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Air Quality: EPA's 2023 Proposed Changes to the Particulate Matter (PM) Standard

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SUMMARY

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Air Quality: EPA's 2023 Proposed Changes to the Particulate Matter (PM) Standard

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to issue national ambient (outdoor) air quality criteria (standards) for certain listed pollutants and then review those standards every five years. Among the air pollutants for which EPA issued a national ambient air quality standard (NAAQS) was particulate matter (PM), especially PM 2.5 micrometers or less in diameter ($PM_{2.5}$). Exposure to PM has been associated with adverse health effects, with haze formation, and with other ecological effects.

On January 27, 2023, EPA proposed to review and modify the NAAQS for PM. EPA has established short-term (24-hour) and long-term (annual) standards for two categories of PM based on size: $PM_{2.5}$ for particles smaller than 2.5 micrometers, and slightly larger, inhalable particles less than or equal to 10 micrometers (referred to as PM_{10}). The CAA provides for two types of NAAQS: (1) primary standards, "the attainment and maintenance of which in the judgment of the [EPA] Administrator ... are requisite to protect the public health" with "an adequate margin of safety"; and (2) secondary standards, which are necessary to protect public welfare.

EPA's 2023 proposal would lower the primary $PM_{2.5}$ annual NAAQS limit from 12.0 micrograms per cubic meter ($\mu g/m^3$) to a value between 9.0 to 10.0 $\mu g/m^3$. The proposal also sought comments on alternative annual standard levels down to 8.0 $\mu g/m^3$ and up to 11.0 $\mu g/m^3$. The proposal would maintain the current primary and secondary 24-hour $PM_{2.5}$ standards, primary and secondary 24-hour standards for PM_{10}, and the secondary annual $PM_{2.5}$ standard. In addition, EPA proposed revisions to other aspects related to the PM NAAQS, including to the Air Quality Index (AQI) and monitoring requirements for the PM standards.

Revising a NAAQS established under the CAA sets in motion a process under which the states and EPA identify areas that exceed the standard (*nonattainment areas*) using multiyear air quality monitoring data and other criteria. The CAA directs states and tribes, within 12 months from the effective date of the issuance of a final new or revised NAAQS, to submit designation recommendations to EPA as to whether an area is attaining the standard. Using the recommendations and information from air quality monitors and/or models, EPA designates areas as either *attainment/unclassifiable* or *nonattainment*. If designated *nonattainment*, states are required to submit to EPA a State Implementation Plan (SIP) detailing efforts to reduce pollutant concentrations in order to meet the standard. The area is designated *attainment/unclassifiable* if it is attaining the standard and *unclassifiable* if EPA is not able to determine the status after evaluating the available information for an area.

Congress and numerous stakeholders often raise concern over EPA and state application of an updated standard. These concerns can involve the designation process, timelines, implementation, cross-boundary impacts, and exceptional events. For EPA's proposed reconsideration of the PM NAAQS, some in Congress have raised concern over items such as the additional resources needed to document wildfire- and prescribed-fire-related exceptional events. The EPA defines e*xceptional event*s as "unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that air agencies may implement in order to attain and maintain the [NAAQS]." Exceptional events may include wildfires, prescribed fires, high wind dust events, stratospheric ozone intrusions, and volcanic and seismic activities. Some in Congress, some states, and certain stakeholders have expressed concern that EPA's proposed PM NAAQS will require considerable resources to document the effect on air quality of wildland fire-related exceptional events, in order to have those events and their data excluded from regulatory consideration and the designation process.

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Introduction

Under Sections 108-109 of the Clean Air Act (CAA),[1] the U.S. Environmental Protection Agency (EPA) is to issue national ambient (outdoor) air quality standards (NAAQS) for certain listed pollutants (1) whose emissions "may reasonably be anticipated to endanger public health or welfare" and (2) whose presence in ambient air "results from numerous or diverse mobile or stationary sources."[2] EPA has identified and promulgated NAAQS for six principal pollutants, commonly referred to as *criteria pollutants*:

1. particulate matter (PM),
2. ozone (O_3),
3. nitrogen dioxide (NO_2),[3]
4. sulfur dioxide (SO_2),
5. carbon monoxide (CO), and
6. lead (Pb).

PM refers to a mixture of solid particles and liquid droplets in the atmosphere. PM components may include acids, organic chemicals, metals, and soil or dust particles. The size of PM varies, ranging from tiny particles that can be seen only through a high-power microscope to larger particles (e.g., soot). Exposure to PM has been associated with adverse health effects (e.g., aggravated asthma, chronic bronchitis, and premature death).[4] PM has also been linked with haze formation and other ecological effects.[5]

For PM, EPA established short-term (24-hour) and long-term (annual) standards. Additionally, EPA established separate standards for two categories of PM based on size: "fine" PM 2.5 micrometers or less in diameter (referred to as $PM_{2.5}$) and slightly larger, but still inhalable, particles less than or equal to 10 micrometers in diameter (referred to as PM_{10}).

