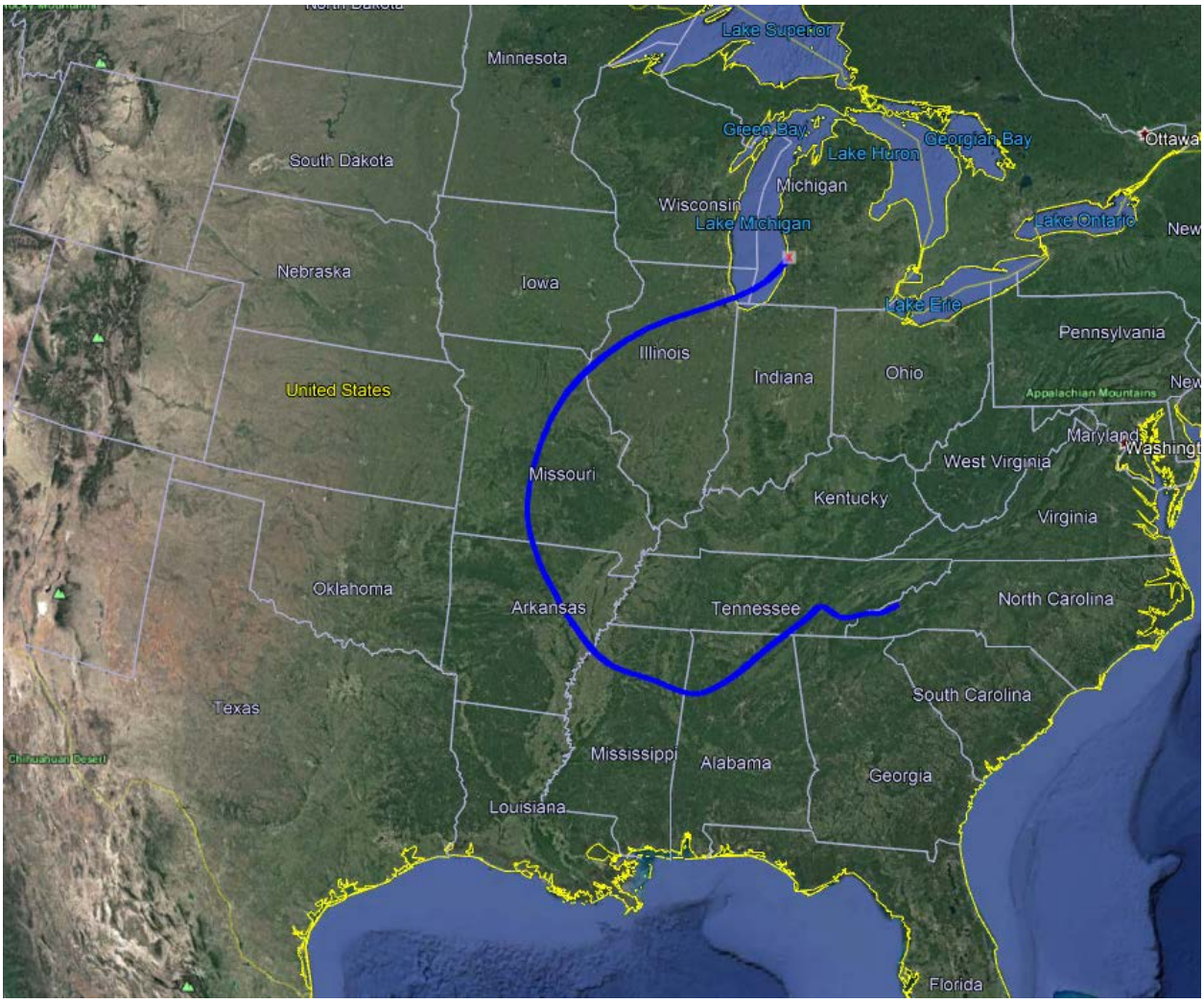


Figure 4 above depicts the trajectory of an air parcel that passed through northeastern Arkansas on May 20, 2009 and arrived at the Allegan County, MI ozone monitor on May 21, 2009. The air parcel had a residence time through Arkansas of twelve out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through four other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two states, the Columbia, MO MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 5: Linked Back-Trajectory (Red = 100 m; Blue = 500 m) (April 15, 2010 18:00 hours UTC)

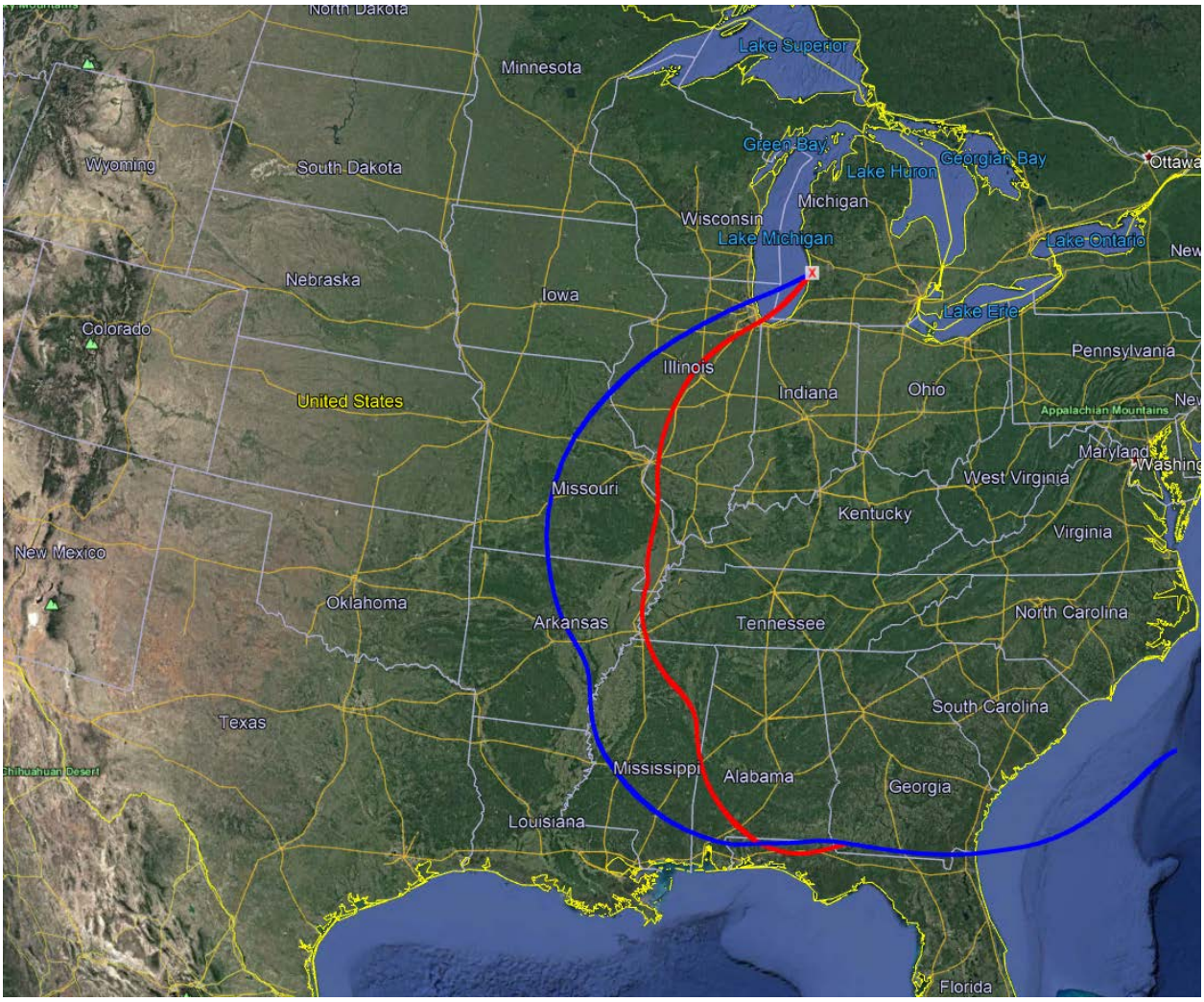


Figure 5 above depicts the trajectories of two air parcels traveling through Arkansas. The 100 m trajectory traveled along eastern Arkansas/western Tennessee through the Memphis, TN-MS-AR MSA on April 14, 2010 and had a residence time through Arkansas of four hours out of the seventy-two hours included in the back-trajectory. The 500 m trajectory had a residence time in Arkansas of twelve hours out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the 100 m air parcel passed through five states, and the Memphis TN-MS-AR MSA. The 500 m air parcel passed through four states and the Mobile AL, MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the 100 m air parcel passed through two states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA before arriving at the Allegan County, MI ozone monitor on April 15, 2010. The 500 m air parcel passed through two states and the Chicago-Naperville-Eglin, IL-IN-WI MSA before arriving at the Allegan County, MI ozone monitor on April 15, 2010.

Figure 6: Linked Back-trajectory (500 m) (July 6, 2010 16:00 hours UTC)

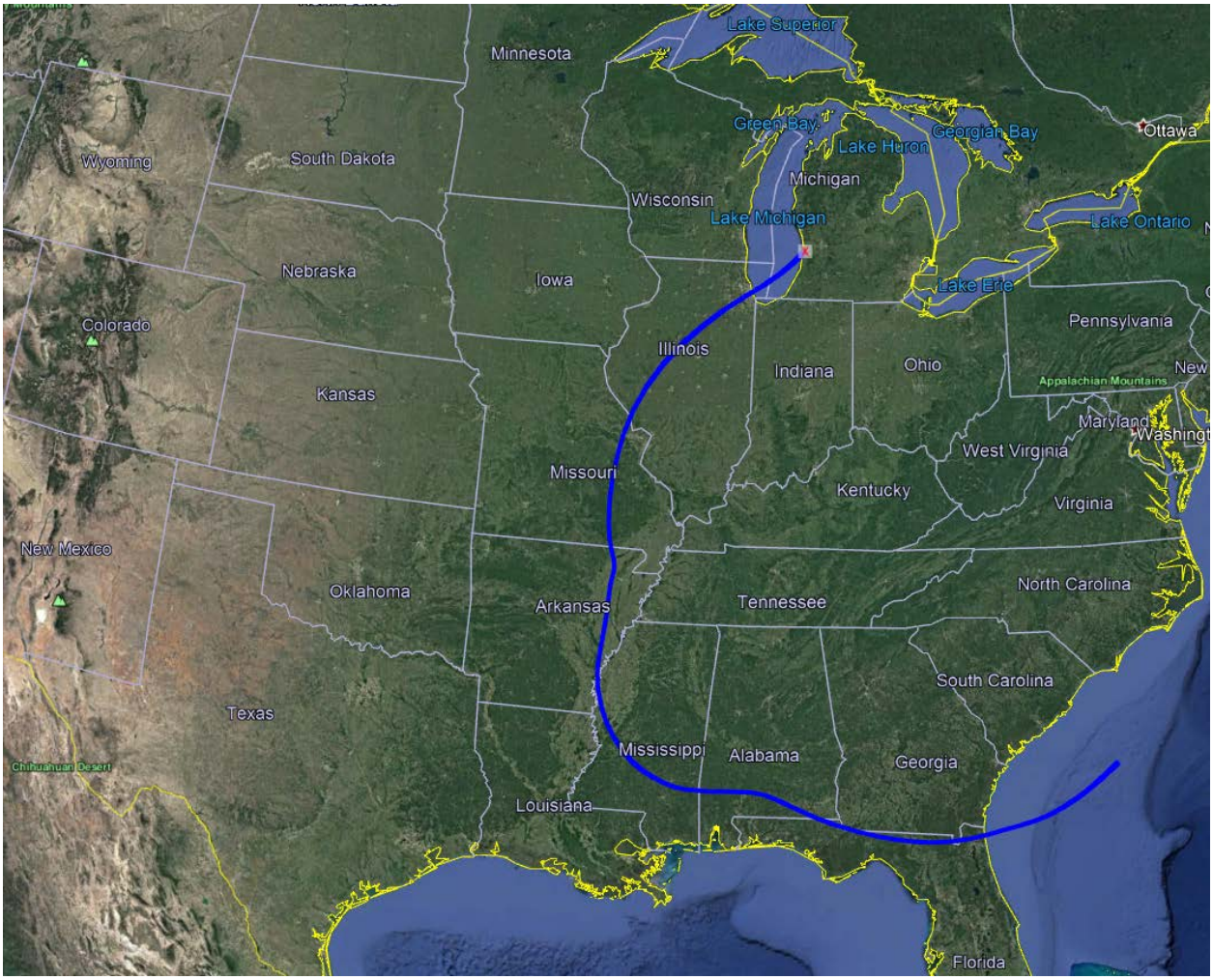


Figure 6 above depicts the trajectory of an air parcel that passed through Arkansas on July 5, 2010 and arrived at the Allegan County, MI ozone monitor on July 6, 2010. The air parcel had a residence time through Arkansas of eleven out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through the Jackson, MS MSA and three other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 7: Linked Back-trajectory (500 m) (July 6, 2010 17:00 hours UTC)

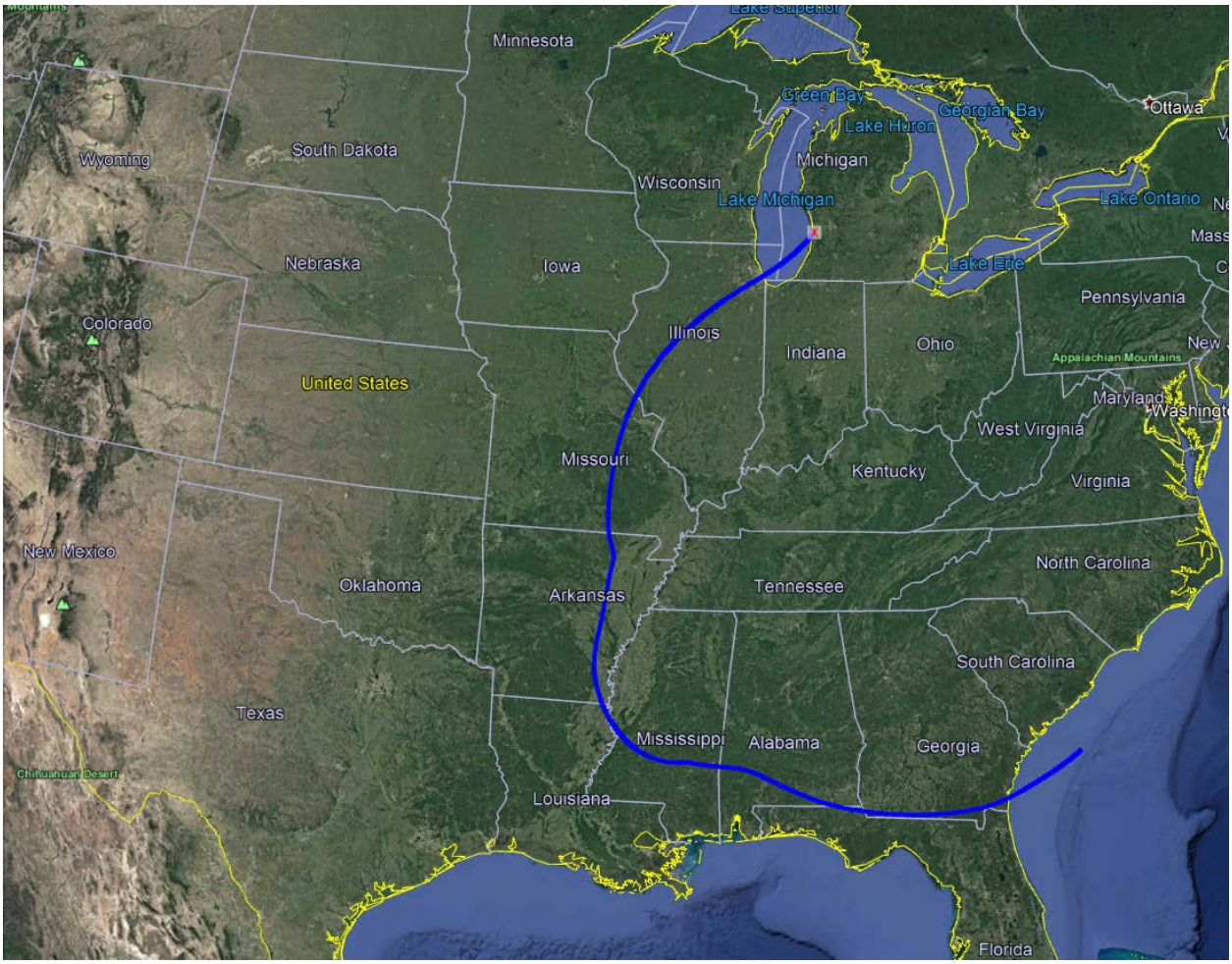


Figure 7 above depicts the trajectory of an air parcel that passed through Arkansas on July 5, 2010 and arrived at the Allegan County, MI ozone monitor on July 6, 2010. The air parcel had a residence time through Arkansas of fifteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through four other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 8: Linked Back-trajectory (100 m) (June 7, 2011 17:00 hours UTC)

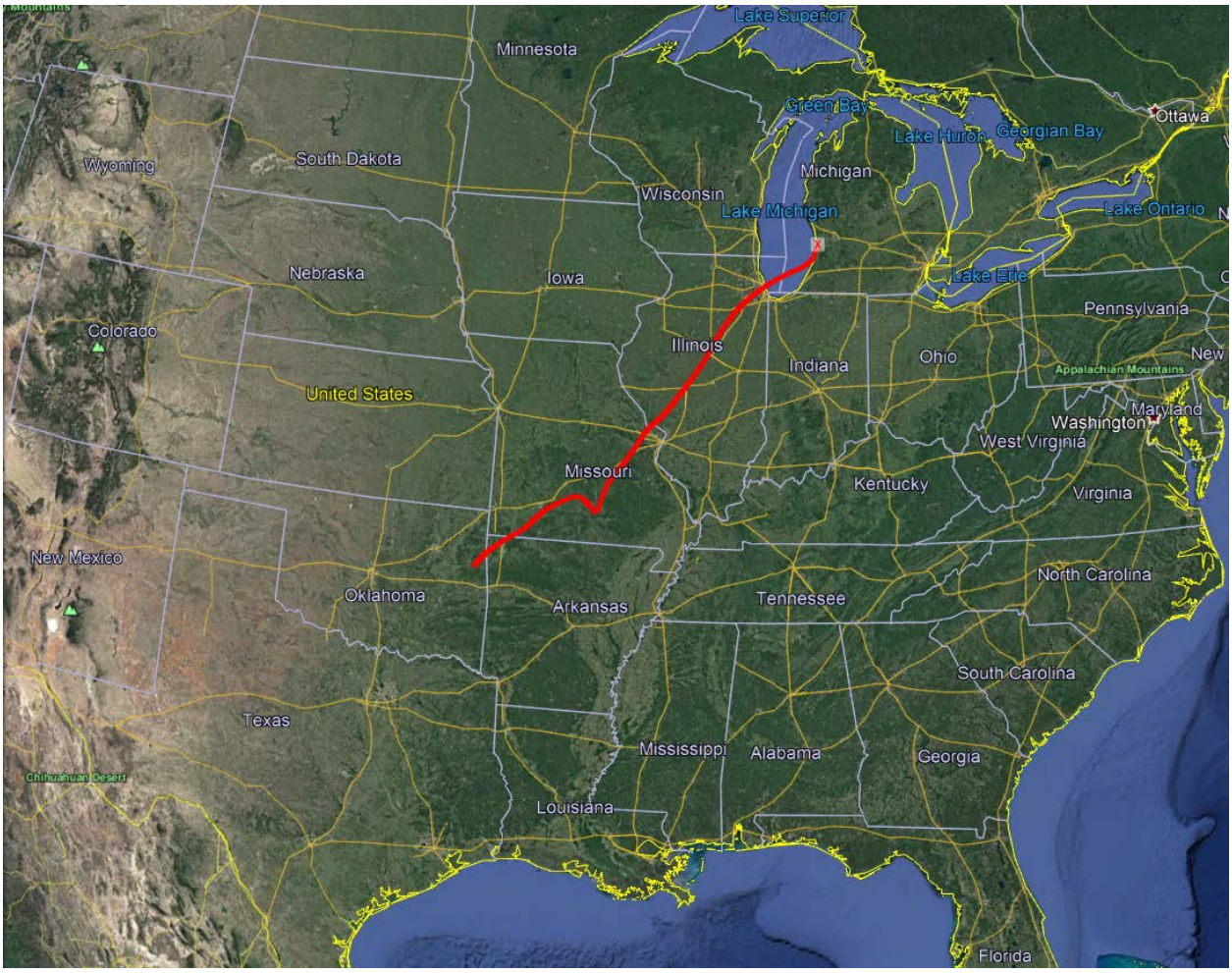


Figure 8 above depicts the trajectory of an air parcel that passed through Arkansas on June 4, 2011 and arrived at the Allegan County, MI ozone monitor on June 7, 2011. The air parcel had a residence time through northwestern Arkansas of four out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, the Springfield, MO MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 9: Linked Back-Trajectory (100 m) (June 7, 2011 18:00 hours UTC)

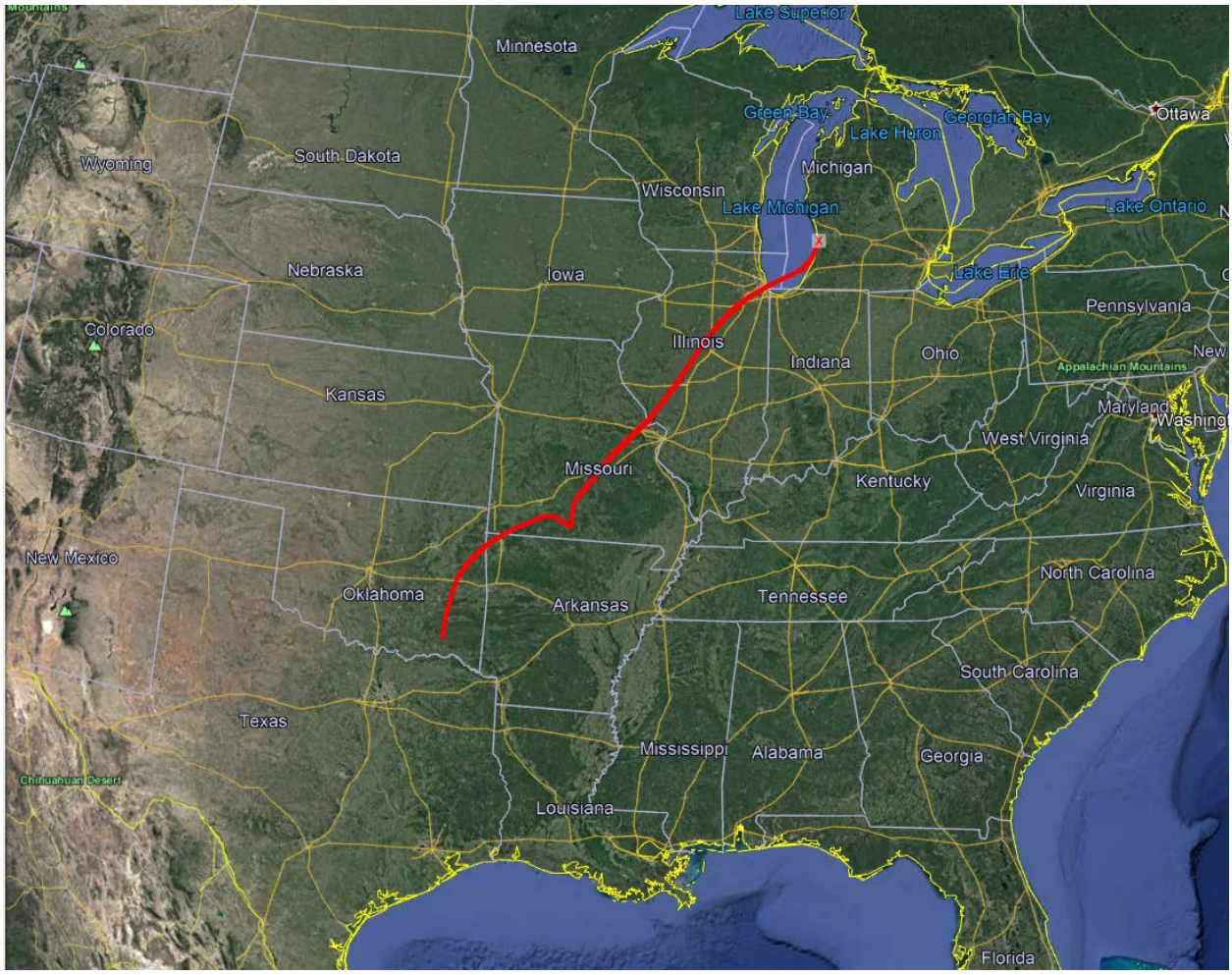


Figure 9 above depicts the trajectory of an air parcel that passed through Arkansas on June 5, 2011 and arrived at the Allegan County, MI ozone monitor on June 7, 2011. The air parcel had a residence time through northwestern Arkansas of two out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, the Springfield, MO MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 10: Linked Back-Trajectory (100 m) (June 8, 2011 15:00 hours UTC)

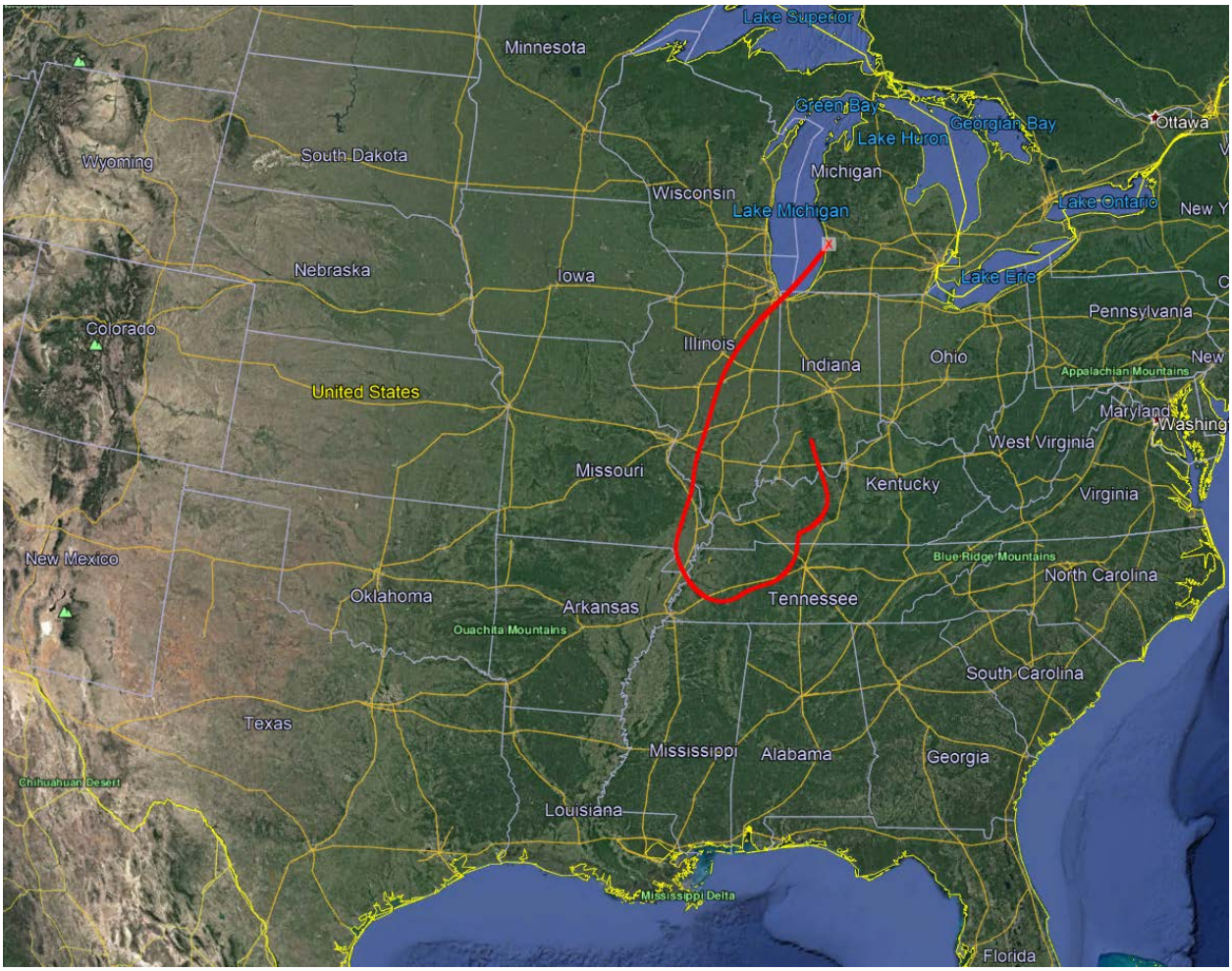


Figure 10 above depicts the trajectory of an air parcel that passed through northeastern Arkansas on June 7, 2011 and arrived at the Allegan County, MI ozone monitor on June 8, 2011. The air parcel had a residence time through northeastern Arkansas of one out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through three other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 11: Linked Back-Trajectory (100 m) (September 2, 2011 17:00 hours UTC)

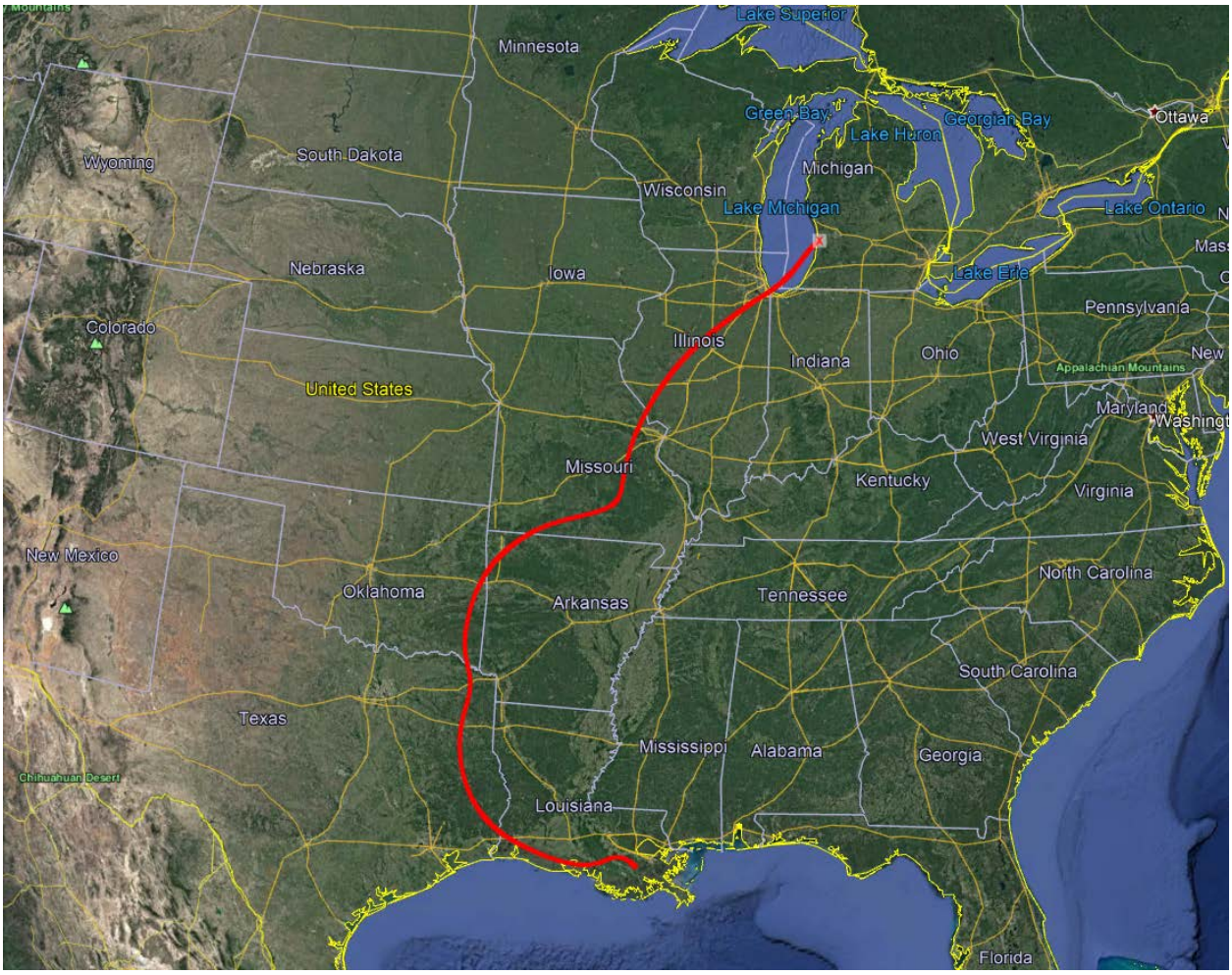


Figure 11 above depicts the trajectory of an air parcel that passed through Arkansas on September 1, 2011 and arrived at the Allegan County, MI ozone monitor on September 2, 2011. The air parcel had a residence time through northwestern Arkansas of four out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through three other states, the New Orleans-Metairie-Kenner MSA, and the Lake Charles, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 12: Linked Back-Trajectory (500 m) (May 20, 2012 15:00 hours UTC)

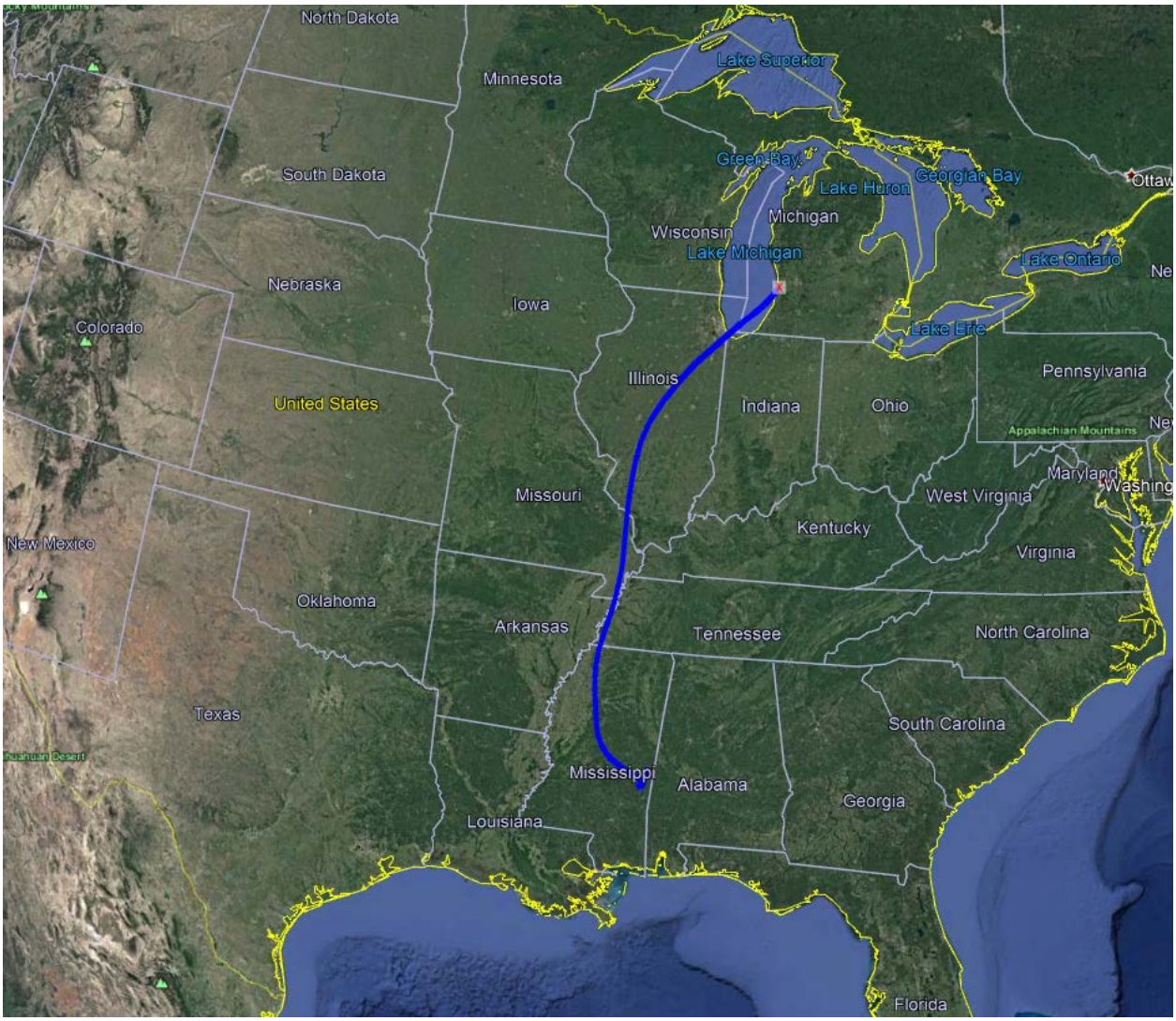


Figure 12 above depicts the trajectory of an air parcel that passed through Arkansas on May 19, 2012 and arrived at the Allegan County, MI ozone monitor on May 20, 2012. The air parcel had a residence time through northeastern Arkansas of one out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states and the Memphis, TN-MS-AR MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 13: Linked Back-Trajectory (500 m) (May 20, 2012 16:00 hours UTC)

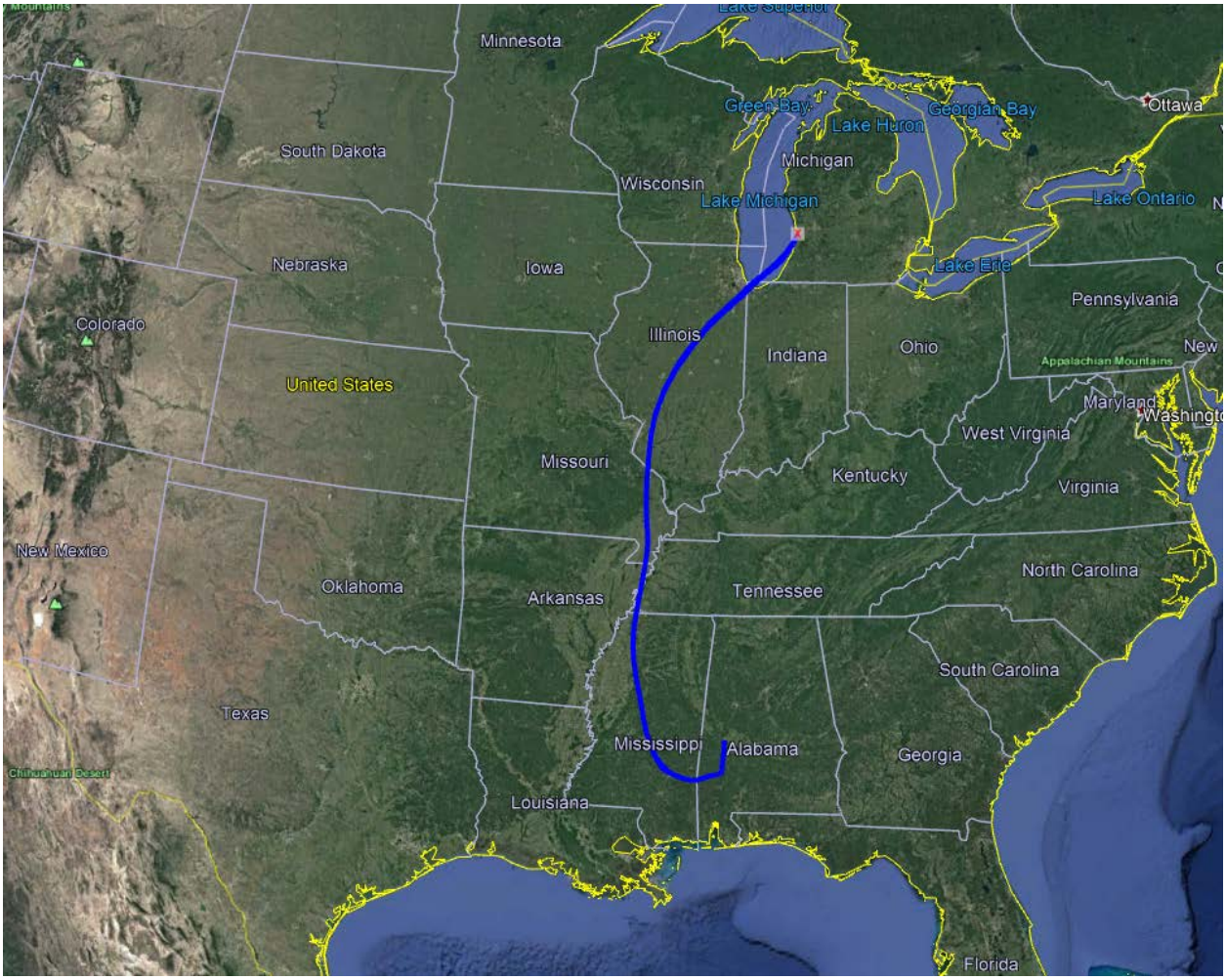


Figure 13 above depicts the trajectory of an air parcel that passed through Arkansas on May 19, 2012 and arrived at the Allegan County, MI ozone monitor on May 20, 2012. The air parcel had a residence time through northeastern Arkansas of two out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through three other states and the Memphis, TN-MS-AR Metropolitan Statistical Area (MSA). After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, the Saint Louis, MO-IL MSA, the Bloomington, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 14: Linked Back-Trajectory (Blue = 500 m; Orange = 1000 m) (May 20, 2012 17:00 hours UTC)

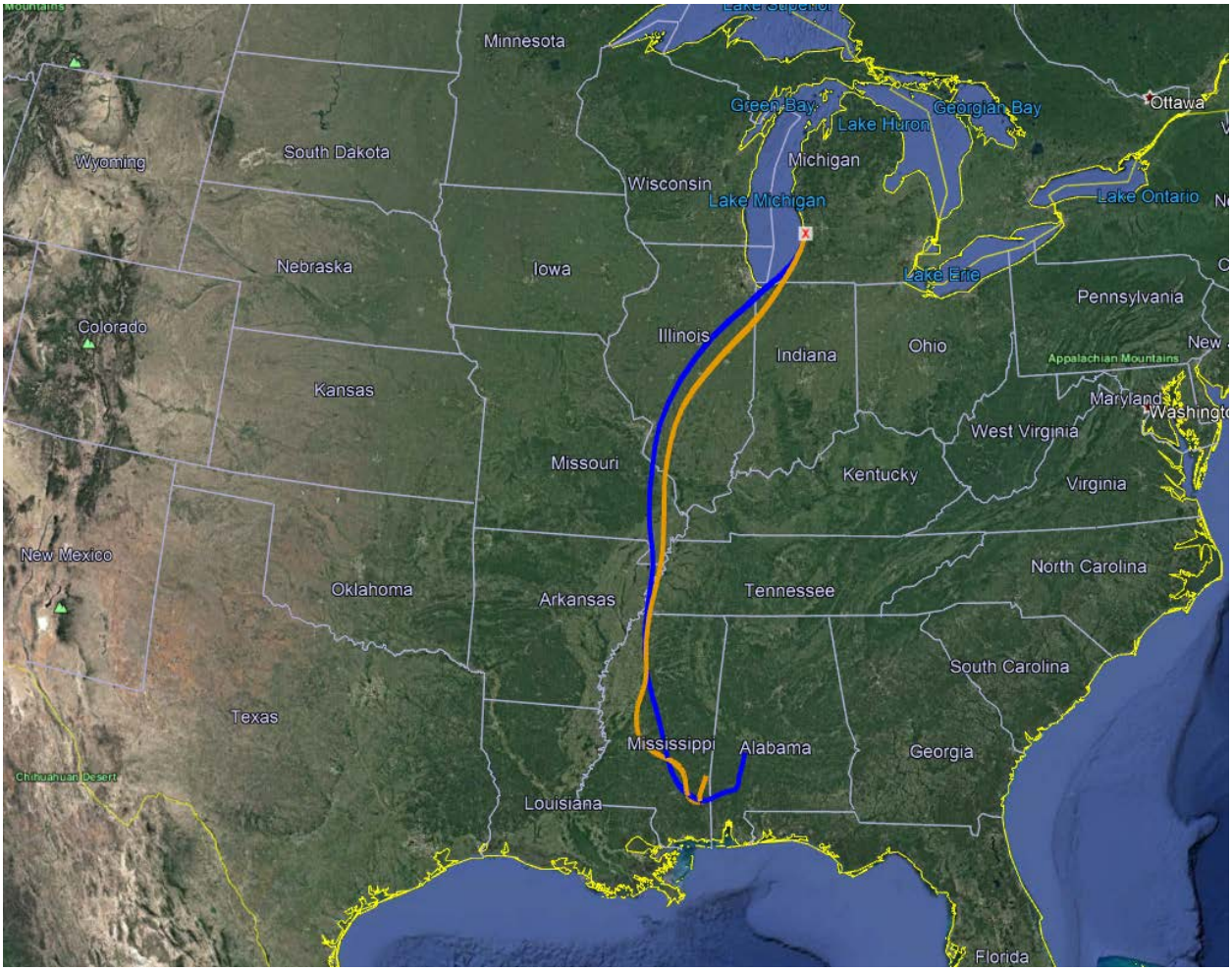


Figure 14 above depicts the trajectories of two air parcels that traveled through Arkansas and arrived at the Allegan County, MI ozone monitor on May 20, 2012. Both air parcel trajectories traveled along eastern Arkansas/western Tennessee through the Memphis, TN-MS-AR MSA on May 19, 2012 and had a residence time through Arkansas of three hours (500 m) and one hour (1000 m) out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcels passed through three (500 m) and two (1000 m) other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, both air parcels passed through three other states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 15: Linked Back-Trajectory (500 m) (May 27, 2012 19:00 hours UTC)

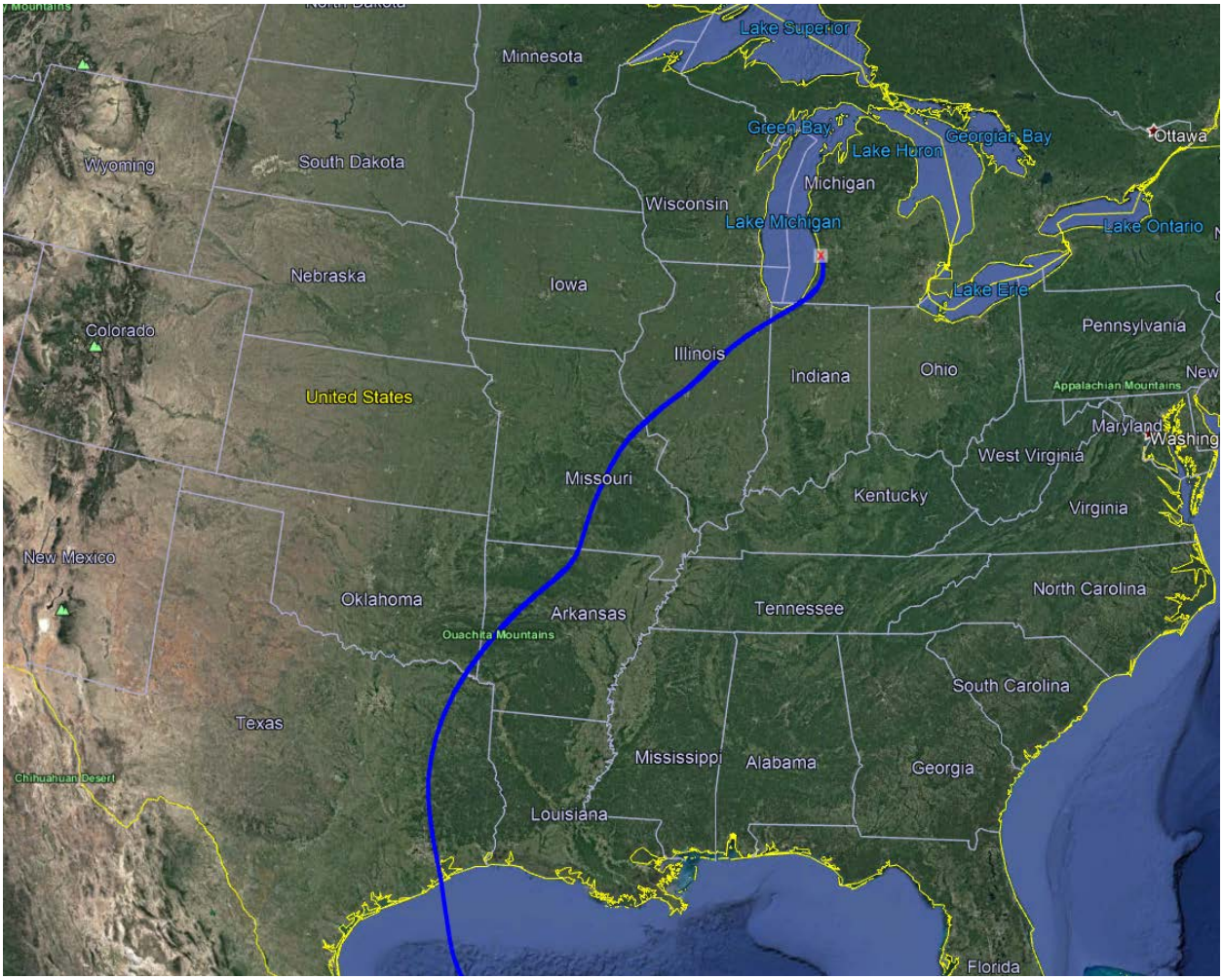


Figure 15 above depicts the trajectory of an air parcel that passed through Arkansas on May 26, 2012 and arrived at the Allegan County, MI ozone monitor on May 27, 2012. The air parcel had a residence time through Arkansas of seven out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states and the Houston-The Woodlands-Sugar Land MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 16: Linked Back-Trajectories (100 m) (May 28, 2012 14:00 hours UTC)

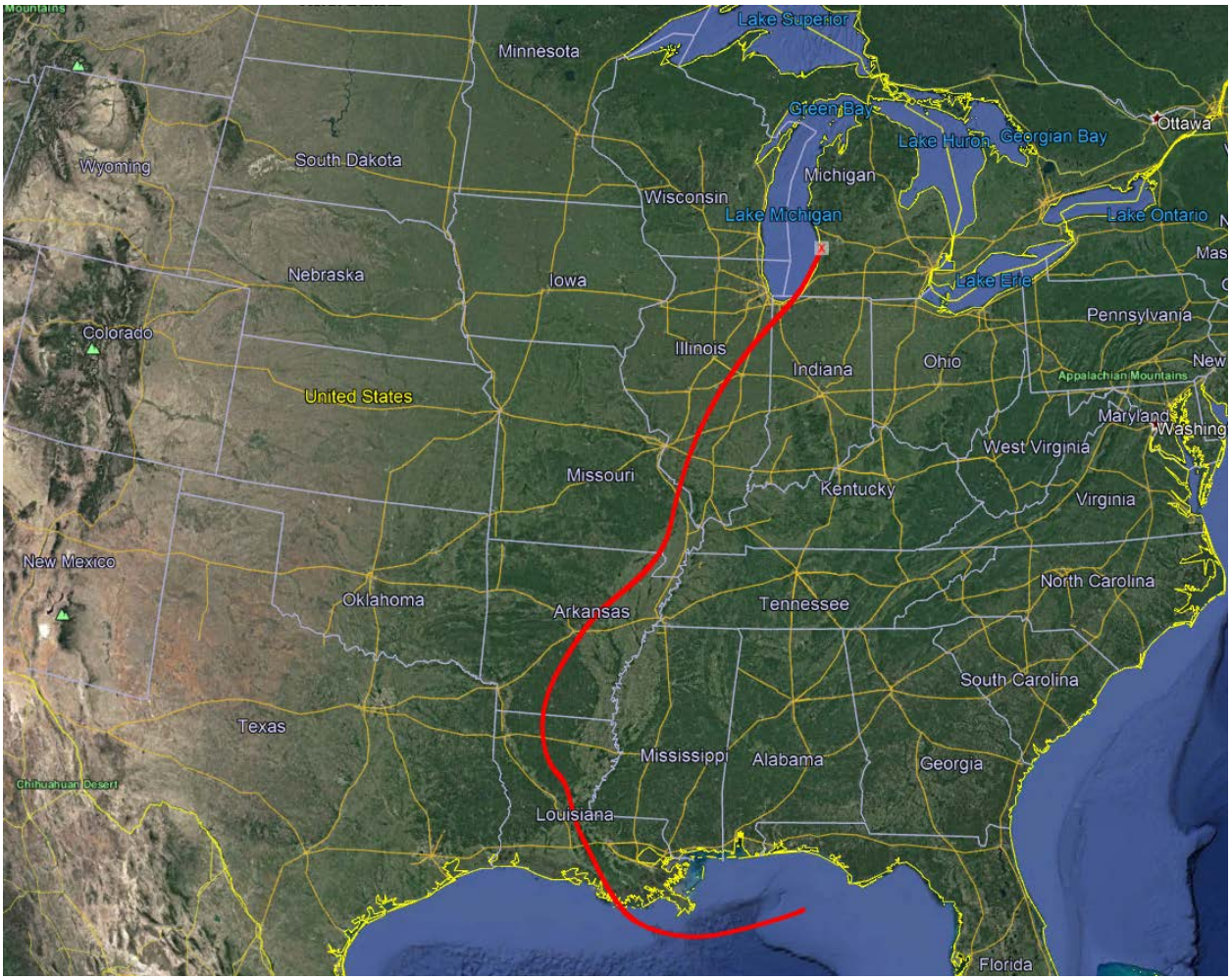


Figure 16 above depicts the trajectory of an air parcel that passed through Arkansas on May 27, 2012 and arrived at the Allegan County, MI ozone monitor on May 28, 2012. The air parcel had a residence time through Arkansas of fourteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state and the Lafayette, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 17: Linked Back-Trajectory (100 m) (May 28, 2012 15:00 hours UTC)