The statute requires that EPA review the latest scientific studies and either reaffirm or modify previously established NAAQS every five years. EPA last revised the PM NAAQS in 2012. On December 18, 2020, EPA reviewed and decided to retain the 2012 $PM_{2.5}$ and PM_{10} standards, without revision. While EPA is meant to review the NAAQS every five years, it has rarely met its statutory obligation.[6] On January 27, 2023, EPA proposed a reconsideration of the 2020 decision to retain the PM NAAQS and would lower the annual $PM_{2.5}$ allowable limit. (See PM NAAQS chronology presented in **Table A-1**.)

This report focuses on the NAAQS implementation process and timelines, primarily as they relate to $PM_{2.5}$ and the proposed reconsideration of the $PM_{2.5}$ NAAQS. Also included in this report is an

[1] These sections can be found at 42 U.S.C. §7408 and §7409.

[2] For more information regarding the Clean Air Act (CAA) and its major requirements, see CRS Report RL30853, *Clean Air Act: A Summary of the Act and Its Major Requirements*, by Richard K. Lattanzio.

[3] The national ambient air quality standard (NAAQS) is for nitrogen dioxide (NO_2); nitrogen gases that are ozone precursors are referred to as *nitrogen oxides*, or NO_x.

[4] See Section 3.3, "Health Effects Evidence," of the U.S. Environmental Protection Agency's (EPA's) final "Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter," at https://www.epa.gov/system/files/documents/2022-05/Final%20Policy%20Assessment%20for%20the%20Reconsideration%20of%20the%20PM%20NAAQS_May2022_0.pdf.

[5] Ibid., Section 5.3.1, "Visibility Effects."

[6] The EPA has met the statutory obligation to review the NAAQS within five years twice. See EPA, "EPA Finalizes Ozone NAAQS, Retaining Current Standards," press release, December 23, 2020, at https://www.epa.gov/newsreleases/epa-finalizes-ozone-naaqs-retaining-current-standards.

overview of the exceptional events process by which EPA excludes air monitoring data influenced by situations such as wildfires and prescribed burns, known as *wildland fires*, when taking regulatory actions with regard to the air quality standards.[7] The report concludes with a discussion of issues for potential consideration by Congress.

NAAQS Requirements and Designation Process

The CAA directs EPA to establish two types of NAAQS:

1. *primary standards*, "the attainment and maintenance of which in the judgment of the [EPA] Administrator ... are requisite to protect the public health" with "an adequate margin of safety";[8] and
2. *secondary standards*,[9] which are necessary to protect *public welfare*,[10] a broad term that includes visibility impairment as well as damage to crops and vegetation, and effects on soil and nutrient cycling, water, wildlife, property, and building materials, among other things.

Establishing NAAQS does not directly limit emissions or compel specific emissions controls; rather, it represents the EPA Administrator's formal judgment regarding the level of ambient pollution that will protect public health with an adequate margin of safety. In setting the NAAQS, the EPA may not consider the costs of implementing the standards.[11] Promulgation of NAAQS sets in motion a process under which the states and tribes first identify geographic *nonattainment areas* (i.e., those areas failing to meet the NAAQS) based on monitoring and analysis of relevant air quality data.[12] *Ambient air monitoring* is "the systematic, long-term assessment of pollutant levels by measuring the quantity and types of certain pollutants in the surrounding, outdoor air."[13] EPA then establishes *nonattainment* areas based on the data and recommendations. States with nonattainment areas then submit State Implementation Plans (SIPs) to EPA, which identify

[7] The terms *wildland fire* and *wildfire* often are used interchangeably, although each term has a distinct definition. The National Wildfire Coordinating Group (NWCG) defines *wildland fire* as any nonstructure fire that occurs in vegetation or natural fuels, including prescribed fire and wildfire. NWCG defines *wildfire* as a wildland fire originating from an unplanned ignition, including unauthorized human-caused fires, escaped prescribed fire projects, and all other wildland fires where the objective is to put out the fire. See NWCG, "Glossary of Wildland Fire Terminology," September 2020, at https://www.nwcg.gov/glossary/a-z. *Prescribed burning* is the deliberate use of fire in specific areas within specified fuel and weather conditions. For further information, see CRS Report R46583, *Federal Wildfire Management: Ten-Year Funding Trends and Issues (FY2011-FY2020)*, by Katie Hoover.

[8] 42 U.S.C. §7409(b)(1).

[9] 42 U.S.C. §7409(b)(2).

[10] 42 U.S.C. 7602(h). The use of *public welfare* in the CAA "includes, but is not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants."

[11] The D.C. Circuit's holding on the cost and constitutional issues were appealed to the U.S. Supreme Court. In February 2001, the Supreme Court issued a unanimous decision upholding the EPA's position on both the cost and constitutional issues. Am. Trucking Ass'ns v. EPA, 531 U.S. 457, 465–472, 475–76 (2001); Am. Trucking Ass'ns, Inc. v. EPA, 283 F.3d 355 (D.C. Cir. 2002).

[12] While 42 U.S.C. §7407(d) specifically addresses states, EPA generally follows the same process and schedule for tribes pursuant to 42 U.S.C. §7601(d), "Tribal Authority and the Tribal Authority Rule."

[13] For information on EPA's air monitoring methods, see EPA, "Air Monitoring Methods—Criteria Pollutants," at https://www.epa.gov/amtic/air-monitoring-methods-criteria-pollutants.

specific state and federal regulations and emissions control requirements that are to bring areas into compliance, as well as actions for maintaining compliance.[14]

The CAA requires EPA to review the scientific data upon which the NAAQS are based every five years, and revise the standards, if necessary. More often than not, EPA has taken more than five years in reviewing the standards, but the establishment of a deadline has allowed interested parties to force review of the standards by filing suit.[15] The CAA also requires EPA to appoint an independent scientific review committee composed of seven members, known as the Clean Air Scientific Advisory Committee (CASAC), that assist in the review process.[16] The CAA directs CASAC to review the NAAQS every five years and recommend to the EPA Administrator "any new national ambient air quality standards and revisions of existing criteria and standards as may be appropriate."[17]

$PM_{2.5}$ NAAQS Designations and Implementation Timelines

The CAA directs EPA and states to take the following actions following promulgation of a new or revised $PM_{2.5}$ NAAQS:

- Within a year after a final NAAQS is promulgated, state and tribal area designation recommendations must be submitted to EPA. Areas are designated as meeting (*attainment/unclassifiable areas*) or not meeting (*nonattainment areas*) the final NAAQS.[18]
- No later than 120 days before promulgating final designations, EPA notifies states and tribes regarding any modifications to their recommendations.[19]
- Within two years after a final NAAQS is promulgated, EPA must designate areas with available information as attainment/unclassifiable areas or nonattainment areas, considering the most recent air quality monitoring data and input from states and tribes. All $PM_{2.5}$ nonattainment areas are initially designated as *Moderate* (i.e., the lesser of the two NAAQS PM nonattainment classifications).[20]

[14] Under certain circumstances EPA may disapprove a State Implementation Plan (SIP) and promulgate a Federal Implementation Plan (FIP). For information regarding SIPs and FIPs, see 42 U.S.C. §7410.

[15] For example, in response to a case filed by the Missouri Coalition for the Environment, the U.S. District Court, Eastern District of Missouri, Eastern Division, issued a decision in September 2005 that a review of the lead NAAQS should be completed by September 1, 2008 (Missouri Coalition for the Environment vs EPA, Civil Action No. 4:04-CV-0066 (ERW) (E.D. Mo. Sept. 14, 2005)).

[16] For information regarding the *Clean Air Scientific Advisory Committee* (CASAC) PM review panel and its activities and reports, see EPA, Clean Air Scientific Advisory Committee (CASAC), at https://casac.epa.gov/ords/sab/f?p=113:1:4378852111566:::::.

[17] 42 U.S.C. §7409(d) regulates the independent scientific review committee regarding the review and revision of criteria air pollutants and the national ambient air quality standards. If the EPA Administrator decides to revise the NAAQS, the regulation is proposed in the *Federal Register*, public comments are considered, and EPA issues a final rule in the *Federal Register* and codifies the regulation in the *Code of Federal Regulations*. For more information see EPA, "The Basics of the Regulatory Process," at https://www.epa.gov/laws-regulations/basics-regulatory-process.

[18] In accordance with 42 U.S.C. §7407(d), the EPA Administrator may not require a governor to submit the initial designation requests sooner than 120 days, but not later than one year. For information on the designation process, see EPA, "NAAQS Designations Process," at https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process.

[19] 42 U.S.C. §7407(d)(B)(ii). Known as the "120-day letter."

[20] EPA is required to designate areas within two years of promulgation of a NAAQS; however, EPA can take an additional year if the Administrator determines it is warranted. PM nonattainment areas are typically initially (continued...)

- Final area designations are typically effective 90 days after *Federal Register* publication.[21]
- Within three years after a final NAAQS is promulgated, CAA Section 110 requires all states to submit SIP revisions to show they have the basic air quality management program components in place to implement the final NAAQS.[22]
- States with new transportation projects must submit a conformity determination within one year of the effective date of nonattainment designation.[23]
- Within 18 months after the effective date of designations, nonattainment area $PM_{2.5}$ SIPs are due.
- The end of the sixth calendar year after the effective date of designations is the attainment date for areas classified as Moderate for $PM_{2.5}$ nonattainment designations.[24]
- The end of the 10th calendar year after the effective date of designations is the attainment date for areas classified as Serious for $PM_{2.5}$ nonattainment designations.[25]
- Designated nonattainment areas, as well as those designated unclassifiable or attainment/unclassifiable for the NAAQS, are also subject to New Source Review (NSR) requirements. As such, states must update stationary source permitting requirements.[26]

New Source Review (NSR)

The fundamental framework of the Clean Air Act provides for different treatment of new versus existing sources of air pollution, and "modification" of existing sources. The distinction was based in part on the expectation that older sources would be replaced by newer ones over time. Accordingly, these newer sources would be subject to more stringent control requirements, and requiring existing sources to adopt stringent controls would be needlessly expensive and unwarranted given the expected replacement with controls applicable to new sources. New Source Review (NSR) aims to ensure that newly constructed facilities or major modifications to

designated as Moderate, but can be reclassified to the more stringent Serious classification. For more information regarding PM classifications, see EPA, "Particulate Matter (PM) Nonattainment Area SIP Requirements," at https://www.epa.gov/pm-pollution/particulate-matter-pm-nonattainment-area-sip-requirements.