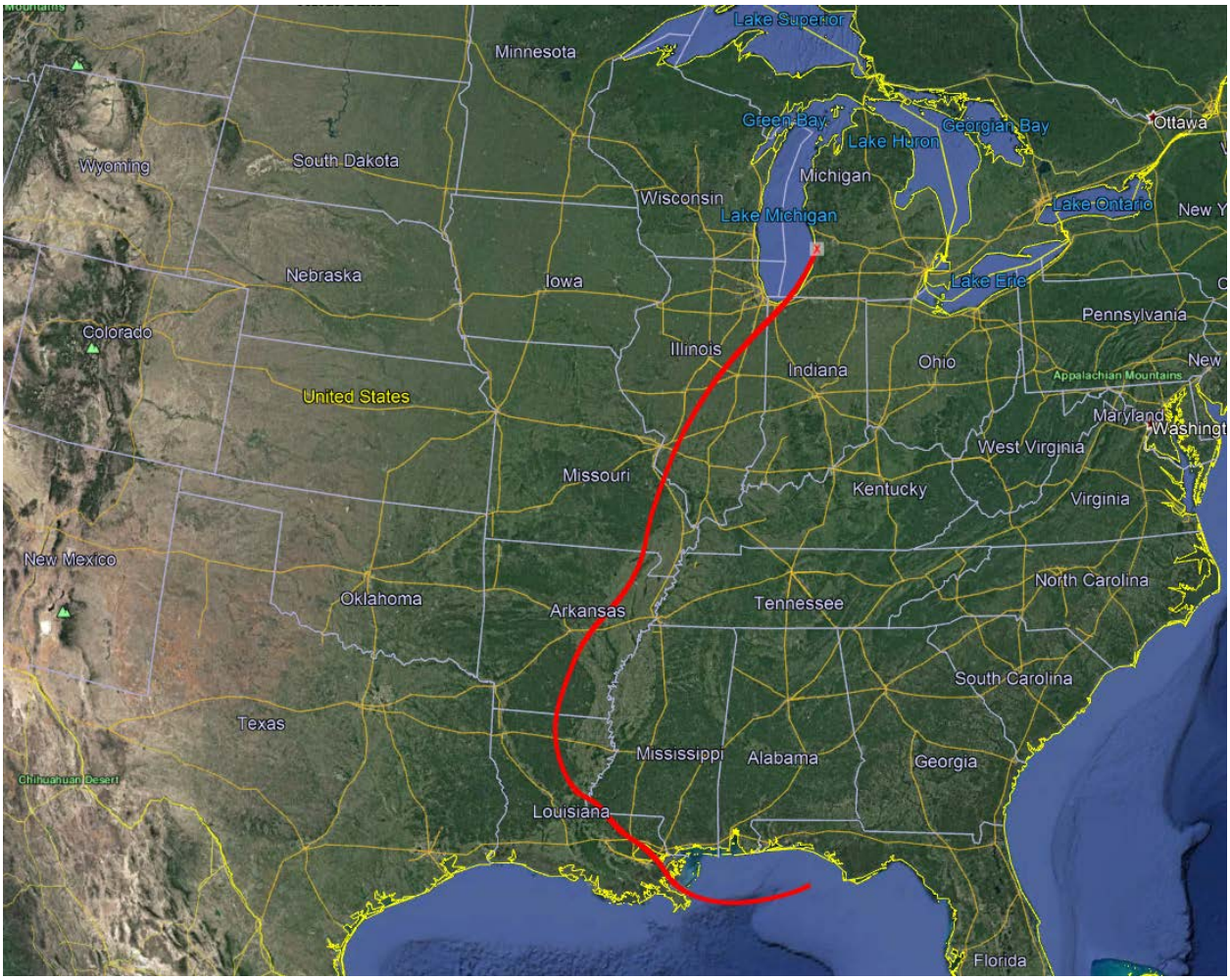


Figure 17 above depicts the trajectory of an air parcel that passed through Arkansas on May 27, 2012 and arrived at the Allegan County, MI ozone monitor on May 28, 2012. The air parcel had a residence time through Arkansas of fourteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states and the New Orleans-Metairie, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 18: Linked Back-Trajectory (100 m) (June 19, 2012 16:00 hours UTC)

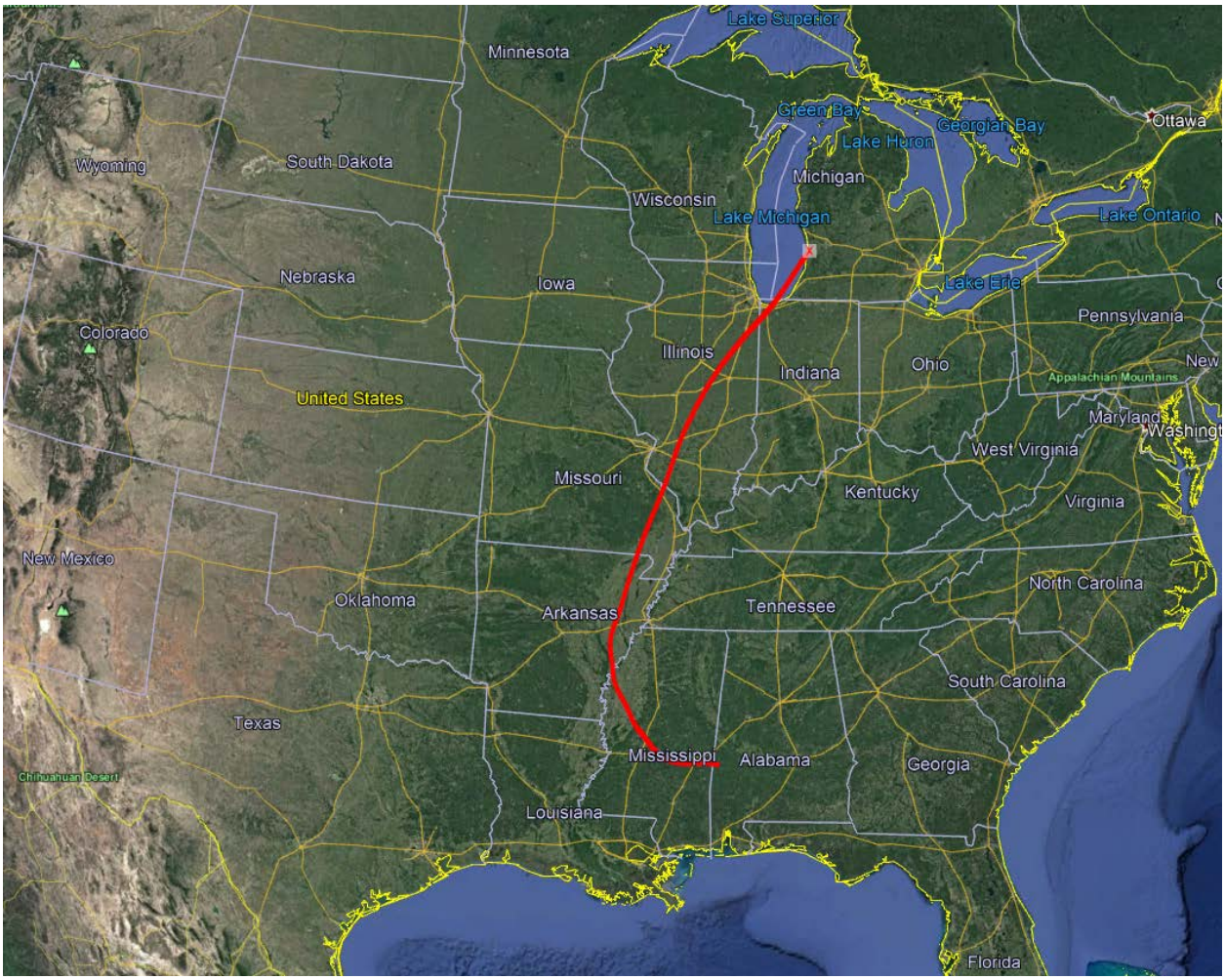


Figure 18 above depicts the trajectory of an air parcel that passed through Arkansas on June 18, 2012 and arrived at the Allegan County, MI ozone monitor on June 19, 2012. The air parcel had a residence time through Arkansas of fifteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, as well as the Saint Louis, MO-IL MSA and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 19: Linked Back-Trajectories (100 m) (June 19, 2012 17:00 hours UTC)

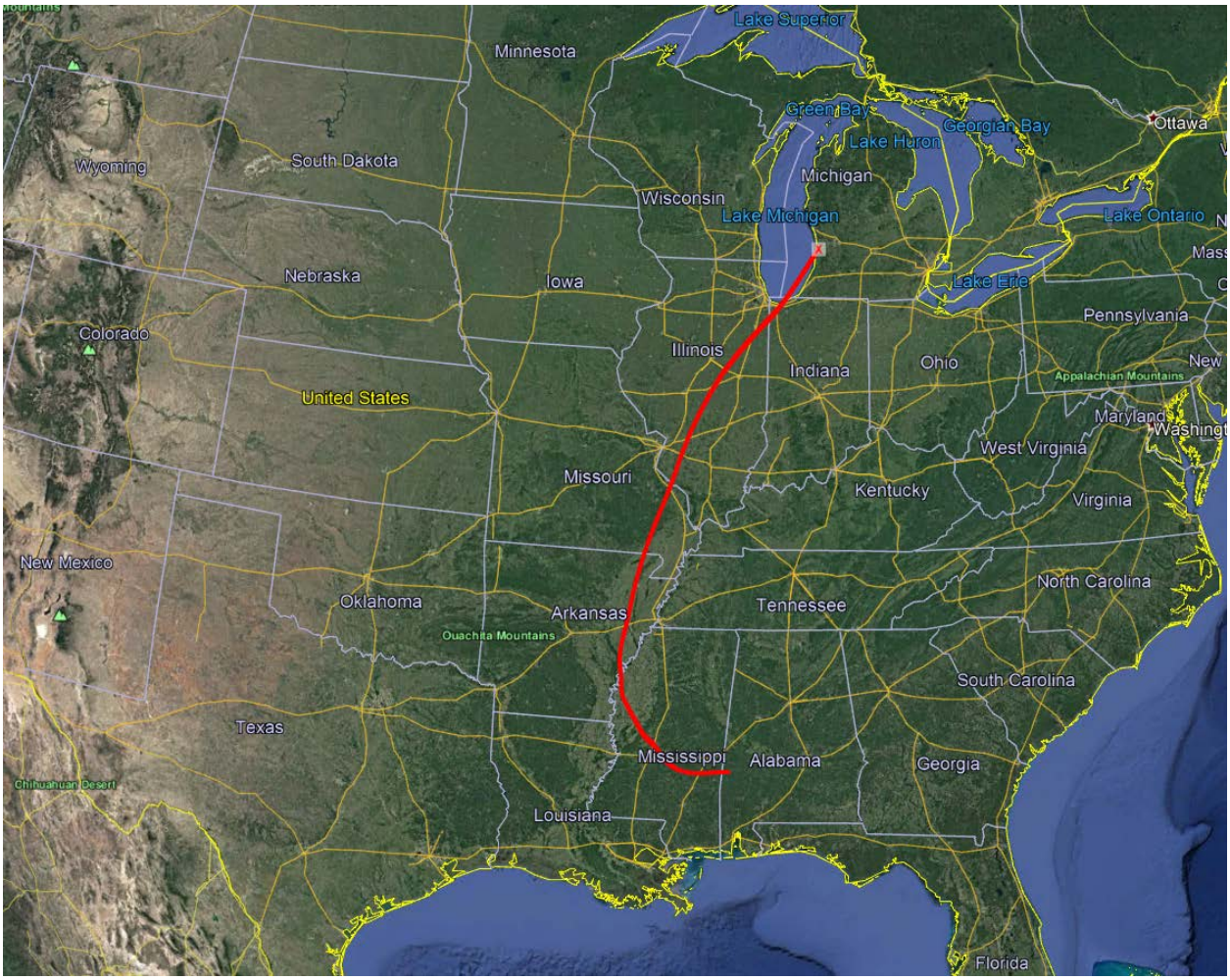


Figure 19 above depicts the trajectory of an air parcel that passed through Arkansas on June 18, 2012 and arrived at the Allegan County, MI ozone monitor on June 19, 2012. The air parcel had a residence time through Arkansas of fifteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, as well as the Saint Louis, MO-IL MSA and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 20: Linked Back-Trajectories (100 m) (June 28, 2012 15:00 hours UTC)

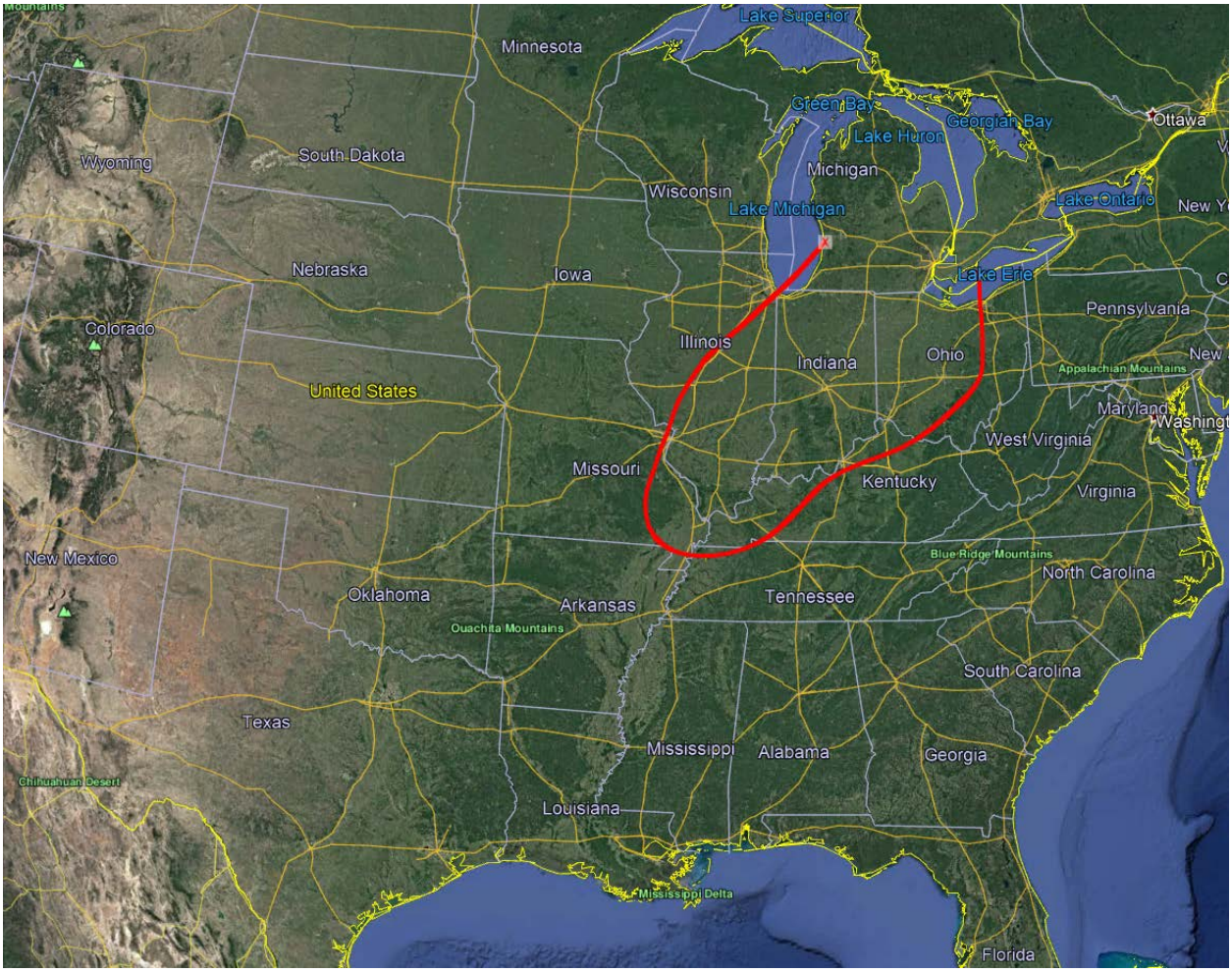


Figure 20 above depicts the trajectory of an air parcel that passed through Arkansas on June 27, 2012 and arrived at the Allegan County, MI ozone monitor on June 28, 2012. The air parcel had a residence time through northeastern Arkansas of one out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through four other states and the Louisville-Jefferson County, KY-IN MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, as well as the Saint Louis, MO-IL MSA and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 21: Linked Back-Trajectory (100 m) (June 28, 2012 16:00 hours UTC)

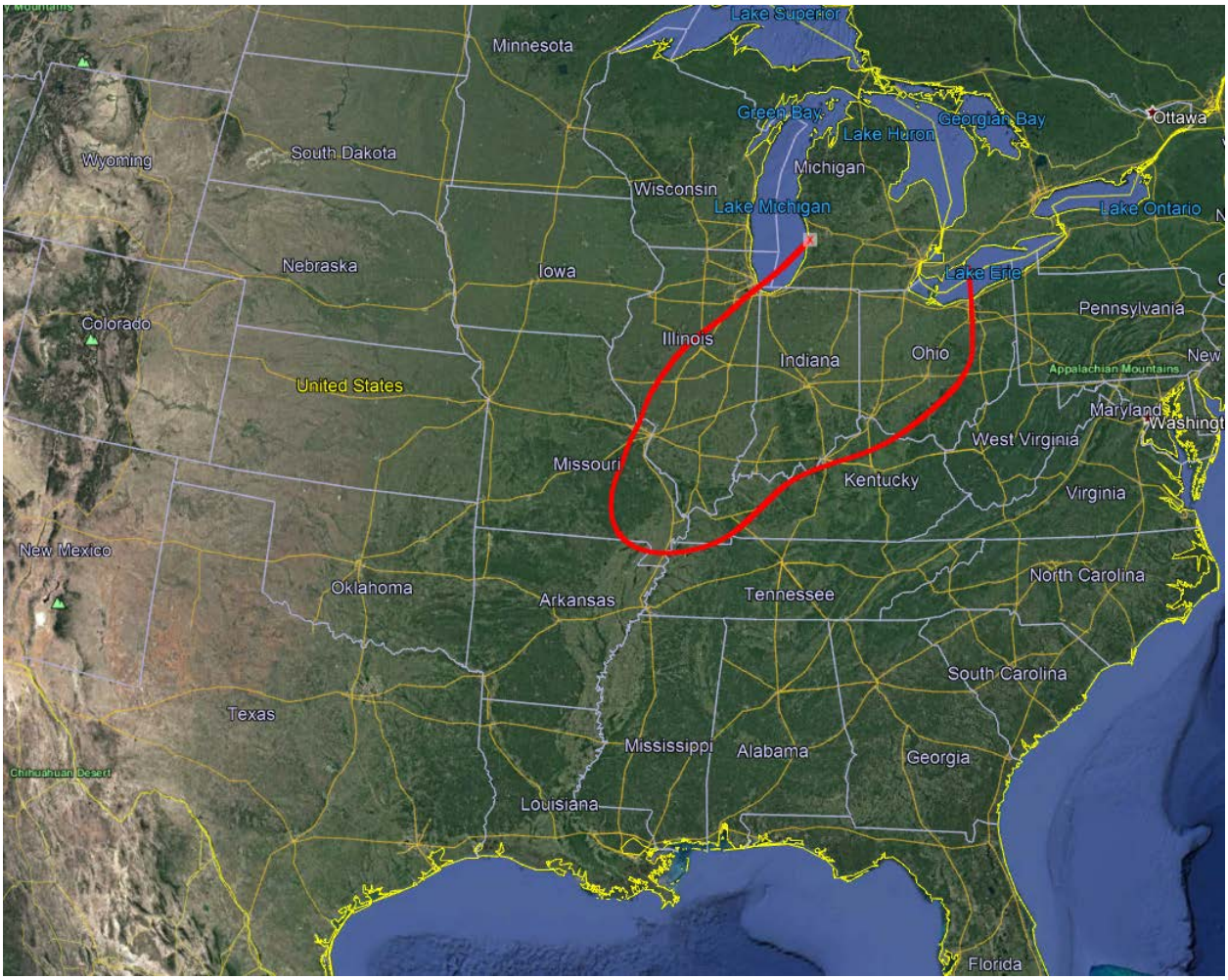


Figure 21 above depicts the trajectory of an air parcel that passed through Arkansas on June 27, 2012 and arrived at the Allegan County, MI ozone monitor on June 28, 2012. The air parcel had a residence time through extreme northeastern Arkansas of two out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through four other states and the Louisville-Jefferson County, KY-IN MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, as well as the Saint Louis, MO-IL MSA and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 22: Linked Back-Trajectory (100 m) (July 3, 2012 18:00 hours UTC)

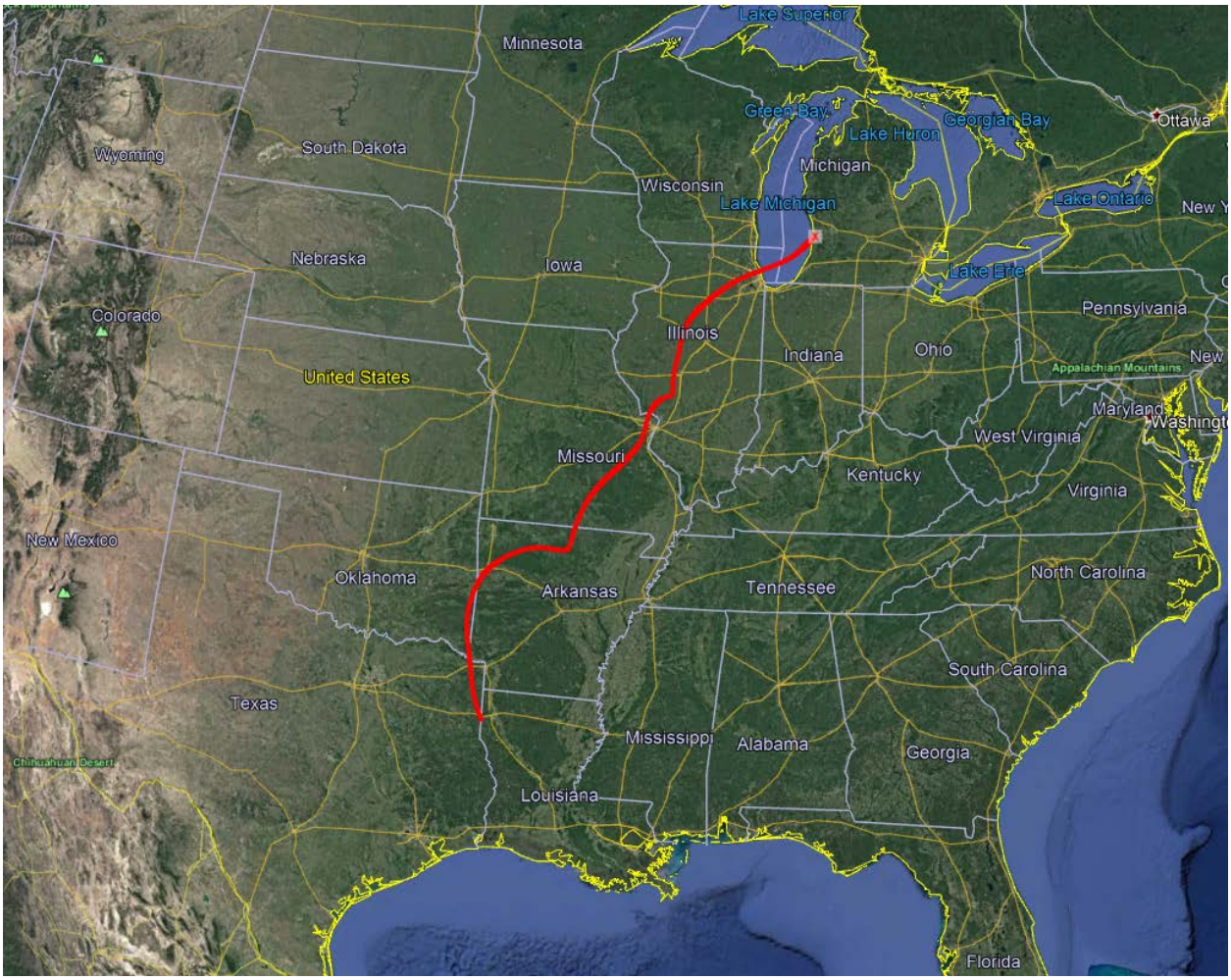


Figure 22 above depicts the trajectory of an air parcel that passed through northern Arkansas on July 1, 2012 and arrived at the Allegan County, MI ozone monitor on July 3, 2012. The air parcel had a residence time through Arkansas of thirteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through three other states and the Shreveport-Bossier City, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, the Peoria, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 23: Linked Back-Trajectory (100 m) (July 3, 2012 19:00 hours UTC)

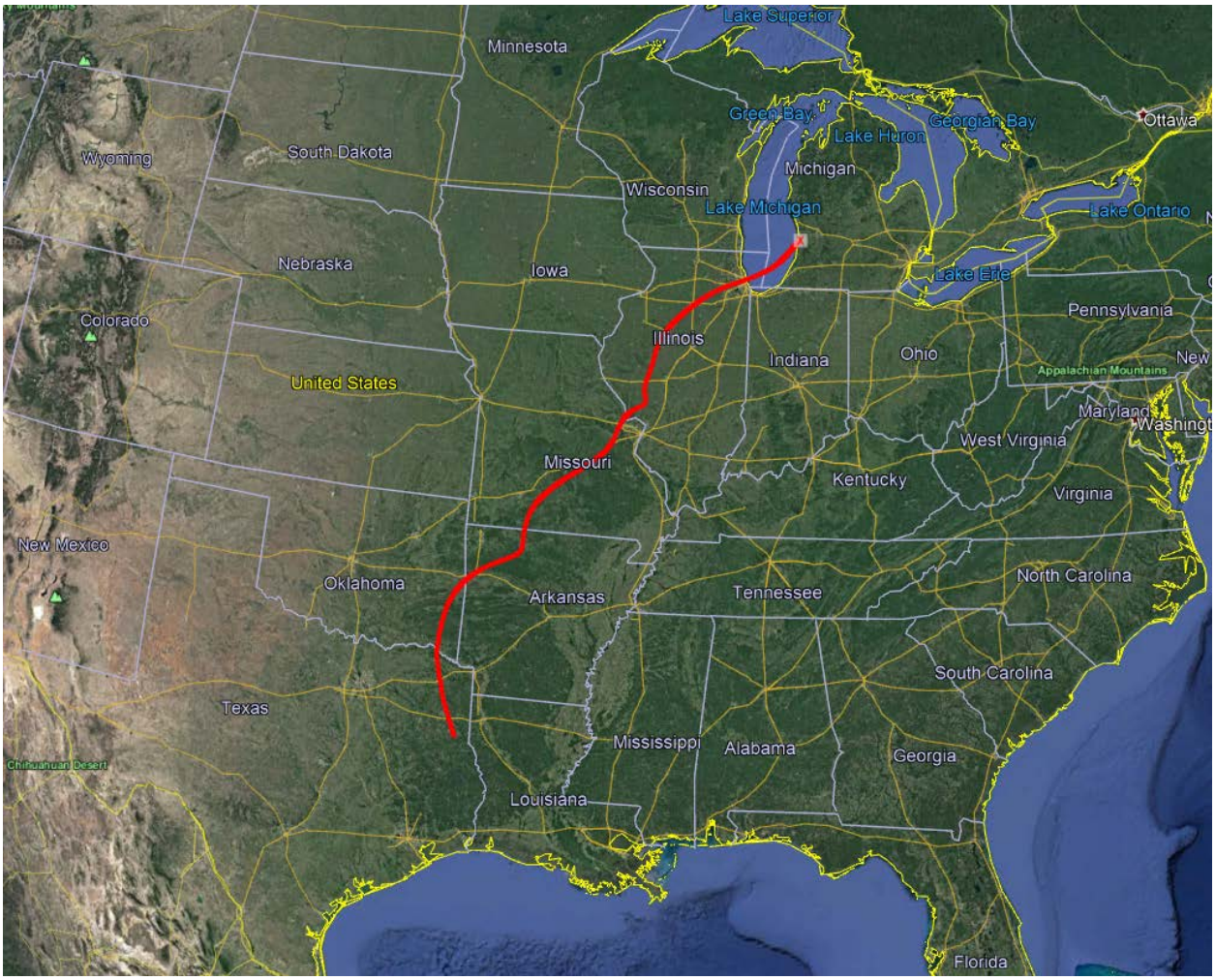


Figure 23 above depicts the trajectory of an air parcel that passed through northwestern Arkansas on July 1, 2012 and arrived at the Allegan County, MI ozone monitor on July 3, 2012. The air parcel had a residence time through Arkansas of eleven out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, the Peoria, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 24: Linked Back-Trajectory (500 m) (July 17, 2012 17:00 hours UTC)

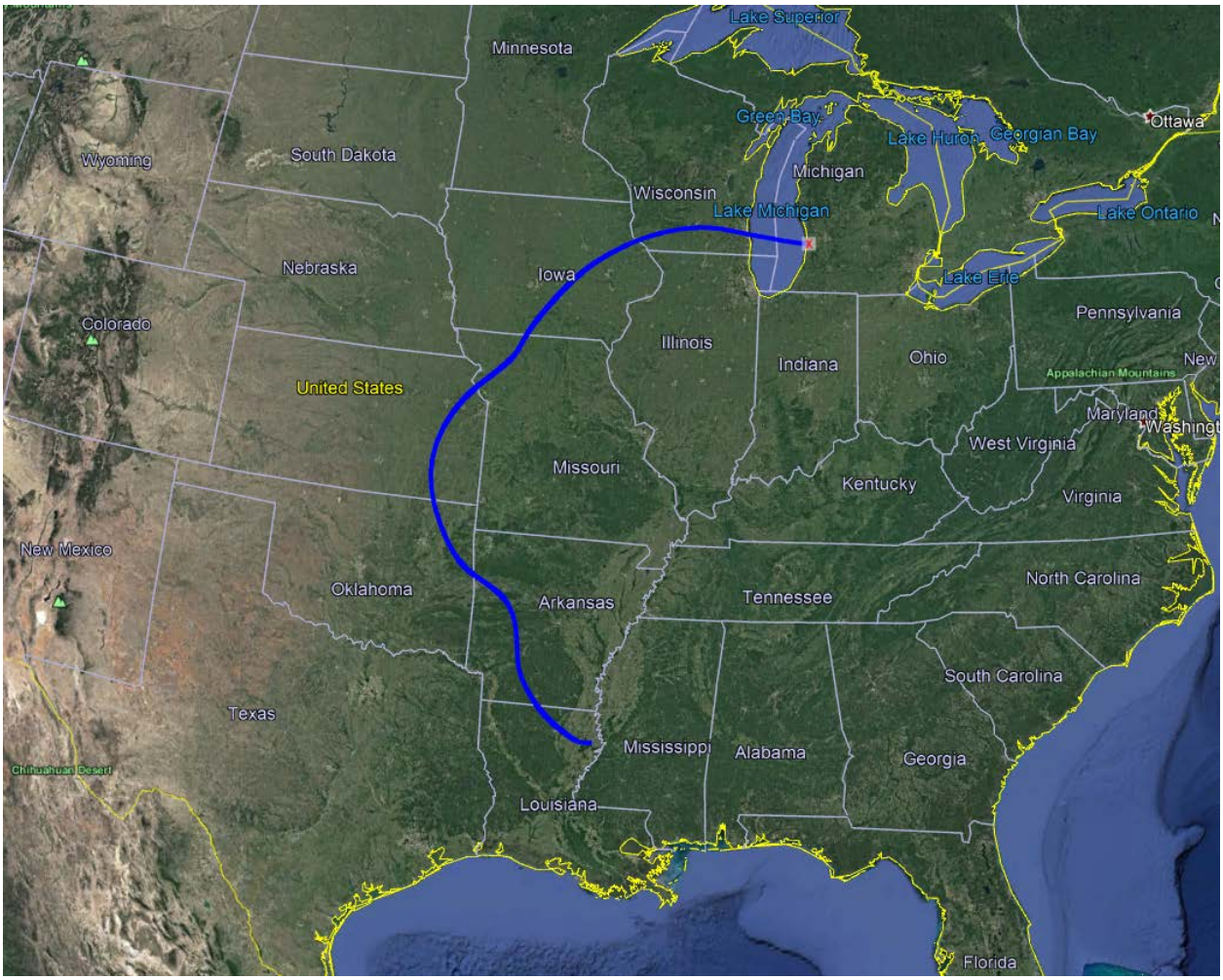


Figure 24 above depicts the trajectory of an air parcel that passed through Arkansas on July 15, 2012 and arrived at the Allegan County, MI ozone monitor on July 17, 2012. The air parcel had a residence time through Arkansas of seventeen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through five states, the Kansas City, MO- MSA, the Madison, WI MSA, and the Milwaukee-Waukesha-West Allis, WI MSA.

Figure 25: Linked Back-Trajectory (100 m) (August 27, 2013 18:00 hours UTC)

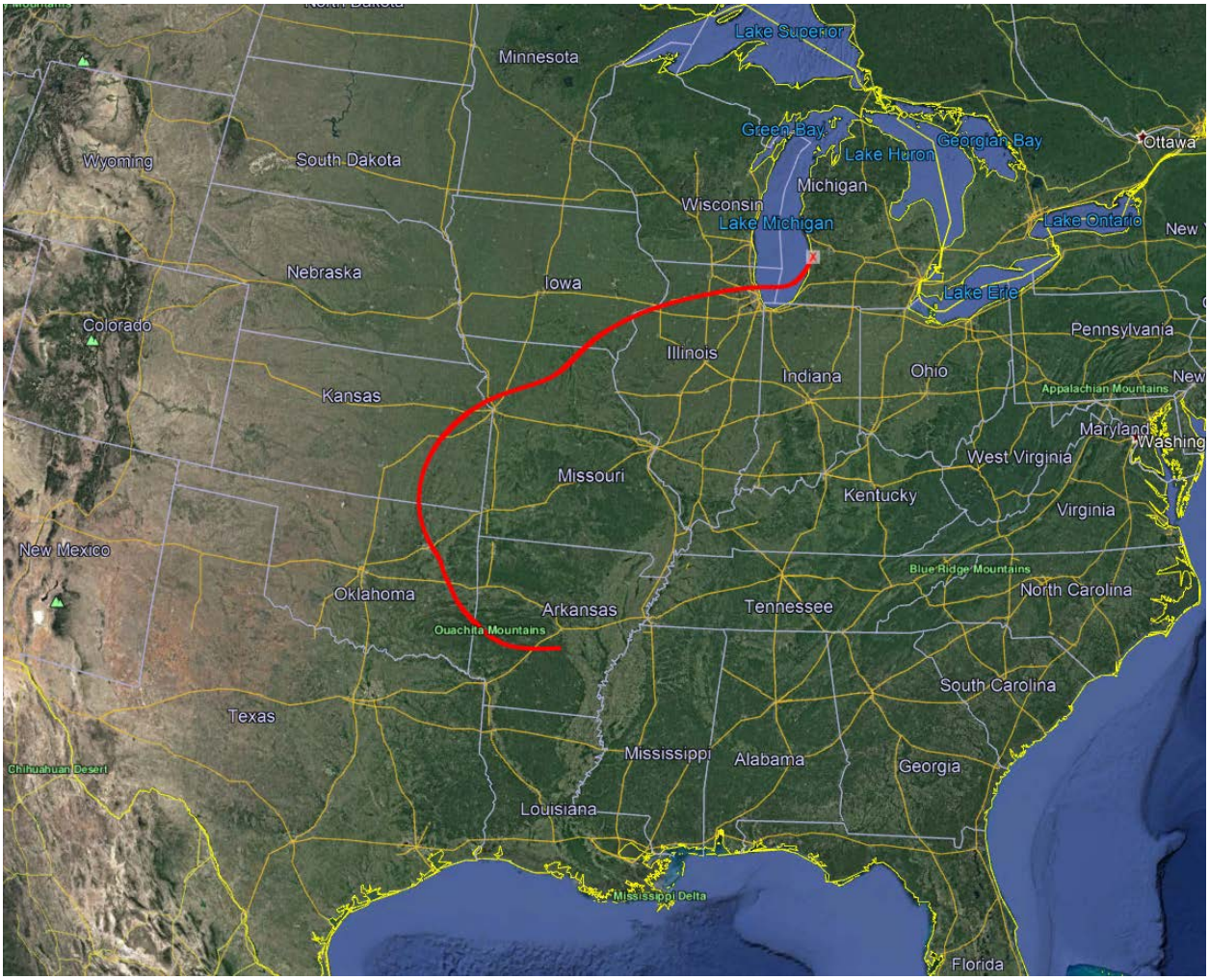


Figure 25 above depicts the trajectory of an air parcel where hour seventy-two began in Arkansas on August 24, 2013 and arrived at the Allegan County, MI ozone monitor on August 27, 2013. The air parcel had a residence time through Arkansas of fourteen out of the seventy-two hours included in the back-trajectory. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through five states, the Kansas City, MO-KS MSA, the Davenport-Moline-Rock Island, IA-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 26: Linked Back-Trajectory (100 m) (September 10, 2013 17:00 hours UTC)

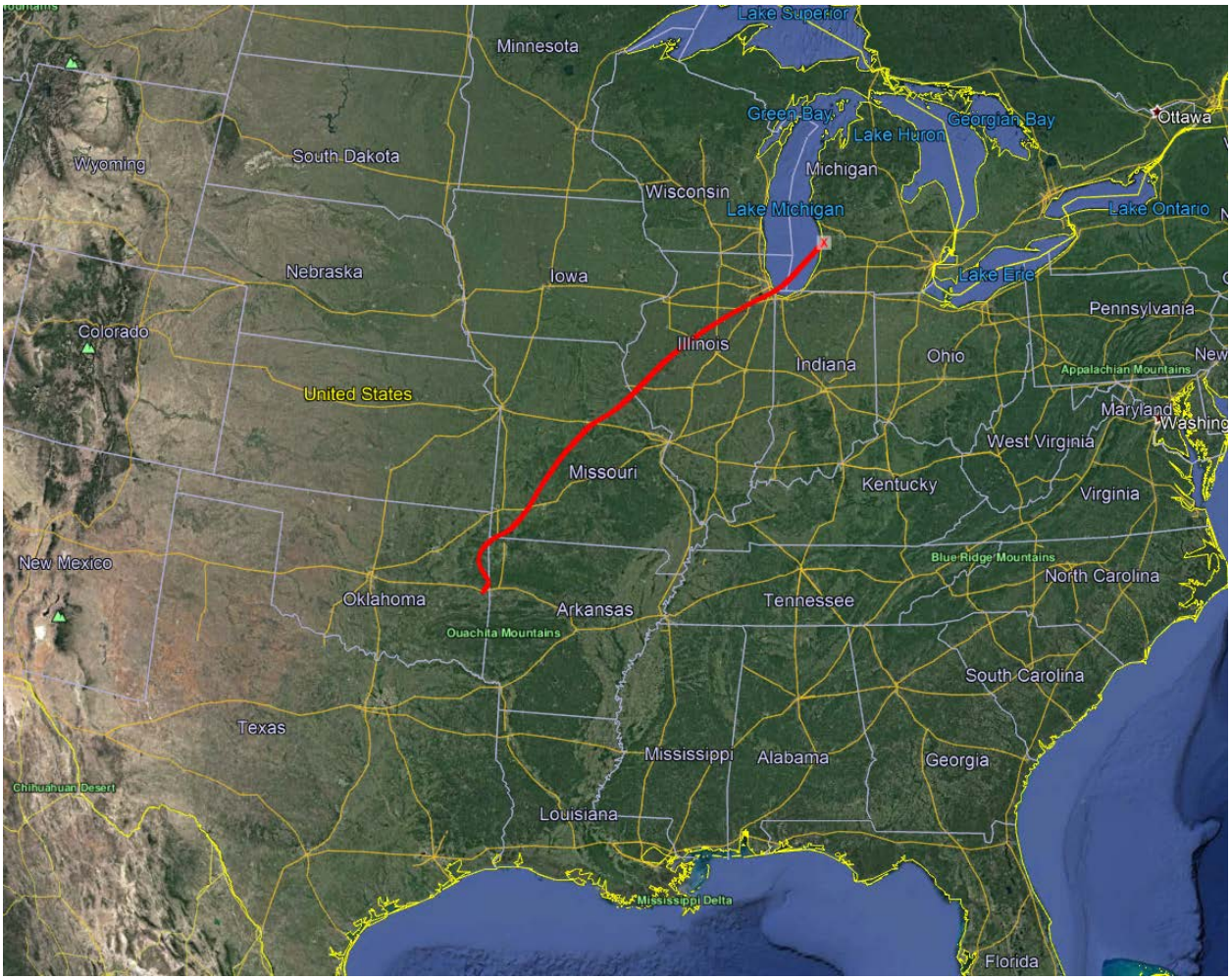


Figure 26 above depicts the trajectory of an air parcel that passed through northwestern Arkansas on September 8, 2013 and arrived at the Allegan County, MI ozone monitor on September 10, 2013. The air parcel had a residence time through Arkansas of two out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Peoria, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 27: Linked Back-Trajectories (100 m) (May 7, 2015 16:00 hours UTC)

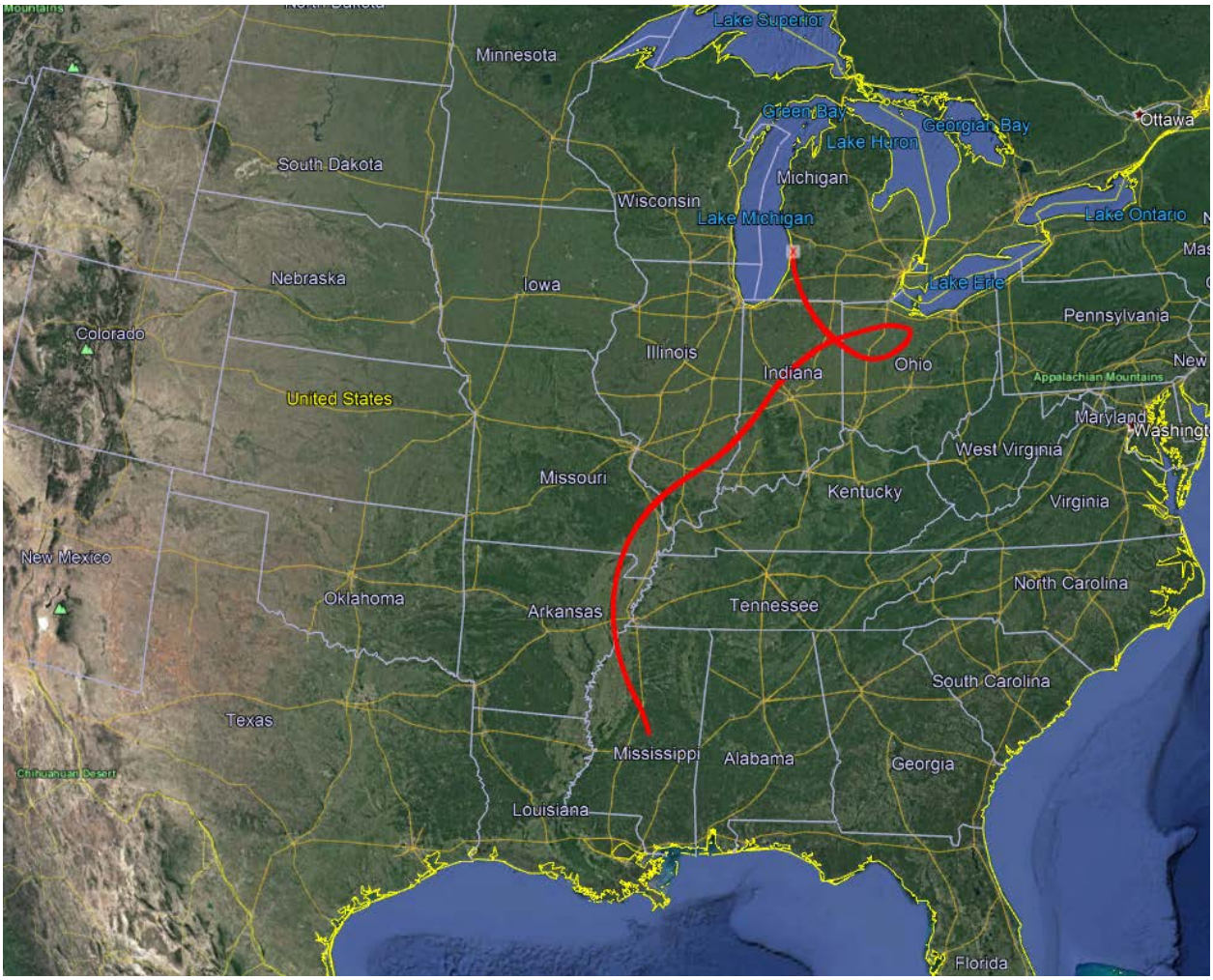


Figure 27 above depicts the trajectory of an air parcel that passed through Arkansas on May 5, 2015 and arrived at the Allegan County, MI ozone monitor on May 7, 2015. The air parcel had a residence time through Arkansas of five out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through four other states, the Fort Wayne, IN MSA, and the South Bend-Mishawaka, IN-MI MSA.

Figure 28: Linked Back-Trajectory (100 m) (May 7, 2015 17:00 hours UTC)

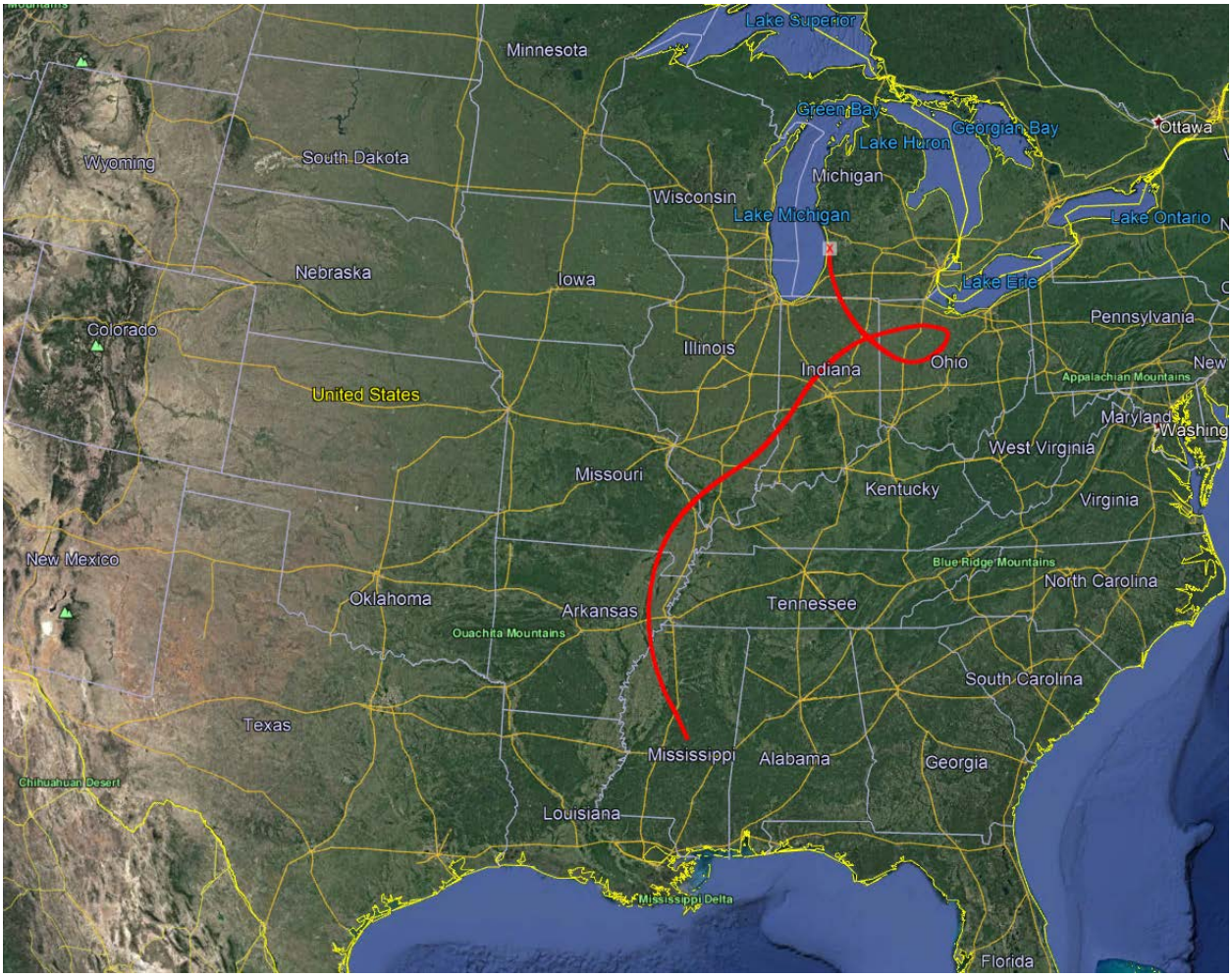


Figure 28 above depicts the trajectory of an air parcel that passed through Arkansas on May 5, 2015 and arrived at the Allegan County, MI ozone monitor on May 7, 2015. The air parcel had a residence time through Arkansas of five out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through one other state. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through four other states, the Indianapolis-Carmel-Anderson, IN MSA, the Columbus, OH MSA, the Toledo, OH MSA, the South Bend-Mishawaka MSA, the Fort Wayne, IN, and the South Bend-Mishawaka, IN-MI MSA.