[21] See National Archives, *Federal Register*, "Table of Effective Dates & Time Periods," at https://www.federalregister.gov/reader-aids/using-federalregister-gov/table-of-effective-dates-time-periods.

[22] These are known as *infrastructure SIPs*, or iSIPs. The list of requirements is codified at 42 U.S.C. §7410(a)(2). 42 U.S.C. §7410(a)(2)(D)(i)(I) Prongs 1 and 2 are known as the "good neighbor" provisions.

[23] EPA, "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements," 81 *Federal Register* 58124, August 24, 2016.

[24] The attainment date is the latest statutory date by which a nonattainment area is required to attain a particular $PM_{2.5}$ NAAQS; see 40 C.F.R. 51.1000. For the Moderate 2012 $PM_{2.5}$ NAAQS attainment date, see EPA, "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements," 81 *Federal Register* 58068, August 24, 2016.

[25] For the Serious 2012 $PM_{2.5}$ NAAQS attainment date, see EPA, "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements," 81 *Federal Register* 58093, August 24, 2016.

[26] See 42 U.S.C. §§7470-7479 for the Prevention of Significant Deterioration (PSD) of air quality requirements. See 42 U.S.C. §§7491-7492 for the PSD requirements for visibility protection. See 42 U.S.C. §§7501-7508 for the nonattainment New Source Review (NSR) requirements.

existing facilities do not result in violation of applicable air quality standards.[27] NSR provisions outline permitting requirements both for construction of new major pollution sources and for modifications to existing major pollution sources. The specific NSR requirements for affected sources depend on whether the sources are subject to Prevention of Significant Deterioration (PSD) or nonattainment provisions.[28]

PSD (attainment area permitting) applies with respect to a new standard in all areas of the United States designated attainment or unclassifiable for the pollutant upon the effective date of the new standard. Any new or modified major emitting facility must undergo preconstruction review and permitting, including the installation of Best Available Control Technology (BACT).[29] State permitting agencies determine BACT on a case-by-case basis, taking into account energy, environmental, and economic impacts. BACT cannot be less stringent than the federal New Source Performance Standards (NSPS), but it can be more so.[30] More stringent controls can be required if modeling indicates that BACT is insufficient to avoid violating PSD emission limitations, or the NAAQS itself.[31]

Nonattainment New Source Review (nonattainment NSR, or NNSR) applies in areas designated nonattainment for the pollutant, which includes any areas newly designated nonattainment at or after the effective date of designations.[32]

$PM_{2.5}$ Proposed Reconsideration

On January 27, 2023, EPA proposed reconsideration of the $PM_{2.5}$ annual NAAQS, with a comment period that closed on March 28, 2023.[33] The proposal would lower the $PM_{2.5}$ annual NAAQS limit from 12.0 micrograms per cubic meter ($\mu g/m^3$) to a range between 9.0 to 10.0

[27] An existing major stationary source proposing a physical change or a change in its method of operation must determine whether that project is a major modification subject to the NSR preconstruction permitting requirements by following a two-step test. The first step is to determine if there is a "significant emission increase" of a regulated NSR pollutant from the proposed modification. If there is, the second step is to determine if there is a "significant net emission increase" of that pollutant. EPA, "Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR): Project Emissions Accounting," 85 *Federal Register* 74890, November 24, 2020.

[28] 42 U.S.C. §7476 authorizes EPA to establish regulations for PSD of any pollutant for which EPA has issued a national standard.

[29] According to 40 C.F.R. §52.21(b)(1), the term *major emitting facility* is defined as a stationary source that emits, or has a potential to emit, at least 100 tons per year, if the source is in 1 of 28 listed source categories, or, if the source is not, then at least 250 tons per year, of "any air pollutant."

[30] Section 111 of the CAA requires EPA to establish nationally uniform, technology-based standards (called New Source Performance Standards, or NSPS) for categories of new industrial facilities. These standards accomplish two goals: (1) they establish a consistent baseline for pollution control that competing firms must meet, and thereby remove any incentive for states or communities to weaken air pollution standards in order to attract polluting industry; and (2) they preserve clean air to accommodate future growth, as well as for its own benefits. For more information on NSPS, see CRS Report RL30853, *Clean Air Act: A Summary of the Act and Its Major Requirements*, by Richard K. Lattanzio.

[31] The 1977 CAA broadened the air quality control regimen with the addition of the PSD and visibility impairment provisions. The PSD program (Part C of Title I of the CAA) focuses on ambient concentrations of SO_2, NO_x, and PM in areas where air quality is better than the NAAQS. The provision allows some increase in clean areas' pollution concentrations depending on their classification. In general, historic or recreation areas (e.g., national parks) are classified Class I areas with very little degradation allowed, while most other areas are classified Class II areas with moderate degradation allowed. States are allowed to reclassify Class II areas to Class III areas, which would be permitted to degrade up to the NAAQS, but none have ever been reclassified to Class III.

[32] 42 U.S.C. §7503. Nonattainment New Source Review (NNSR) applies to new major sources or major modifications at existing sources for pollutants where the area the source is located is nonattainment with a NAAQS.

[33] EPA, "Reconsideration of the National Ambient Air Quality Standards for Particulate Matter," 88 *Federal Register* 5558, January 27, 2023.

$\mu g/m^3$. The proposal also took comment on alternative annual standard levels from 8.0 $\mu g/m^3$ to 11.0 $\mu g/m^3$. See **Table A-1** for a review of previous PM NAAQS and the current proposal. If EPA adopts the proposed revision of the $PM_{2.5}$ NAAQS, the agency would then be required to go through the designation process upon promulgations of the revised NAAQS.[34]

Designations are based on the most recently available *design values*, a statistic that describes the air quality status of a given location relative to the level of the NAAQS.[35] Design values are computed using Federal Reference Method or equivalent data reported by state, tribal, and local air monitoring agencies to EPA's Air Quality System (AQS).[36] *Federal Reference Methods* are methods developed and evaluated by EPA for accurately and reliably measuring pollutants in outdoor air. If concentrations are flagged by state, tribal, or local monitoring agencies as having been affected by an exceptional event (e.g., wildfire, volcanic eruption) and the associated EPA Regional Office concurs, then the associated data are not included in the design value calculations.[37] States and tribes can consider exceptional events data in their designation recommendations.[38] EPA is not proposing to revise the $PM_{2.5}$ Implementation Rule (i.e., 40 C.F.R. §51, Subpart Z).[39] (For more on the Implementation Rule, see section "EPA SIP Requirements and Implementation Rules" of this report.)

The notice also proposed to maintain the current primary and secondary 24-hour $PM_{2.5}$ standards, primary and secondary 24-hour standards for PM_{10}, and the secondary annual $PM_{2.5}$ standard.

In addition, the EPA notice proposed revisions to other key aspects related to the PM NAAQS, including to the Air Quality Index (AQI) and monitoring requirements for the PM NAAQS.[40] These revisions include

- addressing updates in data calculations,
- approval of reference and equivalent methods,
- updates in quality assurance statistical calculations to account for lower concentration measurements,
- updates to support improvements in PM monitoring methods,
- changes to the $PM_{2.5}$ network design to account for at-risk populations,
- updates to the probe and monitoring path siting criteria for NAAQS pollutants,

[34] 42 U.S.C. § 7407(d).

[35] The particulate matter (PM) 2.5 design value is the "annual mean, averaged over 3 years." See EPA, "Criteria Air Pollutants NAAQS Table," at https://www.epa.gov/criteria-air-pollutants/naaqs-table.

[36] The Air Quality System (AQS) contains ambient air pollution data collected by EPA, state, local, and tribal air pollution control agencies from over thousands of monitors. AQS also contains meteorological data, descriptive information about each monitoring station, and data quality assurance/quality control information. See EPA, "Air Quality System (AQS)," at https://www.epa.gov/aqs.

[37] *Exceptional events* are unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state, or local air agencies may implement in order to attain and maintain the NAAQS. See 42 U.S.C. §7619(b).

[38] For more information on the NAAQS and attainment requirements, see CRS Report RL30853, *Clean Air Act: A Summary of the Act and Its Major Requirements*, by Richard K. Lattanzio.

[39] The PM Implementation Rule establishes planning requirements for states with areas that do not meet the PM NAAQS. See EPA, "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements," 81 *Federal Register* 58010, August 24, 2016.

[40] The *Air Quality Index* (AQI) is EPA's color-coded tool used by state and local governments to help inform the public about current and daily air quality; it also recommends steps that individuals can take to reduce their exposure to air pollution. See EPA, "Air Quality Index (AQI) Basics," at https://www.airnow.gov/aqi/aqi-basics/.

- changes to the $PM_{2.5}$ AQI value of 50 to correspond to a concentration range between 9.0 and 10.0 $\mu g/m^3$,[41]
- updates to the $PM_{2.5}$ AQI values of 200, 300, and 500 to correspond to a concentration of 125.4 $\mu g/m^3$, 225.4 $\mu g/m^3$, and 325.4 $\mu g/m^3$, respectively,[42] and
- changes to the AQI daily reporting requirement from five days per week to seven days per week.

The proposal also included language to modify the $PM_{2.5}$ monitoring network design criteria to include an environmental justice factor. This factor aims to account for proximity of populations at increased risk of adverse health effects from $PM_{2.5}$ exposures to sources of concern.