Figure 29: Linked Back-Trajectory (100 m) (September 2, 2015 16:00 hours UTC)

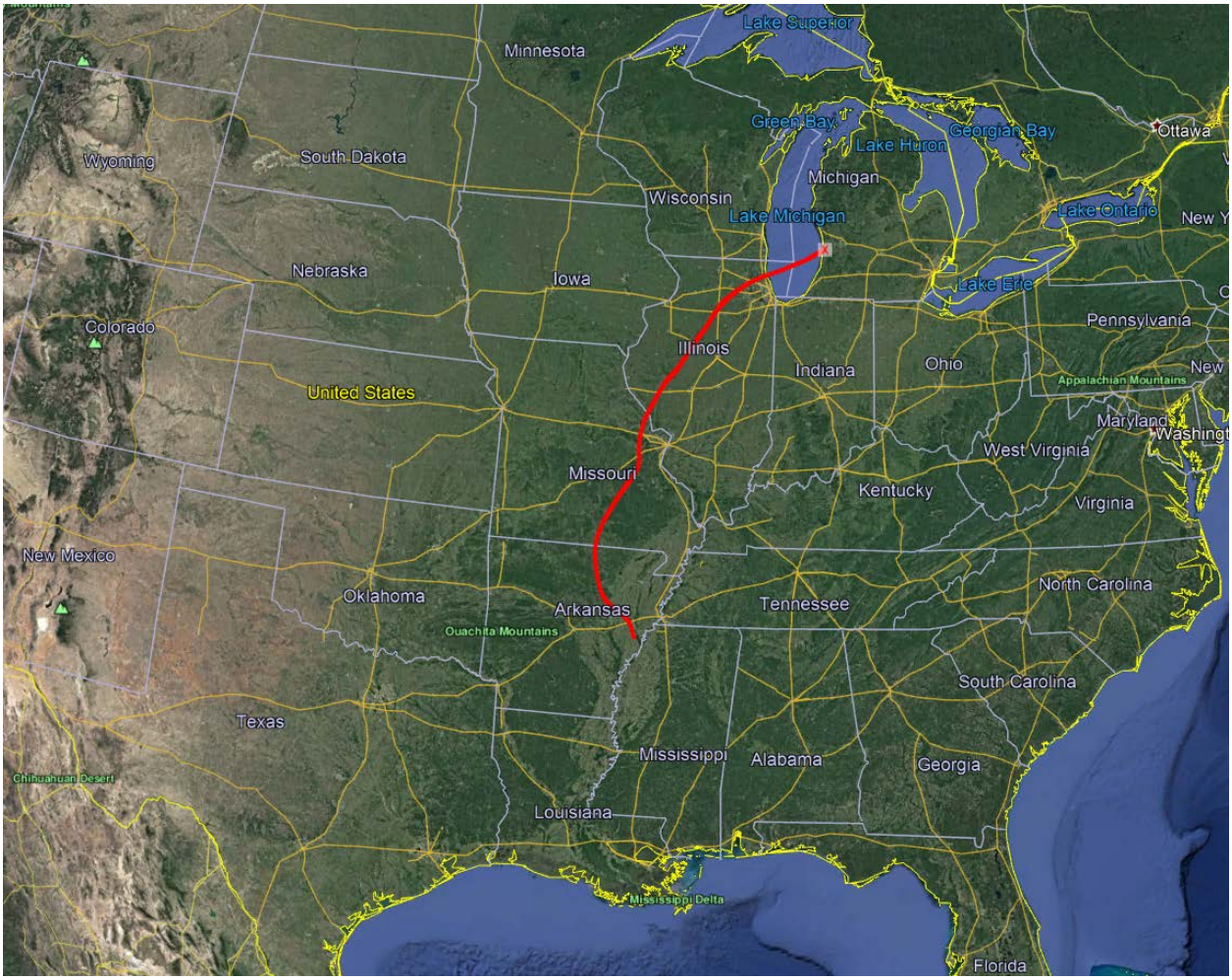


Figure 29 above depicts the trajectory of an air parcel where hour seventy-two began in Arkansas on August 30, 2015 and arrived at the Allegan County, MI ozone monitor on September 2, 2015. The air parcel had a residence time through Arkansas of nineteen hours out of the seventy-two hours included in the back-trajectory. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 30: Linked Back-Trajectory (500 m) (May 24, 2016 17:00 hours UTC)

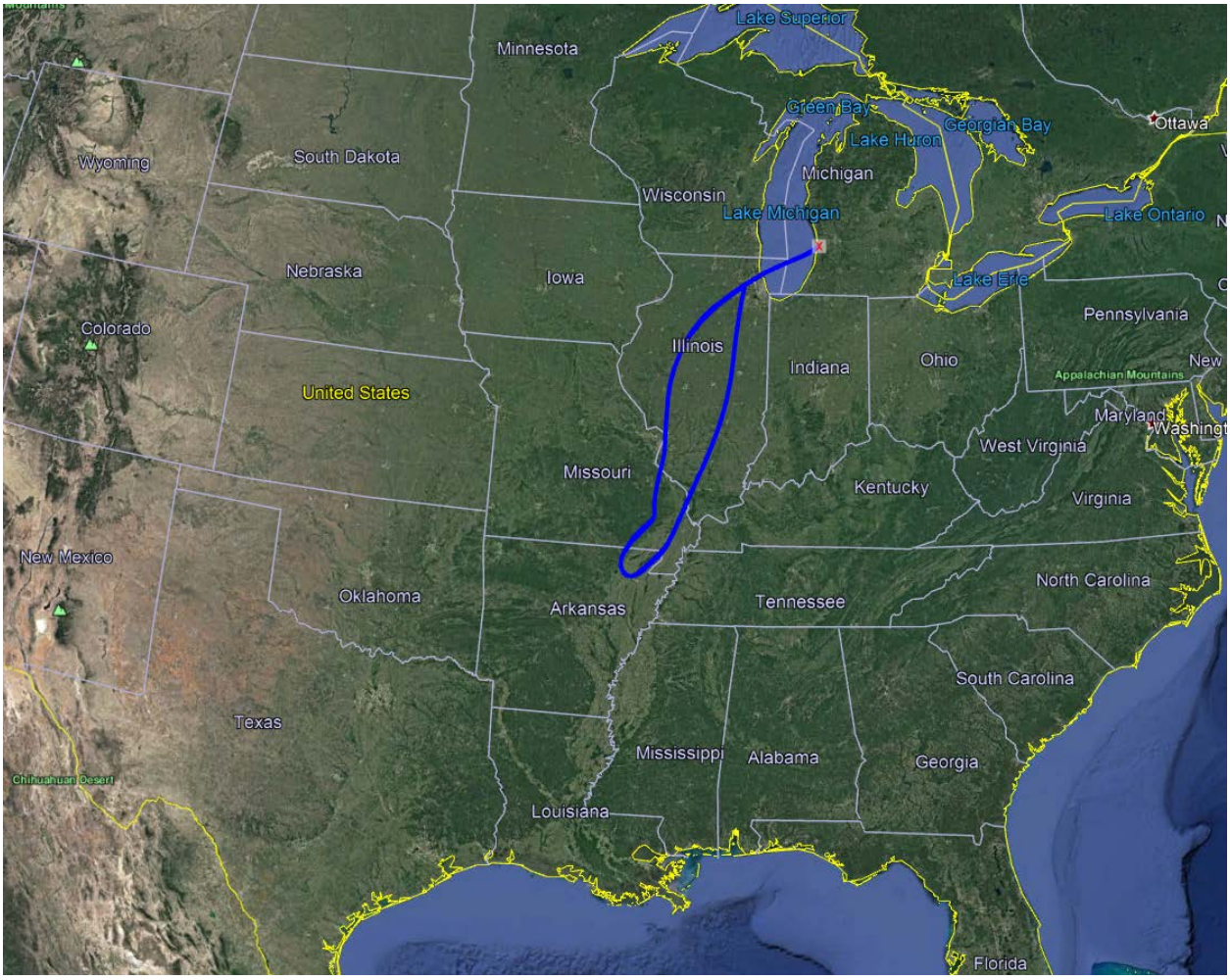


Figure 30 above depicts the trajectory of an air parcel that passed through northeastern Arkansas on May 22–23, 2016 and arrived at the Allegan County, MI ozone monitor on May 24, 2016. The air parcel had a residence time through Arkansas of sixteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through two other states. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 31: Linked Back-Trajectory (Red = 100 m; Blue = 500 m) (June 10, 2017 18:00 hours UTC)

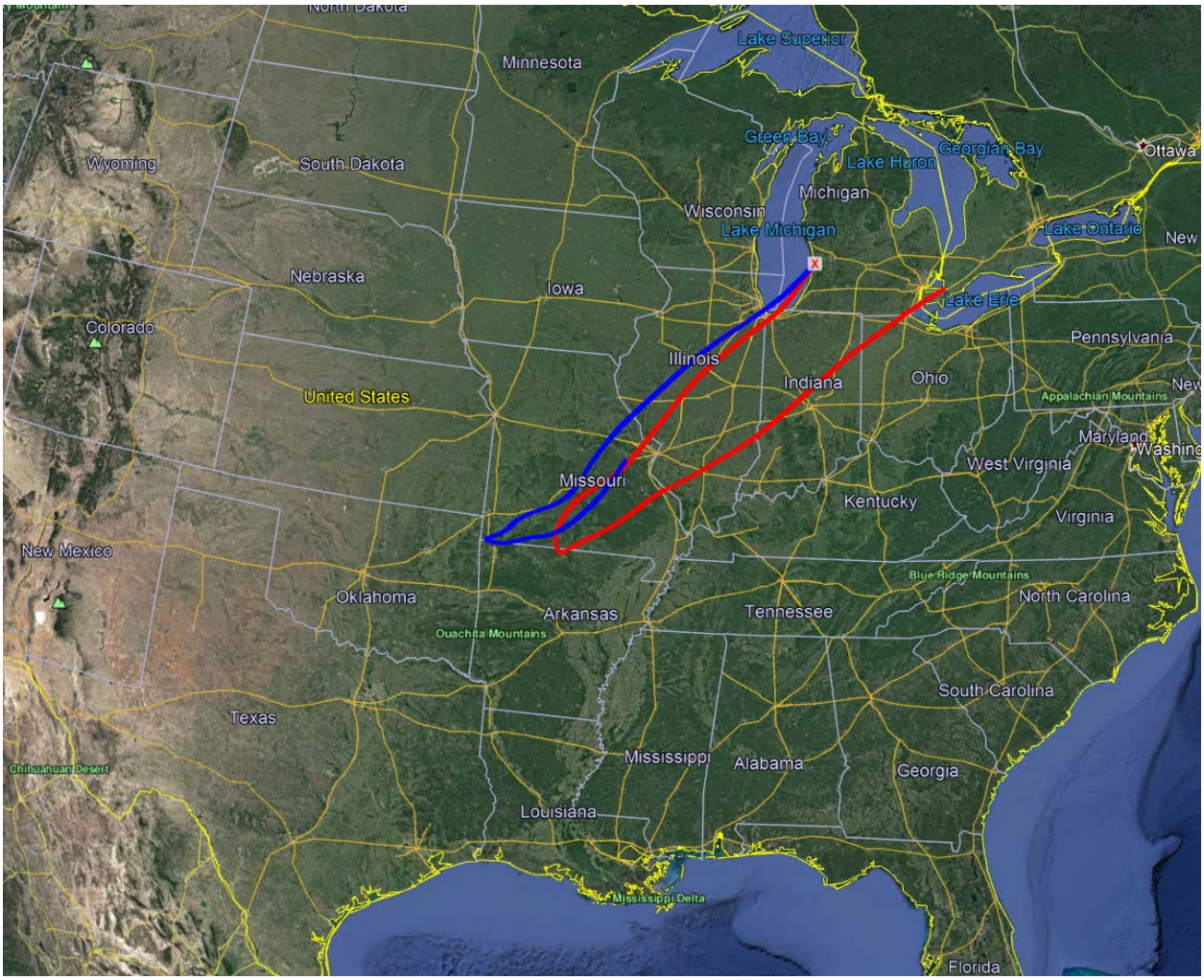


Figure 31 above depicts the trajectories of two air parcels that traveled through Arkansas and arrived at the Allegan County, MI ozone monitor on June 10, 2017. The 100 m air parcel traveled through northern Arkansas on June 8–9, 2017 and had a residence time through Arkansas of nine hours out of the seventy-two hours included in the back-trajectory. The 500 m air parcel traveled through northern Arkansas on June 8, 2017 and had a residence time through Arkansas of four hours out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the 100 m air parcel passed through a Canadian province, four other states, and the Indianapolis-Carmel-Anderson, IN MSA. Prior to entering Arkansas, the 500 m air parcel passed through one other state and the Saint Louis, MO-IL MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, both air parcels passed through three other states, the Saint Louis, MO-IL MSA (100 m), and the Chicago-Naperville-Elgin, IL-IN-WI MSA (both trajectories) before they arrived at the Allegan County, MI ozone monitor.

Figure 32: Linked Back-Trajectory (100 m) (June 10, 2017 19:00 hours UTC)

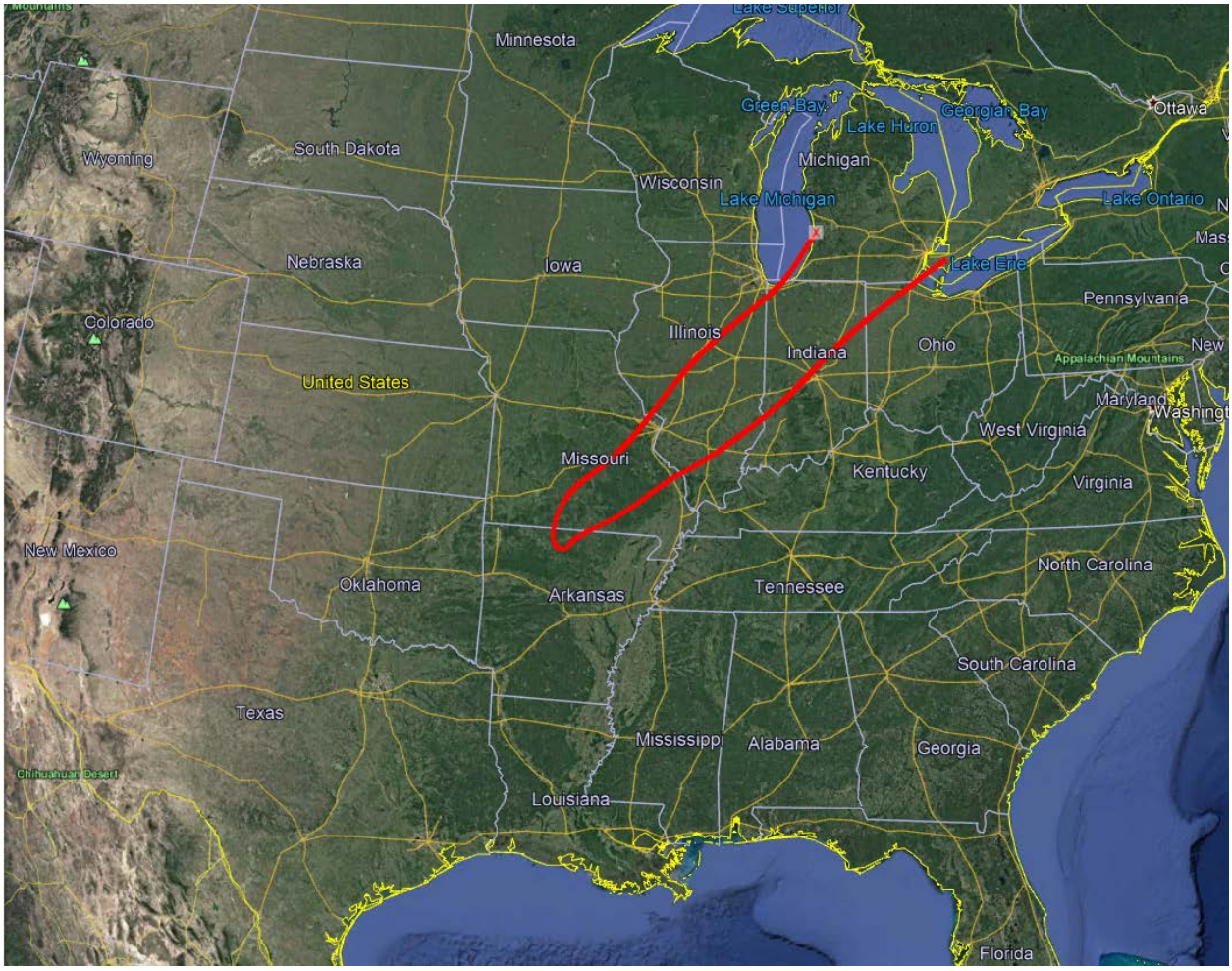


Figure 32 above depicts the trajectory of an air parcel that passed through northern Arkansas on June 8–9, 2017 and arrived at the Allegan County, MI ozone monitor on June 10, 2017. The air parcel had a residence time through Arkansas of fifteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through a Canadian province, four other states, and the Indianapolis-Carmel-Anderson, IN MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, the Saint Louis, MO-IL MSA, the Springfield, IL MSA, the Bloomington, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 33: Linked Back-Trajectory (100 m) (June 10, 2017 20:00 hours UTC)

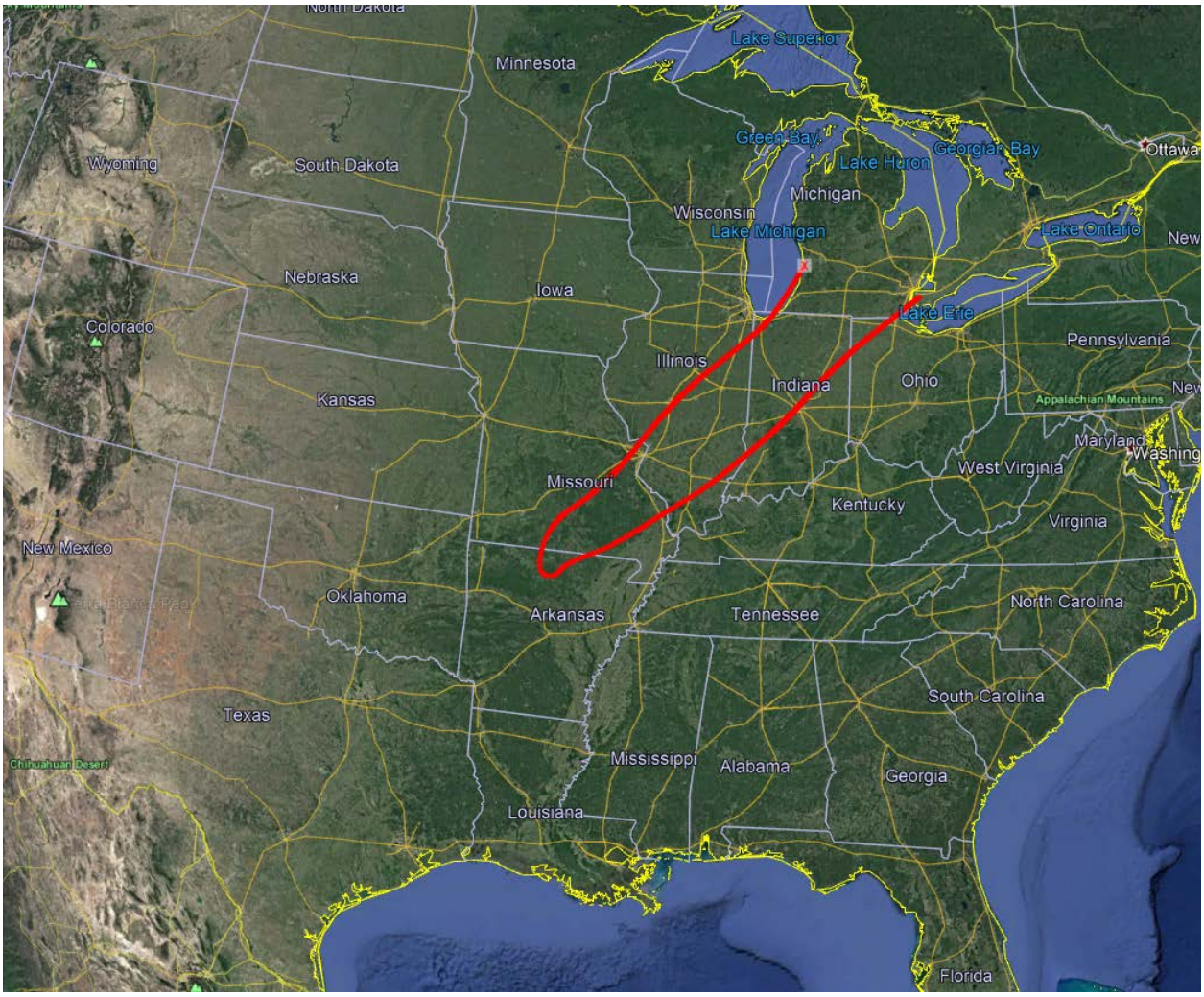


Figure 33 above depicts the trajectory of an air parcel that passed through extreme northern Arkansas on June 8–9, 2017 and arrived at the Allegan County, MI ozone monitor on June 10, 2017. The air parcel had a residence time through Arkansas of seventeen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through a Canadian province, four other states, and the Indianapolis-Carmel-Anderson, IN MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, the Saint Louis, MO-IL MSA, the Springfield, IL MSA, the Bloomington, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 34: Linked Back-Trajectory (100 m) (June 10, 2017 21:00 hours UTC)

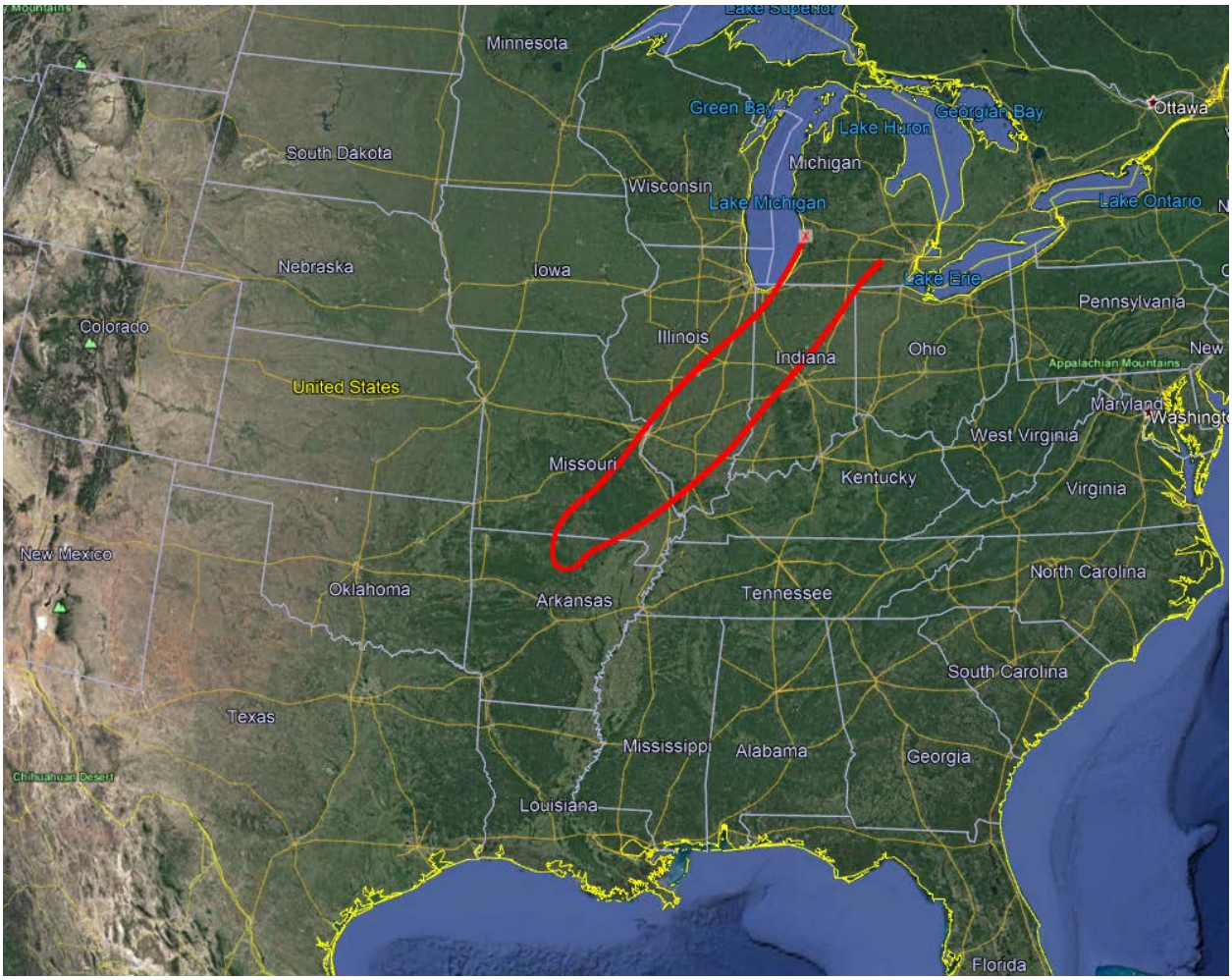


Figure 34 above depicts the trajectory of an air parcel that passed through northern Arkansas on June 8–9, 2017 and arrived at the Allegan County, MI ozone monitor on June 10, 2017. The air parcel had a residence time through Arkansas of nineteen out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the air parcel passed through a five other states, and the Indianapolis-Carmel-Anderson, IN MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through three other states, the Saint Louis, MO-IL MSA, the Springfield, IL MSA, the Bloomington, IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 35: Linked Back-Trajectory (Red = 100 m; Blue = 500 m) (June 12, 2017 15:00 hours UTC)

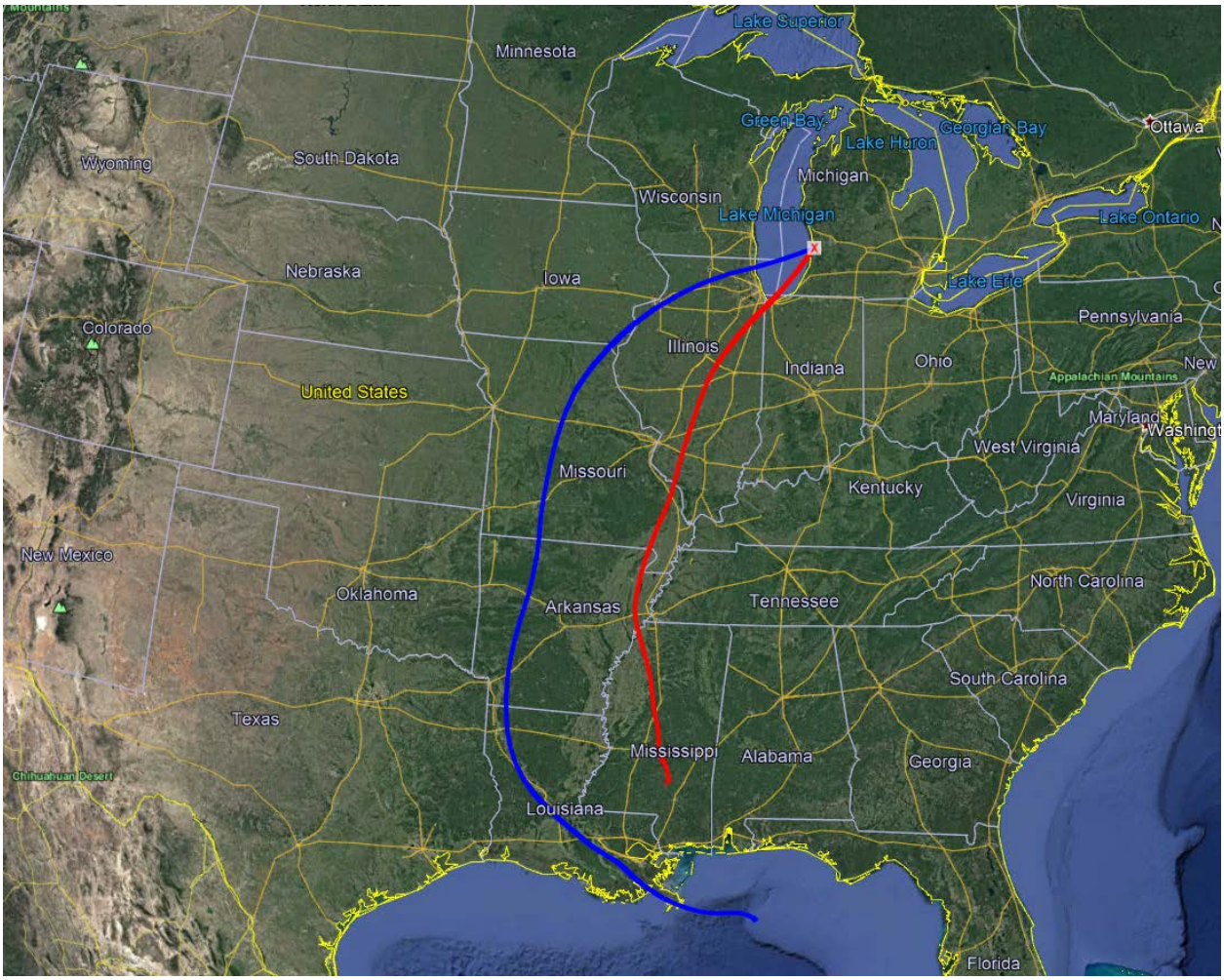


Figure 35 above depicts the trajectories of two air parcels that traveled through Arkansas and arrived at the Allegan County, MI ozone monitor on June 12, 2017. The 100 m air parcel traveled through northeastern Arkansas on June 11, 2017 and had a residence time through Arkansas of eight hours out of the seventy-two hours included in the back-trajectory. The 500 m air parcel traveled through northern Arkansas on June 11, 2017 and had a residence time through Arkansas of ten hours out of the seventy-two hours included in the back-trajectory. Prior to entering Arkansas, the 100 m air parcel passed through one other state. For the 500 m air parcel, hour seventy-two occurred over the Gulf of Mexico and prior to entering Arkansas, this air parcel passed through one other state and the Shreveport-Bossier City, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, both air parcels passed through three other states, while the 500 m air parcel also passed through the Davenport-Moline-Rock Island IA-IL MSA. Then both air parcels passed through the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 36: Linked Back-Trajectory (Red = 100 m; Blue = 500 m) (June 12, 2017 16:00 hours UTC)

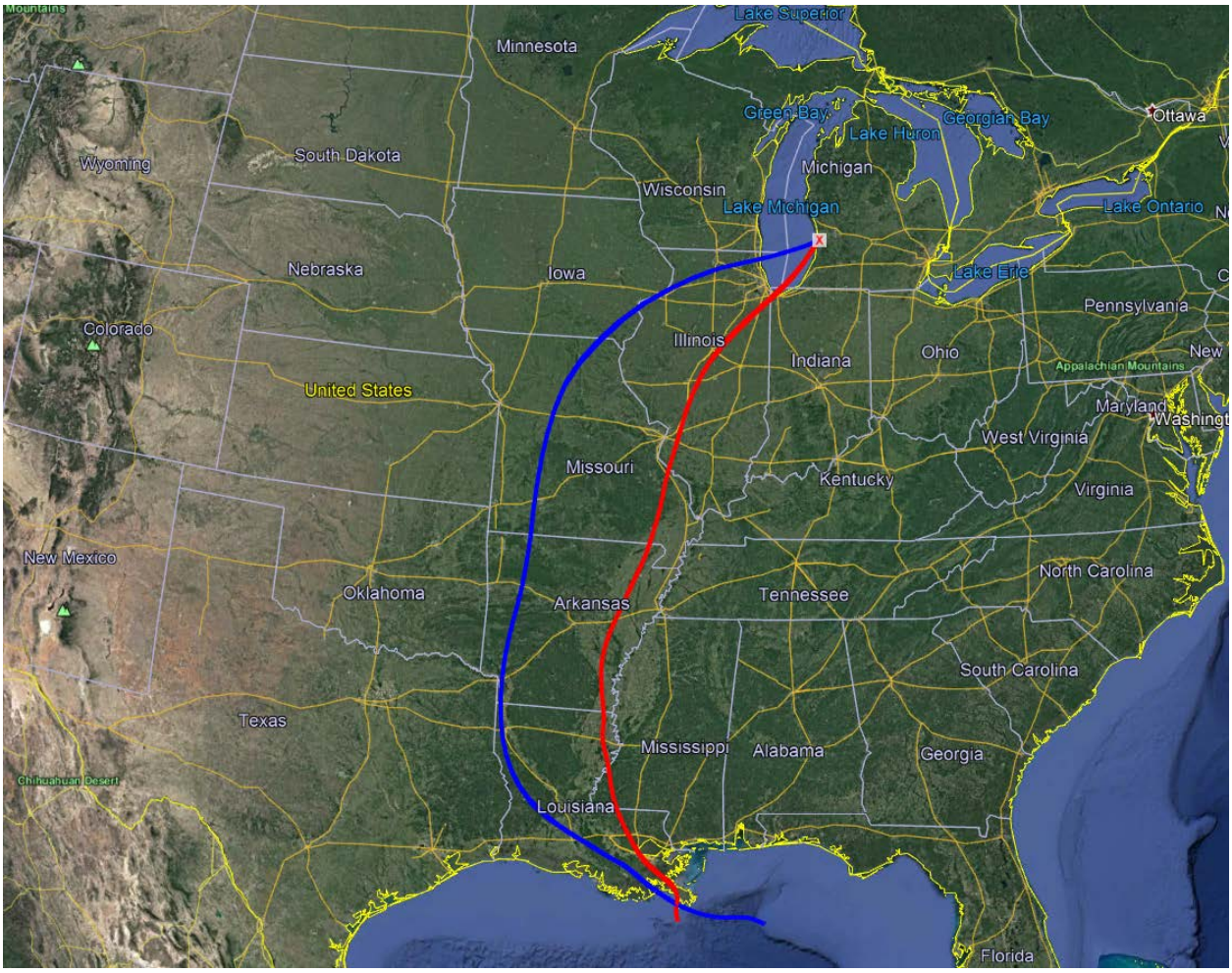


Figure 36 above depicts the trajectories of two air parcels that traveled through Arkansas, arriving at the Allegan County, MI ozone monitor on June 12, 2017. The 100 m air parcel traveled through Arkansas on June 11, 2017 and had a residence time through Arkansas of fifteen hours out of the seventy-two hours included in the back-trajectory. The 500 m air parcel traveled through Arkansas on June 11, 2017 and had a residence time through Arkansas of ten hours. For both air parcels, hour seventy-two occurred over the Gulf of Mexico. Prior to entering Arkansas, the 100 m air parcel passed through two other states, the New Orleans-Metairie, LA MSA, and the Baton Rouge, LA MSA, while the 500 m air parcel passed through one other state, the New Orleans-Metairie, LA MSA, and the Shreveport-Bossier City, LA MSA. After exiting Arkansas both air parcels passed through three other states. The 100 m air parcel also passed through the Saint Louis, MO-IL MSA, and the Bloomington, IL MSA and the 500 m air parcel also passed through the Davenport-Moline-Rock Island IA-IL MSA. Both air parcels also traveled through the Chicago-Naperville-Elgin, IL-IN-WI MSA.

Figure 37: Linked Back-Trajectory (100 m) (June 15, 2017 18:00 hours UTC)

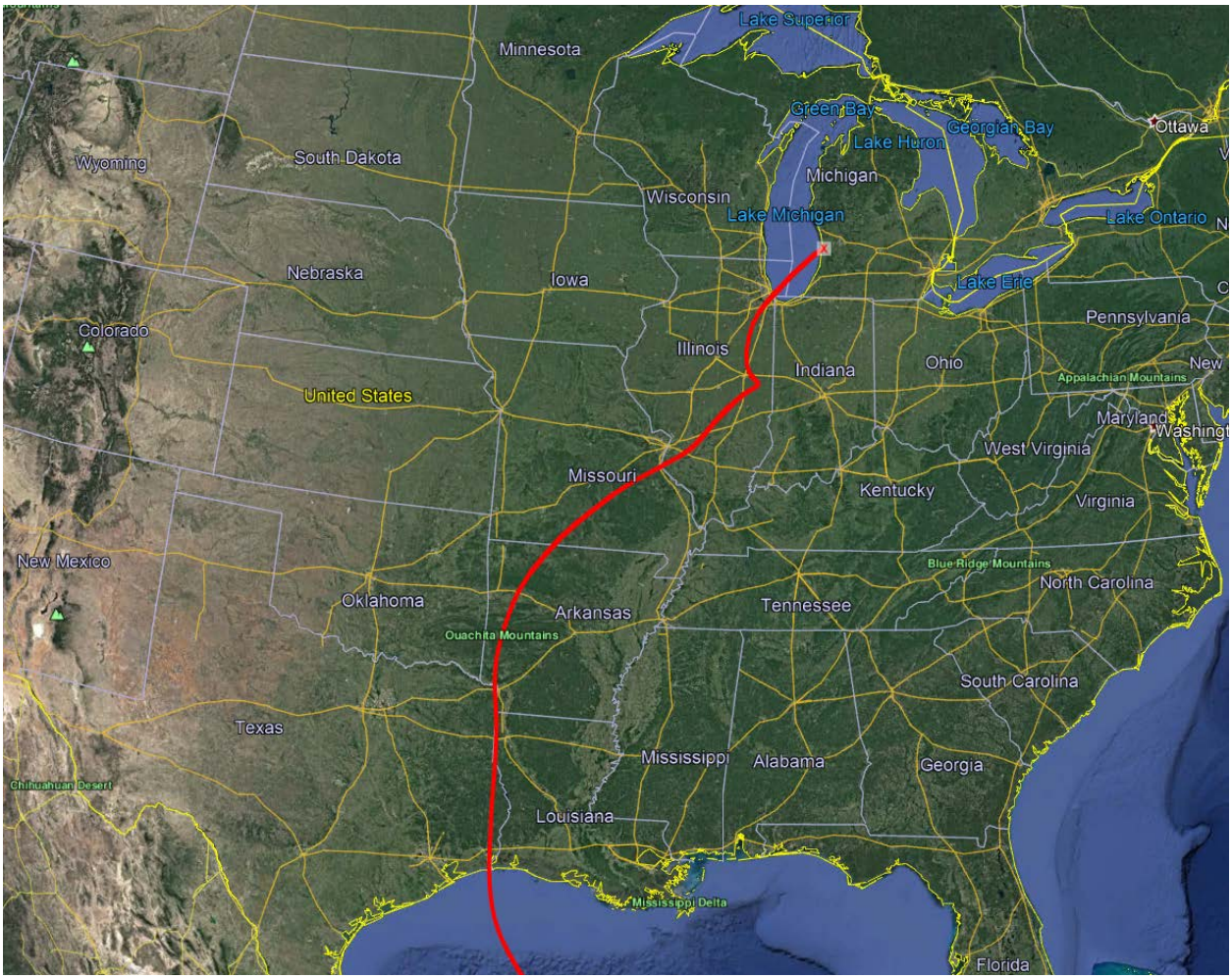


Figure 37 above depicts the trajectory of an air parcel that passed through Arkansas on June 14, 2017 and arrived at the Allegan County, MI ozone monitor on June 15, 2017. The air parcel traveled through Arkansas for eight out of the seventy-two hours included in the back-trajectory. Hour seventy-two occurred over the Gulf of Mexico. Prior to entering Arkansas, the air parcel passed through two other states, the Beaumont-Port Author, TX, MSA, and the Shreveport-Bossier City, LA MSA. After exiting Arkansas and before reaching the Allegan County, MI ozone monitor, the air parcel passed through two other states, the Saint Louis, MO-IL MSA, and the Chicago-Naperville-Elgin, IL-IN-WI MSA.

c. HYSPLIT Analysis Results Summary

Between 2008–2017, forty-one back-trajectories (6.74% of back-trajectories examined) indicated that air parcels passed through Arkansas in the seventy-two hour period prior to a MDA8 ozone concentration of greater than or equal to seventy-one ppb at the Allegan County, MI ozone monitor and entered the level of ambient air in Allegan County, MI. Of air parcels in these linked back-trajectories residence times in Arkansas ranged from one to nineteen (average of 9.1) hours of the seventy-two hour back-trajectory paths. These air parcels passed through other states and through MSAs both before and after passing through Arkansas. Table 7 identifies the number of linked back-trajectories and the number of days with linked-back trajectories to an elevated ozone day in Allegan County, MI for each year examined.

Table 7: Linked Back-Trajectories and Days with Linked Back-Trajectories by Year

Year	Linked Back-Trajectories	Days with Linked Back-Trajectories
2008	1	1
2009	2	1
2010	4	2
2011	4	3
2012	14	7
2013	2	2
2014	0	0
2015	3	2
2016	1	1
2017	10	3

The HYSPLIT runs demonstrate that there is not a consistent or persistent pattern of air flow through Arkansas to Allegan County, MI on elevated ozone days. Of the ten years examined, air passing through Arkansas only reached Allegan County, MI on four or more days in one year: 2012.[24] For 2012, HYSPLIT analyses indicated fourteen Arkansas-Allegan County linked back-trajectories, whereas for 2013 and 2014 the HYSPLIT analyses indicated two and zero Arkansas-Allegan County linked back-trajectories, respectively.

On a straight-line path, the northernmost border of Arkansas is greater than 1050 km (645 miles) away the Allegan County, MI ozone monitor site. The HYSPLIT analysis demonstrated that back trajectories did not typically follow a straight-line path. All forty-one linked back-trajectory air parcels passed through at least one MSA before or after traveling through Arkansas and prior

[24] The number of days in a given year and the number of consecutive years is of particular relevance for the ozone NAAQS, which is calculated based the annual fourth-highest daily maximum eight-hour concentration averaged over three consecutive years.

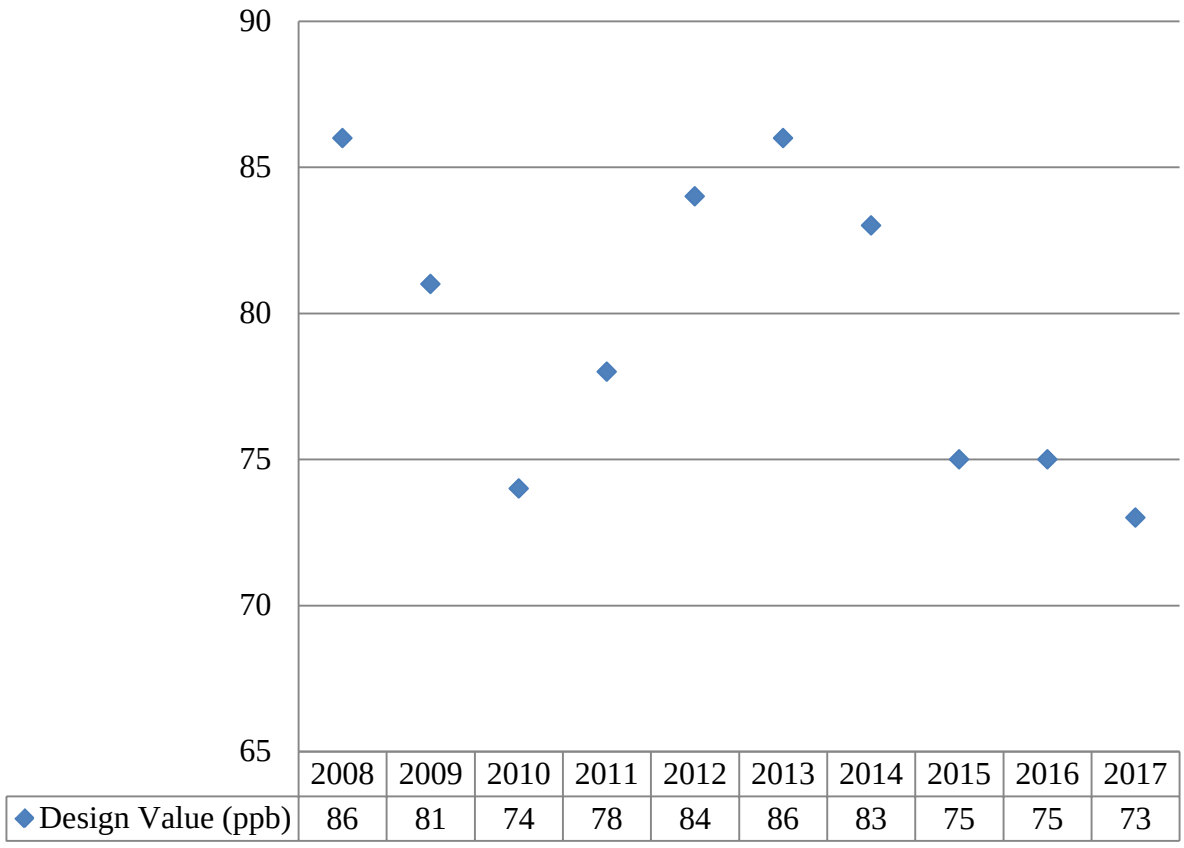
to reaching Allegan County, MI. Thirty-seven passed through the Chicago-Naperville-Elgin, IL-IN-WI MSA prior to reaching Allegan County, MI. These results indicate that other states and MSAs likely also influenced ozone concentrations at the Allegan County, MI monitor on the days with back-trajectories linked to Arkansas.

C. Identification and Evaluation of Air Quality, Upwind States Emissions, and Cost Factors

1. Allegan County, MI Ozone Monitor Trends

Ozone design values in Allegan County, MI fluctuated over the 2008–2017 period. Higher ozone concentrations occurred from 2012 through 2014, but concentrations have generally decreased since 2014. Figure 38 below shows the eight-hour ozone design values for the Allegan County, MI monitor for the years 2008–2017. The most recent design value for 2017 shows that the Allegan County, MI monitor continues to exceed the 2015 ozone NAAQS, although EPA modeling predicts that Allegan County, MI will be a maintenance area by 2023.

Figure 38: Allegan County, MI Eight-hour Ozone Design Values 2008–2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
◆ Design Value (ppb)	86	81	74	78	84	86	83	75	75	73

The EPA-projected 2023 ozone average design value at the Allegan County, MI monitor is 69.0 ppb, which would be in attainment with the 2015 ozone NAAQS in 2023. This projected design

value is 1.9 ppb below the NAAQS. Because EPA's model-projected 2023 maximum three-year design value that exceeds the NAAQS, EPA projects that Allegan County, MI will be a maintenance area in 2023.

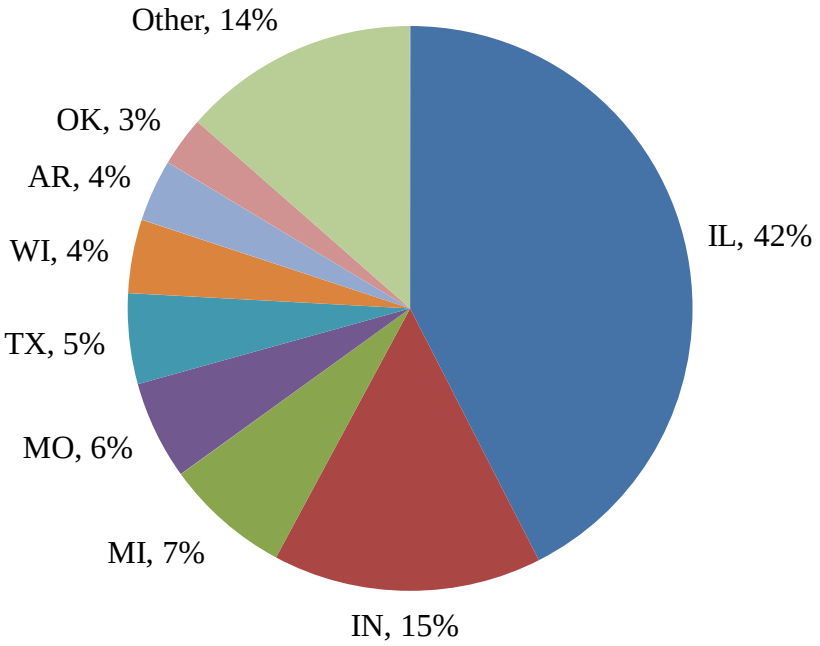
2. Relative Contributions to Linked Receptors

According to EPA's 2023 ozone contribution modeling, the primary state contributors of ozone to the Allegan County, MI monitor are Illinois and Indiana with a combined contribution of fifty-seven percent. Arkansas's contribution, by contrast, is four percent. Table 8 below shows the individual state ozone contributions to the Allegan County, MI monitor for those states with a contribution of one ppb or higher. Figure 39 below shows individual upwind state ozone contributions to the Allegan County, MI monitor as a percentage of the total state ozone contribution to the monitor. The highest four ozone contributors are also states that one-hundred percent of the Arkansas-linked back-trajectory air parcels passed through after leaving Arkansas. States that contribute less than one ppb, tribal, Canada/Mexico, offshore, fire, initial and boundary, and biogenic sources are included in the "other" category in Figure 39.

Table 8: EPA CAMx Modeling Potential Contributors (≥ 1 ppb) Results (Allegan County, MI)

	Modeled 2023 Contribution in Parts Per Billion (ppb)							
Monitor	IL	IN	MI	MO	TX	WI	AR	OK
Allegan County, MI	19.62	7.11	3.32	2.61	2.39	1.95	1.64	1.31

Figure 39: Upwind State Anthropogenic Ozone Relative Contributions to the Allegan County, MI Monitor



ADEQ calculated Arkansas's projected relative impact on the amount by which the 2023 maximum design value for Allegan County exceeds the 2015 ozone NAAQS using the following formula with data from EPA's modeling and apportionment results.[25,26]

$$Relative\ Contribution\ to\ Downwind\ Air\ Quality\ Problems = \frac{(2023\ Max\ DV - Canada + Mexico - 70.9\ ) \times\ (Arkansas\ Countribution)}{Total\ US\ Anthropogenic\ Contribution}$$

ADEQ defines the projected "downwind air quality problem" to be the amount by which the average and/or maximum design value for Allegan exceeds the level of the NAAQS. For the Allegan Michigan monitor, the projected 2023 average design value is below the NAAQS and the projected 2023 maximum design value is above the NAAQS. Therefore, the Allegan Michigan monitor is projected to be a maintenance monitor; however, some emission reductions from upwind states may help ensure that the monitor attains and maintains the NAAQS as projected. ADEQ calculated the fraction attributable to Arkansas of the amount by which the Allegan Michigan monitor 2023 projected maximum design value exceeds the level of the

[25] EPA's requirements for determination of compliance with the NAAQS are based on the nearest ppb rounded down. Therefore, a design value of 70.9 ppb would be in compliance with the 2015 ozone NAAQS.
[26] International air pollution is addressed under Clean Air Act §115; therefore, the contribution from Canada and Mexico was subtracted from the 2023 Max DV before determining Arkansas's share of the amount by which the ozone design value would need to be reduced to meet the NAAQS.

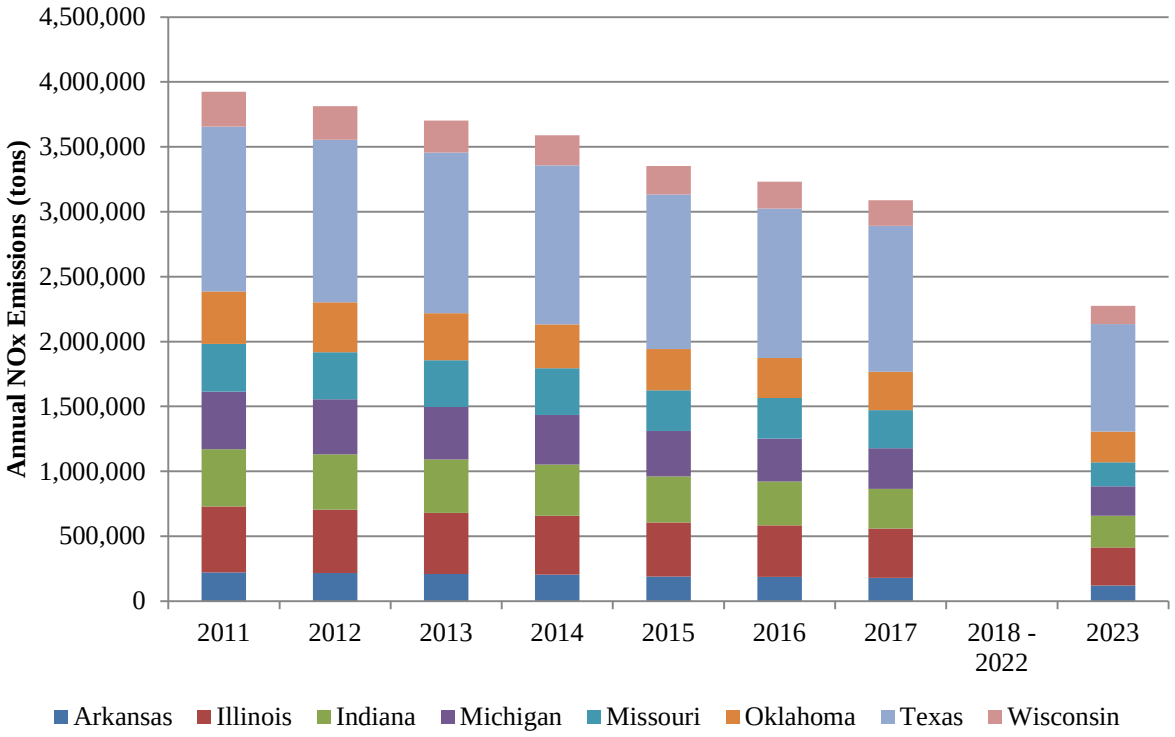
NAAQS to determine whether reducing Arkansas's share of the "downwind air quality problem" would be meaningful. Based on ADEQ's analysis, Arkansas' proportionate share of the "downwind air quality problem" is 0.01 ppb. ADEQ notes that 0.01 ppb is two orders of magnitude lower than the lowest significant digit reported for the 2015 ozone NAAQS.

3. Emissions Trends in States Linked (≥ 1 ppb) to Allegan County, MI Monitor

   a. Statewide Emissions of Ozone Precursors

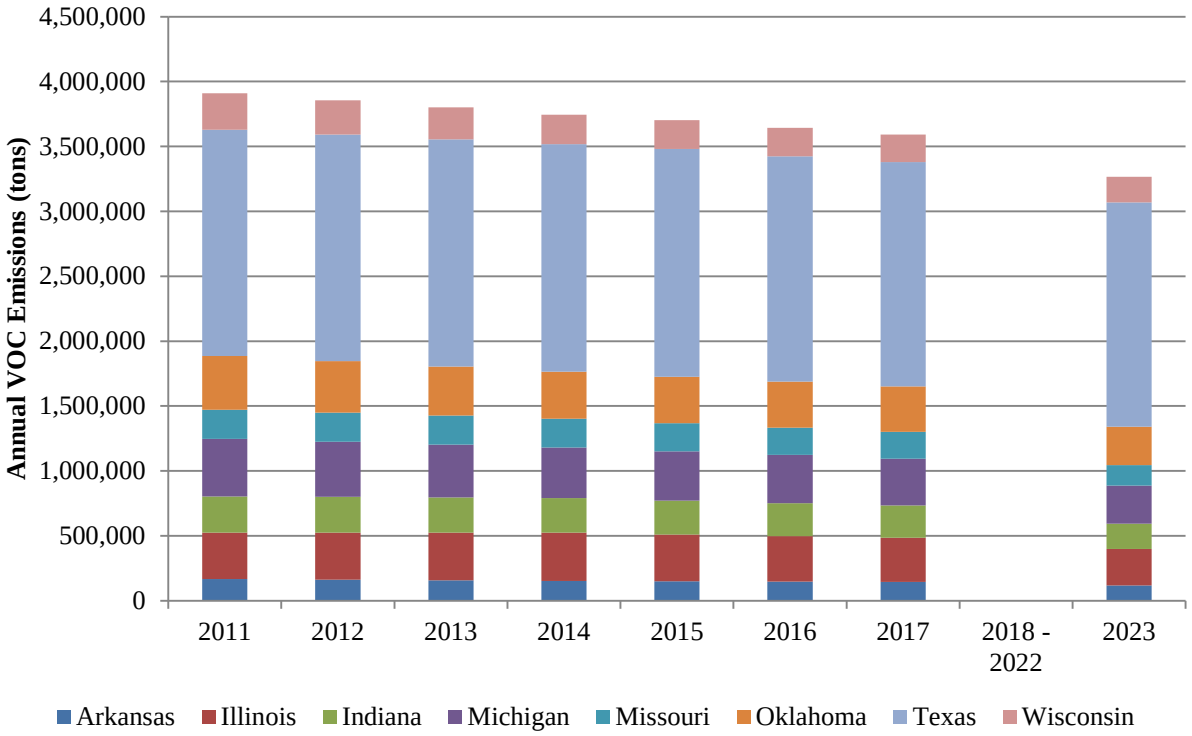
As noted above, EPA projected that eight states will contribute at least one ppb to the Allegan County, MI monitor in 2023. Figures 40 and 41 illustrate statewide emissions trends, as well as the annual statewide emissions projected in 2023, for ozone precursors (NOx and VOCs) in these eight states.[27] These emissions trends support EPA's projection that Allegan County Michigan will be a maintenance receptor in 2023.

Figure 40: Historic 2011 to 2017 and Model-Projected 2023 Statewide Emissions of NOx for States Linked (≥ 1 ppb) to Allegan County, MI Monitor



[27] Data obtained from https://www.epa.gov/sites/production/files/2018-10/annual_emissions_data_by_state_1.xlsx Emissions from Biogenics, Wildfires and Prescribed Fires are not included in estimates.

Figure 41: Historic 2011 to 2017 and Model-Projected 2023 Statewide Emissions of VOC for States Linked (≥ 1 ppb) to Allegan County, MI Monitor



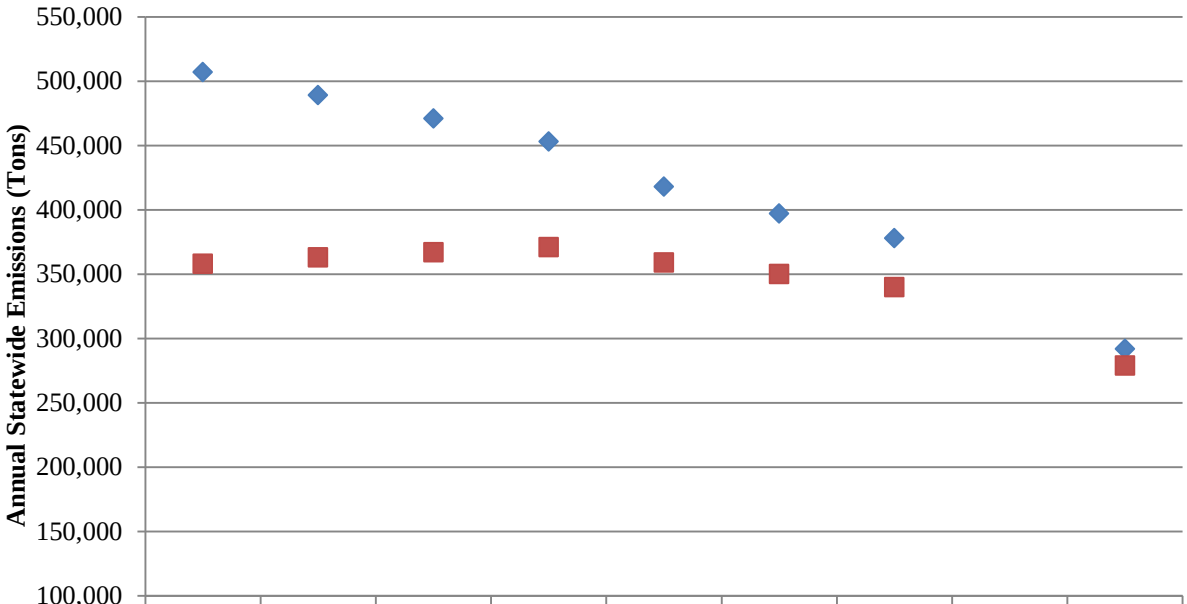
The data show a decrease in statewide NOx and VOC emissions from upwind states linked at a one ppb threshold to Allegan County, MI. Figures 40 and 41 above also indicate the relative scale of NOx and VOC emissions, respectively, from sources in each of the eight states. Texas, which makes up five percent of modeled contributions to the projected 2023 design value at the Allegan County, MI monitor design value, is the largest source of both VOC and NOx emissions. Illinois and Indiana, which together represent fifty-seven percent of modeled contributions to the projected 2023 design value at the Allegan County, MI monitor, have lower emissions of NOx and VOC combined than does Texas. Arkansas has the lowest emissions of both NOx and VOCs among the eight linked states and represents only four percent of contributions to the projected design value at the Allegan County, MI monitor in 2023.