Prior PM NAAQS Regulations

Prior to the 2023 proposal, EPA took several actions with respect to the PM NAAQS, some of which were controversial and subject to legal challenge. **Table A-1** of **Appendix A** is a chronology of the PM NAAQS and its revisions. The agency promulgated separate standards for both coarse and fine particulate matter in 1997.[43] EPA's review and establishment of the 1997 PM NAAQS was the subject of litigation and challenges. Industry groups argued that EPA's regulations were overly stringent. Environmental groups charged that EPA had not regulated stringently enough. Others made claims regarding the constitutionality of the CAA and the scope of EPA's regulatory authority. The agency's action was the subject of a Supreme Court decision, and the standards themselves were ultimately upheld by the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit).[44]

In 2005, EPA completed a statutorily required review of the PM NAAQS. Based on that review, in 2006, EPA revised the standards.[45] Several states and industry, agriculture, business, and environmental and public health advocacy groups petitioned the U.S. Court of Appeals for the District of Columbia Circuit, challenging certain aspects of EPA's revisions of the PM NAAQS as promulgated in December 2006. A February 24, 2009, decision by the D.C. Circuit granted the petitions in part, denying other challenges, and remanded the standards to EPA for further consideration, but did not vacate the 2006 standards.[46]

In 2012, EPA completed a statutorily required review of the PM NAAQS, concluded the 2006 standards were inadequately protective of public health, and revised the standards. In December 2012, EPA announced its final decisions to revise the primary NAAQS for PM.[47] Petitioners

[41] The current AQI levels align with the 2012 PM NAAQS; a revised $PM_{2.5}$ NAAQS would require a shift in the $PM_{2.5}$ AQI to reflect the new standard. See EPA, "AQI Breakpoints," at https://aqs.epa.gov/aqsweb/documents/codetables/aqi_breakpoints.html.

[42] The proposal would revise the upper AQI levels (200 and above) and replace the existing linear-relationship approach used in 1999 (64 *Federal Register* 42530, August 4, 1999) to set these levels, with an approach that more fully considers the $PM_{2.5}$ health effects evidence from controlled human exposure and epidemiologic studies that has become available in the last 20 years. See 88 *Federal Register* 5563, January 27, 2023.

[43] EPA, "National Ambient Air Quality Standards for Particulate Matter," 62 *Federal Register* 38652, July 18, 1997.

[44] Am. Trucking Ass'ns v. EPA, 531 U.S. 457 (2001); Am. Trucking Ass'ns, Inc. v. EPA, 283 F.3d 355 (D.C. Cir. 2002). For questions regarding this case or other legal challenges to EPA's PM NAAQS, congressional offices may contact CRS Legislative Attorney Kate R. Bowers.

[45] EPA, "National Ambient Air Quality Standards for Particulate Matter," 71 *Federal Register* 61143, December 18, 2006.

[46] Am. Farm Bureau Fed'n v. EPA, 559 F.3d 512 (D.C. Cir. 2009).

[47] EPA, "National Ambient Air Quality Standards for Particulate Matter; Final Rule," 78 *Federal Register* 3086, January 15, 2013.

challenged EPA's final rule and argued that EPA acted unreasonably in revising the level and form of the annual standard and in amending the monitoring network provisions. On judicial review, the D.C. Circuit upheld the revised standards and monitoring requirements in all respects.[48]

In May 2018, the EPA Administrator issued a memorandum describing a "back-to-basics" process for reviewing the NAAQS.[49] The memorandum announced EPA would ensure any needed revisions to the PM NAAQS would be finalized by December 2020. In October 2018, the EPA Administrator announced that the role of reviewing the key science assessments developed as part of the ongoing review of the PM NAAQS would be performed by the seven-member chartered CASAC—an independent expert committee tasked with assisting EPA in reviewing the NAAQS.[50] On December 18, 2020, EPA finalized the retention of the primary and secondary PM NAAQS, without revision.[51]

On January 20, 2021, the Biden Administration issued an Executive Order titled "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," which identified several environmental and climate policy goals of the incoming Administration.[52] An accompanying fact sheet provided a "non-exclusive list of agency actions that heads of the relevant agencies will review in accordance with the Executive Order," including the 2020 PM NAAQS action.[53]

Regulatory Impact Analysis for a Lower $PM_{2.5}$ NAAQS

EPA has prepared cost estimates for all economically significant rules since the Carter Administration as the result of executive orders.[54] Under Executive Order (E.O.) 12866, each economically significant regulatory action taken by executive branch agencies (under any statutory authority) must include estimates of the cost and benefits of the action in a Regulatory Impact Analysis (RIA) before it is proposed, and again before it is promulgated.[55] RIAs are part of the interagency review process overseen by the Office of Management and Budget, which precedes the publication of significant rules in the *Federal Register*.[56]

[48] Nat'l Ass'n of Manufacturers v. EPA, 750 F.3d 921 (D.C. Cir. 2014).

[49] See Memorandum from EPA Administrator E. Scott Pruitt to Assistant Administrators, "Back-to-Basics Process for Reviewing National Ambient Air Quality Standards," May 9, 2018, at https://www.epa.gov/sites/default/files/2018-05/documents/image2018-05-09-173219.pdf.

[50] EPA, "Acting Administrator Wheeler Announces Science Advisors for Key Clean Air Act Committee, Tasks Chartered Panel to Lead Review of Ozone and Particulate Matter Standards Under Reformed Process," press release, October 10, 2018, at https://www.regulations.gov/document/EPA-HQ-OAR-2015-0072-0223.

[51] Proposed in 85 *Federal Register* 24094, April 30, 2020, and finalized in 85 *Federal Register* 82684, December 18, 2020.

[52] Executive Order 13990; 86 *Federal Register* 7037, January 25, 2021.

[53] See item 14 in White House, "Fact Sheet: List of Agency Actions for Review," January 20, 2021, at https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/fact-sheet-list-of-agency-actions-for-review/.

[54] The Carter Administration order, Executive Order 12044, "Improving Government Regulations," March 23, 1978, is at http://www.thecre.com/pdf/12044.PDF.

[55] Executive Order 12866, "Regulatory Planning and Review," September 30, 1993, at http://www.plainlanguage.gov/populartopics/regulations/eo12866.pdf. For a discussion of Executive Order 12866 and the regulatory review process, see CRS Report RL32397, *Federal Rulemaking: The Role of the Office of Information and Regulatory Affairs*, coordinated by Maeve P. Carey.

[56] For more information on cost and benefit considerations in CAA regulations, see CRS Report R44840, *Cost and Benefit Considerations in Clean Air Act Regulations*, by James E. McCarthy and Richard K. Lattanzio.

EPA conducted an RIA for the proposed reconsideration of the PM NAAQS.[57] In the RIA, EPA evaluated the proposed $PM_{2.5}$ annual standards of 9.0 and 10.0 $\mu g/m^3$, represented as 9/35 and 10/35, respectively, to illustrate the proposed annual and 24-hour standards. The RIA also reviewed an alternative $PM_{2.5}$ annual standard of 8.0 $\mu g/m^3$ (8/35), and an alternative annual standard of 10.0 $\mu g/m^3$ in combination with a 24-hour $PM_{2.5}$ standard of 30 $\mu g/m^3$ (10/30).[58]

In the RIA, EPA quantified the number and economic value of the estimated avoided premature deaths and illnesses attributable to applying hypothetical national control strategies for more stringent annual $PM_{2.5}$ standards with a sensitivity analysis for a more stringent 24-hour standard that reduces $PM_{2.5}$ concentrations in 2032.[59] The RIA estimates that the 2032 avoided premature mortalities for adults (ages 18-99) for the proposed annual standard of 9/35 would be 4,200 adults, with an annual monetized benefit ranging from $19 billion to $43 billion, and for the proposed annual standard of 10/35, the 2032 avoided premature mortalities for adults would be 1,700 adults, with an annual monetized benefit ranging from $7.6 billion to $17 billion. For the alternative annual standard of 8/35, the avoided premature mortality would be 9,200 adults, with an annual monetized benefit ranging from $41 billion to $95 billion, and for the alternative standard of 10/30, the avoided premature mortality would be 1,900 adults, with an annual monetized benefit ranging from $8.6 billion to $20 billion.[60]

In the RIA, EPA also estimated the annualized control costs attributable to applying hypothetical national control strategies for more stringent annual $PM_{2.5}$ standards. The RIA estimates that the 2032 annualized control costs for the proposed annual standard of 9/35 would be $393.3 million, and for the proposed annual standard of 10/35 it would be $94.5 million. For the alternative annual standard of 8/35, the 2032 annualized control costs would be $1.8 billion, and for the alternative standard of 10/30, it would be $257.2 million.[61]

Possible Impacts of a Lower Annual $PM_{2.5}$ NAAQS

Air agencies input monitoring data into the AQS and certify the data on an annual basis. Certification of air monitoring data and accompanying reports are due to EPA May 1 of each year.[62] If the proposed revision is finalized, the designation process will not be based on past or

[57] EPA develops Regulatory Impact Analyses (RIAs) to support the development of national air pollution regulations. RIAs contain descriptions of the potential social benefits and social costs of a regulation, including those that cannot be quantified in monetary terms and a determination of the potential net benefits of the rule, including an evaluation of the effects that are not monetarily quantified. For more information on EPA RIAs, see EPA, "Regulatory Impact Analyses for Air Pollution Regulations," at https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/regulatory-impact-analyses-air-pollution.

[58] EPA, "Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter," at https://www.epa.gov/system/files/documents/2023-01/naaqs-pm_ria_proposed_2022-12.pdf.

[59] The NAAQS RIAs hypothesize the control strategies that states may choose to enact when implementing a revised NAAQS; individual states will formulate air quality management plans whose mix of emissions controls may differ substantially from those simulated in an RIA. Hence, NAAQS RIAs are illustrative.

[60] Table 5-5 of the RIA for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter includes the avoided mortality and avoided morbidity for the proposed and alternative PM NAAQS. The estimated monetized benefits are summarized in Tables 5-8 and 5-9; see https://www.epa.gov/system/files/documents/2023-01/naaqs-pm_ria_proposed_2022-12.pdf.

[61] Chapter 4 of the RIA for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter includes the engineering cost analyses with the annual control costs summarized in Tables 4-1 through 4-5; see https://www.epa.gov/system/files/documents/2023-01/naaqs-pm_ria_proposed_2022-12.pdf.