ADEQ split the data included in Figures 40 and 41 into Figures 42 through 49 to better show emissions trends for VOC and NOx for each of the eight linked states.[28] For those states with historic emissions of one or more pollutant that appeared to have a linear downward trajectory,

[28] Emissions from Biogenics, Wildfires and Prescribed Fires are not included in estimates

ADEQ confirmed trends based on the coefficient of determination (R^2 value) of the line of best fit for 2011–2017 emissions.[29]

Figure 42: Historic 2011 to 2017 and Model-Projected 2023 Illinois Statewide NOx and VOC Emissions

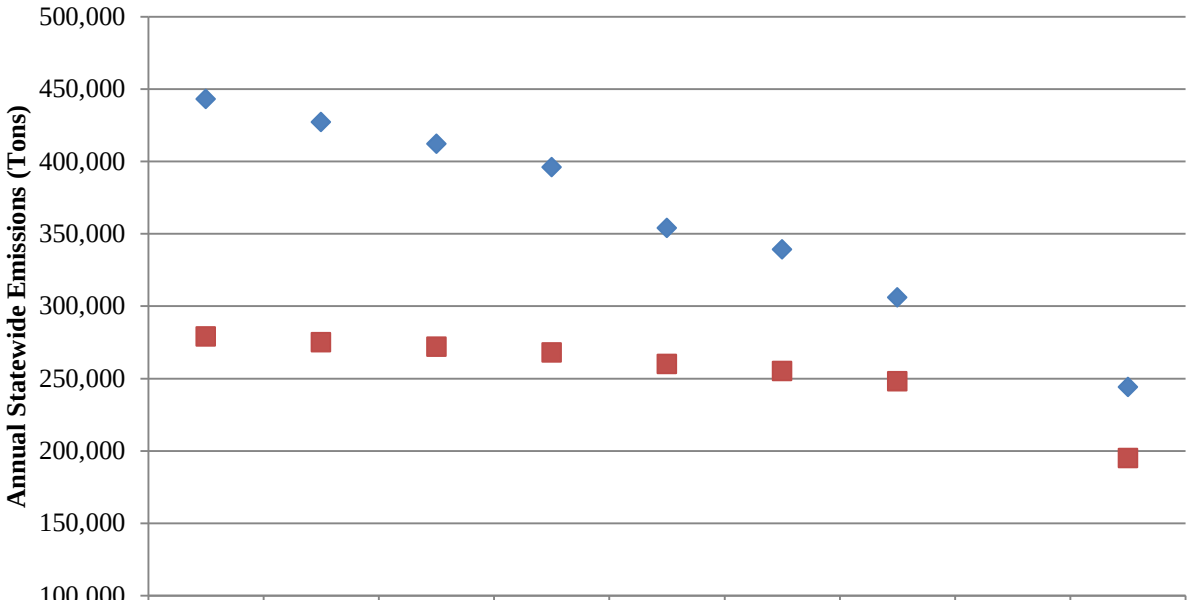


	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	507,000	489,000	471,000	453,000	418,000	397,000	378,000		292,000
VOC	358,000	363,000	367,000	371,000	359,000	350,000	340,000		279,000

Illinois statewide emissions of NOx have shown a near linear decrease (slope = -22,286 tons/year, R^2 = 0.9904) since 2011 and are projected to decrease even further in 2023. Illinois statewide VOC emissions increased between 2011 and 2014 but emissions began to decline in 2015 and are projected to decline even further in 2023.

[29] ADEQ did not include the 2023 projected value in the linear trendline analysis.

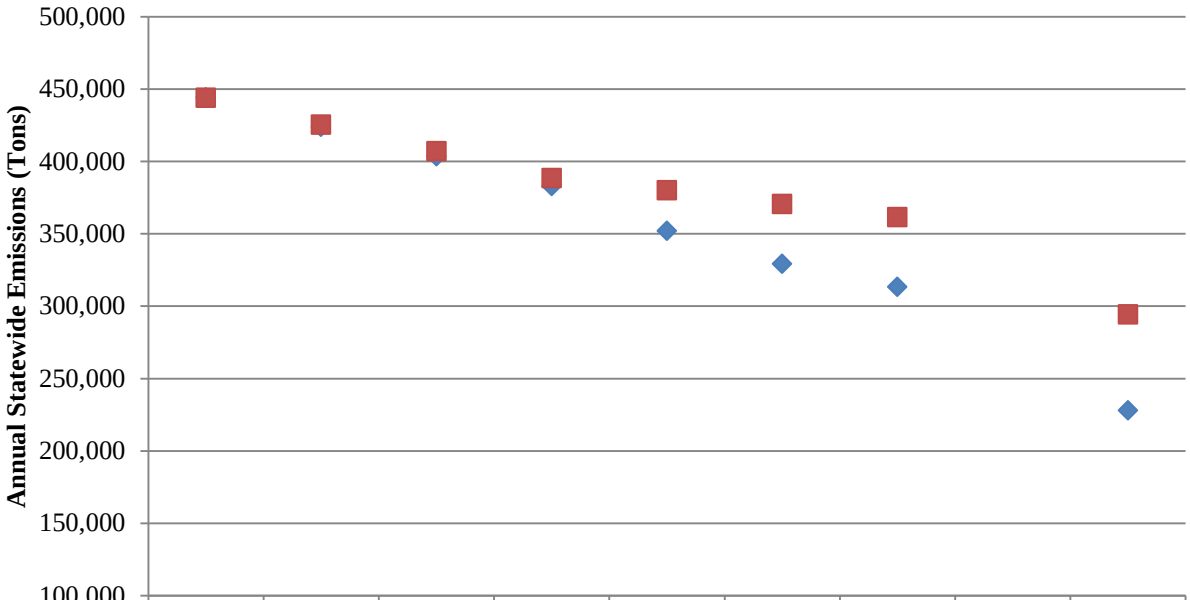
Figure 43: Historic 2011 to 2017 and Model-Projected 2023 Indiana Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	443,000	427,000	412,000	396,000	354,000	339,000	306,000		244,000
VOC	279,000	275,000	272,000	268,000	260,000	255,000	248,000		195,000

Indiana statewide emissions of NOx have shown a near linear year-over-year decrease (slope = -23,036 tons/year, R^2 = 0.9743) since 2011 and are projected to decrease even further in 2023. Indiana statewide VOC emissions have also shown a less dramatic, but still consistent, decrease (-5,178 tons per year, R^2 =0.9785) since 2011 are projected to decrease even further in 2023.

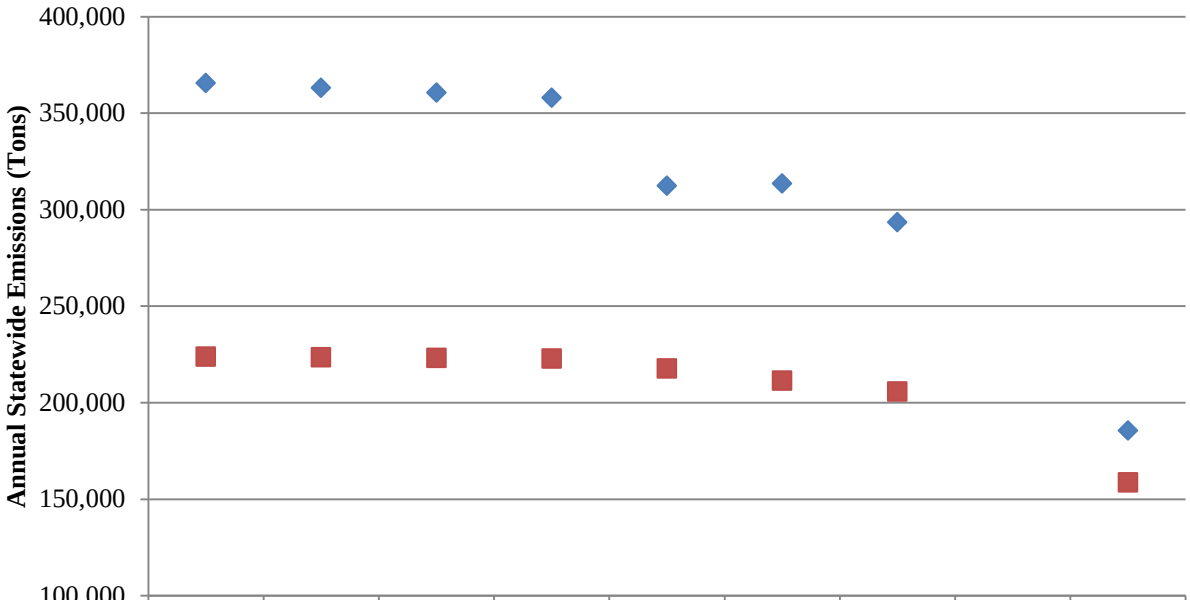
Figure 44: Historic 2011 to 2017 and Model-Projected 2023 Michigan Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	444,088	423,708	403,327	382,946	351,938	329,062	313,277		227,801
VOC	443,805	425,347	406,889	388,431	379,912	370,425	361,423		294,257

Michigan statewide emissions of NOx have shown a near linear year-over-year decrease (slope = -22,611 tons/year, R^2 = 0.9952) since 2011 and are projected to decrease even further in 2023. Michigan statewide VOC emissions have also shown a less dramatic, but still consistent, decrease (-13,713 tons per year, R^2 =0.97) since 2011 are projected to decrease even further in 2023.

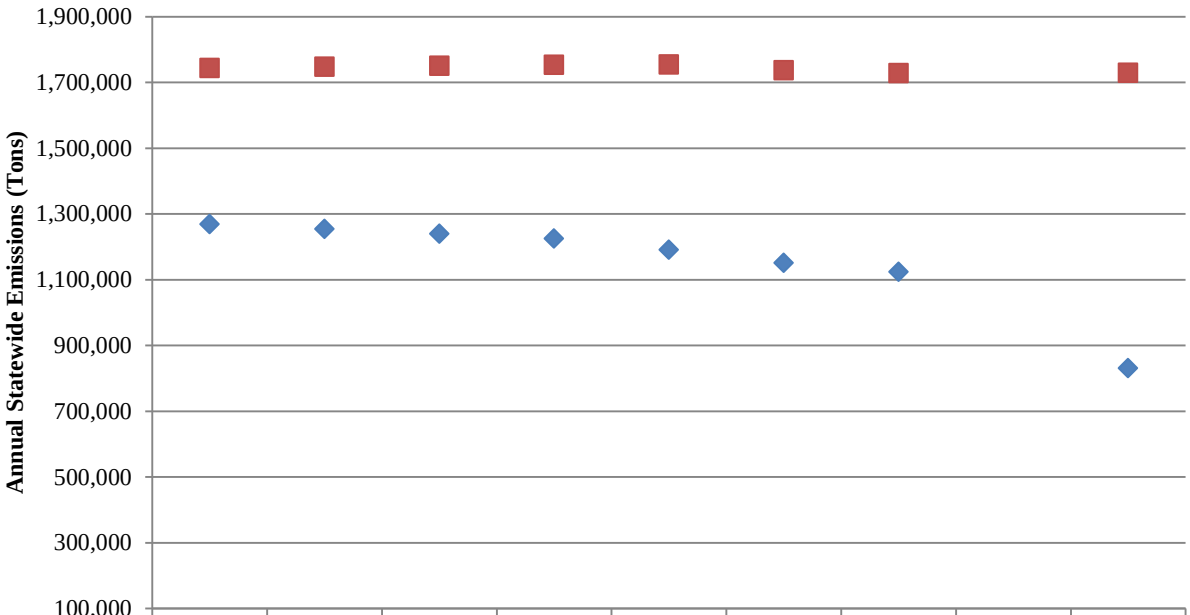
Figure 45: Historic 2011 to 2017 and Model-Projected 2023 Missouri Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	365,593	363,044	360,495	357,946	312,304	313,456	293,440		185,521
VOC	223,847	223,521	223,195	222,869	217,704	211,426	205,705		158,579

Missouri statewide emissions of NOx have decreased since 2011 and are projected to decrease even further in 2023. Missouri statewide VOC emissions were fairly consistent between 2011 and 2014, but decreased between 2014 and 2017 and are projected to decrease even further in 2023.

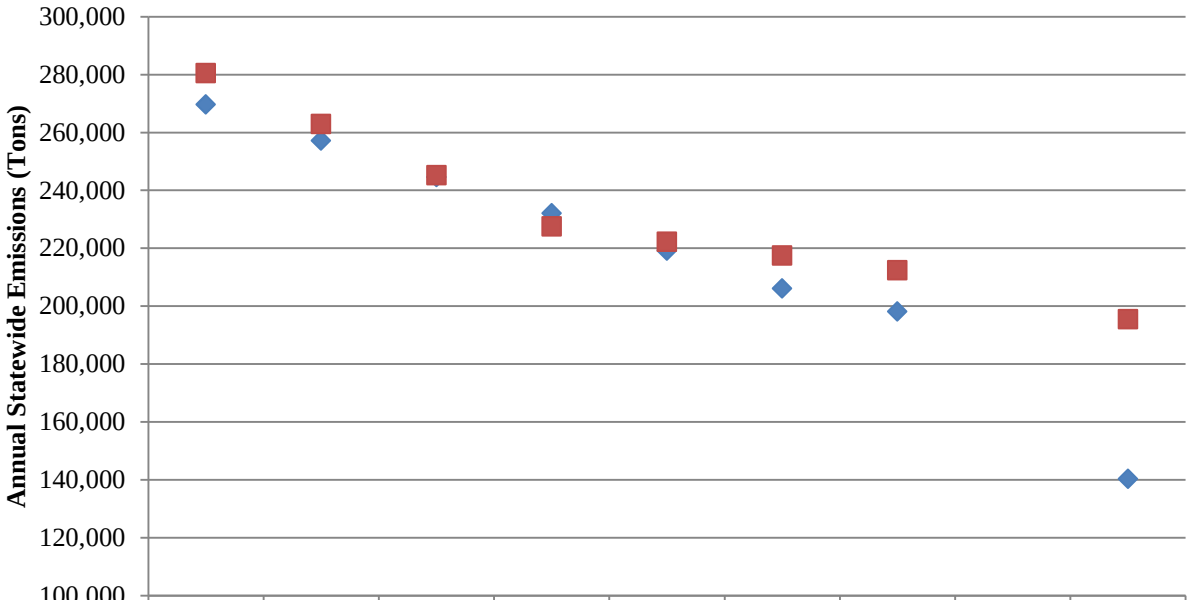
Figure 46: Historic 2011 to 2017 and Model-Projected 2023 Texas Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	1,268,310	1,253,926	1,239,543	1,225,160	1,191,068	1,151,284	1,123,696		830,231
VOC	1,743,762	1,746,897	1,750,032	1,753,167	1,754,571	1,736,525	1,728,204		1,729,313

Texas statewide emissions of NOx have shown a near linear year-over-year decrease (slope = -24,557 tons/year, R^2 = 0.9569) since 2011 and are projected to decrease even further in 2023. Texas statewide VOC emissions have also not changed much since 2011 and 2023 emissions levels are projected to be similar to 2017 levels.

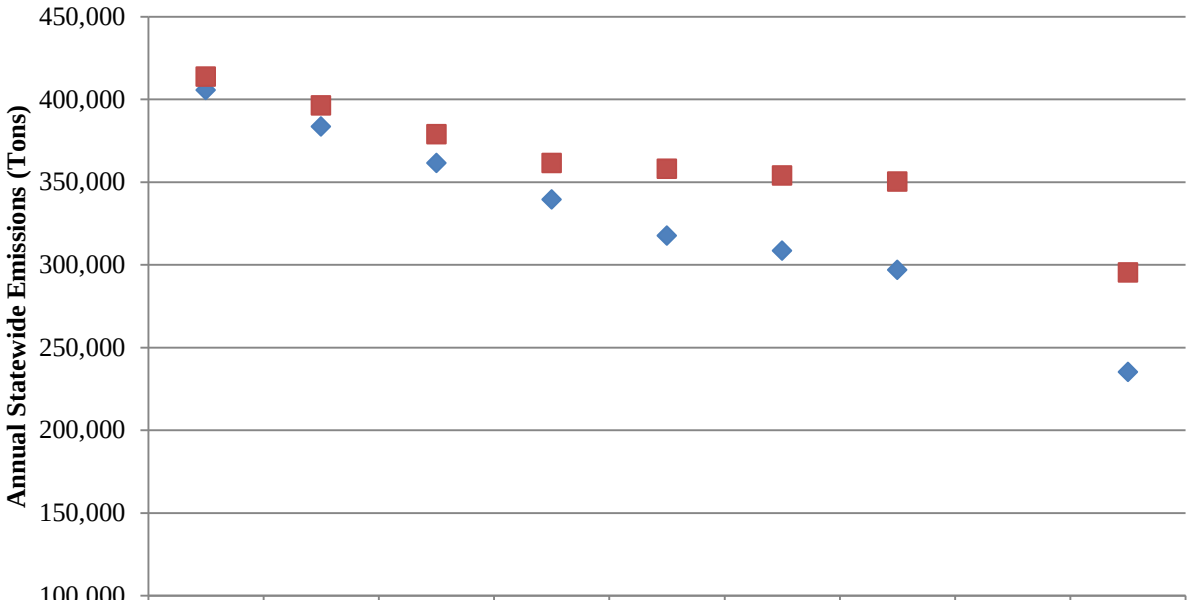
Figure 47: Historic 2011 to 2017 and Model-Projected 2023 Wisconsin Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
NOx	269,582	257,083	244,584	232,085	219,067	206,100	198,157		140,261
VOC	280,477	262,830	245,184	227,538	222,172	217,414	212,352		195,503

Wisconsin statewide emissions of NOx have shown a near linear year-over-year decrease (slope = -12,206 tons/year, R^2 = 0.9974) since 2011 and are projected to decrease even further in 2023. Wisconsin statewide VOC emissions have decreased since 2011. The rate of decrease began to slow from 2015 forward but further decreases in statewide VOC emissions for Wisconsin are projected in 2023.

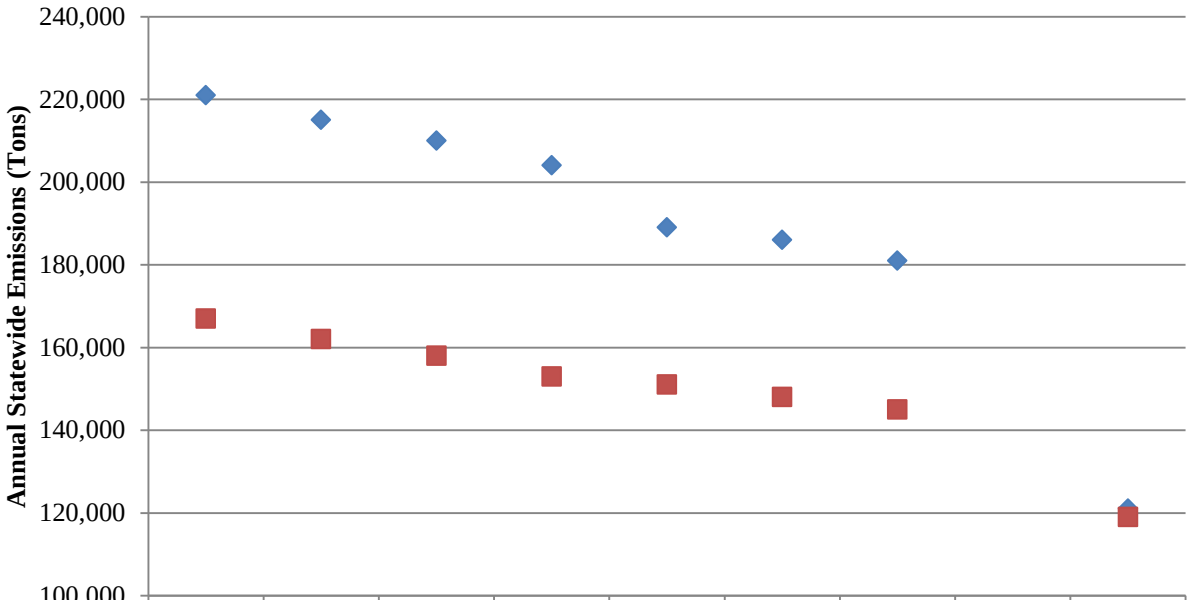
Figure 48: Historic 2011 to 2017 and Model-Projected 2023 Oklahoma Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
◆NOx	405,484	383,481	361,477	339,474	317,558	308,506	296,908		235,147
■VOC	413,703	396,283	378,863	361,442	357,994	353,957	350,214		295,197

Oklahoma statewide emissions of both NOx and VOC have declined since 2011. The rate of decline in emissions was greater between 2011 and 2014 slower than between 2014 and 2017. Further reductions in statewide emissions of both pollutants from Oklahoma are projected in 2023.

Figure 49: Historic 2011 to 2017 and Model-Projected 2023 Arkansas Statewide NOx and VOC Emissions



	2011	2012	2013	2014	2015	2016	2017	2018–2022	2023
◆NOx	221,000	215,000	210,000	204,000	189,000	186,000	181,000		121,000
■VOC	167,000	162,000	158,000	153,000	151,000	148,000	145,000		119,000

Arkansas statewide emissions of NOx have shown a near linear year-over-year decrease (slope = -7,107 tons/year, R^2 = 0.9721) since 2011 and are projected to decrease even further in 2023. Arkansas statewide VOC emissions have also shown a less dramatic, but still consistent, decrease (-3,607 tons per year, R^2 =0.9824) since 2011 are projected to decrease even further in 2023.

Figures 42–49 show a consistent pattern in statewide emission trends for the eight states linked (contribution threshold ≥ 1 ppb) to the Allegan County, MI monitor based on EPA's 2023 modeling. Statewide NOx emissions have decreased in all eight states and are projected to decrease even further in 2023. This is particularly relevant for Illinois and Indiana, which have seen greater than 20,000 tons per year in year-over-year NOx reductions, because these states make up approximately fifty-seven percent of modeled contributions to the 2023 projected design value at the Allegan County, MI monitor. For seven of the linked states, VOC emissions also decreased and are projected to decrease even further in 2023. The continuation of trends in emission reductions observed, particularly from Illinois and Indiana, are resulting in air quality improvements in Allegan County, MI. This further supports the basis for anticipating that the Allegan County, MI monitor will be a maintenance area in 2023.

Section III.3.b. below further explores emissions trends from Arkansas by looking at patterns in NOx emissions from elevated point sources.[30] VOC emissions from Arkansas sources are not further examined below because the Arkansas VOC emission inventory is largely dominated by biogenic sources and point sources only contribute two percent of total VOC emissions to Arkansas's VOC emission inventory.[31]

b. Arkansas Elevated Stack Emissions

i. NOx Historical Emissions Trends

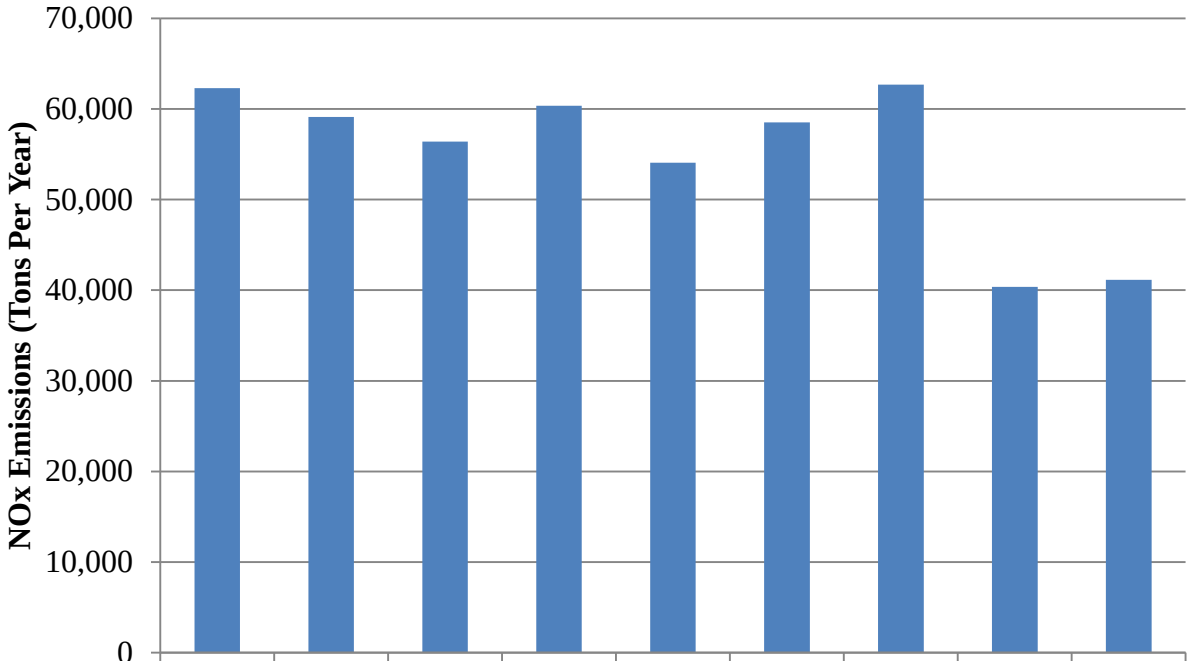
Figure 50 below shows annual NOx emissions between 2008 and 2016 for Arkansas elevated point sources.[32] Annual Arkansas elevated point source NOx emissions were highest in 2014 and lowest in 2015 and 2016, which were lower than they were in EPA's 2011 base year. Although 2015 and 2016 indicate a substantial and consistent decrease compared to 2008–2014 emissions, there is no strong trend in emissions from these sources.

[30] Emissions from elevated point sources are more likely to penetrate through the atmospheric mixing layer due to their stack characteristics. Therefore emissions from these sources are likely to be transported long distances.

[31] According to the EPA 2014 National Emission Inventory, emissions from biogenic sources make up eight-two percent of the Arkansas VOC emission inventory.

[32] An elevated point source is a source whose emissions plume penetrates through the mixing layer. Mixing height varies based on meteorological conditions. For the purpose of this analysis, ADEQ has used a stack height threshold of thirty-five feet to select sources to be considered as elevated point sources. This stack height threshold is conservative as the mixing height could be hundreds or thousands of feet given certain meteorological conditions. Only Type A sources, which are required to report emissions annually, are included in this analysis. Type B sources, which typically have much lower emissions, only report every three years. Type A and Type B sources are defined under 40 CFR §51.50. Data was obtained from EPA's Emissions Inventory System Gateway. See Spreadsheet EIS_emis_sum_rel_pt_NOx Type A 2008-2016 ob8_20_2018.

Figure 50: 2008–2016 Annual NOx emissions from Arkansas Elevated Point Sources



	2008	2009	2010	2011	2012	2013	2014	2015	2016
Tons	62,306	59,123	56,403	60,347	54,055	58,518	62,680	40,360	41,139

Although electric generating units (EGUs) have been included in the Arkansas elevated point source data set, ADEQ also examined trends in EGU data separately in Figure 51 and Figure 52. EGUs are the second largest source of emissions of NOx in Arkansas, but the largest source category of emissions that ADEQ regulates.[33] EGU NOx emissions are regulated through a variety of air pollution programs administered by EPA that require more granular reporting of emissions. EPA's Clean Air Markets Division collects hourly EGU emissions data and makes the data publicly available for download from the Air Markets Program Data (AMPD) database. Because of the magnitude of NOx emissions from EGUs and the height of their stacks, these sources have traditionally been regulated under state and federal implementation plans addressing interstate transport. Figures 51 and 52 below show Arkansas's EGU total annual and ozone season NOx emissions for the years 2008–2017. The blue bars represent the total annual NOx emissions from EGUs in Arkansas for each year.

[33] EPA 2014 National Emissions Inventory https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data

Figure 51: Arkansas Annual EGU NOx Emissions[34] for 2008–2017

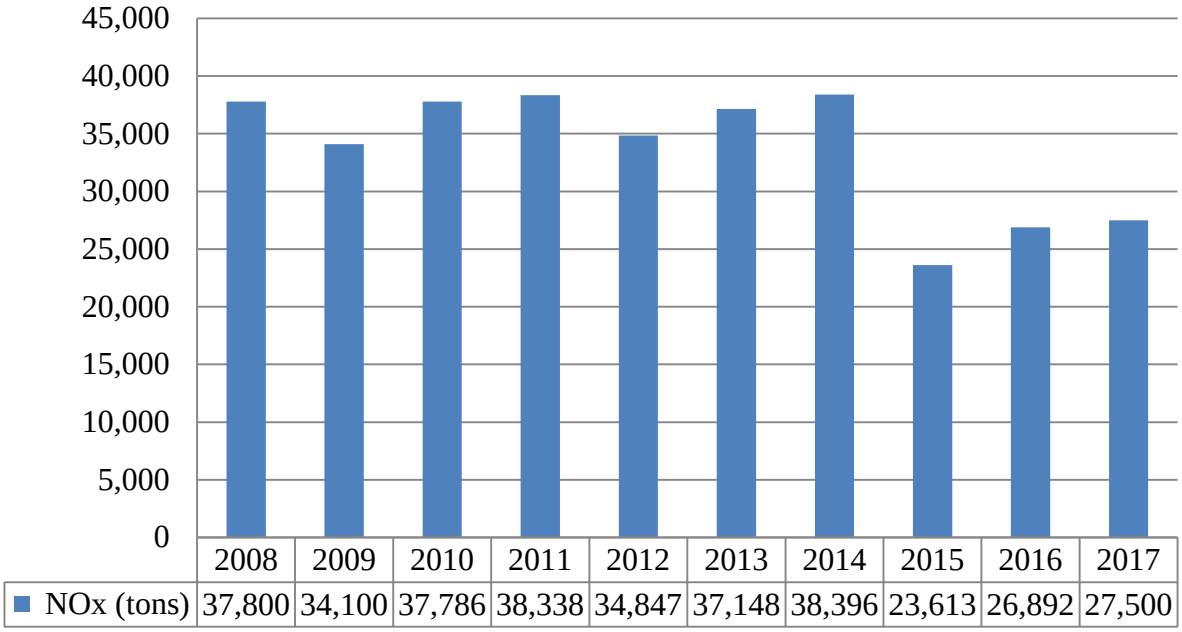
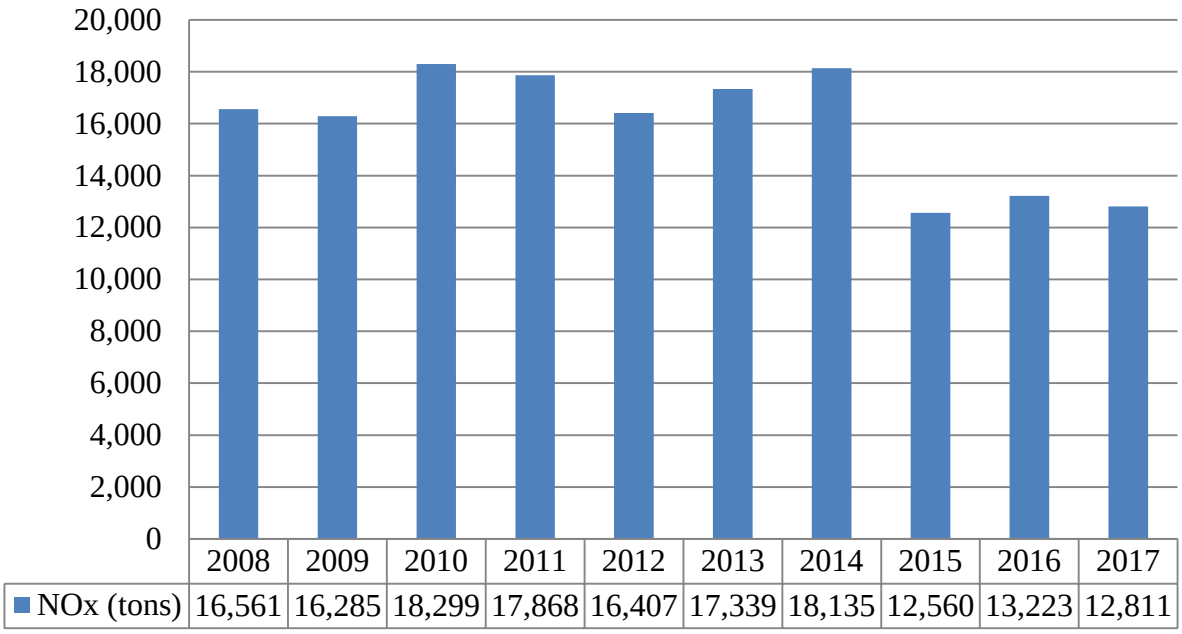


Figure 52: Arkansas Total Ozone Season EGU NOx Emissions[35] for 2008–2017



[34] NOx emissions data were downloaded from EPA's Air Markets Program Data database, https://ampd.epa.gov/ampd/

[35] NOx emissions data were downloaded from EPA's Air Markets Program Data database, https://ampd.epa.gov/ampd/

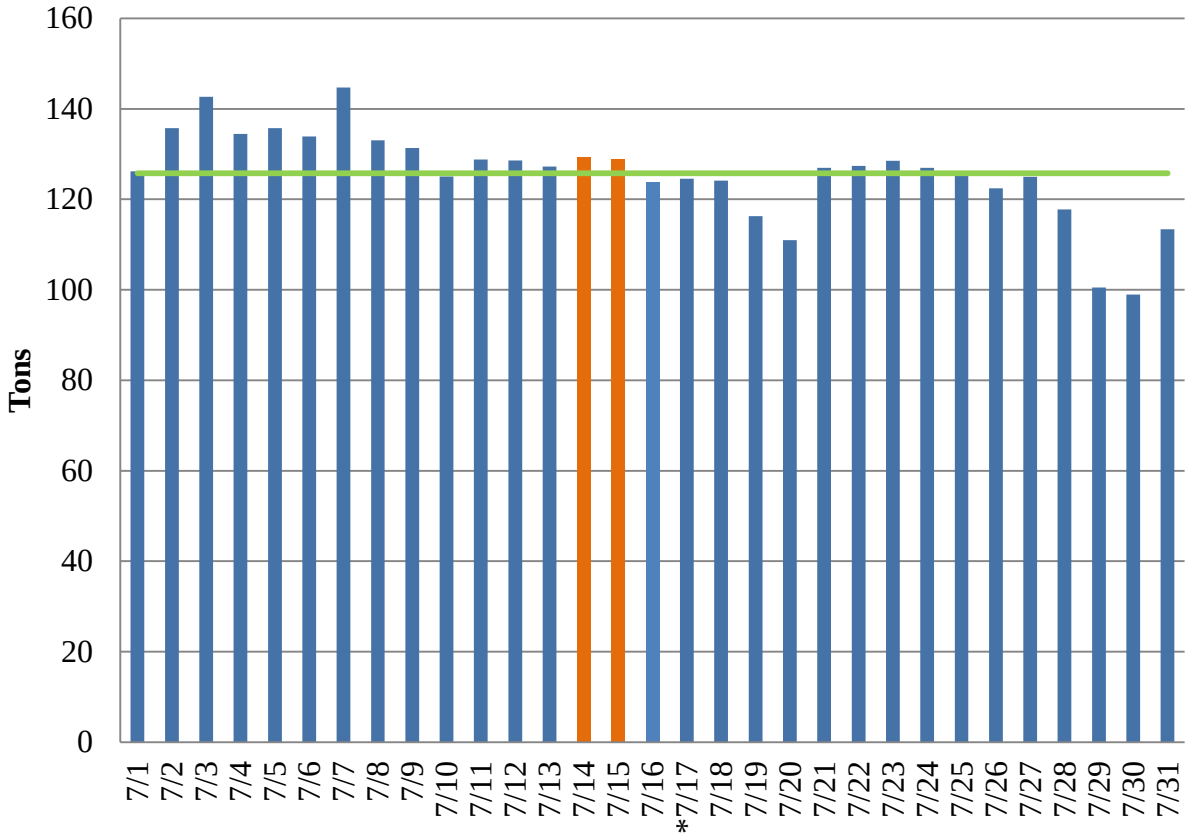
Total annual and ozone season NOx emissions from Arkansas EGUs were lower in 2015–2017 than in the previous seven years. Arkansas EGU NOx emissions in 2012, the year in which Allegan County, MI had the highest number of elevated ozone days during the ten year period were lower relative to the preceding two years and following two years. In fact, the EGU NOx emissions for 2012 were the second lowest on an annual basis and for the ozone season compared to other years in the first seven years of the time period assessed. Changes in dispatch of EGUs beginning in 2015 have resulted in lower NOx emissions from Arkansas EGUs. ADEQ further assesses the potential relationship between elevated ozone days at the Allegan County, MI monitor and Arkansas EGU emissions below.

ii. Relationship Between Elevated Ozone Days and EGU emissions during Periods with Linked HYSPLIT Back-trajectories

ADEQ assessed the potential for a relationship between Arkansas EGU NOx emissions and elevated ozone days using hourly emissions data from AMPD for each linked back-trajectory. ADEQ summed the total EGU NOx emissions for the twenty-four hour periods prior to an air parcel exiting Arkansas before eventually reaching Allegan County, MI. ADEQ then compared these 24-hour emissions to average daily NOx emissions for the month in which each elevated ozone day occurred.

Figures 53–67 below depict Arkansas daily EGU NOx emissions for all months from 2008 through 2017 in which HYSPLIT back-trajectory analysis showed air parcels passing through Arkansas and traveling to Allegan County, MI on elevated ozone days. The blue bars represent daily emissions during the month. The green horizontal line in each figure represents the average daily EGU NOx emissions for the month. Orange bars represent the days on which air parcels were in residence over Arkansas for any amount of time prior to reaching the Allegan County, MI monitor on elevated ozone days. All dates were determined based on Central Standard Time. Elevated ozone days at the Allegan County, MI monitor are denoted with an asterisk.

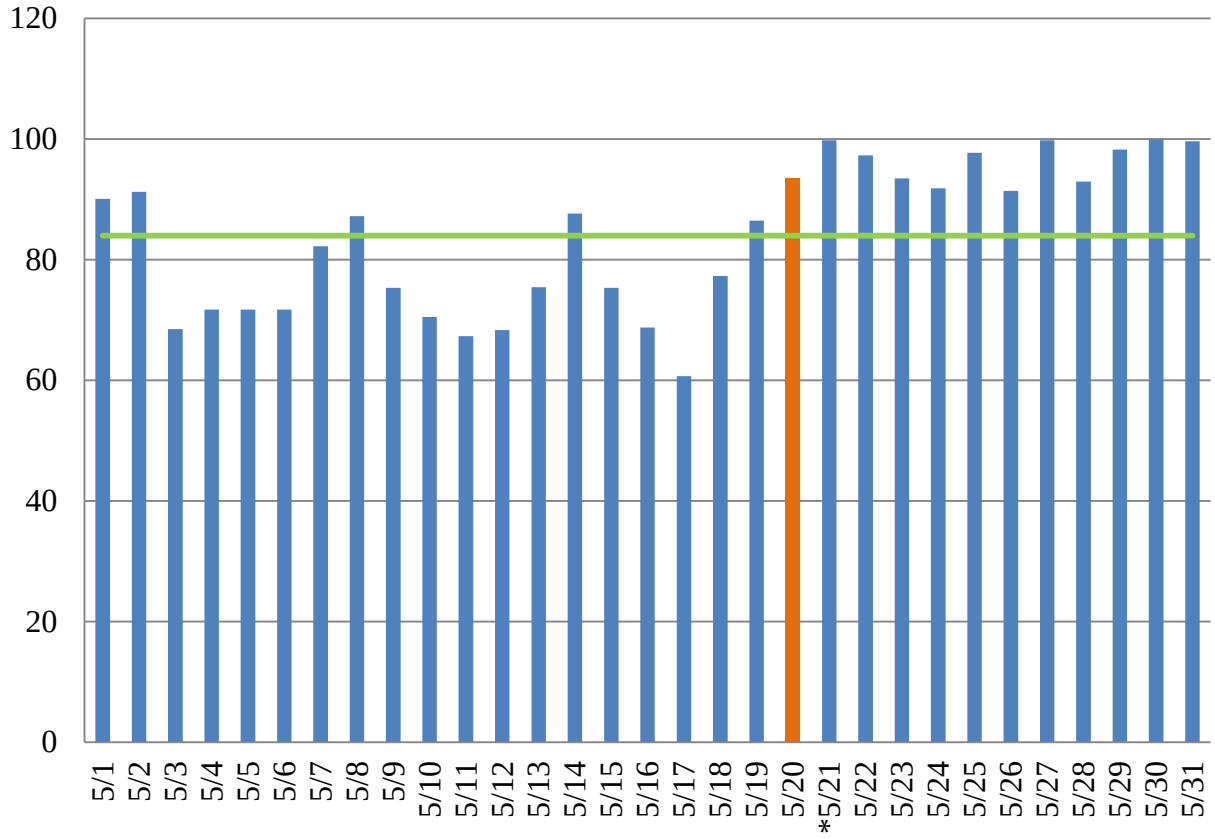
Figure 53: July 2008 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in July 2008 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on July 17, 2008 was 100 ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

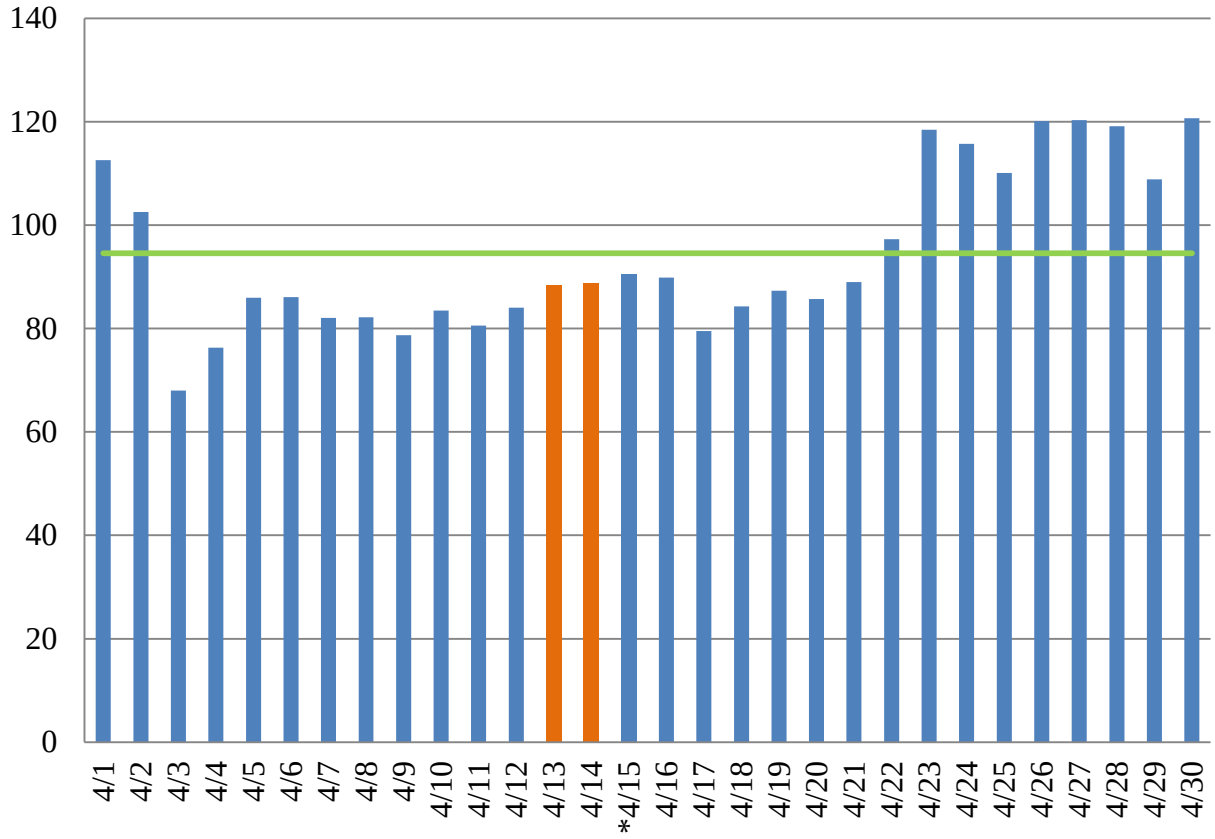
Figure 54: May 2009 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in May 2009 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on May 21, 2009 was ninety-two ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

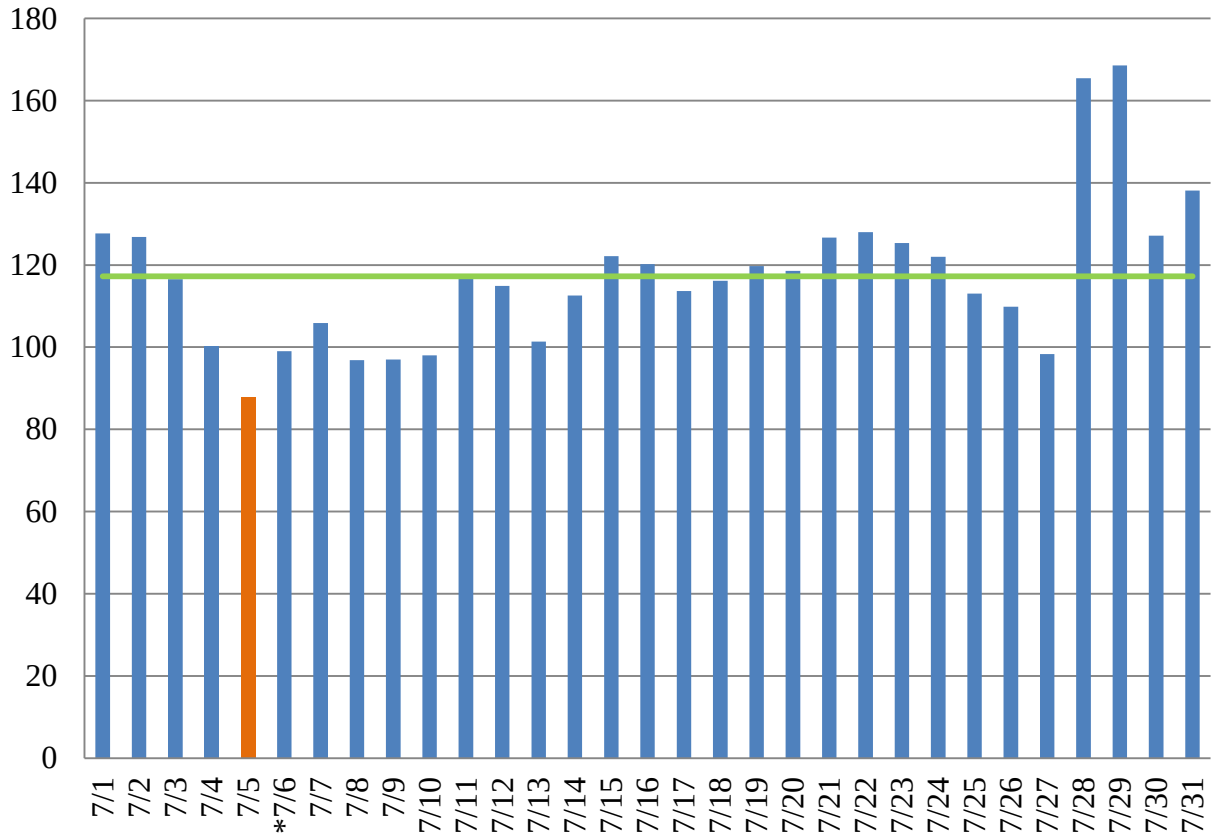
Figure 55: April 2010 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in April 2010 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on April 15, 2010 was seventy-five ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month.

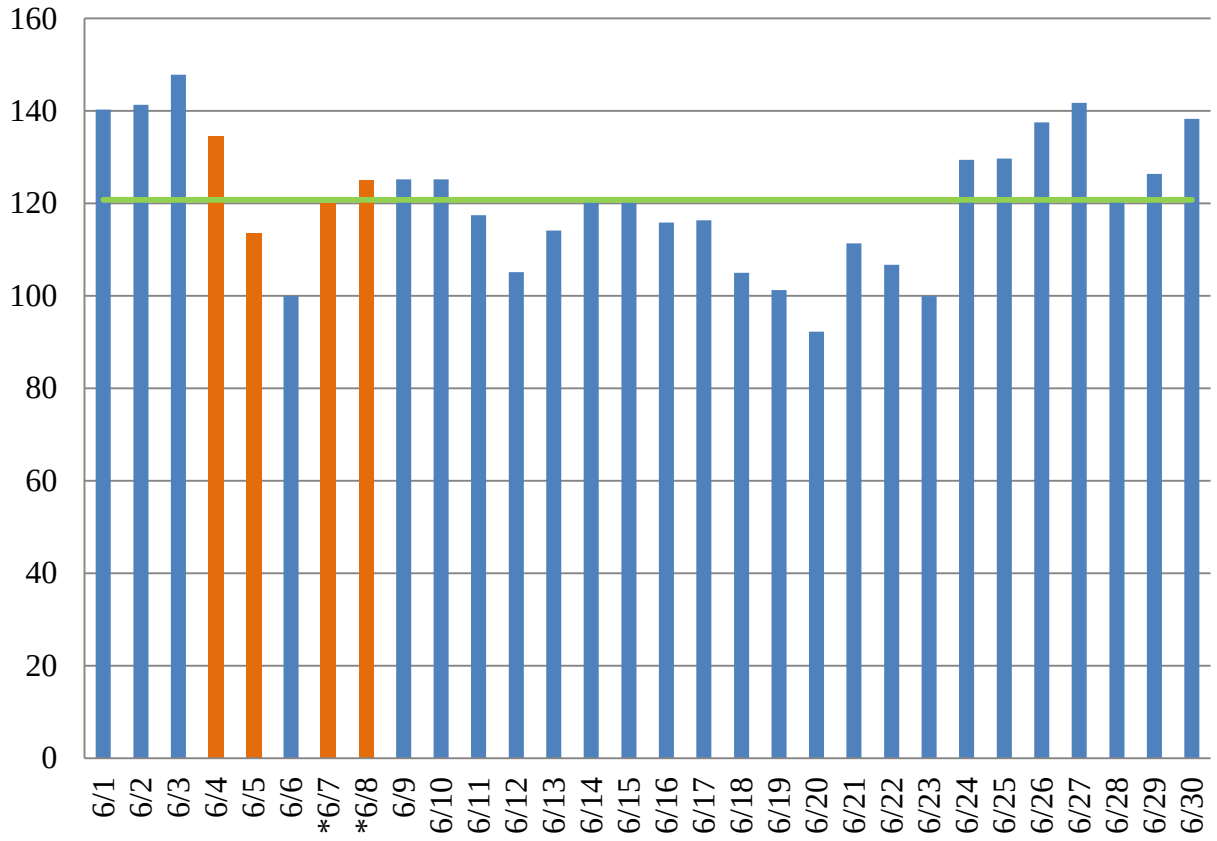
Figure 56: July 2010 Arkansas Daily EGU NOx emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in July 2010 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on July 6, 2010 was seventy-six ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month.

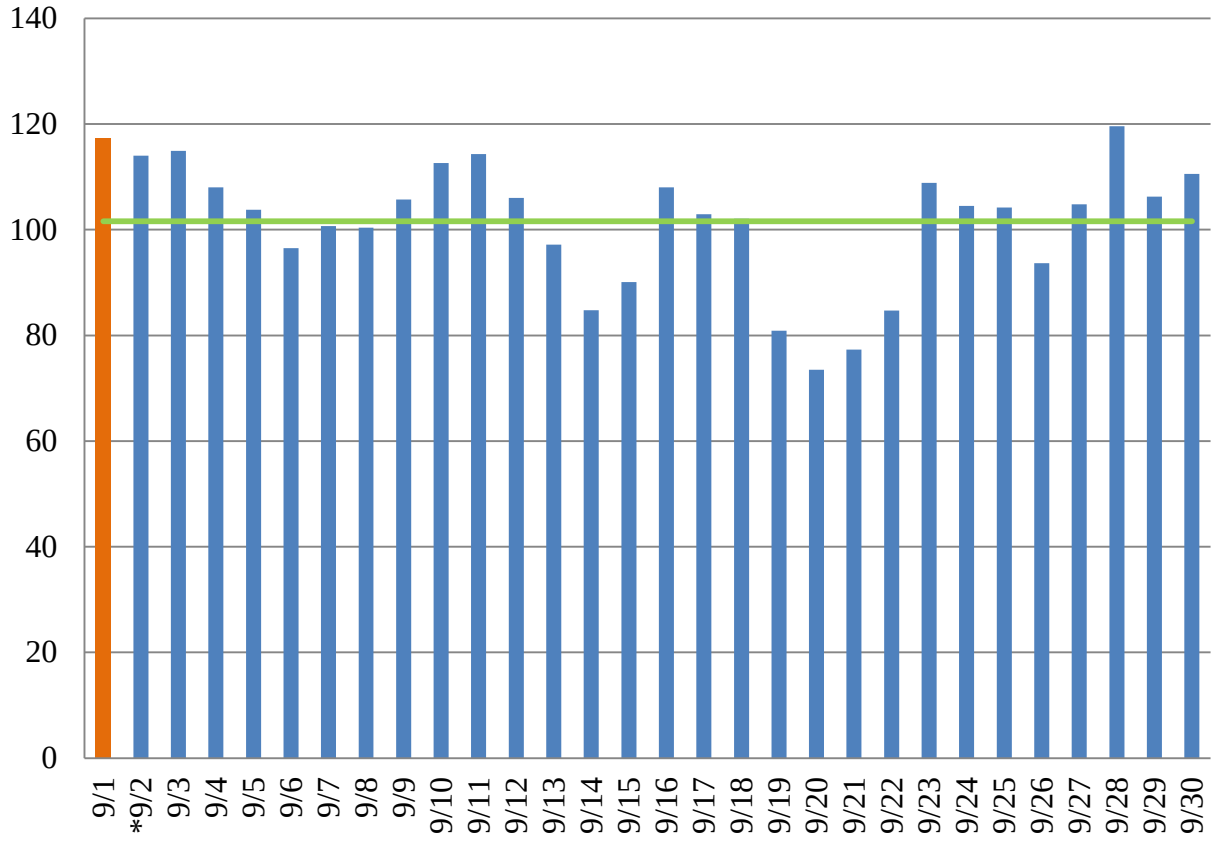
Figure 57: June 2011 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There were two elevated ozone days at the Allegan County, MI monitor in June 2011 with an Arkansas-linked back-trajectory. The MDA8 ozone concentrations for the Allegan County, MI monitor were ninety-five and ninety-seven ppb on June 7, 2011 and June 8, 2011, respectively. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average on June 5th and June 7th, and above average on June 4th and June 8th.

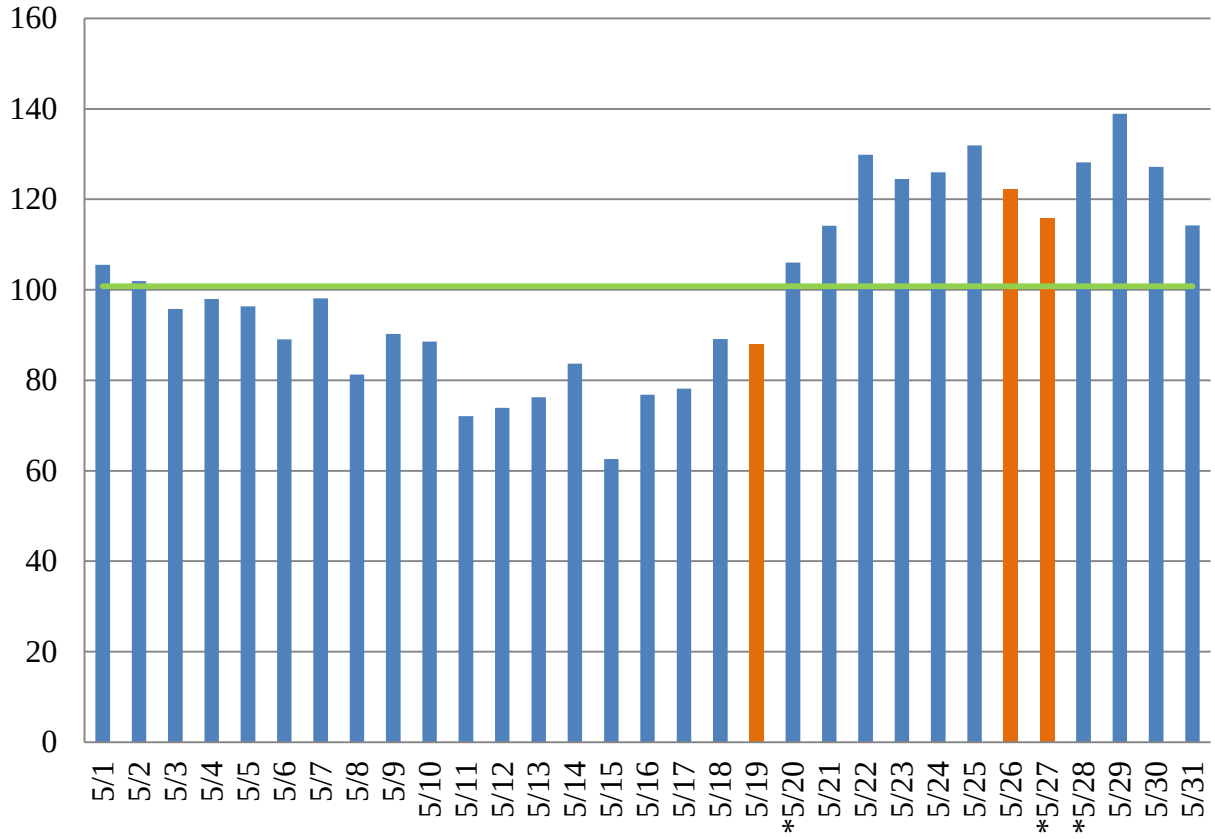
Figure 58: September 2011 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in September 2011 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on September 2, 2011 was seventy-nine ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

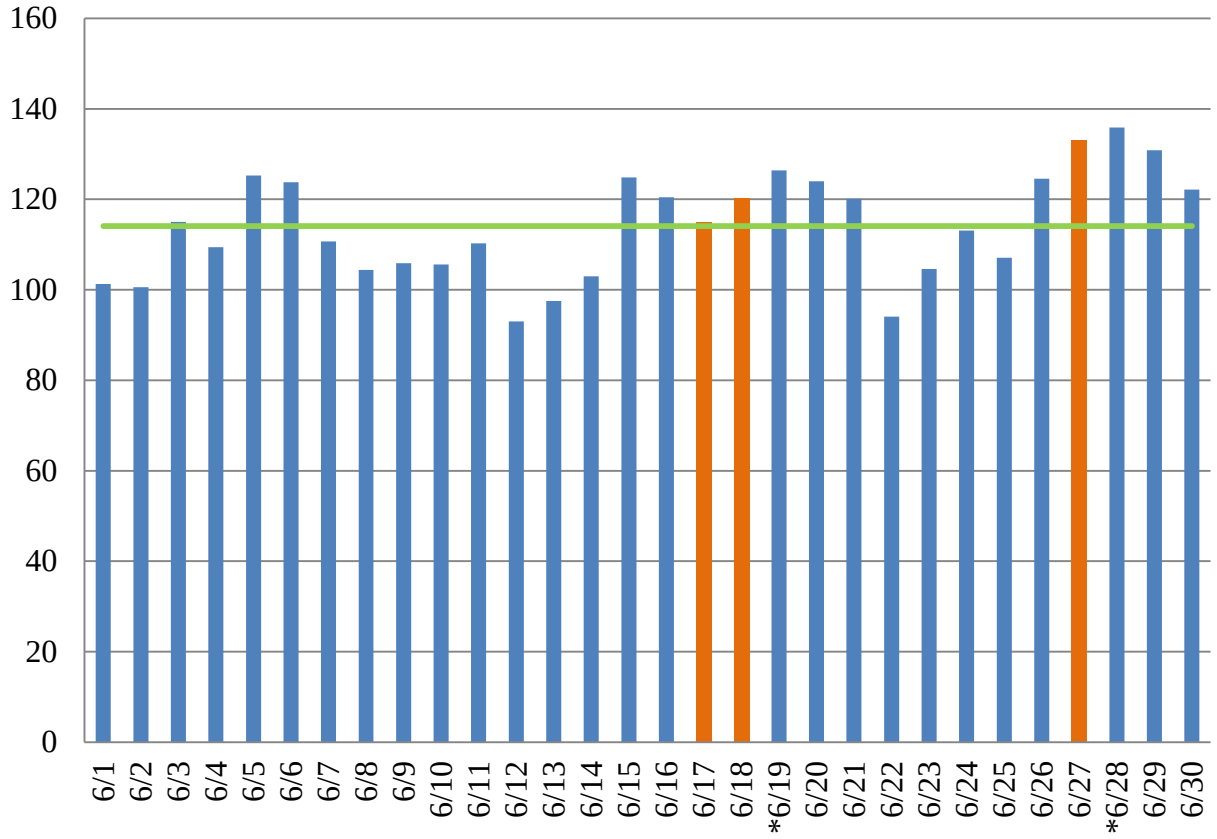
Figure 59: May 2012 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There were three elevated ozone days at the Allegan County, MI monitor in May 2012 with an Arkansas-linked back-trajectory. The MDA8 ozone concentrations for the Allegan County, MI monitor on May 20, 2012, May 27, 2012, and May 28, 2012 were seventy-seven ppb, seventy-one ppb, and seventy-one ppb, respectively. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average on May 19th and above average on May 26th, and May 27th.

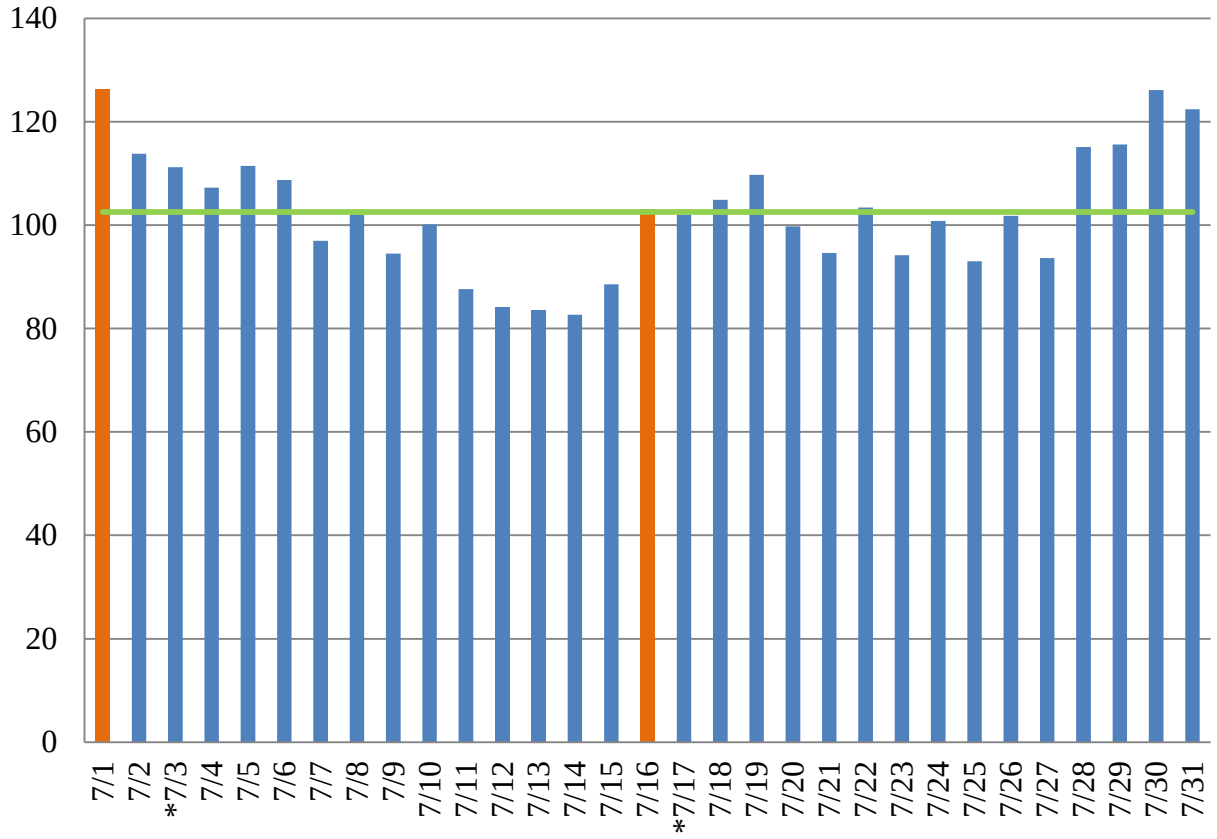
Figure 60: June 2012 Arkansas daily EGU NOx emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There were two elevated ozone days at the Allegan County, MI monitor in June 2012 with an Arkansas-linked back-trajectory. The MDA8 ozone concentrations for the Allegan County, MI monitor on June 19, 2012 and June 28, 2012 were seventy-four ppb and 101 ppb, respectively. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

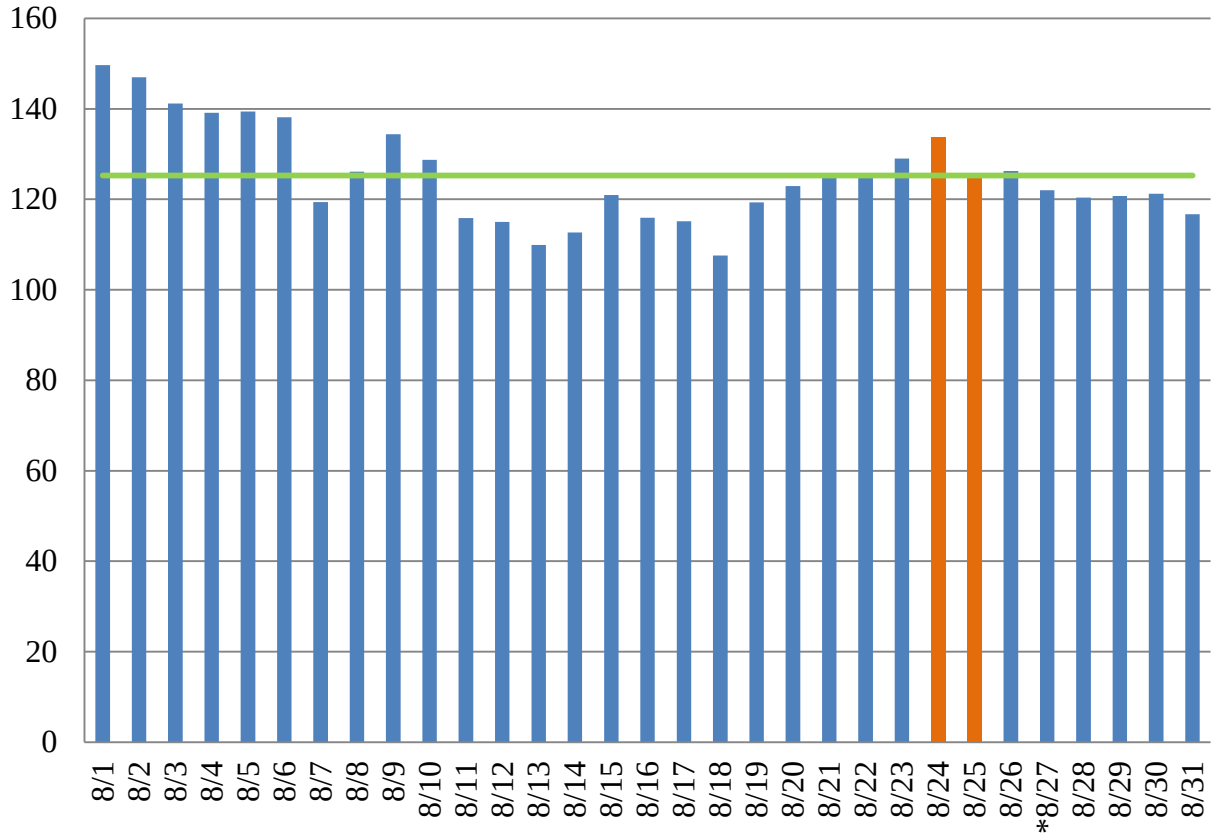
Figure 61: July 2012 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There were two elevated ozone days at the Allegan County, MI monitor in July 2012 with an Arkansas-linked back-trajectory. The MDA8 ozone concentrations for the Allegan County, MI monitor on July 3, 2012 and July 17, 2012, were 103 ppb and eighty-seven ppb respectively. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

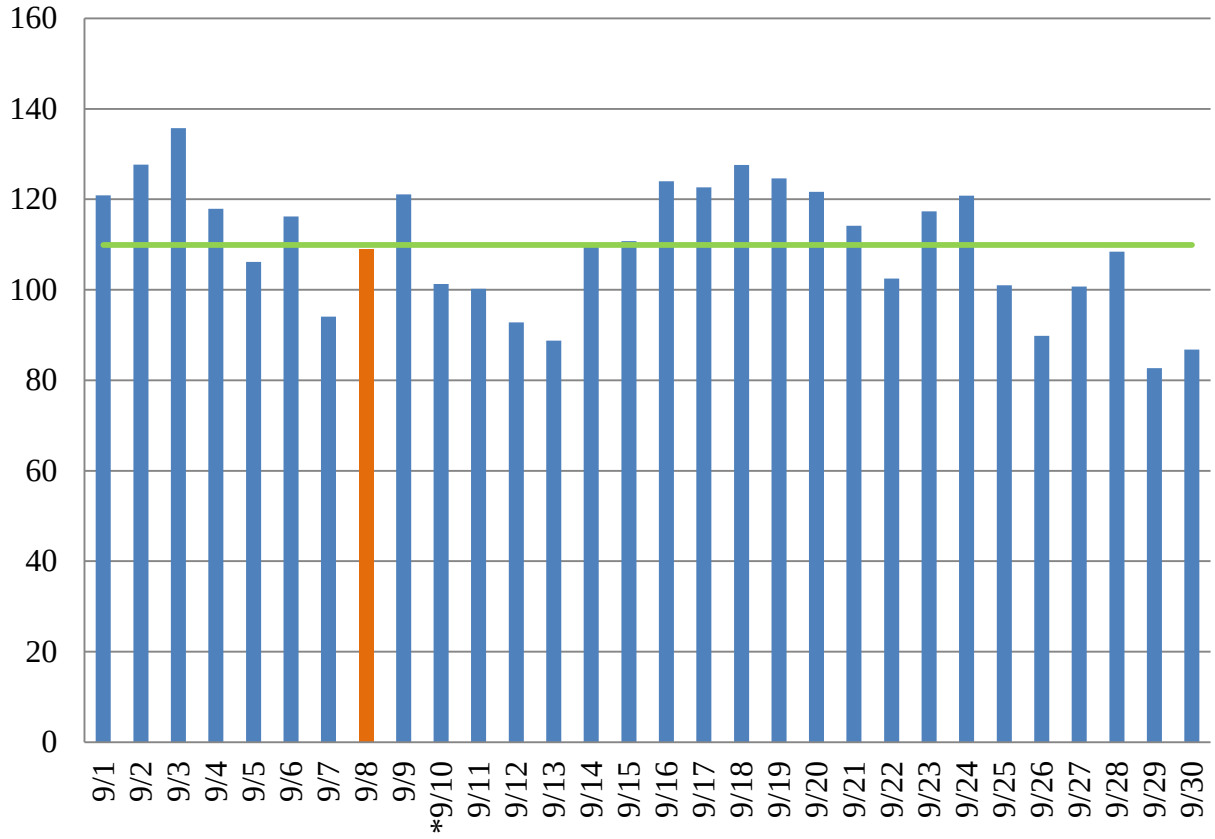
Figure 62: August 2013 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in August 2013 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on July 19, 2013 was seventy-eight ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month on August 24th and below average on August 25th.

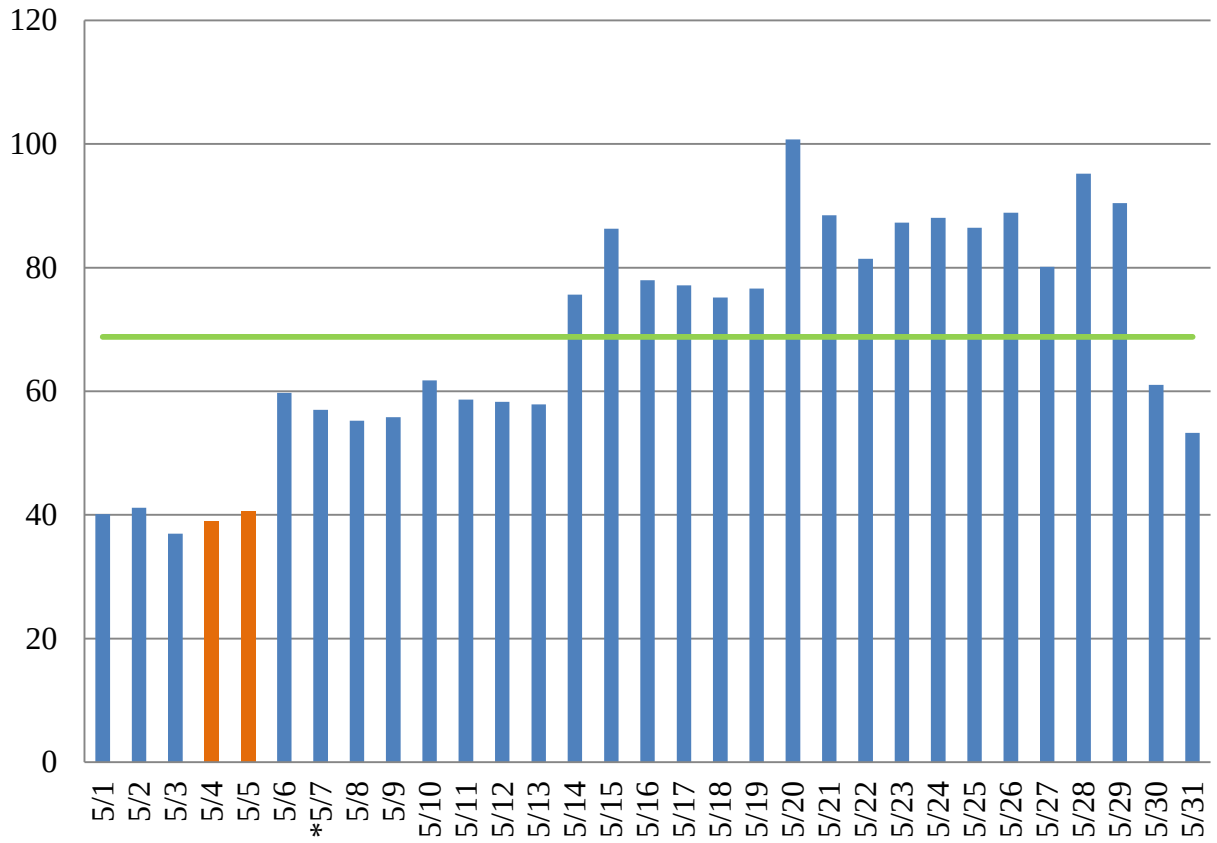
Figure 63: September 2013 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in September 2013 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on July 19, 2013 was eighty-seven ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month.

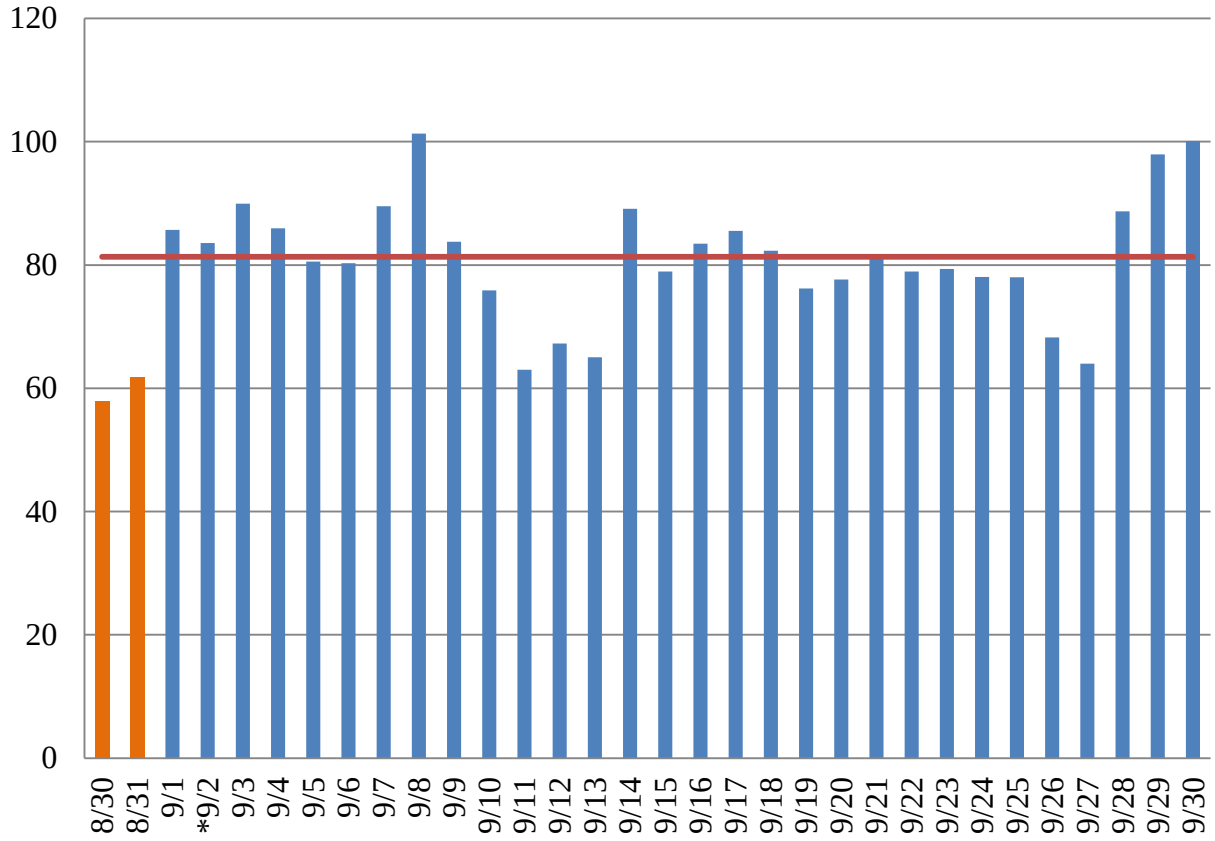
Figure 64: May 2015 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in May 2015 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on May 7, 2015 was seventy-five ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month.

Figure 65: September 2015 Arkansas Daily EGU NOx Emissions (tons)[36]

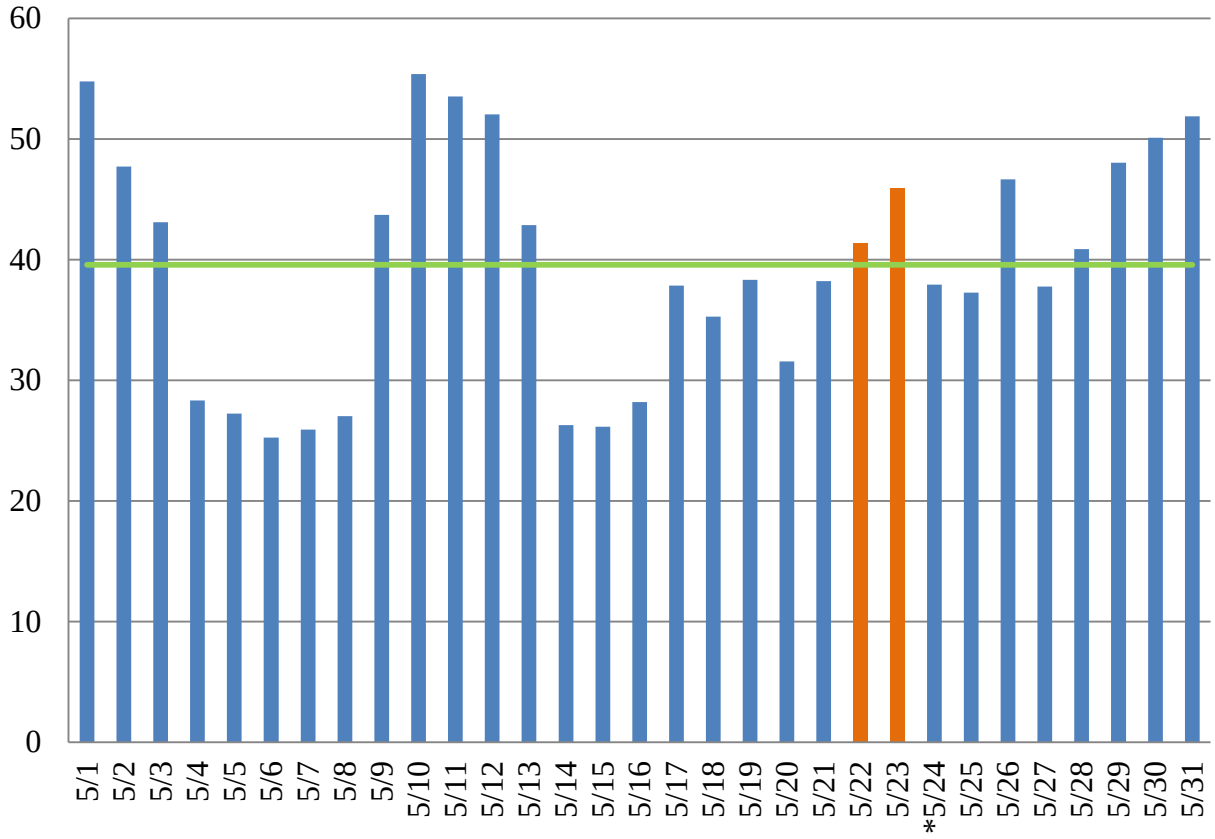


*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in September 2015 with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on September 2, 2015 was seventy-two ppb. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month of September.

[36] The HYSPLIT model showed the air parcel that passed through Arkansas prior to reaching the Allegan County monitor on September 2, 2015 was in residence over Arkansas on August 30-31, 2015. For that reason, emissions for the last two days of August are included in Figure 46. Emissions for the two days in August are compared to the average emissions for September, the month in which the exceedance occurred.

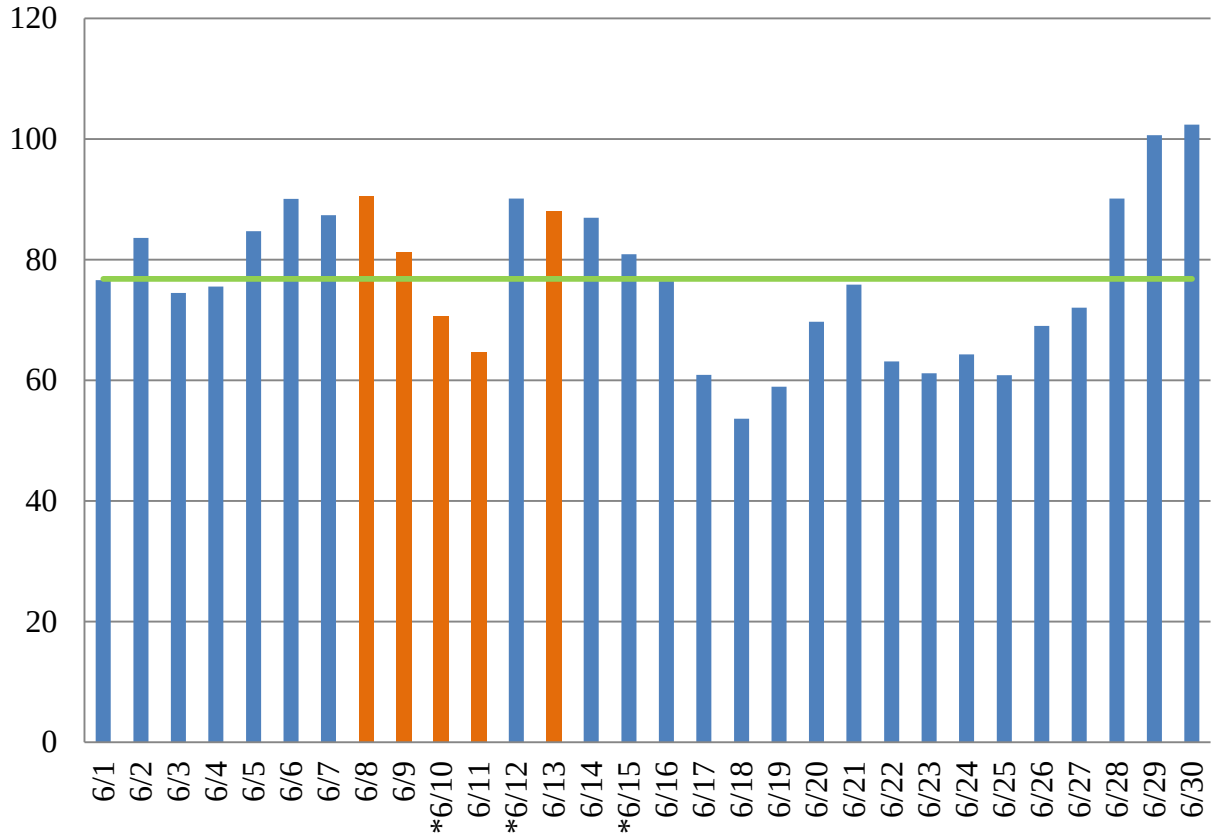
Figure 66: May 2016 Arkansas Daily EGU NOx Emissions (tons)



*Elevated ozone day at the Allegan County, MI monitor

There was one elevated ozone day at the Allegan County, MI monitor in May with an Arkansas-linked back-trajectory. The MDA8 ozone concentration for the Allegan County, MI monitor on May 24, 2016 was seventy-one. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were above average for the month.

Figure 67: June 2017 Arkansas Daily EGU NOx Emissions

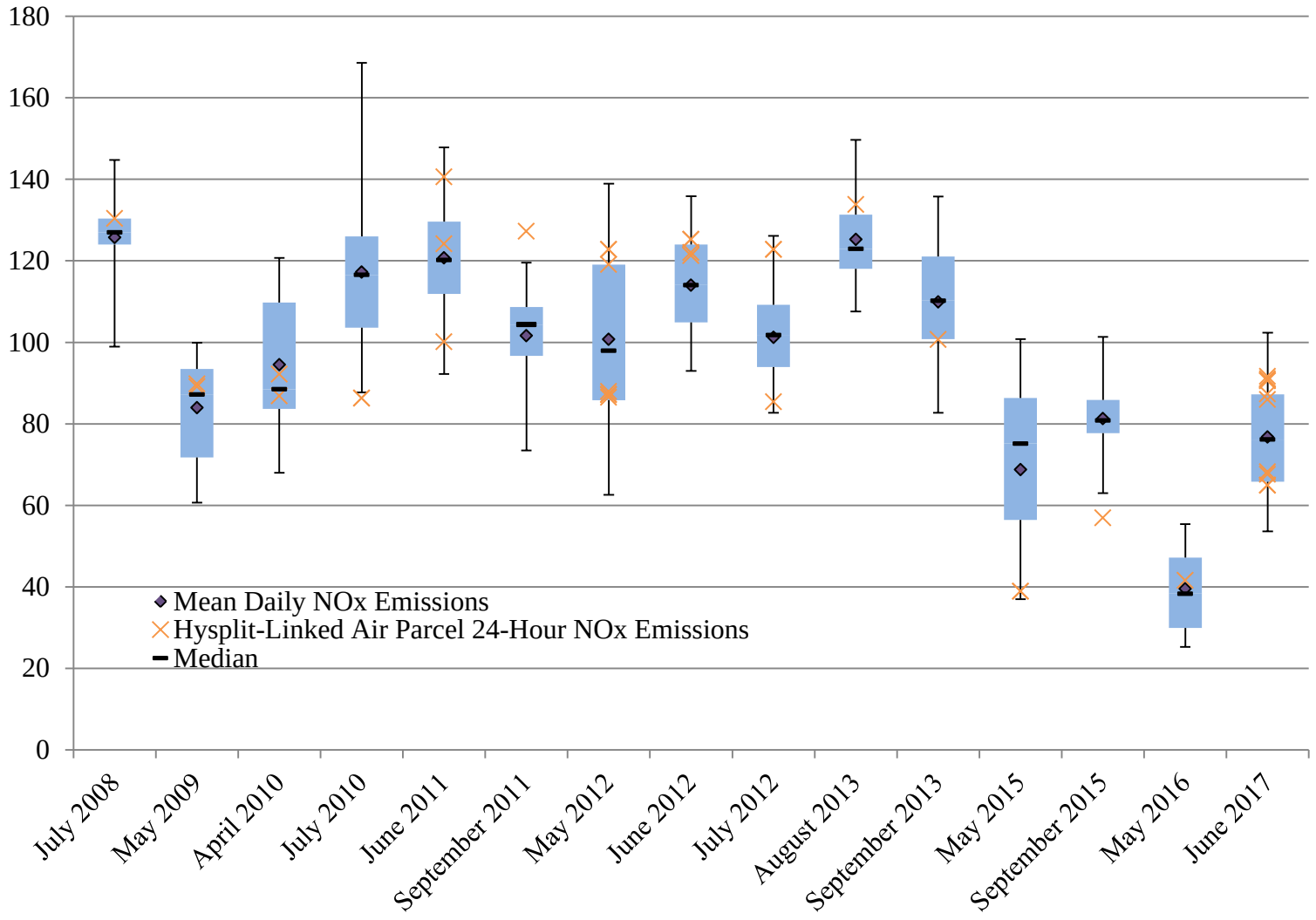


*Elevated ozone day at the Allegan County, MI monitor

There were three elevated ozone days at the Allegan County, MI monitor in June 2017 with an Arkansas-linked back-trajectory. The MDA8 ozone concentrations for the Allegan County, MI monitor on June 10, 2017, June 12, 2017, and June 15, 2017 were seventy-one ppb, seventy-four ppb, and seventy-four ppb respectively. EGU NOx emissions in Arkansas in the twenty-four hours preceding departure of the air parcel from Arkansas toward Allegan County in the linked trajectory were below average for the month on June 10th and June 11th, and above average for the month on June 8th, June 9th, and June 13th.

As depicted in Figures 53–67 above, the EGU NOx emissions in Arkansas twenty-four hours prior to an air parcel on a HYSPLIT-linked trajectory to Allegan County, MI on an elevated ozone day do not show a consistent pattern of being either higher or lower than mean daily EGU NOx emissions for the corresponding month. Figure 68 below further illustrates the lack of persistent pattern by comparing the Arkansas EGU NOx emissions from the twenty-four hours preceding an air parcel traveling on a HYSPLIT-linked back-trajectory to Allegan County, MI on an elevated ozone day to measures of central tendency for daily Arkansas EGU NOx emissions (midnight to 11:59 pm) for the corresponding month.

Figure 68: Arkansas EGU 24-Hour NOx Emissions Linked to Elevated Ozone Days at Allegan County, MI Relative to Observed Daily Arkansas EGU NOx Emissions for the Corresponding Month



There is no consistent pattern in EGU NOx emissions in the twenty-four hours preceding an air parcel exiting Arkansas on its way to Allegan County, MI on a linked back trajectory compared to the measures of central tendency for the daily EGU NOx emissions for the corresponding month. Emissions during fifteen twenty-four hour periods associated with linked back-trajectories were in the top twenty-five percent of observations for the corresponding month; seven were above the median and mean, but within the interquartile range; one was above the mean, but below the median; seven were below the median and mean, but within the interquartile range; and seven were in the bottom twenty-five percent of observations. There was one outlier that occurred in September 2011 where the emissions during the twenty-four-hour period associated with the linked back-trajectory were greater than all observed daily NOx emissions for the corresponding month and three outliers—two in July 2010 and one in September 2015—where the twenty-four hour period emissions were lower.[37] ADEQ notes that for some elevated ozone days in Allegan County, MI, there were multiple linked trajectories.[38] This central tendency analysis indicates to ADEQ that there has not been a persistent and consistent pattern in Arkansas EGU NOx emissions in the twenty-four hours preceding the time an air parcel left Arkansas on a linked back-trajectory to Allegan County, MI on an elevated ozone day.

4. Cost Analysis of NOx Emission Reductions

Consistent with EPA's March 27, 2018 memorandum on interstate transport for the 2015 Ozone NAAQS, ADEQ performed a cost analysis of NOx controls. ADEQ's analysis focused on EGUs, which are the second largest source category of emissions of NOx in Arkansas and the largest source of emissions that ADEQ regulates.[39] Aggregated emissions from mobile sources are the largest source of NOx emissions in Arkansas; however, ADEQ does not have regulatory authority over mobile emissions.[40] In Arkansas, NOx emissions from individual EGUs tend to be larger than for any other stationary source category. Table 9 lists the top ten sources of 2016 NOx emissions among elevated point sources in Arkansas.[41]

[37] Outliers in this analysis are possible because of the difference in the twenty-four hour period start and end time compared to the daily emissions start time, which begins at midnight.
[38] May 21, 2009 (two trajectories); April 15, 2010 (two trajectories); July 6, 2010 (two trajectories); June 7, 2011 (two trajectories); May 20, 2012 (four trajectories); May 28, 2012 (two trajectories); June 19, 2012 (two trajectories); June 28, 2012 (two trajectories); July 3, 2012 (two trajectories); May 7, 2015; June 10, 2017 (five trajectories)
[39] EPA 2014 National Emissions Inventory https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
[40] EPA pre-empts states from setting mobile emissions standards unless granted a waiver.
[41] 2016 is the most recent inventory that includes nonEGUs as of March 7, 2019.

Table 9: Top Ten Sources of 2016 Actual NOx Emissions among Elevated Point Sources[42]

Source	2016 NOx Actual Emissions (tons)	Permitted Emission Rates		NOx Control Technologies
		Pounds per Hour	Tons per Year	
White Bluff Unit 2	5,100	6,090	26.674.2	Low NOx Burners with Over-Fire Air[43]
Independence Unit 1	4,594	6,090	26.674.2	Low NOx Burners with Over-Fire Air[44]
Independence Unit 2	4,910	6,090	26.674.2	Low NOx Burners with Over-Fire Air[45]
White Bluff Unit 1	4,619	6,090	2674.2	Low NOx Burners with Over-Fire Air[46]
Flint Creek Boiler	3,055	-	5,733.7	Low NOx Burners with Over-Fire Air[47]
Plum Point Energy Station Unit 1 Boiler	1,750	602	2,635	SCR, Low NOx Burners with Separated Over Fire Air[48]
Ash Grove Cement Company	829	685.9	2,978.6	SNCR operated continuously on kiln component (1.5 lbs NOx/ton clinker); Emergency Generator operations restricted to 500 hrs/year; Portable Crusher has an hourly limit for a combination of NOx and VOC per EPA Tier III emission standards
Georgia-Pacific LLC – Crossett Paper (8R Recovery Furnace)	744	276	1,208.6	Combustion control pursuant to BACT analysis. Staged Combustion with Four levels of combustion air[49]
John W Turk Power Plant (Main Boiler)	688	420.0	1,314.0	Low-NOx Burners with Over-Fire air, Selective Catalytic Reduction[50]

[42] Emission unit with an associated stack height of thirty-five feet or greater.
[43] Permit # 0263-AOP-R14
[44] Permit # 0449-AOP-R14
[45] Permit # 0449-AOP-R14
[46] Permit # 0263-AOP-R14
[47] Permit # 0276-AOP-R8
[48] Permit # 1995-AOP-R9
[49] 0597-AOP-R18
https://cfpub.epa.gov/rblc/index.cfm?action=PermitDetail.PollutantInfo&Facility_ID=26915&Process_ID=106897&Pollutant_ID=149&Per_Control_Equipment_Id=147682

Domtar Ashdown Mill (No. 3 Recovery Boiler)	589	270	1182.6	None identified in permit[51]

The top seven emitters of NOx in Arkansas among elevated point sources during 2016 were EGUs located at White Bluff, Independence, Flint Creek, and Plum Point, which are all coal-fired power plants. The next highest emitter during 2016 was located at a cement plant whose NOx emissions were less than half that of the EGU at Plum Point and one sixth that of the highest emitter: White Bluff Unit 2. Therefore, ADEQ has focused its cost analysis for NOx emission controls on EGUs.

This analysis focuses on the cost effectiveness of incremental NOx controls on EGUs in Arkansas that emitted greater than 100 tons of NOx in 2018 and that did not already have post-combustion controls installed.[52] In particular, ADEQ has evaluated the cost effectiveness of selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) using EPA's cost calculation spreadsheet tools.[53] All coal-fired EGUs listed in Table 9 are operating state-of-the-art combustion controls (low NOx burners with over-fire air).

ADEQ used EPA's Cost Manual Spreadsheet tools to calculate cost-effectiveness for two scenarios: annual emissions from 2018 and emissions from the 2018 ozone season, which is May 1–September 30.[54] ADEQ entered the following 2018 unit-specific parameters obtained from the EPA Air Markets Program Database (AMPD) for each EGU into the spreadsheet: boiler operating time, gross load, NOx rate (lb/MMBtu), heat input, fuel type. For SCR/SNCR operating time, ADEQ used the same number of SCR/SNCR operating days and boiler operating days in the annual scenario, but revised the SCR/SNCR operating days to May 1 through September 30 for the ozone season scenario. ADEQ used the standard 2018 electricity cost per kWh and labor rate.[55] For all EGUs, ADEQ used the following default data from the EPA cost sheet: retrofit factor, stoichiometric ratio factor, operating life of catalyst (for SCR) and

[50] Permit # 2123-AOP-R7
[51] Permit # 0287-AOP-R21
[52] Plum Point and John W. Turk Power Plants control NOx using low NOx burner technology and selective catalytic reduction.
[53] https://www3.epa.gov/ttn/ecas/docs/scr_cost_manual_spreadsheet_2016_vf.xlsm
https://www3.epa.gov/ttn/ecas/docs/sncr_cost_manual_spreadsheet_2016_vf.xlsm
[54] ADEQ notes that use of EPA's tools are more limited in their ability to account for site-specific factors than an more refined engineering analysis using control equipment vendor and site-specific specifications. In addition, operation hours and capacity factors greatly influence emission reductions achieved from operation of post-combustion emission controls, such as SCR and SNCR. However, EPA's tools provide a uniform method of estimating costs for controls.
[55] U.S. Energy Information Administration (eia), 2018. "Electric Power Monthly". <https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a>
United States Department of Labor, 2018. "Occupational Employment Statistics". <https://www.bls.gov/oes/current/oes518091.htm>

equipment, concentration and density of reagent, cost of reagent, maintenance cost factor, and annual interest rate. Tables 10 and 11 contain the results of ADEQ's cost analysis for SCR at large EGUs in Arkansas.[56] Tables 12 and 13 contain the results of ADEQ's cost analysis for SNCR at large EGUs in Arkansas. Note that the Plum Point Energy Station and John W. Turk, Jr. Power Plant have operated SCR control on their main boilers (SN-01) since start up and therefore, are not included in the analysis.

Table 10: Cost-Effectiveness Calculations for SCR for Large EGUs in Arkansas based on 2018 actual annual emissions

State	Facility Name	Unit ID	NOx actual emission in 2018 (Tons)	Unit type	NOx control(s) installed[57]	NOx removed by SCR [58] (Tons)	Cost Effectiveness per ton NOx removed by SCR in 2017$
AR	Flint Creek Power Plant	1	2,927	Dry bottom wall fired boiler	LNB SOFA	2,563	6,441
AR	Independence	1	4,133	Tangentially fired	LNB SOFA	3,791	6,773
AR	Independence	2	3,556	Tangentially fired	LNB SOFA	3,214	7,913
AR	Lake Catherine	4	423	Dry bottom wall fired	N/A	245	15,830
AR	White Bluff	1	3,229	Tangentially fired	LNB SOFA	3,084	8,291
AR	White Bluff	2	3,683	Tangentially fired	LNB SOFA	3,285	7,774
AR	Pine Bluff Energy Center	CT-1	244	Combined Cycle	N/A	196	14,460
AR	Thomas Fitzhugh	2	115	Combined Cycle	Dry Low NOx Burner	93	15,700

[56] Large means that the EGU has a nameplate capacity of greater than 25 MW and 2018 NOx emissions higher than 100 tons per year. Amortization of capital costs for White Bluff was based on a state-enforceable agreement with Entergy Arkansas to cease coal-fired operations by the end of 2028.

[57] Construction of low NOx burners with separated overfire air (LNB SOFA) was completed on May 18, 2018 at Flint Creek Unit 1. Construction of LNB SOFA at Entergy Independence Unit 2 was completed on December 22, 2017. Construction of LNB SOFA on White Bluff Unit 1 was completed on June 1, 2018 and plant will retire on 2028.

[58] SCR efficiency of 90% for coal plant and 80% for natural gas power plant for both the annual and ozone season cases. Available at: https://www.epa.gov/air-quality-implementation-plans/menu-control-measures-naaqs-implementation

Table 11: Cost-Effectiveness Calculations for SCR for Large EGUs in Arkansas based on 2018 ozone season (May 1 through September 30) actual emissions

State	Facility Name	Unit ID	Ozone Season NOx actual emission in 2018 (Tons)	Unit type	NOx control(s) installed	NOx removed by SCR (Tons)	Cost Effectiveness per ton NOx removed by SCR in 2017$
AR	Flint Creek Power Plant	1	1,317	Dry bottom wall fired boiler	LNB SOFA	1,191	12,642
AR	Independence	1	1,960	Tangentially fired	LNB SOFA	1,836	12,605
AR	Independence	2	1,968	Tangentially fired	LNB SOFA	1,726	13,587
AR	Lake Catherine	4	301	Dry bottom wall fired	N/A	165	22,789
AR	White Bluff	1	1,699	Tangentially fired	LNB SOFA	1,454	13,326
AR	White Bluff	2	1,596	Tangentially fired	LNB SOFA	1,481	15,532
AR	Pine Bluff Energy Center	CT-1	85	Combined Cycle	N/A	71	31,580
AR	Thomas Fitzhugh	2	73	Combined Cycle	Dry Low NOx Burner	59	23,823

Table 12: Cost-Effectiveness Calculations for SNCR for Large EGUs in Arkansas based on 2018 annual emissions

State	Facility Name	Unit ID	NOx emission in 2018 (Tons)	Unit type	NOx control(s) installed	NOx removed by SNCR[59] (Tons)	Cost Effectiveness per ton NOx removed by SNCR in 2017$
AR	Flint Creek Power Plant	1	2,927	Dry bottom wall fired boiler	LNB SOFA	754	3,284
AR	Independence	1	4,133	Tangentially fired	LNB SOFA	1,276	2,744
AR	Independence	2	3,556	Tangentially fired	LNB SOFA	952	3,198
AR	Lake Catherine	4	423	Dry bottom wall fired	N/A	38	27,373
AR	White Bluff	1	3,229	Tangentially fired	LNB SOFA	667	4,060
AR	White Bluff	2	3,683	Tangentially fired	LNB SOFA	1,089	2,962
AR	Pine Bluff Energy Center	CT-1	244	Combined Cycle	N/A	116	5,718
AR	Thomas Fitzhugh	2	115	Combined Cycle	Dry Low NOx Burner	17	29,871

[59] SNCR NOx removal efficiency of 35% for Flint Creek, Independence and White Bluff and 50% for Lake Catherine, Pine Bluff, and Thomas Fitzhugh for both the annual and ozone season cases.

Table 13: Cost-Effectiveness Calculations for SNCR for Large EGUs in Arkansas based on 2018 ozone season (May 1 through September 30) emissions

State	Facility Name	Unit ID	Ozone season NOx emission in 2018 (Tons)	Unit type	NOx control(s) installed	NOx removed by SNCR (Tons)	Cost Effectiveness per ton NOx removed by SNCR in 2017$
AR	Flint Creek Power Plant	1	1,316	Dry bottom wall fired boiler	LNB SOFA	354	5,443
AR	Independence	1	1,960	Tangentially fired	LNB SOFA	616	4,221
AR	Independence	2	1,967	Tangentially fired	LNB SOFA	508	4,800
AR	Lake Catherine	4	301	Dry bottom wall fired	N/A	25	40,984
AR	White Bluff	1	1,699	Tangentially fired	LNB SOFA	408	5,784
AR	White Bluff	2	1,596	Tangentially fired	LNB SOFA	491	4,909
AR	Pine Bluff Energy Center	CT-1	85	Combined Cycle	N/A	42	13,998
AR	Thomas Fitzhugh	2	73	Combined Cycle	Dry Low NOx Burner	11	45,581

In the Cross-State Air Pollution Rule Update for the 2008 ozone NAAQS, EPA developed the EGU NOx emissions budgets using a uniform control stringency that corresponds to a $1400/ton threshold.[60] Cost-effectiveness estimates for annual operation of controls at the Arkansas EGUs assessed in this analysis range from $6,441–$15,830/ton of NOx for SCR and $2,744 to $29,871 for SNCR. Under the more likely assumption of ozone-season-only control operation, the cost-effectiveness estimates for SCR range from $12,605–$31,580/ton and the cost-effectiveness estimates for SNCR range from $4,221–$45,581. One of the key factors influencing the dollar per ton results in the ozone season scenario is the low total system capacity factor.[61] The lowest

[60] https://www.gpo.gov/fdsys/pkg/FR-2016-10-26/pdf/2016-22240.pdf

[61] Total system capacity factor is a measure of the average annual use of the boiler in conjunction with the SCR or SNCR system. Available at: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution

cost of control in this analysis is almost double the threshold EPA used to develop budgets for the 2008 NAAQS in the Cross-State Air Pollution Rule Update. Based on 2018 emissions data and ADEQ's initial screening analysis, the average cost-effectiveness of the installation of new SCR is $10,398 (annual) and $18,325 (ozone season), while for SNCR the average cost-effectiveness would be $9,901 (annual) and $15,715 (ozone season).

D. Arkansas's Prongs 1 and 2 Control Strategy

Based on the 2023 projected source apportionment data provided by EPA in their March 2018 memo[62] on ozone transport, ADEQ determined that Arkansas has a potential linkage, based on a one ppb threshold, to one projected maintenance receptor (Allegan County, MI monitor, AQS ID 260050003) and no nonattainment receptors for the 2015 ozone NAAQS. Eight other states are potentially linked to the Allegan County, MI monitor based on a one ppb threshold. In particular, two states, Illinois and Indiana, make up fifty-seven percent of the contribution to the Allegan County, MI monitor's 2023 projected maximum design value. By contrast, Arkansas's modeled contribution is four percent. Although ADEQ most heavily considered EPA's modeling, ADEQ found that other modeling performed by TCEQ and Alpine Geophysics demonstrate that the use of alternative modeling protocols, including base year and grid resolution, can cause considerable differences in design value projections and ozone concentration contributions. Therefore, ADEQ also considered of other evidence regarding the potential linkage between emissions from Arkansas and air quality in Allegan County, MI.

ADEQ analyzed ten years (2008–2017) of HYSPLIT back-trajectories to examine potential relationships between elevated ozone days at the Allegan County, MI monitor and emissions from Arkansas. The HYSPLIT modeling showed that, over the ten year period examined, only 6.74% of the back-trajectories for days in Allegan County, MI with MDA8 ozone concentrations >70.9 ppb passed through Arkansas. ADEQ infers from this result that there is no consistent or persistent relationship between elevated ozone days in Allegan County, MI and air traveling through Arkansas. All air parcels on these linked back-trajectories that passed through Arkansas also passed through at least one MSA, most frequently the Chicago-Naperville-Eglin MSA, after leaving Arkansas and prior to reaching Allegan County, MI. This supports EPA's modeling data showing that Illinois and Indiana have a larger influence on air quality in Allegan County, MI. In addition, emissions data indicate that there is no consistent relationship between daily NOx emissions for a given month and the NOx emissions in that month from EGUs in the twenty-four hours prior to an air parcel exiting Arkansas on a linked back-trajectory to Allegan County, MI.

[62] Memorandum from Peter Tsirigotis, *Director of the Office of Air Quality Planning and Standards, March 27, 2018, Information on Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I).* EPA Office of Air Quality Planning and Standards. https://www.epa.gov/sites/production/files/2018-03/documents/transport_memo_03_27_18_1.pdf

Emissions trends support EPA's projection that Allegan County, MI will be a maintenance area in 2023. ADEQ notes that the two states with the highest contributions to Allegan County, MI—Illinois and Indiana—have both experienced historic year-over-year decreases in NOx emissions in excess of 20,000 tons of NOx reduced per year. Arkansas has also experienced decreases in NOx emissions each evaluated year and emits less NOx than any other of the potentially linked states. In addition, EPA projects that most potentially linked states will continue to realize reductions in NOx, as well as VOCs, through 2023.

ADEQ finds that the costs to install additional NOx controls (SCR and SNCR) at EGUs exceed the thresholds EPA has historically used for cost-effectiveness for the CSAPR and CSAPR Update rules. ADEQ's screening analysis using EPA tools showed that cost-effectiveness values for ozone-season operation of SCR and SNCR were particularly high: $12,605–$31,580/ton for SCR and $4,221–$45,581 for SNCR. ADEQ notes that any costs imposed to install controls at the examined EGUs would be passed on to Arkansas ratepayers.

Based on ADEQ's evaluation of the evidence, ADEQ concludes that no additional controls beyond those already on the books under state and federal regulations are warranted for Arkansas sources to satisfy interstate transport obligations for the 2015 Ozone NAAQS. EPA projects that Allegan County, MI will attain the 2015 ozone standard by 2023 based on emissions projections for linked states. An examination of meteorological patterns in the ten year period of 2008–2017 show that there is neither a consistent and persistent pattern in transport from Arkansas to Allegan County, MI on elevated ozone days, nor is there a consistent and persistent relationship between Arkansas EGU emissions and elevated ozone days in Allegan County, MI. Furthermore, the high costs of additional controls on Arkansas's largest sources of NOx emissions are not reasonable given the recent reduction in Arkansas' EGU NOx emissions, the projected attainment status of Allegan County, MI, and the lack of persistent and consistent contribution from Arkansas sources to the Allegan County, MI monitor on elevated ozone days. Therefore, ADEQ has not included any new control measures with this SIP submission.

III. Prong 3: Prevention of Significant Deterioration

ADEQ has a fully approved comprehensive PSD permitting program. All new major sources and major modifications are subject to ADEQ's PSD permitting program. Chapter 9 of APC&EC Regulation No. 19 authorizes enforcement of regulations governing the PSD of air quality and of regulations governing the protection of visibility in mandatory Federal Class I areas. ADEQ's PSD program satisfies the obligations under Clean Air Act Section 110(a)(2)(D)(i)(II) Prong 3: Interstate transport—prevention of significant deterioration.

IV. Prong 4: Interstate Visibility Transport

EPA guidance sets forth two ways that a state may satisfy prong 4 for any relevant NAAQS:

1) The state may confirm in its infrastructure SIP submission that it has a fully approved regional haze SIP and that any five-year progress reports indicate that the SIP continues to be sufficient with respect to ensuring reasonable progress in a Class I area in another state; or

2) The state may demonstrate in its infrastructure SIP submission that the emissions within the state do not interfere with other state's plans to protect visibility.

Arkansas is subject to the Regional Haze Regulations, but the State does not yet have a fully approved regional haze SIP for the first planning period.[63] Therefore, Arkansas assessed whether the emissions within Arkansas interfere with other state's plans to protect visibility.

The Regional Haze Regulations contain provisions requiring consultation among states to develop coordinated emission management strategies. In particular, a state having emissions that are reasonably anticipated to contribute to visibility impairment in a Class I area located in another state must do the following:

A. Consult with the other state in which the affected Class I area is located.
B. Demonstrate that the state has included in its plan all measures necessary to obtain its share of the emission reductions necessary to achieve the reasonable progress goals set by the state in which the affected Class I area is located.
C. Document the technical basis for the determination of the state's apportionment of emission reduction obligations necessary for achieving reasonable progress in the affected Class I area.

Sections IV.A–C demonstrate how Arkansas has addressed the three requirements for states reasonably anticipated to contribute to visibility impairment in a Class I area located in another state.

A. Consultation

During the first planning period, Arkansas participated in the Central Region Air Planning Regional Planning Organization (CENRAP). This organization facilitated consultation among the central states—Texas, Louisiana, Arkansas, Missouri, Oklahoma, Iowa, Nebraska, Kansas, and Minnesota—and coordinated regional technical analyses for use by the states in developing their plans. EPA approved the consultation process included in Arkansas's 2008 Regional Haze

[63] EPA partially approved and partially disapproved Arkansas's 2008 Regional Haze SIP. ADEQ has submitted three corrective SIP revisions—a 2017 SIP revision that addresses NOx from Arkansas EGUs, a 2018 SIP revision that addresses the remaining disapproved SIP provisions with the exception of Domtar Ashdown Mill, and a 2019 SIP revision to address requirements for Domtar Ashdown Mill. EPA approved the 2017 SIP revision addressing NOx from Arkansas EGUs on February 12, 2018. EPA approved the 2018 Phase II SIP revision on September 27, 2019.

SIP submission (2008 AR RH SIP).[64] Based on assessments of emissions and regional modeled visibility impacts conducted by CENRAP and ADEQ, ADEQ determined that sources in Arkansas contribute to visibility impairment in two Class I areas in Missouri: Hercules Glades Wilderness (Hercules Glades) and Mingo National Wildlife Refuge (Mingo).[65] EPA also approved Missouri's consultation process and reasonable progress goals for its Class I areas.[66]

B. Technical Basis for Determination of Arkansas's Apportionment of Emission Reduction Obligations at Affected Class I areas

1. Identification of Key Pollutants and Source Categories Projected to Contribute to Visibility Impairment in Missouri Class I Areas in 2018

CENRAP contracted with ENVIRON International and the University of California at Riverside (Collectively "Environ/UCR") to perform emissions and air quality modeling, including particulate source apportionment (PSAT) for a 2002 base case and 2018 projection. The PSAT data show that sulfates, particularly from elevated point source emissions of SO_2, are the largest contributor to visibility impairment—as estimated by beta extinction (Bext)—at Hercules Glades and Mingo on the projected twenty percent worst days in 2018.[67] Sulfates were projected to contribute approximately fifty-five percent of modeled light extinction at both Hercules Glades and Mingo. The majority of the sulfates were attributed to emissions of SO_2 from elevated point sources. Nitrates from a variety of sources of NOx emissions also contribute to visibility impairment at these class I areas, but to a lesser extent than sulfates. Nitrates were projected to contribute approximately thirteen percent to modeled light extinction at Hercules Glades and nineteen percent at Mingo on the twenty percent worst days in 2018 (W20% Projected Bext). Primary organic aerosols (POA), primarily from area sources, were projected to have similar visibility impacts to nitrates in Hercules Glades and were projected to be the third largest species of visibility impairing particulate at Mingo. The other species, crustal material (CM), soil, anthropogenic and biogenic secondary organic aerosols (SOAA and SOAB) and elemental carbon (EC) were projected to contribute six percent or less each to modeled visibility impairment at Hercules Glades and Mingo on the twenty percent worst days.

Figures 69 and 70 show the relative impacts of particulate species from elevated point sources, low level point sources, natural sources, onroad mobile sources, nonroad sources, area sources, international contribution (IC), and boundary conditions (BC) projected on the twenty percent worst days in 2018 at Hercules Glades and Mingo. Point source emissions attributed to regions in

[64] Approval and Promulgation of Implementation Plans; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze. (77 FR 14604, March 12, 2012)
[65] 2008 State of Arkansas Regional Haze Rule State Implementation Plan. Page 45
[66] Approval and Promulgation of Implementation Plans; State of Missouri: Regional Haze (77 FR 38007, June 26, 2012)
[67] August 27, 2007 CENRAP PSAT tool: W20% Projected Bext

Texas were further categorized into EGU Point and non-EGU Point categories. EGU emissions in other states were primarily captured under the elevated point source category. This data demonstrates that sulfates from elevated point sources were projected to be the primary contributor to visibility impairment at Missouri Class I areas.

Figure 69: CENRAP PSAT Projected W20% 2018 Bext at Hercules Glades by Source Category

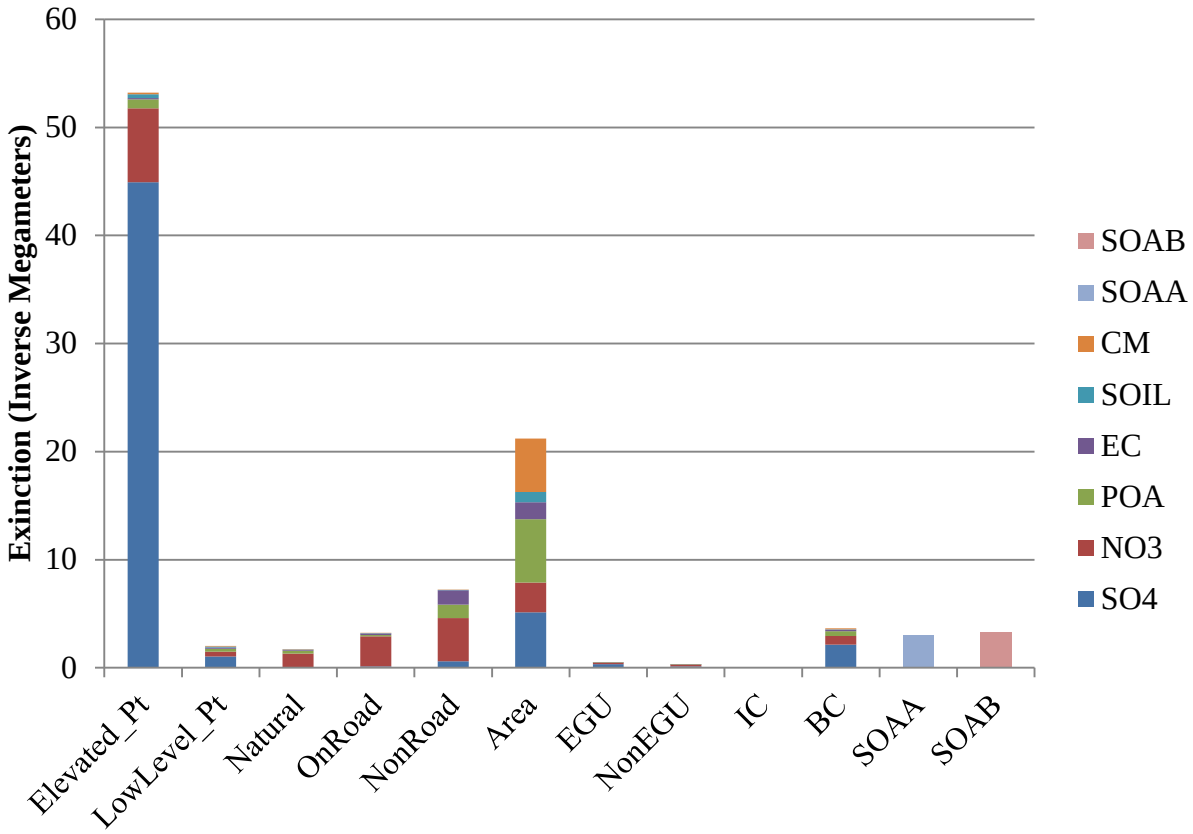


Figure 70: CENRAP PSAT Projected W20% 2018 Bext at Mingo by Source Category

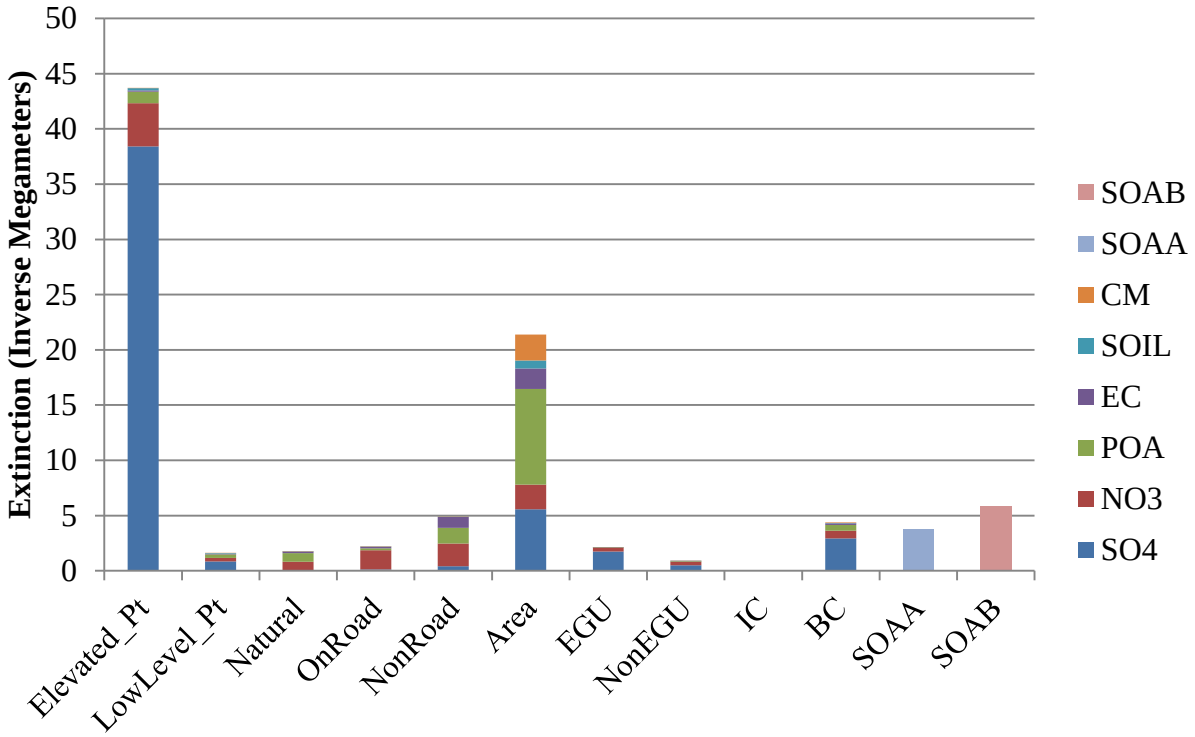


Table 14 shows the percentage of each pollutant species attributable to emissions from Arkansas sources that impact total projected light extinction on the twenty percent worst days in Hercules Glades and Mingo. The CENRAP modeling for the 2018 twenty percent worst days in Missouri projects that emissions from Arkansas contribute 7.6% of light extinction at Hercules Glades and 4.4% of light extinction at Mingo. Sulfates makes up the largest portion of that contribution for Hercules Glades. Nitrates makes up the largest portion of that contribution for Mingo.

Table 14: CENRAP PSAT Projected W20% 2018 Bext

Particulate Species	Hercules Glades		Mingo	
	Bext	% of Total Bext	Bext	% of Total Bext
SO_4	3.25639547	3.52%	1.12279515	1.13%
NO_3	1.1212008	1.21%	1.8173296	1.83%
POA	1.8609495	2.01%	0.7249093	0.73%
EC	0.4881985	0.53%	0.31722969	0.32%
Soil	0.107500081	0.12%	0.092363872	0.09%
CM	0.222402549	0.24%	0.270965464	0.27%

Figures 71 and 72 show the relative impacts of particulate species from each source region projected for the twenty percent worst days in 2018 for Hercules Glades and Mingo. Emissions from Arkansas were projected to be the second highest contributor to visibility impairment on the twenty percent worst days in 2018 at Hercules Glades, which places Arkansas behind Missouri. Emissions from Arkansas were projected to be the sixth highest contributor to visibility impairment on the twenty percent worst days in 2018 at Mingo, behind Missouri, Illinois, Indiana, Kentucky, and the eastern United States region.

Figure 71: CENRAP PSAT Projected W20% 2018 Bext at Hercules Glades by Region

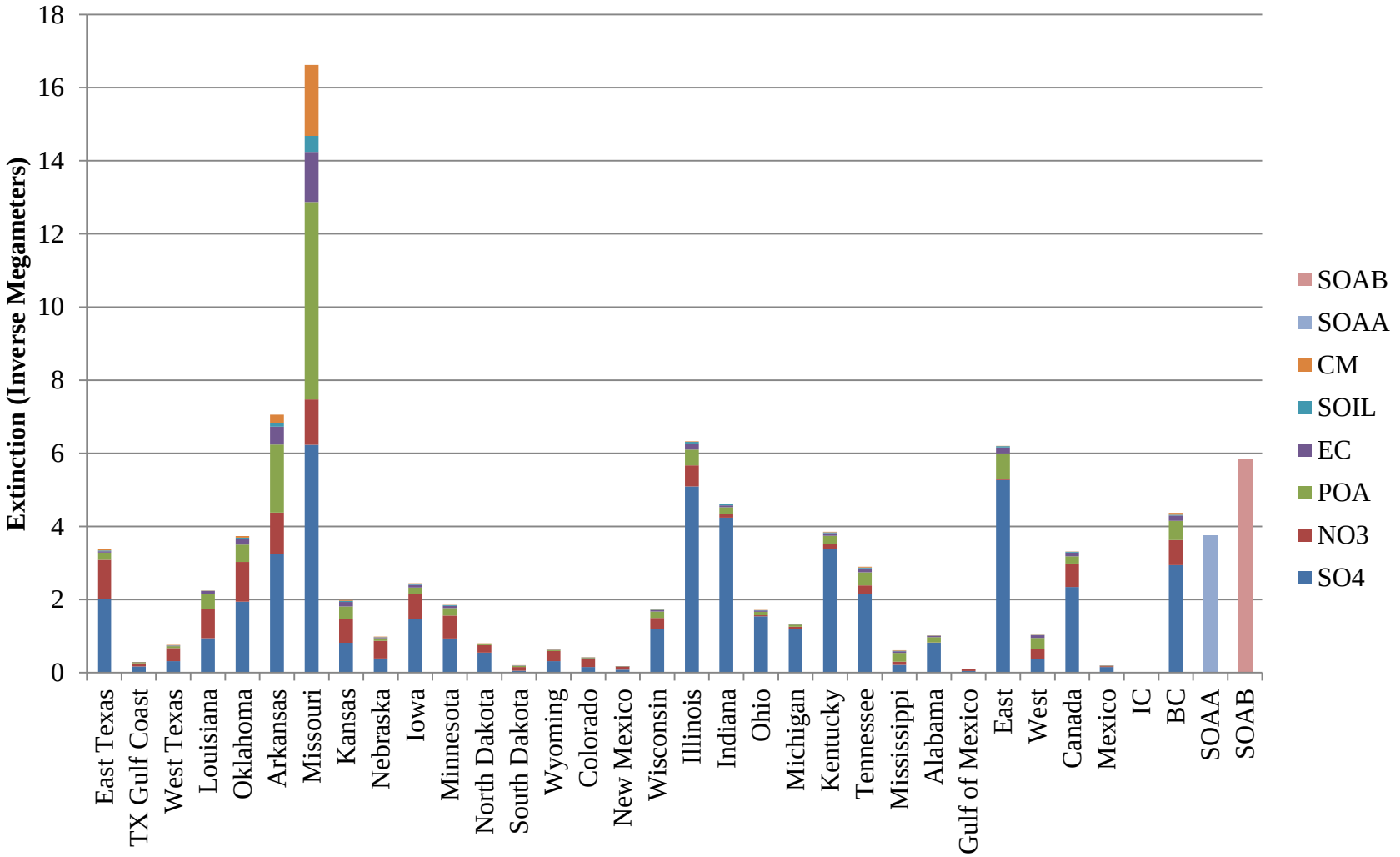
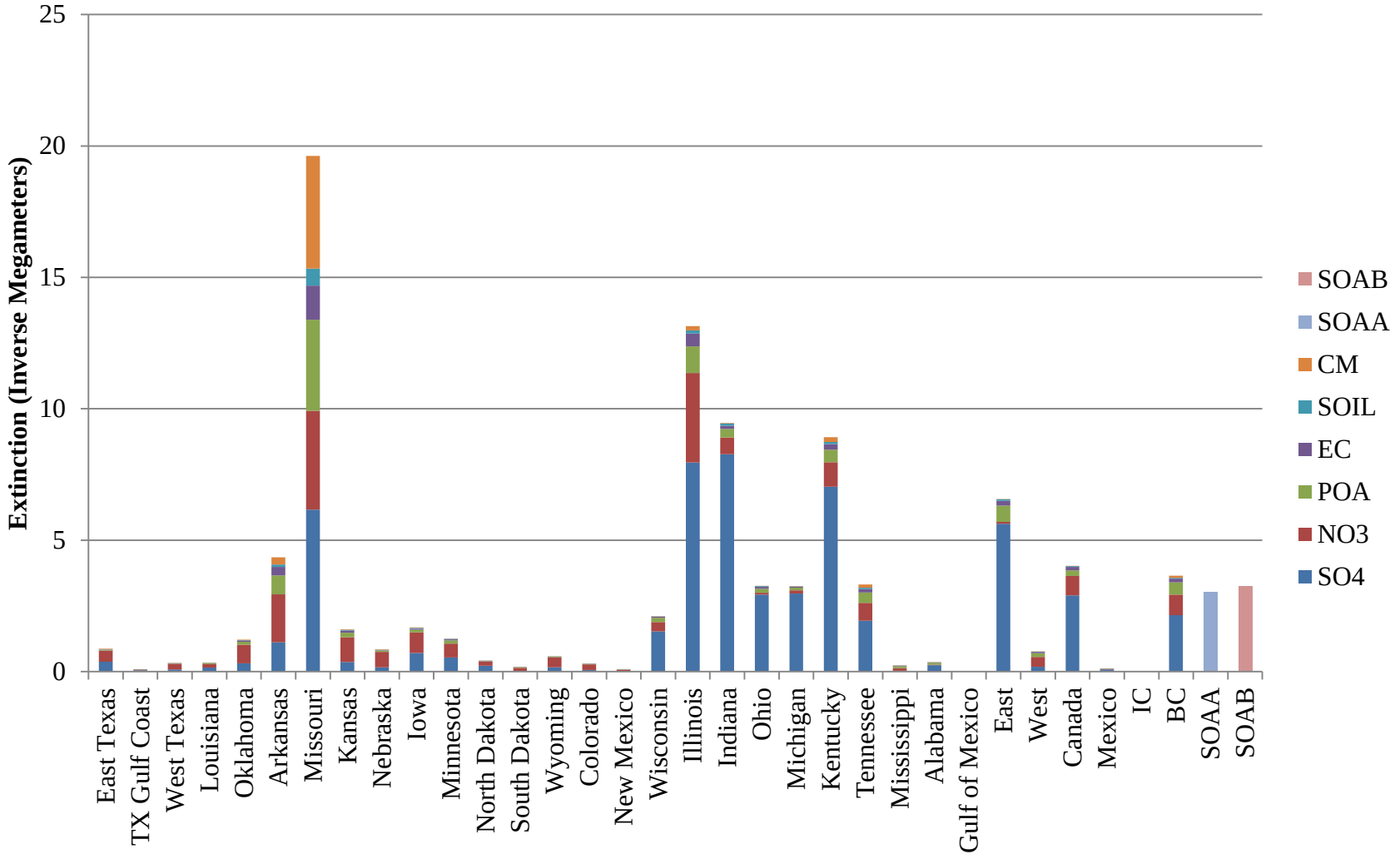


Figure 72: CENRAP PSAT Projected W20% 2018 Bext at Mingo by Region



2. Assumptions used by Missouri in Establishing Reasonable Progress Goals

Based on the Environ/UCR results, both Hercules Glades and Mingo were expected to achieve equal to or greater improvements in visibility than would be achieved under a uniform rate of progress by 2018 under 2018 base case (2018 BASE G) modeling, which included reductions anticipated from best available retrofit technology (BART) controls at EGUs in Arkansas, Oklahoma, Kansas, and Nebraska.[68] The emissions contained in the Table 15 below represent the Arkansas emissions in 2018 assumed by Missouri in setting their reasonable progress goals. Table 16 includes the 2018 projected emissions of NOx and SO_2 from Arkansas subject-to-BART EGUs.

Table 15: 2018 Projected Arkansas Annual Emissions

	VOC (tons)	NOx (tons)	$PM_{2.5}$ (tons)	PM_{10} (tons)	NH_3 (tons)	CO (tons)	SO_2 (tons)
Point	55,603	71,107	13,775	19,799	2,575	75,708	106,461
Nonpoint	107,387	31,531	69,585	148,592	201,722	448,760	31,169
Nonroad Mobile	31,475	34,305	3,387	3,678	49	293,734	211
Onroad Mobile	19,924	33,640	949	949	3,412	367,152	443
Biogenics	1,385,666	18,960				136,688	
Total	1,600,055	189,542	87,695	173,019	207,758	1,322,043	138,283

Table 16: 2018 Projected Arkansas BART EGU Annual Emissions[69]

BART Source Facility	NOx (tons)	SO_2 (tons)
White Bluff	9242	45,970
McClellan	288	0.1
Flint Creek	4335	2896
Carl E Bailey	0	0
Lake Catherine	0	0

CENRAP contracted with Alpine Geophysics to evaluate control strategies for reasonable progress based on the Environ/UCR emissions and modeling results.[70] Alpine Geophysics

[68] Environ International Corporation and University of California at Riverside (2007). "Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans."

[69] Facility annual emissions were calculated from daily emission values for Monday, Weekday, Saturday, and Sunday for each month from Pechan CENRAP EI Summary Project_Final Aug 2007.mdb. (See Exhibit F.6 of Arkansas Phase II Regional Haze SIP available at https://www.adeq.state.ar.us/air/planning/sip/pdfs/regional-haze/f.6-sip-rev-rpg-data-sheet.xlsx).

[70] Alpine Geophysics, LLC (2006) "CENRAP Regional Haze Control Strategy Analysis Plan."

recommended reasonable progress control strategies for six Class I areas within the CENRAP region: Big Bend National Park, Breton Island, Boundary Waters, Guadalupe Mountains, Wichita Mountain, and Voyageurs.[71] Neither Hercules Glades nor Mingo were included in the list of regions for which additional control strategies were recommended for reasonable progress. Missouri set reasonable progress goals based on 2018 BASE G CMAQ visibility projections from the Environ/UCR modeling.[72] Missouri did not request of Arkansas any specific measures beyond the anticipated reductions included as inputs in the 2018 CENRAP BASE G modeling. EPA approved Missouri's reasonable progress goals.

C. Demonstration that Arkansas has implemented all measures necessary to obtain its share of the emission reduction obligation

On September 9, 2008, Arkansas submitted a SIP for the 2008–2018 planning period of the Regional Haze program. In 2012, EPA approved the following elements of the 2008 AR RH SIP:

- Identification of Class I areas affected by sources in Arkansas;
- Determination of baseline and natural visibility conditions;
- Determination of a uniform rate of progress (URP);
- Select BART determinations:
    - PM determination on SWEPCO Flint Creek Plant Boiler No. 1;
    - SO_2 and PM determinations for the natural gas firing scenario for Entergy Lake Catherine Plant Unit 4;
    - PM determinations for both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Plant Units 1 and 2; and
    - PM determination for Domtar Ashdown Mill Power Boiler No. 1;
- Consultation with FLMs and other states regarding RPGs and long-term strategy;
- Coordination of regional haze and reasonably attributable visibility impairment (RAVI);
- Regional haze monitoring strategy and other SIP requirements under 40 C.F.R. 51.308(d)(4);
- A commitment to submit periodic regional haze SIP revisions; and
- A commitment to submit periodic progress reports that include a description of progress toward RPG and a determination of adequacy of the existing SIP.

EPA disapproved the following elements of the 2008 AR RH SIP:

- BART compliance dates;
- BART-eligible sources and subject-to-BART sources;
- Select BART determinations:
    - SO_2, NOx, and PM BART determinations for AECC Bailey Plant Unit 1;
    - SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;

[71] Id
[72] Missouri Department of Natural Resources (2009) State or Missouri Regional Haze Plan

    - SO_2 and NOx BART determinations for SWEPCO Flint Creek Plant Boiler No. 1;
    - SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Lake Catherine Plant Unit 4;
    - SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
    - BART determination for Entergy White Bluff Plant Auxiliary Boiler;
    - SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
    - SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2;
- RPGs; and
- Long-term strategy.

On September 27, 2016, EPA finalized a regional haze FIP for Arkansas (AR RH FIP).[73] This FIP established new BART requirements for those sources whose BART determinations in the 2008 AR RH SIP were disapproved until such time as Arkansas submits and EPA approves corrective SIP revisions. ADEQ has submitted two corrective SIP revisions to address previously disapproved portions of the 2008 AR RH SIP. The Phase I SIP revision, finalized on October 31, 2017 and approved by EPA on February 12, 2018, replaced source-specific NOx emission limits for EGUs with reliance on the Cross-State Air Pollution Rule (CSAPR) for ozone season NOx as an alternative to BART.[74] In August 2018, ADEQ submitted the Phase II SIP revision, which addressed all remaining disapproved portions of the 2008 AR RH SIP, with the exception of those portions specifically pertaining to Domtar Ashdown Mill.[75] With these two SIP revisions in place, ADEQ has addressed all BART requirements for EGUs. EPA proposed approval of the Phase II SIP revision on November 30, 2018. EPA finalized approval of the Phase II SIP revision on September 27, 2019. In addition, ADEQ proposed on October 5, 2018 a third corrective SIP revision (Phase III SIP) to address requirements for Domtar Ashdown Mill. The Phase III SIP revision was submitted to EPA for approval on August 14, 2019.

Although Arkansas does not yet have a fully approved Regional Haze SIP for the first planning period, Arkansas has nevertheless obtained its share of the emission reductions necessary to achieve the reasonable progress goals set by Missouri at Hercules Glades and Mingo. Recent emissions and monitoring data, as well as controlled emissions based on measures included in Arkansas's Regional Haze Phase I and Phase II SIP submittals, support this determination.

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[73] Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility Transport Federal Implementation Plan; Final Rule (81 FR 66332, September 27, 2016)

[74] The final Phase 1 Regional Haze SIP Revision can be accessed here https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx#collapse2017

[75] The final Phase 2 Regional Haze SIP Revision can be accessed here: https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx#collapse2018

1. Comparison of Recent Emissions Data to Assumptions for Arkansas Emissions in the CENRAP 2018 Base G Case

Total emissions from all point sources based on the most recent inventory data are lower than were projected for Arkansas Emissions in 2018 Base G. Table 17 below represents the most recent complete emission inventory data for Arkansas. In particular, point source emissions of the most impactful contributors to visibility impairment, NOx and SO_2 emissions, were thirty-two percent and forty-eight percent lower than projected, respectively. Total SO_2 emissions from all categories were sixty percent lower than projected. Total NOx emissions were five percent higher than projected, largely due to increased emissions from the onroad mobile category.

Table 17: 2014 and 2016 Arkansas Emissions[76]

	VOC (tons)	NOx (tons)	$PM_{2.5}$ (tons)	PM_{10} (tons)	NH_3 (tons)	CO (tons)	SO_2 (tons)
Point	20,210	48,365	6,026	8,021	1,666	35,300	54,847
Nonpoint	71,791	33,982	61,881	297,331	63,812	82,329	735
Nonroad Mobile	23,204	18,819	1,835	1,926	28	141,627	41
Onroad Mobile	33,171	79,428	2,436	4,001	1,235	333,500	333
Biogenics	1,339,614	18,588				148,624	
Total	1,487,991	199,182	72,178	311,279	66,742	741,380	55,956

2. Comparison of SIP measures to Assumptions for Arkansas Subject-to-BART Source Emissions in the CENRAP 2018 Base G Case

Table 18 compares CENRAP Base G 2018 emissions projections assumed based on installation of BART at subject-to-BART EGUs to controlled emission rates under the Arkansas Phase II Regional Haze SIP. The total controlled annual SO_2 emissions from Arkansas subject-to-BART sources are lower than assumed in the CENRAP Base G 2018 projections. EPA proposed approval of the Phase II Regional Haze SIP on November 30, 2018.[77]

[76] Point source data is from the Arkansas Department of Environmental Quality 2016 Emission Inventory. All other data is from EPA's 2014 National Emission Inventory

[77] Approval and Promulgation of Implementation Plans; Arkansas; Approval of Regional Haze State Implementation Plan Revision and Partial Withdrawal of Federal Implementation Plan (83 FR 62204, November 30, 2018)

Table 18: Comparison of 2018 CENRAP BASE G Emissions to Arkansas Regional Haze Phase II SIP Controlled Emissions at Arkansas Subject-to-BART EGUs

Subject-to-BART EGUs	2018 CENRAP Base G SO_2 Emissions[78] (tons)	Phase II SIP SO_2 Controlled Rates (tons)[79]
Arkansas Electric Cooperatives Carl E. Baily Generating Station	0	10
Entergy Arkansas Lake Catherine	0	<1
Entergy Arkansas White Bluff	45,970	29,175[80]
Arkansas Electric Cooperatives John L. McClellan	<1	75
Southwestern Power Company Flint Creek	2,896	907
Total	48,866	30,167

In the Arkansas Regional Haze Phase I SIP, ADEQ addressed NOx BART requirements for Arkansas EGUs by relying on participation in the CSAPR ozone season NOx trading program as an alternative to BART. Therefore, there are no source-specific NOx measures for the subject-to-BART EGUs, with the exception of a limit for White Bluff Auxiliary boiler, included in Arkansas Regional Haze SIP revision submissions. EPA approved the Phase I SIP on February 12, 2018. ADEQ's determination was supported by EPA's September 29, 2017 affirmation of CSAPR as an approvable alternative to BART under 40 CFR 51.308(e)(4).[81] ADEQ notes that three of the Arkansas subject-to-BART EGUs—White Bluff units 1 and 2 and Flint Creek—have installed low NOx burners with separated overfire air.

ADEQ designated one non-EGU as subject-to-BART in the 2008 AR RH SIP: Domtar Ashdown Mill. However, the 2018 Base G case assumed no emission reductions from Ashdown Mill.

[78] Facility annual emissions calculated by EPA from daily emission values for Monday, Weekday, Sat, and Sun for each month from Pechan CENRAP EI Summary. These values have been included in the spreadsheet that Arkansas adapted from a Reasonable Progress Goal scaling spreadsheet developed by EPA for use in determining the extent that changes in control requirements are anticipated to result in changes in visibility impairment on the twenty percent worst days for Arkansas Class I areas. This spreadsheet can be accessed at https://www.adeq.state.ar.us/air/planning/sip/pdfs/regional-haze/f.6-sip-rev-rpg-data-sheet.xlsx.

[79] With the exception of White Bluff Controlled Emission Rates, controlled emission rates can be found on the 2018 tab of the F.6 SIP Rev RPG Data Sheet. (Available at https://www.adeq.state.ar.us/air/planning/sip/pdfs/regional-haze/f.6-sip-rev-rpg-data-sheet.xlsx)

[80] Entergy (2017) "Updated BART Five-Factor Analysis for SO_2 for Units 1 and 2" for White Bluff Steam Electric Station (Available at https://www.adeq.state.ar.us/air/planning/sip/pdfs/regional-haze/appendix-d-d.1---d.8.pdf)

[81] Interstate Transport of Fine Particulate Matter: Revision of Federal Implementation Plan Requirements for Texas:Final Rule (82 FR 44581, September 29, 2017)

Table 18 compares the 2018 CENRAP projected emissions to 2016 actual emissions for Ashdown Mill.

Table 19: Comparison of 2018 CENRAP BASE G Emissions to 2016 Emissions at Domtar Ashdown Mill

	NOx emissions (tons)	SO_2 emissions (tons)
2018 CENRAP Base G	3839	2241
2016 ADEQ Emission Inventory	2238	1549

The controlled emission rates for subject-to-BART EGUs for SO_2 and requirements NOx under Arkansas Regional Haze SIP submissions conform to the emission reductions assumed under Missouri's Regional Haze SIP for setting reasonable progress goals for Hercules Glades and Mingo for the first planning period.

3. IMPROVE Monitoring System Data

Figure 73 and Figure 74 demonstrate that Missouri is achieving its near-term visibility goals. In Missouri's 2009 Regional Haze SIP, Missouri established 2018 reasonable progress goals of 23.71 deciview for Mingo and 23.06 deciview for Hercules Glades. The most recent calculations for the twenty percent worst days and twenty percent best days for Class I areas were performed for 2016.[82] For both Mingo and Hercules Glades, visibility impairment on the twenty percent worst days in 2016 beat Missouri's 2018 RPGs for both Class I areas. The most recent five-year rolling average of observed visibility impairment on the twenty percent worst days at Hercules Glades beat Missouri's 2018 RPG for that Class I area, and the most recent five year-rolling average of observed visibility impairment on the twenty percent worst days at Mingo is on track to beat Missouri's RPG for that Class I area.[83] The visibility progress observed indicates that sources in Arkansas are not interfering with the achievement of Missouri's RPGs for Hercules Glades and Mingo.

[82] 2000–2016 visibility data were obtained from: Visibility Status and Trends Following the Regional Haze Rule Metrics: IMPROVE Aerosol, Regional Haze Rule II (New Equation), with substituted data. Hercules Glades, Mingo http://views.cira.colostate.edu/fed/SiteBrowser/Default.aspx.
Note: Missouri DNR revised its natural baseline conditions for Mingo on the twenty percent haziest days from 12.4 deciviews to 11.3 deciviews in their 2012 technical supplement to their 2009 Regional Haze SIP. https://dnr.mo.gov/env/apcp/reghaze/regional-haze-jan-30-2012.pdf

[83] In reporting progress on visibility, the Regional haze Rule requires states to express values in five-year averages. EPA's 2013 "Guidance Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)" suggests that states present rolling-five year averages for each year from the baseline period through the year with the most recent data.

Figure 73: Hercules Glades Reasonable Progress Assessment – 20% Worst Days

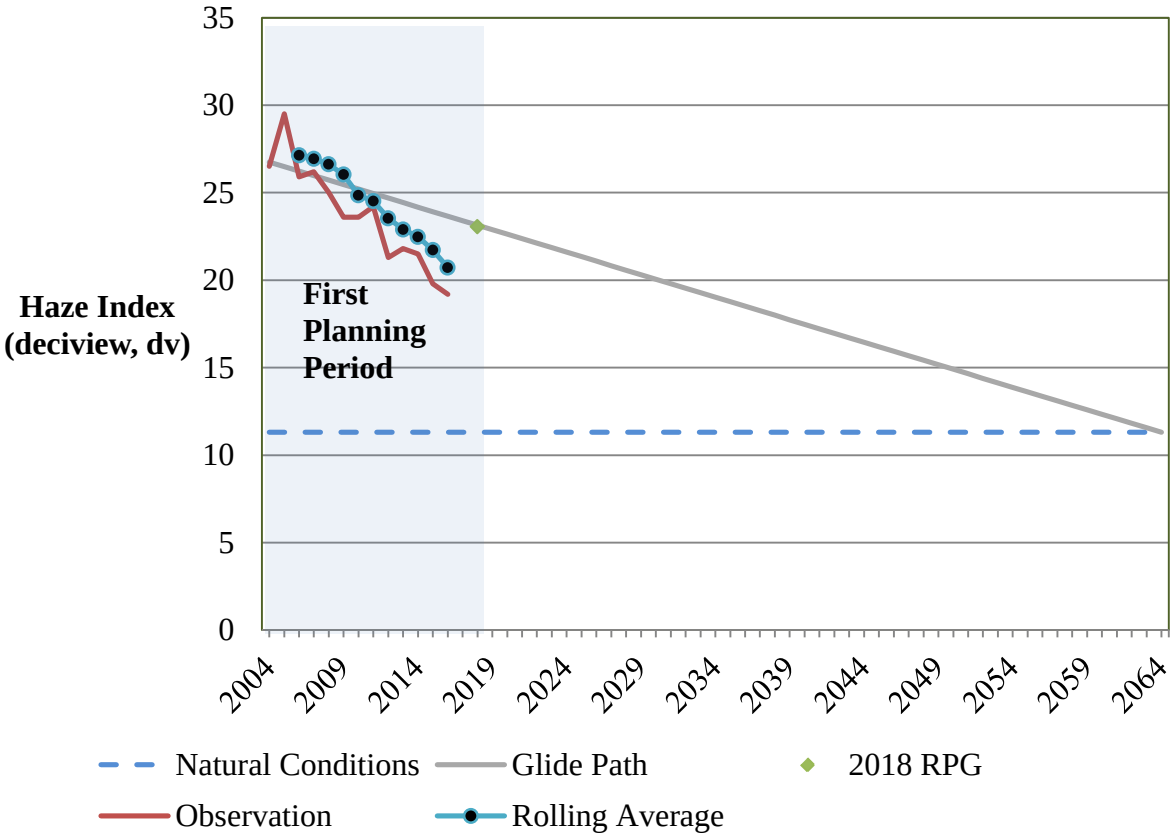
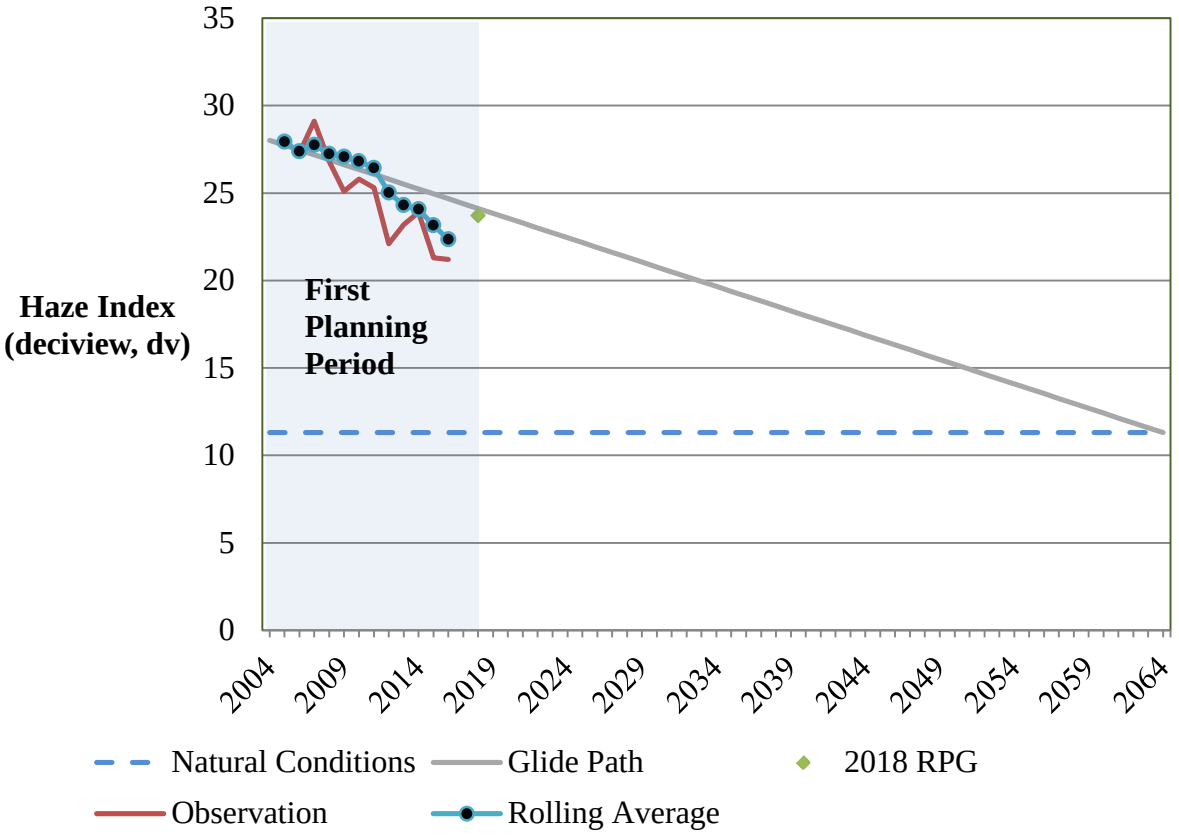


Figure 74: Mingo Reasonable Progress Assessment – 20% Worst Days



D. Prong IV Analysis Conclusions

Based on the analysis described above, ADEQ concludes that sources in Arkansas do not significantly interfere with other states' plans to protect visibility. In addition to having demonstrated that emissions originating within Arkansas do not interfere with measures required to be included in other states' Regional Haze plans; Arkansas will have a fully approved Regional Haze program once the Phase II and Phase III SIPs are approved by EPA. A fully approved regional haze plan further ensures that emissions from Arkansas sources are not interfering with measures required to be included in other air agencies' plans to protect visibility. This analysis supersedes the Prong IV portion of the 2017 infrastructure SIP submittals for the 2006 and 2012 $PM_{2.5}$ NAAQS, 2008 Ozone NAAQS, 2010 SO_2 NAAQS, and 2010 NO_2 NAAQS. This also supplements the Phase II SIP submittal. ADEQ requests that EPA approve Arkansas's determination that control measures included in Arkansas's SIP submittals satisfy the interstate transport visibility requirements for the 2008, and 2015 ozone NAAQS; the 2006 and 2012 $PM_{2.5}$ NAAQS, the 2010 SO_2 NAAQS, and the 2010 NO_2 NAAQS.

V. Interstate Transport SIP Revision Conclusions

This SIP revision fully addresses Arkansas's interstate transport obligations with respect to the 2015 Ozone NAAQS as well as the visibility component of interstate transport obligations for the following NAAQS: 2006 and 2012 $PM_{2.5}$ NAAQS; 2008 Ozone NAAQS, 2010 SO_2 NAAQS, and 2010 NO_2 NAAQS.

ADEQ's evaluation of Arkansas's interstate obligations under Prongs 1 and 2 of Clean Air Act Section 110(a)(2)(D) followed the four-step framework included in EPA guidance. First, ADEQ evaluated photochemical modeling from EPA and other states to identify potential downwind air quality problems and upwind states' contributions. Next, ADEQ identified potential linkages by setting an appropriate contribution threshold of one ppb and evaluating wind back-trajectories for elevated ozone days to determine potential linkages. ADEQ identified the following potential linkages for Arkansas: one 2023 projected maintenance receptor—Allegan County, MI—and no 2023 projected nonattainment receptors. Third, ADEQ looked at emissions trends and patterns in Arkansas and other states linked to Allegan County to identify potential relationships between emissions of precursor pollutants and elevated ozone days in Allegan County. This examination of emissions showed that annual emissions of ozone precursors are declining in states linked to Allegan County, particularly in those states with the highest downwind contribution to the Allegan County monitor: Illinois and Indiana. ADEQ did not find a consistent and persistent pattern in NOx emissions relative to average emissions for the month from EGUs—Arkansas's highest individual sources of NOx emissions—during periods of time that air parcels passed through Arkansas and entered the mixing layer in Allegan County, MI on elevated ozone days. In addition, Arkansas also examined potential costs of NOx controls for EGUs and found that no new controls beyond those recently implemented at three of Arkansas's largest EGUs were cost-effective given that Allegan County, MI is projected to be in attainment with the 2015 ozone NAAQS and Arkansas's contribution relative to other states potentially linked to Allegan County, MI based on EPA's modeling. Lastly, ADEQ determined based on this analysis that no additional controls beyond those already on the books under state and federal regulations are warranted for Arkansas sources to satisfy interstate transport obligations for the 2015 Ozone NAAQS.

Prong 3 of Clean Air Act Section 110(a)(2)(D) is satisfied by ADEQ's fully-approved comprehensive PSD permitting program.

ADEQ's evaluation of Arkansas's interstate obligations under Prong 4 of Clean Air Act Section 110(a)(2)(D) explained how ADEQ has satisfied visibility transport obligations for the following NAAQS: 2006 and 2012 $PM_{2.5}$ NAAQS; 2008 Ozone NAAQS, 2010 SO_2 NAAQS, and 2010 NO_2 NAAQS. First, ADEQ participated in an EPA-approved consultation process for regional haze, which included consultation with Missouri. There are two Class I areas in Missouri impacted by Arkansas sources. Second, ADEQ detailed how Arkansas's share of emissions reductions necessary to achieve reasonable progress in Missouri Class I areas were determined.

Lastly, ADEQ demonstrated that Missouri's Class I areas are already on track to achieve their reasonable progress goals, that Arkansas has achieved its share of emission reductions, and that sources in Arkansas do not significantly interfere with Missouri's plans to protect visibility.

State's Legal Authority to Adopt and Implement the Plan

The State's legal authority to adopt and implement this State Implementation Plan revision can be found in Arkansas Code Annotated (Ark. Code Ann.) §§ 8-1-203(b)(1), 8-4-311(a)(1), 8-4-317.

8-1-203. Powers and responsibilities of the Arkansas Pollution Control and Ecology Commission.

(a) The Arkansas Pollution Control and Ecology Commission shall meet regularly in publicly noticed open meetings to discuss and rule upon matters of environmental concern.

(b) The commission's powers and duties shall be as follows:

(1) (A) Promulgation of rules and regulations implementing the substantive statutes charged to the Arkansas Department of Environmental Quality for administration.

(B) In promulgation of such rules and regulations, prior to the submittal to public comment and review of any rule, regulation, or change to any rule or regulation that is more stringent than the federal requirements, the commission shall duly consider the economic impact and the environmental benefit of such rule or regulation on the people of the State of Arkansas, including those entities that will be subject to the regulation.

(C) The commission shall promptly initiate rulemaking proceedings to further implement the analysis required under subdivision (b)(1)(B) of this section.

(D) The extent of the analysis required under subdivision (b)(1)(B) of this section shall be defined in the commission's rulemaking required under subdivision (b)(1)(C) of this section. It will include a written report which shall be available for public review along with the proposed rule in the public comment period.

(E) Upon completion of the public comment period, the commission shall compile a rulemaking record or response to comments demonstrating a reasoned evaluation of the relative impact and benefits of the more stringent regulation;

(2) Promulgation of rules, regulations, and procedures not otherwise governed by applicable law that the commission deems necessary to secure public participation in environmental decision-making processes;

(3) Promulgation of rules and regulations governing administrative procedures for challenging or contesting department actions;

(4) In the case of permitting or grants decisions, providing the right to appeal a permitting or grants decision rendered by the Director of the Arkansas Department of Environmental Quality or his or her delegatee;

(5) In the case of an administrative enforcement or emergency action, providing the right to contest any such action initiated by the director;

(6) Instruct the director to prepare such reports or perform such studies as will advance the cause of environmental protection in the state;

(7) Make recommendations to the director regarding overall policy and administration of the department. However, the director shall always remain within the plenary authority of the Governor; and

(8) Upon a majority vote, initiate review of any director's decision.

(c) (1) In providing for adjudicatory review as contemplated by subdivisions (b)(4) and (5) of this section, the commission may appoint one (1) or more administrative hearing officers. The administrative hearing officers shall at all times serve as agents of the commission.

(2) In hearings upon appeals of permitting or grants decisions by the director or contested administrative enforcement or emergency actions initiated by the director, the administrative hearing officer shall administer the hearing in accordance with procedures adopted by the commission and, after due deliberation, submit his or her recommended decision to the commission.

(3) (A) (i) Commission review of any appealed or contested matter shall be upon the record compiled by the administrative hearing officer and his or her recommended decision.

(ii) Commission review shall be de novo. However, no additional evidence need be received unless the commission so decides in accordance with established administrative procedures.

(B) The commission may afford the opportunity for oral argument to all parties of the adjudicatory hearing.

(C) (i) By the majority vote of a quorum, the commission may affirm, reverse and dismiss, or reverse and remand to the director.

(ii) If the commission votes to affirm or reverse, such decision shall constitute final agency action for purposes of appeal.

(4) Any party aggrieved by the commission decision may appeal as provided by applicable

law.

(d) The chair of the Arkansas Pollution Control and Ecology Commission may appoint one (1) or more committees composed of commission members to act in an advisory capacity to the full commission.

HISTORY: Acts 1991, No. 1230, § 1; 1993, No. 163, § 7; 1993, No. 165, § 7; 1993, No. 1264, § 2; 1995, No. 117, § 1.

Ark. Code Ann. § 8-4-311

8-4-311. Powers generally.

(a) The Arkansas Department of Environmental Quality or its successor shall have the power to:

(1) Develop and effectuate a comprehensive program for the prevention and control of all sources of pollution of the air of this state;

(2) Advise, consult, and cooperate with other agencies of the state, political subdivisions, industries, other states, the federal government, and with affected groups in the furtherance of the purposes of this chapter;

(3) Encourage and conduct studies, investigations, and research relating to air pollution and its causes, prevention, control, and abatement as it may deem advisable and necessary;

(4) Collect and disseminate information relative to air pollution and its prevention and control;

(5) Consider complaints and make investigations;

(6) Encourage voluntary cooperation by the people, municipalities, counties, industries, and others in preserving and restoring the purity of the air within the state;

(7) Administer and enforce all laws and regulations relating to pollution of the air;

(8) Represent the state in all matters pertaining to plans, procedures, or negotiations for interstate compacts in relation to air pollution control;

(9) (A) Cooperate with and receive moneys from the federal government or any other source for the study and control of air pollution.

(B) The department is designated as the official state air pollution control agency for such purposes;

(10) Make, issue, modify, revoke, and enforce orders prohibiting, controlling, or abating air pollution and requiring the adoption of remedial measures to prevent, control, or abate air pollution;

(11) Institute court proceedings to compel compliance with the provisions of this chapter and rules, regulations, and orders issued pursuant to this chapter;

(12) Exercise all of the powers in the control of air pollution granted to the department for the control of water pollution under §§ 8-4-101 -- 8-4-106 and 8-4-201 -- 8-4-229; and

(13) Develop and implement state implementation plans provided that the commission shall retain all powers and duties regarding promulgation of rules and regulations under this chapter.

(b) The Arkansas Pollution Control and Ecology Commission shall have the power to:

(1) (A) Promulgate rules and regulations for implementing the substantive statutes charged to the department for administration.

(B) In promulgation of such rules and regulations, prior to the submittal to public comment and review of any rule, regulation, or change to any rule or regulation that is more stringent than federal requirements, the commission shall duly consider the economic impact and the environmental benefit of such rule or regulation on the people of the State of Arkansas, including those entities that will be subject to the regulation.

(C) The commission shall promptly initiate rulemaking to further implement the analysis required under subdivision (b)(1)(B) of this section.

(D) The extent of the analysis required under subdivision (b)(1)(B) of this section shall be defined in the commission's rulemaking required under subdivision (b)(1)(C) of this section. It will include a written report that shall be available for public review along with the proposed rule in the public comment period.

(E) Upon completion of the public comment period, the commission shall compile a rulemaking record or response to comments demonstrating a reasoned evaluation of the relative impact and benefits of the more stringent regulation;

(2) Promulgate rules, regulations, and procedures not otherwise governed by applicable law that the commission deems necessary to secure public participation in environmental decision-making processes;

(3) Promulgate rules and regulations governing administrative procedures for challenging or contesting department actions;

(4) In the case of permitting or grants decisions, provide the right to appeal a permitting or grants decision rendered by the Director of the Arkansas Department of Environmental Quality or his or her delegatee;

(5) In the case of an administrative enforcement or emergency action, providing the right to contest any such action initiated by the director;

(6) Instruct the director to prepare such reports or perform such studies as will advance the cause of environmental protection in the state;

(7) Make recommendations to the director regarding overall policy and administration of the department, provided, however, that the director shall always remain within the plenary authority of the Governor;

(8) Upon a majority vote, initiate review of any director's decision;

(9) Adopt, after notice and public hearing, reasonable and nondiscriminatory rules and regulations requiring the registration of and the filing of reports by persons engaged in operations that may result in air pollution;

(10) (A) Adopt, after notice and public hearing, reasonable and nondiscriminatory rules and regulations, including requiring a permit or other regulatory authorization from the department, before any equipment causing the issuance of air contaminants may be built, erected, altered, replaced, used, or operated, except in the case of repairs or maintenance of equipment for which a permit has been previously used, and revoke or modify any permit issued under this chapter or deny any permit when it is necessary, in the opinion of the department, to prevent, control, or abate air pollution.

(B) A permit shall be issued for the operation or use of any equipment or any facility in existence upon the effective date of any rule or regulation requiring a permit if proper application is made for the permit.

(C) No such permit shall be modified or revoked without prior notice and hearing as provided in this section.

(D) Any person that is denied a permit by the department or that has such permit revoked or modified shall be afforded an opportunity for a hearing in connection therewith upon written application made within thirty (30) days after service of notice of such denial, revocation, or modification.

(E) The operation of any existing equipment or facility for which a proper permit application has been made shall not be interrupted pending final action thereon.

(F) (i) An applicant or permit holder that has had a complete application for a permit or for a modification of a permit pending longer than the time specified in the state regulations promulgated pursuant to Title V of the Clean Air Act Amendments of 1990, or any person that participated in the public participation process, and any other person that could obtain judicial review of such actions under state laws, may petition the commission for relief from department inaction.

(ii) The commission will either deny or grant the petition within forty-five (45) days of its submittal.

(iii) For the purposes of judicial review, either a commission denial or the failure of the department to render a final decision within thirty (30) days after the commission has granted a petition shall constitute final agency action;

(11) (A) Establish through its rulemaking authority, either alone or in conjunction with the appropriate state or local agencies, a system for the banking and trading of air emissions designed to maintain both the state's attainment status with the national ambient air quality standards mandated by the Clean Air Act and the overall air quality of the state.

(B) The commission may consider differential valuation of emission credits as necessary to achieve primary and secondary national ambient air quality standards, and may consider establishing credits for air pollutants other than those designated as criteria air pollutants by the United States Environmental Protection Agency.

(C) Any regulation proposed pursuant to this authorization shall be reported to the House Interim Committee on Public Health, Welfare, and Labor and the Senate Interim Committee on Public Health, Welfare, and Labor or appropriate subcommittees thereof prior to its final promulgation; and

(12) In the case of a state implementation plan, provide the right to appeal a final decision rendered by the Director of the Arkansas Department of Environmental Quality or his or her delegate under § 8-4-317.

HISTORY: Acts 1949, No. 472, [Part 2], § 5, as added by Acts 1965, No. 183, § 7; A.S.A. 1947, § 82-1935; Acts 1993, No. 994, § 1; 1995, No. 895, § 4; 1997, No. 179, § 1; 1997, No. 1219, § 6; 1999, No. 1164, § 31; 2013, No. 1302, §§ 2, 3.

8-4-317. State implementation plans generally.

(a) In developing and implementing a state implementation plan, the Arkansas Department of Environmental Quality shall consider and take into account the factors specified in § 8-4-312 and the Clean Air Act, 42 U.S.C. § 7401 et seq., as applicable.

(b) (1) (A) Whenever the department proposes to finalize a state implementation plan submittal for review and approval by the United States Environmental Protection Agency, it shall cause notice of its proposed action to be published in a newspaper of general circulation in the state.

(B) The notice required under subdivision (b)(1)(A) of this section shall afford any interested party at least thirty (30) calendar days in which to submit comments on the proposed state implementation plan submittal in its entirety.

(C) (i) In the case of any emission limit, work practice or operational standard, environmental standard, analytical method, air dispersion modeling requirement, or monitoring requirement that is incorporated as an element of the proposed state implementation plan submittal, the record of the proposed action shall include a written explanation of the rationale for the proposal, demonstrating the reasoned consideration of the factors in § 8-4-312 as applicable, the need for each measure in attaining or maintaining the National Ambient Air Quality Standards, and that any requirements or standards are based upon generally accepted scientific knowledge and engineering practices.

(ii) For any standard or requirement that is identical to an applicable federal regulation, the demonstration required under subdivision (b)(1)(C)(i) of this section may be satisfied by reference to the regulation. In all other cases, the department shall provide its own justification with appropriate reference to the scientific and engineering literature considered or the written studies conducted by the department.

(2) (A) At the conclusion of the public comment period and before transmittal to the Governor for submittal to the United States Environmental Protection Agency, the department shall provide written notice of its final decision regarding the state implementation plan submittal to all persons who submitted public comments.

(B) (i) The department's final decision shall include a response to each issue raised in any public comments received during the public comment period. The response shall manifest reasoned consideration of the issues raised by the public comments and shall be supported by appropriate legal, scientific, or practical reasons for accepting or rejecting the substance of the

comment in the department's final decision.

(ii) For the purposes of this section, response to comments by the department should serve the roles of both developing the record for possible judicial review of a state implementation plan decision and serving as a record for the public's review of the department's technical and legal interpretations on long-range regulatory issues.

(iii) This section does not limit the department's authority to raise all relevant issues of regulatory concern upon adjudicatory review by the Arkansas Pollution Control and Ecology Commission of a particular state implementation plan decision.

(c) (1) Only those persons that submit comments on the record during the public comment period have standing to appeal the final decision of the department to the commission upon written application made within thirty (30) days after service of the notice under subdivision (b)(2)(A) of this section.

(2) An appeal under subdivision (c)(1) of this section shall be processed as a permit appeal under § 8-4-205. However, the decision of the Director of the Arkansas Department of Environmental Quality shall remain in effect during the appeal.

HISTORY: Acts 2013, No. 1302, § 4.

Arkansas Democrat Gazette

STATEMENT OF LEGAL ADVERTISING

ADEQ/FISCAL DIVISION
5301 NORTHSHORE DR
NORTH LITTLE ROCK AR 72118

ATTN: Jake Harper
DATE : 10/04/18 INVOICE #: 3195345
ACCT #: L6016734 P.O. #:

REMIT TO:
ARKANSAS DEMOCRAT-GAZETTE, INC.
P.O. BOX 2221
LITTLE ROCK, AR 72203

BILLING QUESTIONS CALL 378-3873

ADCOPY

STATE OF ARKANSAS, }
COUNTY OF PULASKI, } ss.

I, SuAnn Scales, do solemnly swear that I am the Legal Billing Clerk of the Arkansas Democrat - Gazette, a daily newspaper printed and published in said County, State of Arkansas; that I was so related to this publication at and during the publication of the annexed legal advertisement in the matter of:

hearing

pending in the Court, in said County, and at the dates of the several publications of said advertisement stated below, and that during said periods and at said dates, said newspaper was printed and had a bona fide circulation in said County; that said newspaper had been regularly printed and published in said County, and had a bona fide circulation therein for the period of one month before the date of the first publication of said advertisement; and that said advertisement was published in the regular daily issues of said newspaper as stated below.

DATE	DAY	LINAGE	RATE	DATE	DAY	LINAGE	RATE
10/03	Wed	164	1.35				
10/04	Thu	164	1.35				

TOTAL COST ---------- 442.80
Billing Ad #: 74695853

SuAnn Scales

Subscribe and sworn to me this 4th day of October, 20 18

Notary Public

OFFICIAL SEAL - #12696773
CHARLES A. McNEICE, JR.
NOTARY PUBLIC-ARKANSAS
PULASKI COUNTY
MY COMMISSION EXPIRES: 02-02-26

Arkansas Democrat Gazette
STATEMENT OF LEGAL ADVERTISING
THIS PAGE USED FOR ADDITIONAL AD COPY SPACE AS NEEDED.
PAGE MAY BE BLANK

NOTICE OF PROPOSED AIR QUALITY REGULATION CHANGES, PROPOSED STATE IMPLEMENTATION PLAN REVISION, PUBLIC HEARING, AND COMMENT PERIOD

The Arkansas Pollution Control and Ecology Commission (APC&EC) will hold a public hearing on November 2, 2018 to receive public comments on proposed changes to APC&EC Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control and a revision to the Arkansas state implementation plan (SIP). The Regulation No. 19 hearing will begin at 2:00 p.m. and the hearing for the SIP will immediately follow. Both hearings will be in the Commission Room at the Arkansas Department of Environmental Quality (ADEQ) headquarters building, 5301 Northshore Drive, North Little Rock, AR 72118.

The rulemaking seeks to adopt the 2015 ozone national ambient air quality standard (NAAQS) promulgated by the United States Environmental Protection Agency (EPA) on October 26, 2015 (80 FR 65292). Adoption of the 2015 ozone NAAQS by the Arkansas Pollution Control and Ecology Commission (APC&EC) is required under Ark. Code Ann. 8-4-318(b)(1) for submission by the Arkansas Department of Environmental Quality (ADEQ) of (a) state implementation plan(s) demonstrating compliance with Clean Air Act §110 requirements for the standard to the EPA. The complete filing with the Commission related to the Regulation 19 amendment can be found on the Draft Regulations page on ADEQ's website at www.adeq.state.ar.us/draft_regs.aspx under APC&E Commission Docket #18-006-R. The proposed SIP revision has been included as Exhibit H in the docket for this rulemaking.

ADEQ will accept both oral and written statements at the hearings, but prefers written comments in the interest of accuracy. ADEQ will accept written and electronic comments received no later than 4:30 p.m. on Monday, November 19, 2018. Send electronic comments on the regulatory changes to: reg-comment@adeq.state.ar.us. Send electronic comments on the proposed SIP revision to AirPlan-Comments@adeq.state.ar.us. Send written comments on both the regulatory changes and the proposed SIP revision to:

Tricia Treece
Office of Air Quality
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118.

The public may obtain copies of the proposed regulation changes and the proposed SIP revision for inspection during normal business hours in the ADEQ's headquarters building in North Little Rock. The public may also visit ADEQ information depositories located in public libraries at Arkadelphia, Batesville, Blytheville, Camden, Clinton, Crossett, El Dorado, Fayetteville, Forrest City, Fort Smith, Harrison, Helena, Hope, Hot Springs, Jonesboro, Little Rock, Magnolia, Mena, Monticello, Mountain Home, Pocahontas, Russellville, Searcy, Stuttgart, Texarkana, and West Memphis. Campus libraries at the University of Arkansas at Pine Bluff and the University of Central Arkansas at Conway; and the Arkansas State Library, 900 W. Capitol, Suite 100, Little Rock, which can also provide access to this information. In addition, a copy of the draft regulation showing the proposed changes, along with related support documents are available for viewing or downloading on the draft regulations page of the ADEQ's Internet website at www.adeq.state.ar.us. A copy of the proposed SIP is available on ADEQ's Internet website at https://www.adeq.state.ar.us/air/planning/sip/2015ozone.aspx.

Inclement weather or other unforeseen circumstances may cause postponement of the hearing. In the event of a decision to postpone or reschedule, a new legal notice will announce the details of the new hearing date and comment period.

Published October 3, 2018
Becky W. Keogh, Director
Arkansas Department of Environmental Quality
74695853f

Arkansas Democrat Gazette

STATEMENT OF LEGAL ADVERTISING

ADEQ/FISCAL DIVISION
5301 NORTHSHORE DR
NORTH LITTLE ROCK AR 72118

ATTN: Jake Harper

DATE : 11/08/18 INVOICE #: 3197903
ACCT #: L6016734 P.O. #:

REMIT TO:
ARKANSAS DEMOCRAT-GAZETTE, INC.
P.O. BOX 2221
LITTLE ROCK, AR 72203

BILLING QUESTIONS CALL 378-3873

ADCOPY

STATE OF ARKANSAS, }
COUNTY OF PULASKI, } ss.

I, Yvette Hines, do solemnly swear that I am the Legal Billing Clerk of the Arkansas Democrat - Gazette, a daily newspaper printed and published in said County, State of Arkansas; that I was so related to this publication at and during the publication of the annexed legal advertisement in the matter of:

hearing

pending in the Court, in said County, and at the dates of the several publications of said advertisement stated below, and that during said periods and at said dates, said newspaper was printed and had a bona fide circulation in said County; that said newspaper had been regularly printed and published in said County, and had a bona fide circulation therein for the period of one month before the date of the first publication of said advertisement; and that said advertisement was published in the regular daily issues of said newspaper as stated below.

DATE	DAY	LINAGE	RATE	DATE	DAY	LINAGE	RATE
11/08	Thu	111	1.35				

TOTAL COST ---------- 149.85 AIR
Billing Ad #: 74740937 450450/10301-19

Yvette Hines

Subscribed and sworn to me this 8th day of Nov 20 18

Deanna Griffin
Notary Public

OFFICIAL SEAL - #12347408
DEANNA GRIFFIN
NOTARY PUBLIC-ARKANSAS
PULASKI COUNTY
MY COMMISSION EXPIRES: 03-30-26

Arkansas Democrat Gazette
STATEMENT OF LEGAL ADVERTISING
THIS PAGE USED FOR ADDITIONAL AD COPY SPACE AS NEEDED.
PAGE MAY BE BLANK

NOTICE OF RESCHEDULED PUBLIC HEARING AND COMMENT PERIOD EXTENSION

The Arkansas Pollution Control and Ecology Commission (APC&EC) is rescheduling a hearing for proposed changes to APC&EC Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control, and the Arkansas Department of Environmental Quality (ADEQ) is rescheduling a hearing on a proposed revision to the Arkansas state implementation plan (SIP).

The rescheduled Regulation No. 19 hearing will begin at 2:00 p.m. on November 16th, and the hearing for the SIP will immediately follow. Both hearings will be in the Commission Room at the Arkansas Department of Environmental Quality (ADEQ) headquarters building, 5301 Northshore Drive, North Little Rock, AR 72118.

In addition, APC&EC is extending the comment period on the Regulation No. 19 rulemaking, and ADEQ is extending the comment period on the proposed SIP revision. The comment period for both the rulemaking and the proposed SIP revision will now close on Friday, November 30, 2018. Send electronic comments on the regulatory changes to: reg-comment@adeq.state.ar.us. Send electronic comments on the proposed SIP revision to AirPlanComments@adeq.state.ar.us. Send written comments on both the regulatory changes and the proposed SIP revision to:

Tricia Treece
Office of Air Quality
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118.

The rulemaking seeks to adopt the 2015 ozone national ambient air quality standard (NAAQS) promulgated by the United States Environmental Protection Agency (EPA) on October 26, 2015 (80 FR 65292). Adoption of the 2015 ozone NAAQS by the APC&EC is required under Ark. Code Ann. 8-4-318(b)(1) for submission by ADEQ of the proposed SIP revision, which addresses Clean Air Act §110 requirements for the 2015 Ozone NAAQS to the EPA.

A copy of the draft regulation showing the proposed changes, along with related support documents are available for viewing or downloading on the draft regulations page of the ADEQ's Internet website at www.adeq.state.ar.us. A copy of the proposed SIP is available on ADEQ's Internet website at https://www.adeq.state.ar.us/air/planning/sip/2015ozone.aspx.

Inclement weather or other unforeseen circumstances may cause postponement of the hearing. In the event of a decision to postpone or reschedule, a new legal notice will announce the details of the new hearing date and comment period.

74740937f

Arkansas Democrat Gazette

STATEMENT OF LEGAL ADVERTISING

ADEQ/FISCAL DIVISION
5301 NORTHSHORE DR
NORTH LITTLE ROCK AR 72118

ATTN: Jake Harper
DATE : 04/14/19 INVOICE #: 3207813
ACCT #: L6016734 P.O. #:

REMIT TO:
ARKANSAS DEMOCRAT-GAZETTE, INC.
P.O. BOX 2221
LITTLE ROCK, AR 72203

BILLING QUESTIONS CALL 378-3873

STATE OF ARKANSAS, }
COUNTY OF PULASKI, } ss.

I, Charles A McNeice Jr, do solemnly swear that I am the Accounting Manager of the Arkansas Democrat-Gazette, a daily newspaper printed and published in said County, State of Arkansas; that I was so related to this publication at and during the publication of the annexed legal advertisement the matter of:

ADEQ

pending in the Court, in said County, and at the dates of the several publications of said advertisement stated below, and that during said periods and at said dates, said newspaper was printed and had a bona fide circulation in said County; that said newspaper had been regularly printed and published in said County, and had a bona fide circulation therein for the period of one month before the date of the first publication of said advertisement; and that said advertisement was published in the regular daily issues of said newspaper as stated below.

DATE	DAY	LINAGE	RATE	DATE	DAY	LINAGE	RATE
04/14	Sun	70	1.57				

TOTAL COST ---------- 109.90
Billing Ad #: 74909813

Charles A McNeice Jr

Subscribe and sworn to me this 15
day of April 20 19

Deanna Griffin
Notary Public

OFFICIAL SEAL - #12347408
DEANNA GRIFFIN
NOTARY PUBLIC-ARKANSAS
PULASKI COUNTY
MY COMMISSION EXPIRES: 03-30-26

ADCOPY

Arkansas Department of Environmental Quality
Public Notice

The Arkansas Department of Environmental Quality (ADEQ) is publishing this Public Notice to provide interested persons the opportunity to comment on ADEQ's proposed state implementation plan (SIP) revision.

The proposed SIP revision addresses Clean Air Act interstate transport obligations for the 2015 ozone NAAQS and for transport of visibility impairing pollutants. A copy of Arkansas's proposed SIP revision is available for public inspection during normal business hours at the ADEQ headquarters building in North Little Rock. In addition, Arkansas's SIP revision is available for viewing or downloading on ADEQ's website at: https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx.

ADEQ will accept written and electronic comments received by no later than 4:30 p.m. on Monday, May 20, 2019. Written comments should be mailed to Tricia Treece, Office of Air Quality, Arkansas Department of Environmental Quality, 5301 Northshore Drive, North Little Rock, AR 72118. Electronic comments should be sent to: airplancomments@adeq.state.ar.us.

ADEQ will hold a public hearing at 2:00 pm on Monday, May 20, 2019 to receive public comments on the SIP revision. The public hearing will be located in the Commission Room at the Arkansas Department of Environmental Quality headquarters building, 5301 Northshore Drive, North Little Rock, AR 72118.

If inclement weather or unforeseen circumstances require ADEQ to postpone the hearing, ADEQ will post this decision on its website at https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx.

74909813f

RECEIVED
APR 17 2019
BY:

RECEIVED
APR 17 2019
BY

OFFICIAL SEAL - STATE OF ARKANSAS
DEANNA GRIFFIN
NOTARY PUBLIC-ARKANSAS
PULASKI COUNTY
MY COMMISSION EXPIRES: 03-10-26

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

HEARING/MEETING REGISTRATION

Name *Please Print Legibly*	**Address** *Street* *City* *State* *Zip*	Organization Represented
Erika Droke		ADEQ
Rebecca Miller-Rice		BLR
Kelly Jobe		ADEQ

Public hearing/meeting on: Regulation 19 & State Implementation Plan **Date:** 11-16-2018

Location: ADEQ, 5301 Northshore Dr., NLR, AR 72117 **Page** 1 of 1

Ozone Transport SIP Revision Public Hearing

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

HEARING/MEETING REGISTRATION

May 20, 2019
2:00 p.m.

Name *Please Print Legibly*	Address *Street* *City* *State* *Zip*	Organization Represented
Brandy Rakes	brakes@entergy.com	Entergy
David Triplett	dtripl1@entergy.com	Entergy
John Pickard	johnp@ppgmrlaw.com	PPGMR

Public hearing/meeting on: _____ **Date:** _____

Location: _____ **Page** ___ **of** ___

Certification of Compliance with Public Notice and Hearing Requirements of Arkansas Pollution Control & Ecology Commission Regulation 8: Chapter 8

Public Hearing for Amendments to Regulation No. 19: Docket No. 18-006-R

My name is Stuart Spencer. I am of sound mind, capable of making this certification, and have personal knowledge of the facts stated:

1. I am the Associate Director of the Office of Air Quality within the Arkansas Department of Environmental Quality (ADEQ) in its regular course of business, and I am personally familiar with the public participation process for Docket No. 18-006-R.

2. A public hearing was held in accordance with the information provided in the public notice, any and all applicable state laws, and with the public hearing requirements of APC&EC Reg. 8.804 and 8.805.

3. I attest that a public notice for the Public Hearing on the above matter was initially published on October 3, 2018, and scheduled for November 2, 2018, with comment period ending November 19, 2018.

4. The public notice for the hearing on the above matter was then rescheduled for November 16, 2018, and a notice was published on November 6, 2018, informing the public of that change.

5. The public notice of November 6, 2018 also informed the public that the comment period was extended to November 30, 2018.

6. The notice announcing the 30 day public comment period included the date, place and time of the public hearing.

7. No written comments were received during the public comment period.

8. The Public Hearing was held November 16, 2018, at ADEQ headquarters, 5301 Northshore Drive, North Little Rock, Arkansas, at 2:00 p.m.

9. There were no spoken comments at the Hearing of November 16, 2018. The public comment period ended on November 30, 2018, at 4:30 p.m.

3-22-19

Affiant: Date:
Stuart Spencer, Associate Director
Arkansas Department of Environmental Quality

Certification of Compliance with the Public Hearing Requirements set forth in 40 C.F.R. 51.102

Public Hearing for 2015 Ozone NAAQS Infrastructure SIP

My name is Stuart Spencer. I am of sound mind, capable of making this certification, and have personal knowledge of the facts stated:

1. I am the Associate Director of the Office of Air Quality within the Arkansas Department of Environmental Quality (ADEQ) in its regular course of business, and I am familiar with the public participation process for Arkansas's SIP.

2. A public hearing was held in accordance with the information provided in the public notice, any and all applicable state laws, and with the public hearing requirements of 40 C.F.R. 51.102.

3. I attest that a public notice for the Public Hearing on the above matter was initially published on October 3, 2018, and scheduled for November 2, 2018, with comment period ending November 19, 2018.

4. The public notice for the hearing on the above matter was then rescheduled for November 16, 2018, and a notice was published on November 6, 2018, informing the public of that change.

5. The public notice of November 6, 2018 also informed the public that the comment period was extended to November 30, 2018.

6. The notice announcing the 30 day public comment period included the date, place and time of the public hearing.

7. No written comments were received during the public comment period.

8. The Public Hearing was held November 16, 2018, at ADEQ headquarters, 5301 Northshore Drive, North Little Rock, Arkansas, at 2:00 p.m.

9. There were no spoken comments at the Hearing of November 16, 2018. The public comment period ended on November 30, 2018, at 4:30 p.m.

3-22-19

Affiant: Date:
Stuart Spencer, Associate Director
Arkansas Department of Environmental Quality

RESPONSIVE SUMMARY FOR STATE IMPLEMENTATION PLAN REVISION:

Arkansas State Implementation Plan Revision: 2015 Ozone National Ambient Air Quality Standard–Interstate Transport

Pursuant to Arkansas Code Annotated (Ark. Code Ann.) § 8-4-317(b)(2)(B)(i), the Arkansas Department of Energy and Environment, Division of Environmental Quality (ADEQ or "Department"), must prepare a record of the public process in the form of a written response to each issue raised during the public comment period. A responsive summary groups public comments into similar categories and explains why ADEQ accepts or rejects the rationale for each category.

On April 14, 2019, ADEQ proposed a state implementation plan (SIP) revision to address Clean Air Act interstate obligations for the 2015 ozone national ambient air quality standard (NAAQS) and for transport of visibility impairing pollutants. This proposed SIP revision is hereinafter referred to as the "Proposed SIP."

The public comment period for the Proposed SIP closed on May 20, 2019. A public hearing was held on May 20, 2019. ADEQ received two comment letters on the Proposed SIP: One from Entergy Arkansas, LLC (EAL) and one from the United States Environmental Protection Agency (EPA) Region 6 Office.

Comments received during the public comment period for the Proposed SIP are summarized and a response for each is provided below.

Comment 1:

EAL supports the Proposed SIP. EAL confirms that the company has installed cost-effective NOx controls its coal-fired facilities in Arkansas to comply with the Cross-State Air Pollution Rule (CSAPR) during Ozone Season and to reduce nitrogen oxides (NOx) emissions throughout the year, as is stated in the Proposed SIP. EAL recognizes and appreciates the thorough evaluation performed by ADEQ to ensure all provisions of the Clean Air Act are met.

Response 1:

ADEQ acknowledges and appreciates this comment. No changes to the Proposed SIP pursuant to this comment are necessary.

Comment 2:

EPA states that it would be helpful if Arkansas explained what each point in Figure 1 on page 8 of the Proposed SIP represents.

Response 2:

Arkansas added clarification to Figure 1 of the Proposed SIP that now reads that the data points represent "EPA updated 2011 CAMx model performance statistic: individual monitoring site-specific mean error" and provided the following footnote as additional information and the data source: "Data is from an EPA file (http://www.epa.gov/sites/production/files/2015-11/updated_2011_camx_performance_stats.xlsx.) that contains air quality model performance statistics for 8-hour daily maximum ozone for individual monitoring sites from the 2011eh base year model simulation performed by EPA in support of the updated ozone transport modeling for the 2008 ozone NAAQS."

Comment 3:

EPA suggests that it would be helpful to provide data to support the statement "that the use of alternative modeling protocols, including base year and grid resolution, can cause considerable differences in design value projections and ozone contributions." EPA provided the following table showing the base period and 2023 design values (DV) for the receptor in Allegan County, MI based on the modeling sets discussed in the Proposed SIP.

	Based on 2011 Meteorology							Based on 2012 Meteorology	
	2009-2013 Base Period	EPA 2023 12 km No Water	LADCO 2023 12 km No Water	EPA 2023 12 km 3x3	LADCO 2023 12 km 3x3	MOG 2023 12 km 3x3	MOG 2023 4 km 3x3	2010-2014 Base Period	TCEQ 2023 12 km 3x3
Average DVs (ppb)	82.7	69.0	68.7	69.0	68.8	69.0	70.3	84.3	71.0
Maximum DVs (ppb)	86	71.7	71.5	71.8	71.5	71.8	73.1	86	-

Response 3:

In response to EPA's comment, a table showing greater and lesser differences in projected design values resulting from different modeling strategies will be added to the SIP narrative. Several monitoring sites in the Northeast as well as in Texas showed greater differences in design values than did the monitoring site in Allegan County, MI.

Comment 4:

EPA disagrees with ADEQ on the applicability of the prevention of significant deterioration (PSD) significant impact level (SIL) to a one ppb threshold for assessing linkages to downwind receptors because EPA's analysis for the SIL did not contain information that could be used to evaluate the collective contribution from upwind states at downwind receptors, a key element for consideration given the regional nature of ozone transport.

Response 4:

ADEQ disagrees with EPA's opinion on the applicability of technical analysis behind the PSD SIL to linkage thresholds. Rather, ADEQ agrees with the assessment of other states, such as Georgia who states in support of its 2015 ozone NAAQS transport SIP that the PSD SIL is a conservative linkage threshold based on a statistical analysis of air quality variability that is independent of number of sources, location of sources, and size of sources in an area. See Appendix A to Georgia's 2015 Ozone Transport SIP.[1] As Georgia states, the EPA guidance was

[1]https://epd.georgia.gov/air/sites/epd.georgia.gov.air/files/related_files/document/9_APPENDIX_A_GAEPD_2015_Ozone_Transport_Summary_update.pdf

written for single source (consisting of multiple emission units), and the same approach can be applied for a single state (consisting of multiple emission sources) impacting ozone monitors located in other states. The fact that the SIL analysis does not provide information to be used to evaluate the collective contribution from upwind states at downwind receptors does not diminish the persuasive value of the remaining technical analysis that was performed in support of the SIL.

In addition, EPA Office of Air Quality Planning and Standards released a memo to Regional Air Division Directors providing guidance about what thresholds may be appropriate for use in SIP revisions addressing the good neighbor provision for the 2015 ozone NAAQS.[2] In the memo, EPA concludes that it may be appropriate for States to use the one ppb threshold in determining whether the States potentially contribute to downwind nonattainment and/or maintenance receptors because the contributions captured at the one percent and one ppb thresholds are generally comparable. In addition, a one ppb threshold is reasonable for other reasons, including monitoring capabilities and reporting requirements, as discussed in the Proposed SIP.

No changes to the Proposed SIP pursuant to this comment are necessary.

Comment 5:

EPA recommends that the Proposed SIP be revised to discuss the collective contribution captured at the following individual receptors by a one ppb threshold as compared to a 0.70 parts per billion (ppb) threshold:

- Texas Harris (482011039)
- Texas Brazoria (480391004)
- Texas Tarrant (48292003)

EPA further suggests that the Proposed SIP be revised to include a discussion of the degree to which these receptors are transport influenced.

[2] Memorandum from Peter Tsirigotis, Director of the Office of Air Quality planning and Standards, August 31, 2018, Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards. https://www.epa.gov/sites/production/files/2018-09/documents/contrib_thresholds_transport_sip_subm_2015_ozone_memo_08_31_18.pdf

Response 5:

The information requested by EPA regarding collective contribution captured for these receptors is presented in Tables 2 and 3 of the 2015 ozone NAAQS memo referenced above. This memo is also referenced in the Proposed SIP.

For Texas Harris (482011039), 57.1% of the contribution captured with a one percent threshold is captured with a one ppb threshold and 57.1% is captured with a two ppb threshold. For Texas Brazoria (480391004), 64.2% of the contribution captured with a one percent threshold is captured with a one ppb threshold and 50.8% is captured with a two ppb threshold. For Texas Tarrant (48292003), 81.4% of the contribution captured with a one percent threshold is captured with a one ppb threshold and 0% is captured with a two ppb threshold.

All three receptors mentioned by EPA in this comment are primarily influenced by Texas rather than interstate transport from upwind states (See Table 1 of the 2015 ozone NAAQS Memo). For Texas Harris (482011039), total upwind state contributions make up eighteen percent of the projected 2023 projected average design value. For Texas Brazoria (480391004), total upwind state make up eighteen percent of the projected 2023 projected average design value. For Texas Tarrant (48292003), total upwind state make up 13.9% of the projected 2023 projected average design value.

Although, the percent of upwind state contributions captured by one ppb versus a 0.70 ppb threshold is lower than average, the three receptors identified by EPA are not primarily transport influenced. This further supports ADEQ's decision not to bring these receptors forward for further analysis.

No changes are necessary to the Proposed SIP pursuant to this comment.

Comment 6:

EPA recommends that the Proposed SIP be revised to discuss the collective contribution captured at the Michigan Allegan (260050003) monitor by one ppb and 2 ppb thresholds as compared to a 0.70 ppb (1%) threshold.

EPA further suggests that the Proposed SIP be revised to include a discussion of the degree to which the Allegan receptor is transport influenced.

Response 6:

The information requested by EPA regarding collective contribution captured for these receptors is presented in Tables 2 and 3 of the 2015 ozone NAAQS memo referenced above. This memo is also referenced in the Proposed SIP. For Michigan Allegan (260050003), 94.2% of the contribution captured with a one percent threshold is captured with a one ppb threshold and 81.6% is captured with a two ppb threshold.

The Michigan Allegan (260050003) receptor is much more transport influenced than the three Texas receptors EPA mentions in the comment above. Total upwind state contributions make up 62.2% of the projected 2023 projected average design value. This further supports ADEQ's decision to bring this receptor forward for further analysis as was done in the Proposed SIP.

No changes are necessary to the Proposed SIP pursuant to this comment.

Comment 7:

EPA suggests that additional perspective on the representativeness of EPA's modeling to examine the yearly frequency of back trajectories for which Arkansas emissions are found to contribute to the Allegan monitor. Specifically, EPA recommends comparing the frequency in 2011 to other years analyzed to determine whether 2011 was anomalous.

Response 7:

Table 6 of the Proposed SIP included "Linked Back-Trajectories and Days with Linked Back-Trajectories by Year" for 2008—2017. This table makes it easy to compare the frequency of linked back-trajectories and days per year.

No changes to the Proposed SIP pursuant to this comment are necessary.

Comment 8:

Regarding the HYSPLIT methodology, EPA requests that ADEQ clarify the source of mixing height data and whether the data was for the same hour as the start hour of the trajectory. EPA requests that ADEQ clarify how the start hour of the trajectory was selected.

Response 8:

Regarding the source of the mixing height data, ADEQ stated the following in the Proposed SIP under the heading "HYSPLIT Methods" on page 15: "ADEQ obtained meteorological data for the back-trajectory analysis using Eta Data Assimilation System (EDAS) data." In addition, ADEQ also included an accompanying footnote: "EDAS is an intermittent data assimilation system that uses successive three-hour model forecasts to generate gridded meteorological fields that reflect observations covering the continental United States. EDAS is accessible at http://ready.arl.noaa.gov/edas40.php" as well as "ADEQ obtained meteorological data for the back-trajectory analysis using Eta Data Assimilation System (EDAS) data."

In Section II.B.4.a HYSPLIT Methods, ADEQ will add three clarifying pieces of information (underlined here) to the above statements: "ADEQ obtained 40 km grid meteorological data…", "…HYSPLIT calculates the mixing height for each hour along the trajectory…" and "…ADEQ filtered out back-trajectories that had a starting hour mixing height below the back-trajectory height…".

For determining the HYSPLIT back-trajectory start hour, in Section II.B.4. HYSPLIT Back-Trajectories (page 14) of the Proposed SIP ADEQ stated: "To further evaluate the potential linkage of Arkansas to Allegan County, MI, ADEQ assessed wind patterns on elevated ozone days—days with a maximum daily average eight-hour (MDA8) greater than 70.9 ppb…" and "…ADEQ identified the maximum eight-hour value within these elevated ozone days." and "…ADEQ ran seventy-two-hour back trajectories using the hour of the maximum eight-hour value for each elevated day as the back-trajectory start time." In addition, an associated footnote stated that "If the same maximum eight-hour value for the elevated ozone day occurred multiple times a day, ADEQ evaluated all incidences of the value for that day."

In reviewing the HYSPLIT back-trajectory start hours to evaluate this comment and its response, it was determined that a Eastern Time to Universal Time conversion error was made for the 2008 start times and ADEQ corrected this error and re-ran the 2008 back-trajectories using the corrected start times. The results of correcting the 2008 time conversions increased the total number of re-ran 2008 back-trajectories from seven to eight, with only one 2008 back-trajectory not being filtered out. In that case, the mixing height was higher than the 100 m trajectory height and there was also a path through Arkansas.

As a result of the identified 2008 time conversion errors, Figures 2, Figure 53, and 68, as well as the accompanying discussion of those figures in the Proposed SIP will be revised to correctly indicate the elevated ozone day at the Allegan, MI monitor.

Comment 9:

EPA notes that ADEQ's methodology for dropping back trajectories that had mixing heights below the starting height of the HYSPLIT run is not a standard technique and was not used by EPA in trajectory analyses, such as in Appendix E of the CSAPR Update Air Quality Modeling Technical Support Document.

Response 9:

Mixing height (also known as mixing depth), where the layer adjacent to the ground of varying heights contains wind turbulence that will mix a transported air parcel with the ground-level ambient air, has an effect on ground-level ambient air pollutant concentrations and is well understood concept. Above the mixing height, a transported air parcel will not mix with ground-level ambient air and the transported air parcel will continue on its trajectory above the mixing height and not reach ground-level ambient air at that particular location. ADEQ is unaware of any EPA or NOAA document that precludes using HYSPLIT-generated mixing height data as a "standard technique" to evaluate whether transport winds will mix with ground-level winds.

ADEQ acknowledges that this concept and an evaluation of when transport winds reach ground level were not considered in the CSAPR Update trajectory analyses. Instead, EPA produced line density plots to evaluate the frequency with which a trajectory passed through the atmosphere over a geographic area at a height above ground level up to 1500m regardless of the mixing

height outputs produced by the HYSPLIT model. ADEQ is unaware of any EPA or NOAA document that precludes using HYSPLIT-generated mixing height data as a "standard technique" to evaluate whether transport winds will mix with ground-level ambient air and ADEQ believes the approach of considering mixing height when evaluating whether transported winds would mix with ground-level ambient air is reasonable.

No changes to the Proposed SIP pursuant to this comment are necessary.

Comment 10:

EPA suggests that the location of the forty-kilometer (40 km) meteorological grid cell containing the Allegan monitor being substantially over water may influence the mixing heights used in filtering back trajectories.

Response 10:

For the HYSPLIT back-trajectory analyses included in the Proposed SIP, ADEQ used a North American Mesoscale (NAM) Eta Data Assimilation System (EDAS) 40 km meteorological grid when evaluating air parcel trajectories. ADEQ agrees that the 40 km grid cell that includes Allegan, MI is approximately 50% over Lake Michigan. Therefore, ADEQ performed a sensitivity analysis to determine whether the mixing heights for the 40 km grid cell containing the Allegan monitor were significantly different from the mixing heights for a 12 km grid cell containing the Allegan monitor that is not over water.

To evaluate for any effect on the grid cell mixing height data that may be caused by the grid cell being partially over water, ADEQ compared the mixing heights at the Allegan, MI monitor on elevated ozone days (2008–2017) for the NAM EDAS 40 km grid cell and the NAM EDAS 12 km grid cell, where the 12 km grid cell for Allegan, MI does not include Lake Michigan. The results of a two-tailed t-test comparison indicate no significant difference in the mixing heights of the 40 km grid cell and the 12 km grid cell for any of the four trajectory heights used in the original HYSPLIT analyses: 100 m ($P = 0.353$), 500 m ($P = 0.362$); 1000 m ($P = 0.349$), and 1500 m ($P = 0.341$).

Some researchers[3] have found that any potential effects on mixing height caused by large bodies of water "may reach more than 30 km inland." This finding supports ADEQ's finding of no difference in mixing heights on a given day and time between the 40 km grid cell and the 12 km grid cell that includes the Allegan, MI monitor, because the Allegan, MI monitor is within 30 km of Lake Michigan.[4]

No changes to the Proposed SIP pursuant to this comment are necessary.

Comment 12:

EPA points out that Arkansas's proposed conclusion regarding the states' share of emission reductions obligations is not necessarily prohibited by statute, but is also not mandated. EPA cites to the D.C. Circuit's decision in *EME Homer City Generation, LP v EPA*, 696 F.3d 7 (2012), which held that upwind emission reductions obligations should be allocated in proportion to the size of the upwind states' contribution, that was overturned by Supreme Court in 2014. *EME Homer City Generation, L.P.*, 572 U.S. 489 (2014). The Supreme Court held that the statute does not require a particular allocation method and upheld EPA's methodology in CSAPR.

Response 12:

ADEQ agrees with EPA that the Supreme Court's held that the "Good Neighbor Provision does not dictate the particular allocation of emission among contributing states." E.P.A. v. EME Homer City Generation, L.P., 572 U.S. 489, 518 (2014). However, the Supreme Court did consider the reasonableness of the EPA approach, which was embodied in the Transport Rule in that case. The Court concluded that EPA's approach, which "considered both the magnitude of the upwind States' contributions and the cost associated with eliminating them", was reasonable.

Obligated to eliminate those amounts of ozone that contribute to nonattainment or interfere with maintenance of the NAAQS in downwind States, ADEQ must decide how to determine the Arkansas contribution in the context of multiple upwind states potentially contributing to a single monitoring site's nonattainment status. Similar to EPA in the context of the Transport Rule,

[3] E. Wendell Hewson & Lars E. Olsson (1967) Lake Effects on Air Pollution Dispersion, Journal of the Air Pollution Control Association, 17:11, 757-761.
[4] The Allegan monitor is 5 km east of Lake Michigan.

ADEQ has determined that the magnitude of the Arkansas contribution, both in relation to other contributing states and in absolute magnitude, is a reasonable approach. For example, ADEQ notes "that 0.01 ppb is two orders of magnitude lower than the lowest significant digit reported for the 2015 ozone NAAQS." Similar to EPA's consideration of costs, ADEQ also concludes that it reasonable to consider costs associated with certain potential reductions and considers those costs on pages 94 through 103 in section I.C.3. Cost Analysis of NOx Emission Reductions.

In the case of the Transport Rule, EPA proposed unit-specific allowance allocations to be made on the basis of each unit receiving its proportional share of a state budget based on that unit's share of state emissions assumed in that budget. The EPA approach focused on a proportional allocation at the unit level. ADEQ does not have the regulatory authority to prescribe an inter-state trading program focused on the unit level and faces a decision regarding state-level responsibility. More specifically, ADEQ is facing the decision of how to allocate responsibility in relation to other states that may have a substantially higher impact on downwind monitors. In this context, ADEQ has determined that it is reasonable to allocate its own impact proportionally at the state level in a manner not unlike the unit-level proportional allocation that EPA used in the case of the Transport Rule. Whether at the unit level or the state level, the concept of proportionality is a reasonable method of determining responsibility for reductions.

Comment 13:

EPA questions why Arkansas concludes that the state's share of the downwind air quality problem is sufficiently small as to be "two orders of magnitude lower" than the lowest significant digit reported for the 2015 Ozone NAAQS. EPA asks Arkansas to explain the state's rationale for why it is appropriate to consider (a) Arkansas's proportional impact relative to other upwind states and (b) only a fraction of the total Arkansas contribution when modeling indicates Arkansas' total impact is larger.

Response 13:

Arkansas's proportional impact relative to other upwind states is a reasonable and relevant factor to consider in determining its own obligation under the Good Neighbor provision. As discussed above in Response 12, this approach is analogous to the one EPA chose and that the Supreme

Court upheld in *Homer City* in certain key aspects: (1) consideration of the magnitude of reductions, (2) consideration of costs, and (3) the use of concept of proportionality to allocate responsibility for potential reductions (whether at the unit level in the Transport Rule or by State in the case of this Transport SIP).

The proportional impact relative to other states is reasonable for ADEQ to other upwind states is reasonable for Arkansas to consider for reasons that are best illustrated by two examples. If Arkansas has a much smaller impact relative to another state such as Illinois on a monitor in a state such as Michigan, then emission reductions in Arkansas would have a much smaller absolute impact than those states with a larger impact at a monitor in Michigan. If Arkansas and Illinois reduced emissions by the same absolute amounts, then the downwind impact from reducing emissions in Arkansas would simply be less effective than reducing emissions in Illinois in reducing concentrations at the Michigan monitor. In other words, achieving the same impact at a specific downwind monitor in Michigan would require substantially greater reductions and greater costs for Arkansas than it would for Illinois for example to achieve the same reductions at the downwind monitor.

In addition, upwind states are not obligated to reduce their emissions such that their impact on all out of state receptors is zero. Instead, upwind states must not interfere with attainment or maintenance of the NAAQS. Therefore, it is reasonable and appropriate to consider the degree to which ambient air concentrations of ozone are projected to exceed the level of the NAAQS.

ADEQ defines the projected “downwind air quality problem” to be the amount by which the average and/or maximum design value for Allegan exceeds the level of the NAAQS. For the Allegan Michigan monitor, the projected 2023 average design value is below the NAAQS and the projected 2023 maximum design value is above the NAAQS. Therefore, the Allegan Michigan monitor is projected to be a maintenance monitor. However, some emission reductions from upwind states may help ensure that the monitor attains and maintains the NAAQS as projected. ADEQ calculated the fraction attributable to Arkansas of the amount by which the Allegan Michigan monitor 2023 projected maximum design value exceeds the level of the NAAQS to determine whether reducing Arkansas’s share of the “downwind air quality problem” would be meaningful. Based on ADEQ’s analysis, proportionate share of the “downwind air quality problem” is 0.01 ppb. The fact that this value is two orders of magnitude lower than the

lowest significant digit reported for the 2015 ozone NAAQS illustrates that Arkansas's share of the "downwind air quality problem" is not meaningful.

ADEQ will revise the Proposed SIP to add additional explanation of Arkansas's proportional share of the "downwind air quality problem" consistent with this response.

Comment 14:

EPA asks that Arkansas more fully explain how the comparative analysis of emissions trends in states linked to the Allegan County, MI monitor informs Arkansas's conclusions regarding the Allegan County, MI monitor and Arkansas's good neighbor obligation.

Response 14:

ADEQ intends the comparative analysis of emissions trends in states linked to the Allegan County, MI monitor to be evidence that supports EPA's conclusions based on their photochemical modeling that Allegan County, MI will be a maintenance receptor by 2023. ADEQ notes that there is a consistent trend in NOx emissions reductions in the two states (Illinois and Indiana) with the largest modeled contributions to 2023 projected design values in Allegan County, MI. ADEQ discusses this in more detail on pages 66 and 67 of the Proposed SIP.

No changes are necessary to the Proposed SIP pursuant to this comment.

Comment 15:

EPA suggests adding the most recent ozone-season emissions in Table 8 of the Proposed SIP, and adding actual emission rates for the sources to the table along with the most stringent NOx emission rate limit that applies to that unit, if any. EPA asserts that this will help Arkansas speak to the current operation of existing low NOx burners (LNB) and selective catalytic reduction (SCR), as well as their future emission potential. EPA suggests that such an explanation is useful for demonstrating no risk of emission reductions being impermanent. Furthermore, if Arkansas determines that there is some risk of emissions increases at the units in Table 8, then the requested additional data could be used as grounds to discuss the state's approach to ensure reductions through enforceability of current emission levels.

Response 15:

Table 8 of the Proposed SIP includes the top ten Arkansas NOx elevated point sources for 2016, which includes both EGUs and non-EGUs. At the time of the proposal, 2016 was the most recent year that included emissions for all facilities listed in Table 8. The non-EGU sources in Table 8, Ash Grove Cement Company and Georgia-Pacific LLC — Crossett Paper, do not have separate ozone-season emission rates that could be added to the SIP. The most recent ozone-season emission rates for the EGUs were already included in Table 10 (page 91) of the Proposed SIP.

ADEQ will amend Table 8 as follows to reflect permitted emission rates as well as NOx control technologies employed at each elevated point source.

Source	2016 NOx Actual Emissions (tons)	Permitted Emission Rates (Potential to Emit)		NOx Control Technologies
		Pounds per Hour	Tons per Year	
White Bluff Unit 2	5,100	6090	26.674.2	Low NOx Burners with Over-Fire Air[5]
Independence Unit 1	4,594	6090	26.674.2	Low NOx Burners with Over-Fire Air[6]
Independence Unit 2	4,910	6090	26.674.2	Low NOx Burners with Over-Fire Air[7]
White Bluff Unit 1	4,619	6090	2674.2	Low NOx Burners with Over-Fire Air[8]
Flint Creek Boiler	3,055	-	5733.7	Low NOx Burners with Over-Fire Air[9]
Plum Point Energy Station Unit 1 Boiler	1,750	602	2635	SCR, Low NOx Burners with Separated Over Fire Air[10]

[5] Permit # 0263-AOP-R14
[6] Permit # 0449-AOP-R14
[7] Permit # 0449-AOP-R14
[8] Permit # 0263-AOP-R14
[9] Permit # 0276-AOP-R8

Ash Grove Cement Company	829	685.9	2978.6	SNCR operated continuously on kiln component (1.5 lbs NOx/ton clinker) Emergency Generator operations restricted to 500 hrs/year Portable Crusher has an hourly limit is for a combination of NOx and VOC per EPA Tier III emission standards
Georgia-Pacific LLC – Crossett Paper (8R Recovery Furnace)	744	276	1208.6	Combustion control pursuant to BACT analysis. Staged Combustion with Four levels of combustion air[11]
John W Turk Power Plant (Main Boiler)	688	420.0	1314.0	Low-NOx Burners with Over-Fire air, Selective Catalytic Reduction[12]
Domtar Ashdown Mill (No. 3 Recovery Boiler)	589	270	1182.6	None identified in permit[13]

Figure 51 (Annual EGU NOx Emissions for 2008–2017) and Figure 52 (Total Ozone Season EGU NOx Emissions for 2008–2017) in the Proposed SIP provide trend data as a predictor of these EGU's future emissions, which is a more reliable predictor of future emissions than permitted potential to emit limits that have not been achieved in years. Furthermore, ADEQ anticipates further emission reductions from four EGU units listed in the table above. Entergy-

[10] Permit # 1995-AOP-R9
[11] 0597-AOP-R18
https://cfpub.epa.gov/rblc/index.cfm?action=PermitDetail.PollutantInfo&Facility_ID=26915&Process_ID=106897&Pollutant_ID=149&Per_Control_Equipment_Id=147682
[12] Permit # 2123-AOP-R7
[13] Permit # 0287-AOP-R21

owned White Bluff units 1 and 2, Arkansas' first and fourth largest NOx emitting elevated point sources based on 2016 data, have an enforceable requirement to cease coal-fired operations by the end of the year 2028. Entergy has also included in their integrated review plans filed with the Arkansas Public Service Commission plans to cease coal-fired operations at both Independence units by the end of 2030.[14]

See Response 19 for further discussion of the NOx emissions rates, sources/units, and reductions potentials.

Comment 16:

EPA suggests that Arkansas speak to the emission rate, potential reduction, and corresponding $/ton cost for potential additional EGU mitigation technologies, such as state-of-the-art combustion control installation.

Response 16:

In the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, EPA considered costs associated with optimizing existing SCRs, turning on idled existing SCRs, installing new SCRs, installing state-of-the-art NOx combustion controls, turning on idled existing SNCRs and installing new SNCRs. In its cost analyses using EPA's cost calculation spreadsheet tools, ADEQ considered facilities that did not already have post-combustion controls (SCR and SNCR), while state-of-the-art combustion controls (low-NOx burners and over-fire air) were already installed on all coal-fueled EGUs considered in the analyses. In addition, Arkansas' Plum Point Energy Station and John W. Turk, Jr. Power Plant both already operate SCRs and were not included in the cost analyses. Therefore, ADEQ evaluated emission rates, potential reductions, and corresponding costs for the installation of new SCRs and SNCRs for the remaining EGUs evaluated in the Proposed SIP.

The NOx emissions rates, sources/units, and reductions potentials are further discussed in Response 19.

Comment 17:

[14] https://www.entergy-arkansas.com/userfiles/content/IRP/2018/07-016-U_60_1.pdf

EPA questions how NOx removed was calculated in Table 10. Were different efficiencies used in Table 10 than were used in Table 9? Table 10 appears to have a superscript indicative of a footnote in the second to last column header; however, there is no accompanying explanation in the footer. EPA encourages Arkansas to verify the ozone-season $/ton calculations.

Response 17:

ADEQ re-examined the $/ton cost and NOx removal for ozone season cases per EPA's suggestion. ADEQ identified errors in the mentioned tables and footnotes as discussed below. Tables 10–12 contain typographical errors and some efficiency assumptions were omitted.

ADEQ identified typographic errors for the cost-effectiveness and amount of NOx removed for Pine Bluff Energy Center and Thomas Fitzhugh in Table 9 and for Flint Creek in Table 11. ADEQ will also add more accurate descriptions for the "NOx control(s) installed" column of these tables.

Consistent with EPA's Menu of Control Measures, ADEQ used a SCR efficiency of 90% for coal-fired power plants and 80% for natural gas-fired powered plants, as well as a SNCR efficiency of 35% for Flint Creek, Independence and White Bluff and an efficiency of 50% for Lake Catherine, Pine Bluff, and Thomas Fitzhugh for both annual and ozone season scenarios. ADEQ will correct the tables where necessary and added footnotes that identify the efficiencies used and the reference for the efficiencies.

To the description of the cost-effectiveness methods, ADEQ will add the sentence: "For SCR/SNCR operating time, ADEQ used the same number of SCR/SNCR operating days and boiler operating days in the annual scenario, but revised the SCR/SNCR operating days to May 1 through September 30 for the ozone season scenario."

The superscript in Table 10 was a typographical error will be removed.

These errors will be corrected and further explanation of efficiency assumptions will be added in final SIP.

Comment 18:

EPA suggests that additional justification be provided for why the high costs of post-combustion control retrofits demonstrated in the Proposed SIP would be unreasonable.

Response 18:

Although ADEQ did not draw a bright line for cost-effectiveness in the Proposed SIP, ADEQ did compare the cost-effectiveness estimates for post-combustion controls to the uniform EGU NOx cost threshold EPA used for determining budgets under CSAPR. The comparison illustrates that the cost to install such controls would be considerably higher than the uniform cost that EPA thought was reasonable for addressing the 2008 ozone NAAQS. This is described on pages 93, 94, and 95 of the Proposed SIP.

No changes are necessary to the Proposed SIP pursuant to this comment.

Comment 19:

EPA encourages Arkansas to elaborate on its assessment of all NOx emitting non-EGU facilities, including their NOx emissions, sources/units, reduction potential, and cost of any potential control options. EPA asserts that showing that no further cost-effective reductions are available for non-EGU sources, if that is the case, will bolster the strength/approvability of the approval.

Response 19:

ADEQ describes its rationale for focusing on EGUs on page 89 of the Proposed SIP. In reviewing this data in response to comments, ADEQ identified that Table 8 only listed nine elevated point sources instead of ten. Therefore, ADEQ will add the tenth highest elevated point source to the table. Out of the top ten NOx emitting elevated point sources in the State, three were located at non-EGU facilities: Ash Grove Cement Company, Georgia-Pacific LLC—Crossett Paper, Domtar Ashdown Mill.

ADEQ notes that Georgia-Pacific LLC has recently announced a permanent shutdown of equipment and processes supporting bleached board operations at the Crossett Paper facility in October of 2019.[15]

In the Proposed SIP, ADEQ noted the relative emissions of these three non-EGU elevated point sources as compared to the others on the list. The smaller emissions relative to the other top emitters in and of itself is a well-reasoned basis for not focusing further analysis on these sources or any other elevated point sources with even lower emissions. ADEQ notes that EPA, in its interstate transport federal implementation plans for the 1997 ozone NAAQS and 2008 ozone NAAQS drew a similar conclusion regarding which source category to evaluate for emission reductions to address interstate transport.

ADEQ will revise Table 8 and the discussion below on page 89 of the Proposed SIP to include information about permitted emission rates and control technologies employed at the elevated point sources.

Comment 20:

EPA notes that Arkansas EGUs regularly emit above the CSAPR budget level using the allowances below the $1400/ton price level. The EPA states that ADEQ may want to comment on whether additional emission limitations are needed or appropriate to discourage regular seasonal operation above the budget level.

Response 20:

ADEQ does not find that additional emission limitations are needed or appropriate to discourage regular seasonal operation above the budget level so long as Arkansas EGUs purchase enough allowances (meaning emission reductions are occurring in other states) to ensure compliance with CSAPR requirements. ADEQ included the CSAPR budget level in the Proposed SIP as a reference point for comparing the anticipated costs of controls from installation of SCR and SNCR on EGUs in Arkansas.

Comment 21:

[15] https://www.gp.com/news/2019/06/georgia-pacific-bleach-board-and-particleboard-operations

EPA suggests that ADEQ add a statement on page 105–106 of the Proposed SIP that clarifies that “in addition to having demonstrated that emissions within Arkansas do not interfere with measures required to be included in other states’ Regional Haze plans; Arkansas will have a fully approved Regional Haze program once these two submittals are finalized and approved by EPA. A fully approved regional haze plan further ensures that emissions from Arkansas sources are not interfering with measures required to be included in other air agencies’ plans to protect visibility.”

Response 21:

ADEQ will add a statement consistent with EPA’s suggestion.

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AR-19-021

May 20, 2019

Ms. Tricia Treece
SIP / Planning Supervisor
Air Division
Policy and Planning Branch
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: Proposed 2015 Ozone Transport SIP Revision

Dear Ms. Treece:

Thank you for providing the opportunity to review and comment on the proposed 2015 Ozone Transport SIP revision which addresses the requirements of the Clean Air Act regarding interstate transport for the 2015 seventy part per billion ozone NAAQS. On behalf of Entergy Arkansas, LLC (EAL), Entergy Services, LLC (ESL) has reviewed the SIP package and supports the proposed 2015 Ozone Transport SIP revision. Consistent with what is stated in the Executive Summary of the Public Review Draft, EAL has installed cost-effective NOx controls (Low NOx Burner / Separated Over – Fire Air Systems) over the last two years at both of its coal-fired facilities in Arkansas to comply with the Cross-State Air Pollution Rule during the Ozone Season and to reduce generation of NOx emissions throughout the year.

The effort and the thorough evaluation performed by ADEQ to ensure all provisions of the Clean Air Act are met is recognized and appreciated. Should you wish for any additional information on behalf of EAL regarding the proposed 2015 Ozone Transport SIP revision, feel free to contact Stan Chivers at (501) 377-4033 or myself at (501) 377-4030.

Respectfully Submitted,

David Triplett
Manager, Arkansas Environmental Support

DCT/sac

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

May 20, 2019

Ms. Tricia Treece
Office of Air Quality
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: 2015 Ozone National
Ambient Air Quality Standard –
Interstate Transport Implementation
Plan Revision
Public Review Draft

Dear Ms. Treece:

Thank you for the opportunity to review the 2015 Ozone National Ambient Air Quality Standard – Interstate Transport Public Review Draft of the Arkansas State Implementation Plan Revision, for which the state published a public notice on April 14, 2019. We appreciate the significant work and analysis that ADEQ has put forth to address this important Clean Air Act requirement. We are providing the attached comments for your consideration to potentially further strengthen the legal and technical support for the SIP revision.

If you have any questions or comments regarding this letter, please contact me at (214) 665-9793 or Robert Imhoff of my staff at (214) 665-7262.

Sincerely,

Guy R. Donaldson,
Chief, State Planning Implementation Branch

Enclosure

EPA comments on Arkansas' 2015 Ozone National Ambient Air Quality Standard – Interstate Transport Public Review Draft

1. On page 8 of the draft SIP revision, Arkansas presents a figure showing model performance statistics (Figure 1). It would be helpful if Arkansas could explain what each point in the figure represents. Do the points represent individual sites or individual days, or something else?

2. On page 10 of the draft SIP revision, it would be helpful if Arkansas could provide actual data to support the statement that "that the use of alternative modeling protocols, including base year and grid resolution, can cause considerable differences in design value projections and ozone concentration contributions." For reference, EPA is providing the following table showing the base period and 2023 DVs for or the receptor in Allegan, MI based on the various sets of modeling.

	Based on 2011 Meteorology							Based on 2012 Meteorology	
	2009-2013 Base Period	EPA 2023 12 km No Water	LADCO 2023 12 km No Water	EPA 2023 12 km 3x3	LADCO 2023 12 km 3x3	MOG 2023 12 km 3x3	MOG 2023 4 km 3x3	2010-2014 Base Period	TCEQ 2023 12 km 3x3
Average DVs (ppb)	82.7	69.0	68.7	69.0	68.8	69.0	70.3	84.3	71.0
Maximum DVs (ppb)	86	71.7	71.5	71.8	71.5	71.8	73.1	86	-

3. On page 11 of the draft SIP, Arkansas indicates that "a one ppb significant threshold is appropriate for other reasons." As Arkansas correctly notes in the preceding paragraph, this threshold is a contribution threshold, not a significance threshold. EPA disagrees with the applicability of the PSD SIL to ozone transport because EPA's technical analysis to support the selection of 1 ppb as the ozone SIL does not contain information that can be used to evaluate the collective contribution from upwind states at downwind receptors, which is a key element for consideration in view of the regional nature of ozone transport.

4. On page 12 of the draft SIP, Arkansas includes Table 2 which indicates that the Texas Harris (482011039), Texas Brazoria (480391004), and Texas Tarrant (484392003) monitors are projected to have 2023 average design values exceeding the NAAQS in 2023 and that Arkansas' projected contributions to these receptors are 0.99 ppb, 0.90 ppb, and 0.78 ppb respectively. We recommend the SIP discuss the amount of collective contribution captured at the individual receptors by a 1 ppb threshold as compared to a 0.70 ppb (1%) threshold. The draft SIP would be further strengthened if it contained a discussion of the degree to which these Texas receptors are transport influenced.

5. On page 12 of the draft SIP, Arkansas includes Table 2 which indicates that the Michigan Allegan (260050003) monitor is projected to have a 2023 maximum design value exceeding the NAAQS in 2023 and that Arkansas' projected contributions to this receptor is 1.64 ppb. It may be helpful to discuss the amount of collective contribution captured at the receptor by 1 and 2 ppb thresholds as

compared to a 0.70 ppb (1%) threshold. Furthermore, the draft SIP would also be strengthened if it contained a discussion of the degree to which this receptor is transport influenced.

6. On page 14, a rationale for running the back trajectories and looking at an extended period of time is given. The purpose is to gain a more complete picture of how Arkansas emissions might contribute to elevated ozone in Allegan County, MI, rather than relying entirely on EPA's modeling simulation, which is based on a single base year. It would give additional perspective on the representativeness of EPA's modeling to examine the yearly frequency of back trajectories for which Arkansas emissions are found to contribute to the Allergan monitor. Comparing the frequency in 2011 to the other years analyzed would help determine if the frequency for 2011 was anomalous.

7. On page 15 of the draft SIP a statement of the methodology for selecting days, running HYSPLIT, and filtering days is given. Please clarify what was source of mixing height data and if it was for the same hour as the start hour of the trajectory. In addition, please clarify how the start hour of the trajectory was selected.

8. On page 15 a methodology is given for dropping back trajectories that had a mixing height below the starting height of the HYSPLIT run because these air parcels would not have reached ambient air at the Allegan monitor site due to mixing heights. We note that the methodology of filtering out back trajectories is not a standard technique. This technique has not been used when EPA has performed trajectory analyses such as in Appendix E of the CSAPR Update AQ Modeling TSD.

9. The 40-km meteorological grid cell containing the Allegan monitor appears to be located so that a substantial portion of the cell is located over water. This location may influence the mixing heights used in filtering the back trajectories.

10. Pages 55-57 of the draft SIP contain an analysis of the allocation of emissions among contributing states to the Allegan County, MI monitor. EPA first notes that Arkansas has labelled contributions in terms of NOx but that they are likely intended to be ozone. Arkansas concludes based this analysis that "Arkansas's share of the emission reduction necessary to reduce the 2023 Max DV for Allegan County to below the NAAQS is what would be necessary to reduce" what the state calculates to be its proportional share of collective downwind impacts. The D.C. Circuit's decision in *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7 (2012), which held that upwind emission reductions should be allocated in proportion to the size of the upwind states' contributions, was overturned by the Supreme Court in 2014, 134 S. Ct. 1584 (2014). The Supreme Court held that the good neighbor provision "does not dictate the particular allocation of emissions among contributing States advanced by the D.C. Circuit" and found the EPA's consideration of costs was "an efficient and equitable solution to the allocation problem." 134 S. Ct. at 1606-07. Thus, while the approach in the draft Arkansas SIP is not necessarily prohibited by the statute, it is also not mandated by the statute. Arkansas proposes to apply a version of this approach to identify Arkansas' share of the maintenance problem to which the state is linked. However, rather than suggesting a remedy for Arkansas' proportional share of the downwind air quality problem, Arkansas instead proposes to conclude that the state's share is sufficiently small as to be "two orders of magnitude lower than the lowest significant digit reported for the 2015 ozone NAAQS." Can Arkansas further explain the state's rationale for why it is appropriate to consider (a)

Arkansas's proportional impact relative to other upwind states and (b) only a fraction of the total Arkansas contribution when the model indicates Arkansas' total impact is larger?

11. On pages 57-66 of the draft SIP, Arkansas undertakes a comparative analysis of emissions trends in states linked to the Allegan County, MI monitor. This analysis is also summarized on pages 66-67. Although it is stated that "[t]he continuation of trends in emissions reductions observed, particularly from Illinois and Indiana, are resulting in air quality improvements in Allegan County, MI" and that this "further supports the basis for anticipating that the Allegan County, MI monitor will be a maintenance area in 2023," Arkansas does not indicate how this analysis is relevant in the context of the good neighbor provision because EPA's modeling already projects Allegan to be a maintenance area in 2023. It would improve the draft SIP if Arkansas were to more fully explain how it intends this analysis to inform its conclusion regarding the Allegan County, MI monitor and Arkansas' good neighbor obligation.

12. Beginning on page 88 of the draft SIP revision, Arkansas undertakes a cost analysis of potential additional NOx emission reductions for EGUs. EPA suggests adding the most recent ozone-season emissions in table 8 and adding actual emissions rates for the sources to the table along with the most stringent NOx emission rate limit that applies to that unit, if any. This will help the state speak to the current operation of the existing LNBs and SCRs, as well as their future emission potential. In the situation where the future potential emission rate varies significantly from the recent observed emission rates, the ability of the state to speak to the certainty of its emission projections is useful for demonstrating no risk of emission reductions being impermanent. Moreover, if the state determines there is some risk of emissions increases at these units, they could use the observation as grounds to discuss its approach to ensure reductions through enforceability of current emission levels. EPA also suggests that the state speak to the emission rate, potential reduction, and corresponding $/ton cost for potential additional EGU mitigation technologies such as state-of-the-art combustion control installation. It was not clear to EPA how NOx removed was calculated in table 10. It appears that ADEQ uses different SCR removal efficiencies than the 80% and 90% used in the preceding table. The second to last column has a footnote, but no accompanying explanation in the footer. EPA encourages the state to verify these ozone-season $/ton calculations. Finally, while the state does demonstrate high post-combustion control retrofit cost numbers on a $/ton basis, an additional justification regarding why these costs would be unreasonable to require would strengthen the SIP.

    EPA encourages Arkansas to elaborate on its assessment of all NOx emitting non-EGU facilities, including their NOx emissions sources/units, reduction potential, and cost of any potential control options. Showing that no further cost-effective reductions are available at non-EGU sources, if that is the case, will bolster the strength/approvability of the submittal.

    Finally, current data and ADEQ's analysis suggest that EGUs will collectively continue to rely on allowances above their budget level. While the SIP notes its reliance on CSAPR, and the reasonability of $1400/ton mitigation options, it regularly emits above that budget level using allowances below that price level. While the assurance levels of 21% are intended to accommodate seasonal variability in demand, ADEQ may want to comment on whether additional emission limitations are needed or appropriate to discourage the regular seasonal operation at this level.

13. Prong 4, Visibility Transport - The State's draft SIP mentions the Domtar and phase II submittals but doesn't explicitly say that the Regional Haze SIP will be fully approved upon EPA action approving these two submittals. On page 105-106, please add a statement that clarifies that in addition to having demonstrated that emissions within Arkansas do not interfere with measures required to be included in other states' Regional Haze plans; Arkansas will have a fully approved Regional Haze program once these two submittals are finalized and approved by EPA. A fully approved regional haze plan further ensures that emissions from Arkansas sources are not interfering with measures required to be included in other air agencies' plans to protect visibility.

ARKANSAS REGISTER

Transmittal Sheet

* Use only for **FINAL** and **EMERGENCY RULES**

Secretary of State
Mark Martin
State Capitol, Suite 026
Little Rock, Arkansas 72201-1094
(501) 682-3527
www.sos.arkansas.gov

For Office Use Only:

Effective Date _____ Code Number _____

Name of Agency Arkansas Pollution Control & Ecology Commission

Department Division of Environmental Quality

Contact Stuart Spencer E-mail Spencer@adeq.state.ar.us Phone (501) 682-0750

Statutory Authority for Promulgating Rules Ark. Code Ann. §8-1-203(b)(1)

Rule Title: Rule No. 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No 18-006-R; Minute Order 19-17

Intended Effective Date
(Check One)

- ☐ Emergency (ACA 25-15-204)
- ☐ 30 Days After Filing (ACA 25-15-204)
- ☐ Other 10 Days After Filing
  (Must be more than 30 days after filing date.)

	Date
Legal Notice Published	11/08/2018
Final Date for Public Comment	11/30/2018
Reviewed by Legislatice Council	07/19/2019
Adopted by State Agency	09/27/2019

Electronic Copy of Rule submitted under ACA 25-15-218 by:

Contact Person E-mail Address Date

CERTIFICATION OF AUTHORIZED OFFICER

I Hereby Certify That The Attached Rules Were Adopted
In Compliance with Act 434 of 1967 the Arkansas Administrative Procedures Act. (ACA 25-15-201 et. seq.)

STATE OF ARKANSAS SECRETARY OF STATE

Signature

(501) 682-7890 moulton@adeq.state.ar.us
Phone Number E-mail Address

2019 SEP 30 PM 3:28

Administrative Law Judge
Title

AR REGISTER DIV.

09/30/2019
Date

Revised 8/2011 to reflect new legislation passed in 2011.

ARKANSAS POLLUTION CONTROL & ECOLOGY COMMISSION
101 EAST CAPITOL
SUITE 205
LITTLE ROCK, ARKANSAS 72201
PHONE: (501) 682-7890
FAX: (501) 682-7891

September 30, 2019

Ms. Jessica Sutton
Administrative Rules and Regulations Committee
Room 433, State Capitol Building
Little Rock, Arkansas 72201

RE: Rule No 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No. 18-006-R; Minute Order No. 19-17. - **FINAL FILING**.

Dear Ms. Davis:

I am enclosing the following for filing with your office:

1. One (1) hard copy of the amendment to Rule No 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control.
2. One (1) copy of Commission Minute Order No. 19-17
3. One (1) copy of the Financial Impact Statement.

Please provide written confirmation of your receipt of these materials by file-marking the enclosed copy of this letter and returning it to me.

Thank you for your assistance in this matter.

Respectfully,

Charles Moulton
Administrative Law Judge

Enclosures

ARKANSAS STATE LIBRARY

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Effective Date: **Classification Number:**

Name of Agency: Division of Environmental Quality

Contact Person: Stuart Spencer **Telephone:** (501) 682-0750

Statutory Authority for Promulgating Rules: Ark. Code Ann. §8-1-203(b)(1)

Title of Rule: Rule No. 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No. 18-006-R; Minute Order 19-17

Rule Status	Effective Date Status	Effective Date
☐ New Rule/Regulation	☐ Emergency	
Amended Rule/Regulation	10 Days after filing	September 10, 2019
☐ Repealed Rule/Regulation	☐ Other	
☐ Order	☐ Repealed	
☐ Emergency Rule/Regulation	Adopted by State Agency	

☐ Rule above is proposed and will be replaced by final version

☒ Financial and/or Fiscal Impact Statement Attached

Certification of Authorized Officer

I hereby certify that the attached rules were adopted in compliance with Act 434 of 1967 as amended.

Signature: Charles Moore Date: September 30, 2019

Title: Administrative Law Judge

ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION

SUBJECT: Adoption of Revisions to Regulation 19 Regulations of the Arkansas Plan of Implementation for Air Pollution Control

DOCKET NO. 18 - 006 - R

MINUTE ORDER NO. 19 - 17

On September 28, 2018, the Arkansas Pollution Control and Ecology Commission initiated rulemaking to amend Regulation 19: Regulation of the Arkansas Plan of Implementation for Air Pollution Control. The period for public comment and a public hearing on the proposed rulemaking were all completed before the end of 2018.

Subsequently, the 92nd General Assembly of the State of Arkansas passed Act 315 of 2019, which, among other changes, provided for the uniform use of the term "rule" rather than "regulation" by state agencies. The Administrative Rules and Regulations Subcommittee of the Arkansas Legislative Council approved the proposed changes to Regulation 19 at its July 19, 2019 meeting. Then, Act 315 took effect on July 24, 2019. Act 315 provides that a governmental entity shall "ensure the use of the term rule upon promulgation of any rule after the effective date of this Act."

In consideration of public notice and hearing, the record, the mandates of Act 315 of 2019, and the exigency of the adoption of the 2015 ozone national ambient air quality standard, the Arkansas Pollution Control and Ecology Commission hereby:

(1) adopts the changes to Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control reflected in the version that was filed by the Division of Environmental Quality (Division) and entered into the Rulemaking Docket on August 6, 2019; and

(2) directs the Division to ensure the use of the term "rule" instead of "regulation" in all future petitions to initiate rulemaking pertaining to Regulation 19 consistent with Act 315 of 2019.

PROMULGATED THIS 27TH DAY OF SEPTEMBER, 2019, BY ORDER OF THE ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION.

EXHIBIT F

COMMISSIONERS

L. Bengal
A. Bigger
C. Colclasure
J. Fox
M. Freeze
M. Goggans
D. Haak
B. Holland

R. McMullen
D. Melton
R. Moss, Jr.
R. Reynolds
R. Roper
W. Ward
B. White

D. Melton - Chair

SUBMITTED BY: Stuart Spencer

PASSED: 09/27/19

Pollution Control and Ecology Commission # 014.00-019

ARKANSAS POLLUTION CONTROL and ECOLOGY COMMISSION

REGULATION NO. 19
REGULATIONS OF THE ARKANSAS PLAN OF IMPLEMENTATION FOR AIR POLLUTION CONTROL

Mark-Up Draft
Submitted to the Arkansas Pollution Control and Ecology Commission
September 2018

EXHIBIT A

CHAPTER 2: DEFINITIONS

Terms and phrases used in this regulation which are not explicitly defined herein shall have the same meaning as those terms which are used in the federal Clean Air Act. For purposes of this regulation:

"12-month period" means a period of 12 consecutive months determined on a rolling basis with a new 12-month period beginning on the first day of each calendar month.

"Actual emissions" means the quantity of federally regulated air pollutants emitted from a stationary source considering emissions control equipment and actual hours of source operation or amount of material processed.

"CO_2 equivalent emissions" (CO_2e) shall represent an amount of GHGs emitted, and shall be computed by multiplying the mass amount of emissions tpy, for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A - 1 to Subpart A of 40 C.F.R. Part 98 - Global Warming Potentials (which is incorporated by reference as of the effective date of the federal final rule published by EPA in the Federal Register on November 29, 2013 [78 FR 71948]), and summing the resultant value for each to compute a tpy CO_2 equivalent emissions.

"Commission" means the Arkansas Pollution Control and Ecology Commission.

"Construction" means fabrication, erection, or installation of equipment. See also 40 C.F.R. § 60.2, 40 C.F.R. § 51.165, and 40 C.F.R. § 52.21.

"Control apparatus" means any device which prevents, controls, detects or records the emission of any federally regulated air pollutants.

"Department" means the Arkansas Department of Environmental Quality, or its successor. When reference is made in this regulation to actions taken by or with reference to the Department, the reference is to the staff of the Department acting at the direction of the Director.

"Director" means the Director of the Arkansas Department of Environmental Quality, or its successor, acting directly or through the staff of the Department.

"Emission limitation" and **"emission standard"** mean a requirement established by the Department or the Administrator of the EPA which limits the emissions of federally regulated air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.

"Emission unit" means any article, machine, equipment, operation, or contrivance that emits or has the potential to emit any federally regulated air pollutant.

"EPA" means the United States Environmental Protection Agency.

"Equipment" means any device, except equipment used for any mode of vehicular transportation, capable of causing the emission of a federally regulated air pollutant into the open air, and any stack, conduit, flue, duct, vent, or similar device connected or attached to or serving the equipment.

"Federal Clean Air Act" or **"Clean Air Act"** or **"FCAA"** or **"the Act"** means the federal Clean Air Act, as amended, 42 U.S.C. 7401, *et seq*. and its implementing regulations as of the effective date of this regulation.

"Federally regulated air pollutant" means the following:

(A) Nitrogen oxides or any volatile organic compounds;

(B) Any pollutant for which a National Ambient Air Quality Standard has been promulgated;

(C) Except as provided in (E), any pollutant that is subject to any standard promulgated under 42 U.S.C. § 7401, *et seq*., as of the effective date of this regulation;

(D) Any Class I or II substance subject to a standard promulgated under or established by Title VI of the Clean Air Act, 42 U.S.C. § 7401, *et seq*. as amended as of July 1,1997.

(E) GHGs, except that GHGs shall not be a Federally Regulated Air Pollutant unless the GHG emissions are:

(1) from a stationary source emitting or having the potential to emit 75,000 tpy CO_2e emissions or more; and

(2) regulated under Chapter 9 of this Regulation 19.

"Fugitive emissions" means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Those emissions are those that, according to customary and good engineering practice, considering technological and economic feasibility, could not pass through a stack, chimney, vent or other functionally-equivalent opening, except that the Department will utilize the definition of fugitive emissions for those industries for which an approved EPA definition exist under federal law or regulation and which are meeting that law or regulation.

"Greenhouse gases" (GHGs) means the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

"Hazardous Air Pollutant" or **"HAP"** means any air pollutant listed pursuant to § 112 of the Clean Air Act, as amended, 42 U.S.C. § 7401, *et seq*., as of the effective date of this regulation.

"Modification" means any physical change in, or change in the method of operation of, a stationary source which increases the emission rate of any federally regulated air pollutant over permitted rates or which results in the emission of a federally regulated air pollutant not previously emitted, except that:

(A) Routine maintenance, repair, and replacement shall not be considered a physical change, and

(B) The following shall not be considered a change in the method of operation:

(1) Any change in the production rate, if such change does not exceed the permitted operating capacity of the source;

(2) Any change in the hours of operation, as long as it does not violate applicable air permit conditions; or

(3) The use of an alternate fuel or raw material, as long as it does not violate applicable air permit conditions.

(C) *De Minimis* changes, as defined in Reg. 19.407(C), and changes in ownership shall not be considered.

"National Ambient Air Quality Standards" or **"NAAQS,"** means those ambient air quality standards promulgated by the EPA in 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on ~~January 15, 2013 (78 FR 3086)~~ October 26, 2015 (80 FR 65292), as set forth in Appendix B of Regulation 19.

"NAAQS state implementation plan or "NAAQS SIP" (as defined by Ark. Code Ann. § 8-4-303) means a state implementation plan that specifies measures to be used in the implementation of the state's duties under the Clean Air Act, 42 U.S.C. § 7401 *et seq*., for the attainment and maintenance of a specified NAAQS in each air quality control region or portion of an air quality control region within the state.

"Opacity" means the degree to which air emissions reduce the transmission of light and obscure the view of an object in the background.

"Operator" means any person who leases, operates, controls, or supervises any equipment affected by these regulations.

"Owner" means any person who has legal or equitable title to any source, facility, or equipment affected by these regulations.

"Particulate matter" or "PM" means any airborne finely divided solid or liquid material with an aerodynamic diameter equal to or less than 100 micrometers.

"Particulate matter emissions" means all particulate matter, other than uncombined water, emitted to the ambient air as measured by applicable reference methods, or an equivalent or alternate method, specified in 40 C.F.R. Part 60 Appendix A as of the effective date of the

federal final rule published by EPA in the Federal Register on February 27, 2014 (79 FR 11257), or by a test method specified in these regulations or any supplement thereto, with the exception of condensable particulate matter.

"Person" means any individual or other legal entity or their legal representative or assignee.

"Plan" means the Arkansas Plan of Implementation for Air Pollution Control.

"**$PM_{2.5}$"** means particulate matter with an aerodynamic diameter less than or equal to a nominal two and one-half (2.5) micrometers as measured by a reference method based on Appendix L of 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on October 17, 2006 (71 FR 61226), or by an approved regional method designated in accordance with Appendix C of 40 C.F.R. Part 53.

"$PM_{2.5}$ emissions" means $PM_{2.5}$ emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternate method, specified in 40 C.F.R. Part 51, Appendix M as of the effective date of the federal final rule published by EPA in the Federal Register on April 2, 2014 (79 FR 18452), or by a test method specified in these regulations or any supplement thereto.

"PM_{10}" means particulate matter with an aerodynamic diameter less than or equal to a nominal ten (10) micrometers as measured by a reference method based on Appendix J of 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on August 7, 1987 (52 FR 29467), or by an equivalent method designated in accordance with 40 C.F.R. Part 53 as of December 8, 1984.

"PM_{10} emissions" means PM_{10} emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternate method, specified in 40 C.F.R. Part 51, Appendix M as of the effective date of the federal final rule published by EPA in the Federal Register on April 2, 2014 (79 FR 18452), or by a test method specified in these regulations or any supplement thereto.

"Potential to emit" means the maximum capacity of a stationary source to emit a federally regulated air pollutant under its physical and operational design. Any physical or operational

limitation on the capacity of the source to emit a federally regulated air pollutant, including, but not, limited to, air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design only if the limitation or the effect it would have on emissions is enforceable to the extent it is regulated by the federal Clean Air Act, 42 U.S.C. § 7401 *et seq*. as of February 15, 1999. Secondary air emissions do not count in determining the potential to emit of a stationary source.

"Responsible official" means one of the following:

(A) For a corporation: a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative or such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(1) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 United States dollars); or

(2) The delegation of authority to such representative is approved in advance by the Department;

(B) For partnership or sole proprietorship: a general partner or the proprietor, respectively;

(C) For a municipality, State, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this regulation, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA); or

(D) For acid rain sources:

(1) The designated representative insofar as actions, standards, requirements, or prohibitions under Title IV of the Act or the regulations promulgated thereunder are concerned; and

(2) The designated representative for any other purposes under Part 70.

"Secondary emissions" means those emissions of federally regulated air pollutants which, although associated with a source, are not emitted from the source itself.

"Shutdown" means the cessation of operation of equipment.

"Startup" means the setting in operation of equipment.

"State implementation plan" or "SIP" (as defined at Ark. Code Ann. § 8-4-303), means a plan that specifies measures to be used in the implementation of the state's duties under the Clean Air Act, 42 U.S.C. § 7401 *et seq.*, and that is developed by the department and submitted to the EPA for review and approval.

"Stationary source" means any building, structure, facility, or installation which emits or may emit any federally regulated air pollutant.

"Title I modification" means any modification as defined under any regulation promulgated pursuant to Title I of the federal Clean Air Act. *De minimis* changes under Regulation 19, changes to state only permit requirements, administrative permit amendments, and changes to the insignificant activities list are not Title I modifications.

"Volatile organic compounds" or **"VOC"** means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

(A) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity:

acetone;
methane;
ethane;
methylene chloride (dichloromethane);
1,1,1- trichloroethane (methyl chloroform);
tetrachloroethylene (perchloroethylene);
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
trichlorofluoromethane (CFC-11);

dichlorodifluoromethane (CFC-12);
chlorodifluoromethane (HCFC-22);
trifluoromethane (HFC-23);
1,2-dichloro 1,1, 2, 2-tetrafluoroethane (CFC-114);
chloropentafluoroethane (CFC-115);
1,1,1-trifluoro 2,2-dichloroethane (HCFC-123);
1,1,1,2-tetrafluoroethane (HFC-134a);
1,1-dichloro 1-fluoroethane (HCFC-141b);
1-chloro 1,1-difluoroethane (HCFC-142b);
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
pentafluoroethane (HFC-125);
1,1,2,2-tetrafluoroethane (HFC-134);
1,1,1-trifluoroethane (HFC-143a);
1,1-difluoroethane (HFC-152a);
parachlorobenzotrifluoride (PCBTF);
cyclic, branched, or linear completely methylated siloxanes;
3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca);
1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb);
1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee);
difluoromethane (HFC-32);
ethylfluoride (HFC-161);
1,1,1,3,3,3-hexafluoropropane (HFC-236fa);
1,1,2,2,3-pentafluoropropane (HFC-245ca);
1,1,2,3,3-pentafluoropropane (HFC 245ea);
1,1,1,2,3-pentafluoropropane (HFC-245eb);
1,1,1,3,3-pentafluoropropane (HFC-245fa);
1,1,1,2,3,3-hexafluoropropane (HFC-236ea);
1,1,1,3,3-pentafluorobutane (HFC-365mfc);
chlorofluoromethane (HCFC-31);
1 chloro-1-fluoroethane (HCFC-151a);
1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a);
1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$ or HFE-7100);
2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane
($(CF_3)_2CFCF_2OCH_3$);
1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$ or HFE 7200);
2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane
($(CF_3)_2CFCF_2OC_2H_5$);
methyl acetate;
1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane (n-$C_3F_7OCH_3$ or HFE-7000);
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl) hexane
(HFE-7500);
1,1,1,2,3,3,3-heptafluoropropane (HFC 227ea);
methyl formate ($HCOOCH_3$);

1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-trifluoromethyl-pentane (HFE-7300);
propylene carbonate;
dimethyl carbonate;
trans-1,3,3,3-tetrafluoropropene (HFO-1234ze);
HCF_2OCF_2H (HFE-134);
$HCF_2OCF_2OCF_2H$ (HFE-236cal2);
$HCF_2OCF_2CF_2OCF_2H$ (HFE-338pcc13);
$HCF_2OCF_2OCF_2CF_2OCF_2H$ (H-Galden 1040x or H-Galden ZT 130 [or 150 or 180]);
trans- 1-chloro-3,3,3-triflouroprop-1-ene;
2,3,3,3-tetraflouropropene;
2-amino-2-methyl-1-propanol;

and perfluorocarbon compounds which fall into these classes:

(1) cyclic, branched, or linear, completely fluorinated alkanes;

(2) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(3) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(4) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(B) For purposes of determining compliance with emission limits, VOC will be measured by the test methods in the approved State Implementation Plan (SIP) or 40 C.F.R. Part 60, Appendix A, as of July 1, 1997, as applicable. Where such a method also measures compounds with negligible photochemical reactivity, these negligibly-reactive compounds may be excluded as VOC if the amount of such compounds is accurately quantified, and such exclusion is approved by the Department.

(C) As a precondition to excluding these compounds as VOC or at any time thereafter, the Department may require an owner or operator to provide monitoring or testing methods and results demonstrating, to the satisfaction of the Department, the amount of negligibly-reactive compounds in the source's emissions.

(D) The following compound(s) are VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements which apply to

VOC and shall be uniquely identified in emission reports, but are not VOC for purposes of VOC emissions limitations or VOC content requirements: t-butyl acetate.

ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION

REGULATION NO. 19

APPENDIX B

NATIONAL AMBIENT AIR QUALITY STANDARDS LIST

APPENDIX B: NATIONAL AMBIENT AIR QUALITY STANDARDS LIST

The National Ambient Air Quality Standards as adopted as of the effective date of this Regulation are listed below.

Pollutant	**Final Rule Cite**	**Final Rule Date**	**Primary / Secondary**	**Averaging Time**	**Level**	**Form**	**Applicable Chapters**
Carbon Monoxide	76 FR 54294	August 31, 2011	Primary	8-hour	9 ppm	Not to be exceeded more than once per year	All Chapters
				1-hour	35 ppm		All Chapters
Lead	73 FR 66964	November 12, 2008	Primary and secondary	Rolling 3 month average	0.15 $\mu g/m^3$	Not to be exceeded	All Chapters
Nitrogen Dioxide	75 FR 6474	February 9, 2010	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years	All Chapters
	61 FR 52852	October 8, 1996	Primary and secondary	Annual	53 ppb	Annual Mean	All Chapters
Ozone	~~73 FR 16436~~ 80 FR 65292	~~March 27, 2008~~ October 26, 2015	Primary and secondary	8-hour	~~0.075~~ 0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years	All Chapters
Particle Pollution, $PM_{2.5}$	78 FR 3085	January 15, 2013	Primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years	All Chapters
	71 FR 61144	October 17, 2006	Secondary	Annual	15 $\mu g/m^3$		
			Primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years	All Chapters

Pollutant	Final Rule Cite	Final Rule Date	Primary / Secondary	Averaging Time	Level	Form	Applicable Chapters
Particle Pollution, PM_{10}	71 FR 61144	October 17, 2006	Primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years	All Chapters
Sulfur Dioxide	75 FR 35520	June 22, 2010	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	All Chapters
	38 FR 25678	September 14, 1973	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year	All Chapters

Pollution Control and Ecology Commission # 014.00-019

ARKANSAS POLLUTION CONTROL and ECOLOGY COMMISSION

REGULATION NO. 19
REGULATIONS OF THE ARKANSAS PLAN OF IMPLEMENTATION FOR AIR POLLUTION CONTROL

Approved by the Arkansas Pollution Control and Ecology Commission
September 27, 2019

CHAPTER 2: DEFINITIONS

Terms and phrases used in this regulation which are not explicitly defined herein shall have the same meaning as those terms which are used in the federal Clean Air Act. For purposes of this regulation:

"12-month period" means a period of 12 consecutive months determined on a rolling basis with a new 12-month period beginning on the first day of each calendar month.

"Actual emissions" means the quantity of federally regulated air pollutants emitted from a stationary source considering emissions control equipment and actual hours of source operation or amount of material processed.

"CO_2 equivalent emissions" (CO_2e) shall represent an amount of GHGs emitted, and shall be computed by multiplying the mass amount of emissions tpy, for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A - 1 to Subpart A of 40 C.F.R. Part 98 - Global Warming Potentials (which is incorporated by reference as of the effective date of the federal final rule published by EPA in the Federal Register on November 29, 2013 [78 FR 71948]), and summing the resultant value for each to compute a tpy CO_2 equivalent emissions.

"Commission" means the Arkansas Pollution Control and Ecology Commission.

"Construction" means fabrication, erection, or installation of equipment. See also 40 C.F.R. § 60.2, 40 C.F.R. § 51.165, and 40 C.F.R. § 52.21.

"Control apparatus" means any device which prevents, controls, detects or records the emission of any federally regulated air pollutants.

"Department" means the Arkansas Department of Environmental Quality, or its successor. When reference is made in this regulation to actions taken by or with reference to the Department, the reference is to the staff of the Department acting at the direction of the Director.

"Director" means the Director of the Arkansas Department of Environmental Quality, or its successor, acting directly or through the staff of the Department.

"Emission limitation" and **"emission standard"** mean a requirement established by the Department or the Administrator of the EPA which limits the emissions of federally regulated air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.

"Emission unit" means any article, machine, equipment, operation, or contrivance that emits or has the potential to emit any federally regulated air pollutant.

"EPA" means the United States Environmental Protection Agency.

"Equipment" means any device, except equipment used for any mode of vehicular transportation, capable of causing the emission of a federally regulated air pollutant into the open air, and any stack, conduit, flue, duct, vent, or similar device connected or attached to or serving the equipment.

"Federal Clean Air Act" or **"Clean Air Act"** or **"FCAA"** or **"the Act"** means the federal Clean Air Act, as amended, 42 U.S.C. 7401, *et seq*. and its implementing regulations as of the effective date of this regulation.

"Federally regulated air pollutant" means the following:

(A) Nitrogen oxides or any volatile organic compounds;

(B) Any pollutant for which a National Ambient Air Quality Standard has been promulgated;

(C) Except as provided in (E), any pollutant that is subject to any standard promulgated under 42 U.S.C. § 7401, *et seq*., as of the effective date of this regulation;

(D) Any Class I or II substance subject to a standard promulgated under or established by Title VI of the Clean Air Act, 42 U.S.C. § 7401, *et seq*. as amended as of July 1,1997.

(E) GHGs, except that GHGs shall not be a Federally Regulated Air Pollutant unless the GHG emissions are:

(1) from a stationary source emitting or having the potential to emit 75,000 tpy CO_2e emissions or more; and

(2) regulated under Chapter 9 of this Regulation 19.

"Fugitive emissions" means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Those emissions are those that, according to customary and good engineering practice, considering technological and economic feasibility, could not pass through a stack, chimney, vent or other functionally-equivalent opening, except that the Department will utilize the definition of fugitive emissions for those industries for which an approved EPA definition exist under federal law or regulation and which are meeting that law or regulation.

"Greenhouse gases" (GHGs) means the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

"Hazardous Air Pollutant" or **"HAP"** means any air pollutant listed pursuant to § 112 of the Clean Air Act, as amended, 42 U.S.C. § 7401, *et seq*., as of the effective date of this regulation.

"Modification" means any physical change in, or change in the method of operation of, a stationary source which increases the emission rate of any federally regulated air pollutant over permitted rates or which results in the emission of a federally regulated air pollutant not previously emitted, except that:

(A) Routine maintenance, repair, and replacement shall not be considered a physical change, and

(B) The following shall not be considered a change in the method of operation:

(1) Any change in the production rate, if such change does not exceed the permitted operating capacity of the source;

(2) Any change in the hours of operation, as long as it does not violate applicable air permit conditions; or

(3) The use of an alternate fuel or raw material, as long as it does not violate applicable air permit conditions.

(C) *De Minimis* changes, as defined in Reg. 19.407(C), and changes in ownership shall not be considered.

"National Ambient Air Quality Standards" or **"NAAQS,"** means those ambient air quality standards promulgated by the EPA in 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on October 26, 2015 (80 FR 65292), as set forth in Appendix B of Regulation 19.

"NAAQS state implementation plan or "NAAQS SIP" (as defined by Ark. Code Ann. § 8-4-303) means a state implementation plan that specifies measures to be used in the implementation of the state's duties under the Clean Air Act, 42 U.S.C. § 7401 *et seq*., for the attainment and maintenance of a specified NAAQS in each air quality control region or portion of an air quality control region within the state.

"Opacity" means the degree to which air emissions reduce the transmission of light and obscure the view of an object in the background.

"Operator" means any person who leases, operates, controls, or supervises any equipment affected by these regulations.

"Owner" means any person who has legal or equitable title to any source, facility, or equipment affected by these regulations.

"Particulate matter" or "PM" means any airborne finely divided solid or liquid material with an aerodynamic diameter equal to or less than 100 micrometers.

"Particulate matter emissions" means all particulate matter, other than uncombined water, emitted to the ambient air as measured by applicable reference methods, or an equivalent or alternate method, specified in 40 C.F.R. Part 60 Appendix A as of the effective date of the

federal final rule published by EPA in the Federal Register on February 27, 2014 (79 FR 11257), or by a test method specified in these regulations or any supplement thereto, with the exception of condensable particulate matter.

"Person" means any individual or other legal entity or their legal representative or assignee.

"Plan" means the Arkansas Plan of Implementation for Air Pollution Control.

"**$PM_{2.5}$"** means particulate matter with an aerodynamic diameter less than or equal to a nominal two and one-half (2.5) micrometers as measured by a reference method based on Appendix L of 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on October 17, 2006 (71 FR 61226), or by an approved regional method designated in accordance with Appendix C of 40 C.F.R. Part 53.

"$PM_{2.5}$ emissions" means $PM_{2.5}$ emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternate method, specified in 40 C.F.R. Part 51, Appendix M as of the effective date of the federal final rule published by EPA in the Federal Register on April 2, 2014 (79 FR 18452), or by a test method specified in these regulations or any supplement thereto.

"PM_{10}" means particulate matter with an aerodynamic diameter less than or equal to a nominal ten (10) micrometers as measured by a reference method based on Appendix J of 40 C.F.R. Part 50 as of the effective date of the federal final rule published by EPA in the Federal Register on August 7, 1987 (52 FR 29467), or by an equivalent method designated in accordance with 40 C.F.R. Part 53 as of December 8, 1984.

"PM_{10} emissions" means PM_{10} emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternate method, specified in 40 C.F.R. Part 51, Appendix M as of the effective date of the federal final rule published by EPA in the Federal Register on April 2, 2014 (79 FR 18452), or by a test method specified in these regulations or any supplement thereto.

"Potential to emit" means the maximum capacity of a stationary source to emit a federally regulated air pollutant under its physical and operational design. Any physical or operational

limitation on the capacity of the source to emit a federally regulated air pollutant, including, but not, limited to, air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design only if the limitation or the effect it would have on emissions is enforceable to the extent it is regulated by the federal Clean Air Act, 42 U.S.C. § 7401 *et seq*. as of February 15, 1999. Secondary air emissions do not count in determining the potential to emit of a stationary source.

"Responsible official" means one of the following:

(A) For a corporation: a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative or such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(1) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 United States dollars); or

(2) The delegation of authority to such representative is approved in advance by the Department;

(B) For partnership or sole proprietorship: a general partner or the proprietor, respectively;

(C) For a municipality, State, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this regulation, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA); or

(D) For acid rain sources:

(1) The designated representative insofar as actions, standards, requirements, or prohibitions under Title IV of the Act or the regulations promulgated thereunder are concerned; and

(2) The designated representative for any other purposes under Part 70.

"Secondary emissions" means those emissions of federally regulated air pollutants which, although associated with a source, are not emitted from the source itself.

"Shutdown" means the cessation of operation of equipment.

"Startup" means the setting in operation of equipment.

"State implementation plan" or "SIP" (as defined at Ark. Code Ann. § 8-4-303), means a plan that specifies measures to be used in the implementation of the state's duties under the Clean Air Act, 42 U.S.C. § 7401 *et seq*., and that is developed by the department and submitted to the EPA for review and approval.

"Stationary source" means any building, structure, facility, or installation which emits or may emit any federally regulated air pollutant.

"Title I modification" means any modification as defined under any regulation promulgated pursuant to Title I of the federal Clean Air Act. *De minimis* changes under Regulation 19, changes to state only permit requirements, administrative permit amendments, and changes to the insignificant activities list are not Title I modifications.

"Volatile organic compounds" or **"VOC"** means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

(A) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity:

acetone;
methane;
ethane;
methylene chloride (dichloromethane);
1,1,1- trichloroethane (methyl chloroform);
tetrachloroethylene (perchloroethylene);
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
trichlorofluoromethane (CFC-11);

dichlorodifluoromethane (CFC-12);
chlorodifluoromethane (HCFC-22);
trifluoromethane (HFC-23);
1,2-dichloro 1,1, 2, 2-tetrafluoroethane (CFC-114);
chloropentafluoroethane (CFC-115);
1,1,1-trifluoro 2,2-dichloroethane (HCFC-123);
1,1,1,2-tetrafluoroethane (HFC-134a);
1,1-dichloro 1-fluoroethane (HCFC-141b);
1-chloro 1,1-difluoroethane (HCFC-142b);
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
pentafluoroethane (HFC-125);
1,1,2,2-tetrafluoroethane (HFC-134);
1,1,1-trifluoroethane (HFC-143a);
1,1-difluoroethane (HFC-152a);
parachlorobenzotrifluoride (PCBTF);
cyclic, branched, or linear completely methylated siloxanes;
3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca);
1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb);
1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee);
difluoromethane (HFC-32);
ethylfluoride (HFC-161);
1,1,1,3,3,3-hexafluoropropane (HFC-236fa);
1,1,2,2,3-pentafluoropropane (HFC-245ca);
1,1,2,3,3-pentafluoropropane (HFC 245ea);
1,1,1,2,3-pentafluoropropane (HFC-245eb);
1,1,1,3,3-pentafluoropropane (HFC-245fa);
1,1,1,2,3,3-hexafluoropropane (HFC-236ea);
1,1,1,3,3-pentafluorobutane (HFC-365mfc);
chlorofluoromethane (HCFC-31);
1 chloro-1-fluoroethane (HCFC-151a);
1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a);
1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$ or HFE-7100);
2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane
($(CF_3)_2CFCF_2OCH_3$);
1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$ or HFE 7200);
2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane
($(CF_3)_2CFCF_2OC_2H_5$);
methyl acetate;
1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane (n-$C_3F_7OCH_3$ or HFE-7000);
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl) hexane
(HFE-7500);
1,1,1,2,3,3,3-heptafluoropropane (HFC 227ea);
methyl formate ($HCOOCH_3$);

1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-trifluoromethyl-pentane (HFE-7300);
propylene carbonate;
dimethyl carbonate;
trans-1,3,3,3-tetrafluoropropene (HFO-1234ze);
HCF_2OCF_2H (HFE-134);
$HCF_2OCF_2OCF_2H$ (HFE-236cal2);
$HCF_2OCF_2CF_2OCF_2H$ (HFE-338pcc13);
$HCF_2OCF_2OCF_2CF_2OCF_2H$ (H-Galden 1040x or H-Galden ZT 130 [or 150 or 180]);
trans- 1-chloro-3,3,3-triflouroprop-1-ene;
2,3,3,3-tetraflouropropene;
2-amino-2-methyl-1-propanol;

and perfluorocarbon compounds which fall into these classes:

(1) cyclic, branched, or linear, completely fluorinated alkanes;

(2) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(3) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(4) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(B) For purposes of determining compliance with emission limits, VOC will be measured by the test methods in the approved State Implementation Plan (SIP) or 40 C.F.R. Part 60, Appendix A, as of July 1, 1997, as applicable. Where such a method also measures compounds with negligible photochemical reactivity, these negligibly-reactive compounds may be excluded as VOC if the amount of such compounds is accurately quantified, and such exclusion is approved by the Department.

(C) As a precondition to excluding these compounds as VOC or at any time thereafter, the Department may require an owner or operator to provide monitoring or testing methods and results demonstrating, to the satisfaction of the Department, the amount of negligibly-reactive compounds in the source's emissions.

(D) The following compound(s) are VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements which apply to

VOC and shall be uniquely identified in emission reports, but are not VOC for purposes of VOC emissions limitations or VOC content requirements: t-butyl acetate.

ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION

REGULATION NO. 19

APPENDIX B

NATIONAL AMBIENT AIR QUALITY STANDARDS LIST

APPENDIX B: NATIONAL AMBIENT AIR QUALITY STANDARDS LIST

The National Ambient Air Quality Standards as adopted as of the effective date of this Regulation are listed below.

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Carbon Monoxide	76 FR 54294	August 31, 2011	Primary	8-hour	9 ppm	Not to be exceeded more than once per year	All Chapters
				1-hour	35 ppm		All Chapters
Lead	73 FR 66964	November 12, 2008	Primary and secondary	Rolling 3 month average	0.15 $\mu g/m^3$	Not to be exceeded	All Chapters
Nitrogen Dioxide	75 FR 6474	February 9, 2010	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years	All Chapters
	61 FR 52852	October 8, 1996	Primary and secondary	Annual	53 ppb	Annual Mean	All Chapters
Ozone	80 FR 65292	October 26, 2015	Primary and secondary	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years	All Chapters
Particle Pollution, $PM_{2.5}$	78 FR 3085	January 15, 2013	Primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years	All Chapters
	71 FR 61144	October 17, 2006	Secondary	Annual	15 $\mu g/m^3$		
			Primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years	All Chapters

Pollutant	Final Rule Cite	Final Rule Date	Primary / Secondary	Averaging Time	Level	Form	Applicable Chapters
Particle Pollution, PM_{10}	71 FR 61144	October 17, 2006	Primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years	All Chapters
Sulfur Dioxide	75 FR 35520	June 22, 2010	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	All Chapters
	38 FR 25678	September 14, 1973	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year	All Chapters

ARKANSAS REGISTER

Transmittal Sheet

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Secretary of State
Mark Martin
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(501) 682-3527
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For Office Use Only:

Effective Date _____ Code Number _____

Name of Agency Arkansas Pollution Control & Ecology Commission

Department Division of Environmental Quality

Contact Stuart Spencer E-mail Spencer@adeq.state.ar.us Phone (501) 682-0750

Statutory Authority for Promulgating Rules Ark. Code Ann. §8-1-203(b)(1)

Rule Title: Rule No. 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No 18-006-R; Minute Order 19-17

Intended Effective Date
(Check One)

- ☐ Emergency (ACA 25-15-204)
- ☐ 30 Days After Filing (ACA 25-15-204)
- ☐ Other 10 Days After Filing
  (Must be more than 30 days after filing date.)

	Date
Legal Notice Published	11/08/2018
Final Date for Public Comment	11/30/2018
Reviewed by Legislatice Council	07/19/2019
Adopted by State Agency	09/27/2019

Electronic Copy of Rule submitted under ACA 25-15-218 by:

Contact Person E-mail Address Date

CERTIFICATION OF AUTHORIZED OFFICER

I Hereby Certify That The Attached Rules Were Adopted
In Compliance with Act 434 of 1967 the Arkansas Administrative Procedures Act. (ACA 25-15-201 et. seq.)

STATE OF ARKANSAS SECRETARY OF STATE

Signature

(501) 682-7890 moulton@adeq.state.ar.us
Phone Number E-mail Address

2019 SEP 30 PM 3:28

Administrative Law Judge
Title

AR REGISTER DIV.

09/30/2019
Date

Revised 8/2011 to reflect new legislation passed in 2011.

ARKANSAS POLLUTION CONTROL & ECOLOGY COMMISSION
101 EAST CAPITOL
SUITE 205
LITTLE ROCK, ARKANSAS 72201
PHONE: (501) 682-7890
FAX: (501) 682-7891

September 30, 2019

Ms. Jessica Sutton
Administrative Rules and Regulations Committee
Room 433, State Capitol Building
Little Rock, Arkansas 72201

RE: Rule No 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No. 18-006-R; Minute Order No. 19-17. - **FINAL FILING**.

Dear Ms. Davis:

I am enclosing the following for filing with your office:

1. One (1) hard copy of the amendment to Rule No 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control.
2. One (1) copy of Commission Minute Order No. 19-17
3. One (1) copy of the Financial Impact Statement.

Please provide written confirmation of your receipt of these materials by file-marking the enclosed copy of this letter and returning it to me.

Thank you for your assistance in this matter.

Respectfully,

Charles Moulton
Administrative Law Judge

Enclosures

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Effective Date: **Classification Number:**

Name of Agency: Division of Environmental Quality

Contact Person: Stuart Spencer **Telephone:** (501) 682-0750

Statutory Authority for Promulgating Rules: Ark. Code Ann. §8-1-203(b)(1)

Title of Rule: Rule No. 19, Rule of the Arkansas Plan of Implementation for Air Pollution Control; Docket No. 18-006-R; Minute Order 19-17

Rule Status	Effective Date Status	Effective Date
☐ New Rule/Regulation	☐ Emergency	
Amended Rule/Regulation	10 Days after filing	September 10, 2019
☐ Repealed Rule/Regulation	☐ Other	
☐ Order	☐ Repealed	
☐ Emergency Rule/Regulation	Adopted by State Agency	

☐ Rule above is proposed and will be replaced by final version

☒ Financial and/or Fiscal Impact Statement Attached

Certification of Authorized Officer

I hereby certify that the attached rules were adopted in compliance with Act 434 of 1967 as amended.

Signature: Charles Moore Date: September 30, 2019

Title: Administrative Law Judge

ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION

SUBJECT: Adoption of Revisions to Regulation 19 Regulations of the Arkansas Plan of Implementation for Air Pollution Control

DOCKET NO. 18 - 006 - R

MINUTE ORDER NO. 19 - 17

On September 28, 2018, the Arkansas Pollution Control and Ecology Commission initiated rulemaking to amend Regulation 19: Regulation of the Arkansas Plan of Implementation for Air Pollution Control. The period for public comment and a public hearing on the proposed rulemaking were all completed before the end of 2018.

Subsequently, the 92nd General Assembly of the State of Arkansas passed Act 315 of 2019, which, among other changes, provided for the uniform use of the term "rule" rather than "regulation" by state agencies. The Administrative Rules and Regulations Subcommittee of the Arkansas Legislative Council approved the proposed changes to Regulation 19 at its July 19, 2019 meeting. Then, Act 315 took effect on July 24, 2019. Act 315 provides that a governmental entity shall "ensure the use of the term rule upon promulgation of any rule after the effective date of this Act."

In consideration of public notice and hearing, the record, the mandates of Act 315 of 2019, and the exigency of the adoption of the 2015 ozone national ambient air quality standard, the Arkansas Pollution Control and Ecology Commission hereby:

(1) adopts the changes to Regulation No. 19, Regulations of the Arkansas Plan of Implementation for Air Pollution Control reflected in the version that was filed by the Division of Environmental Quality (Division) and entered into the Rulemaking Docket on August 6, 2019; and

(2) directs the Division to ensure the use of the term "rule" instead of "regulation" in all future petitions to initiate rulemaking pertaining to Regulation 19 consistent with Act 315 of 2019.

PROMULGATED THIS 27TH DAY OF SEPTEMBER, 2019, BY ORDER OF THE ARKANSAS POLLUTION CONTROL AND ECOLOGY COMMISSION.

EXHIBIT F

COMMISSIONERS

L. Bengal
A. Bigger
C. Colclasure
J. Fox
M. Freeze
M. Goggans
D. Haak
B. Holland

R. McMullen
D. Melton
R. Moss, Jr.
R. Reynolds
R. Roper
W. Ward
B. White

D. Melton - Chair

SUBMITTED BY: Stuart Spencer

PASSED: 09/27/19