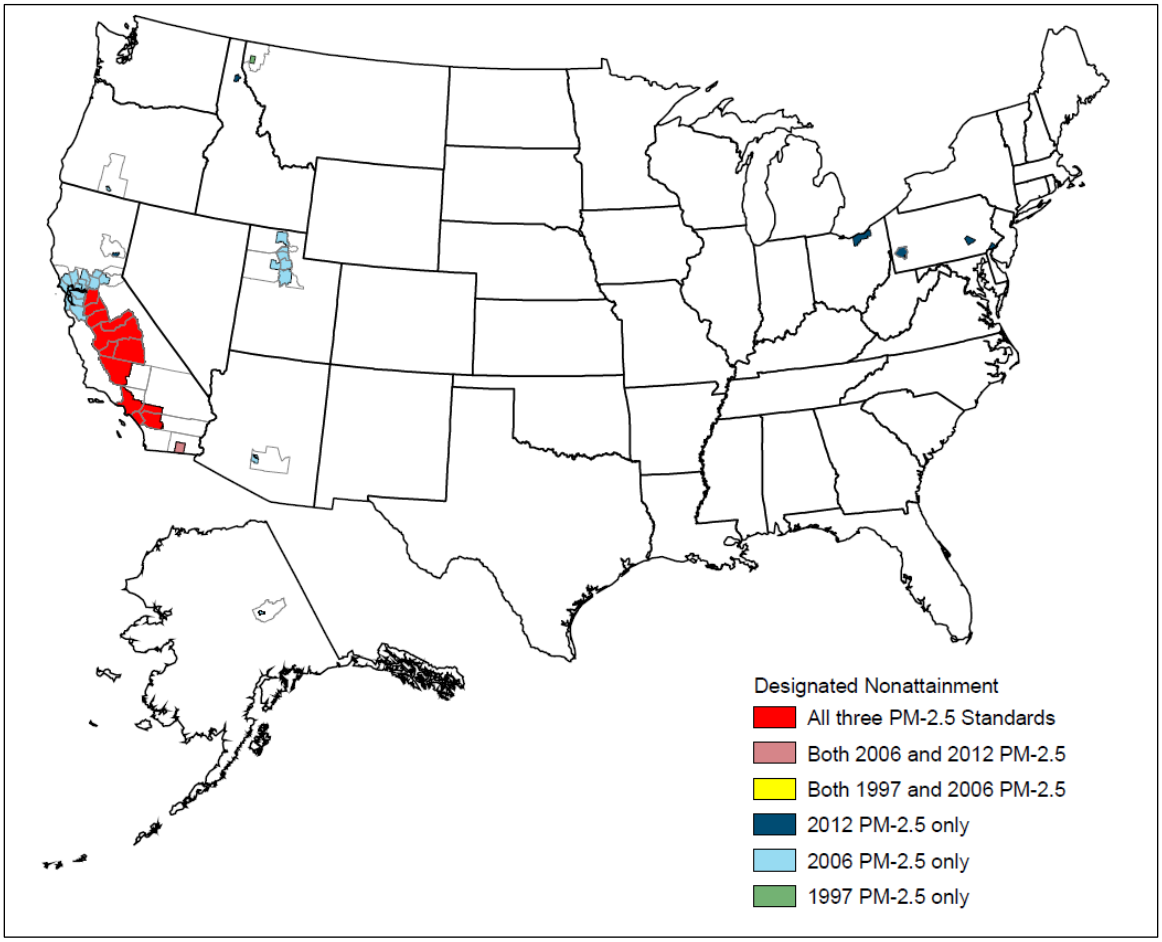
[62] For more information on air monitoring data and the certification process see EPA, "Questions and Answers on Ambient Air Monitoring Data Certification for CY2022 Data," at https://www.epa.gov/system/files/documents/2022-12/Ambient%20Air%20Monitoring%20Data%20Certification%20QA%20for%20CY2022%20FINAL.pdf.

current monitoring data; rather, the process will partly use monitoring data that either have not yet been certified or have not yet been collected. EPA estimates that the data likely to be used for the designation process will be 2021-2024 monitoring data.

For the current existing $PM_{2.5}$ NAAQS (1997, 2006, and 2012 standards), several areas remain nonattainment. **Figure 1** illustrates the areas that are nonattainment for one or more of the current $PM_{2.5}$ standards.

Figure 1. Areas Currently (2023) Designated Nonattainment for a $PM_{2.5}$ Standard

(existing $PM_{2.5}$ include the 1997, 2006, and 2012 standards)



Source: U.S. Environmental Protection Agency (EPA), Green Book Area Maps for Counties Designated Nonattainment for PM-2.5 (1997), PM-2.5 (2006), and/or PM-2.5 (2012), at https://www3.epa.gov/airquality/greenbook/mappm25both.html.

Notes: Nonattainment areas are indicated by color and current as of July 31, 2023. When only a portion of a county is shown in color, it indicates that only part of the county is within a nonattainment area boundary. Hawaii is not included, because there are no areas designated nonattainment in Hawaii.

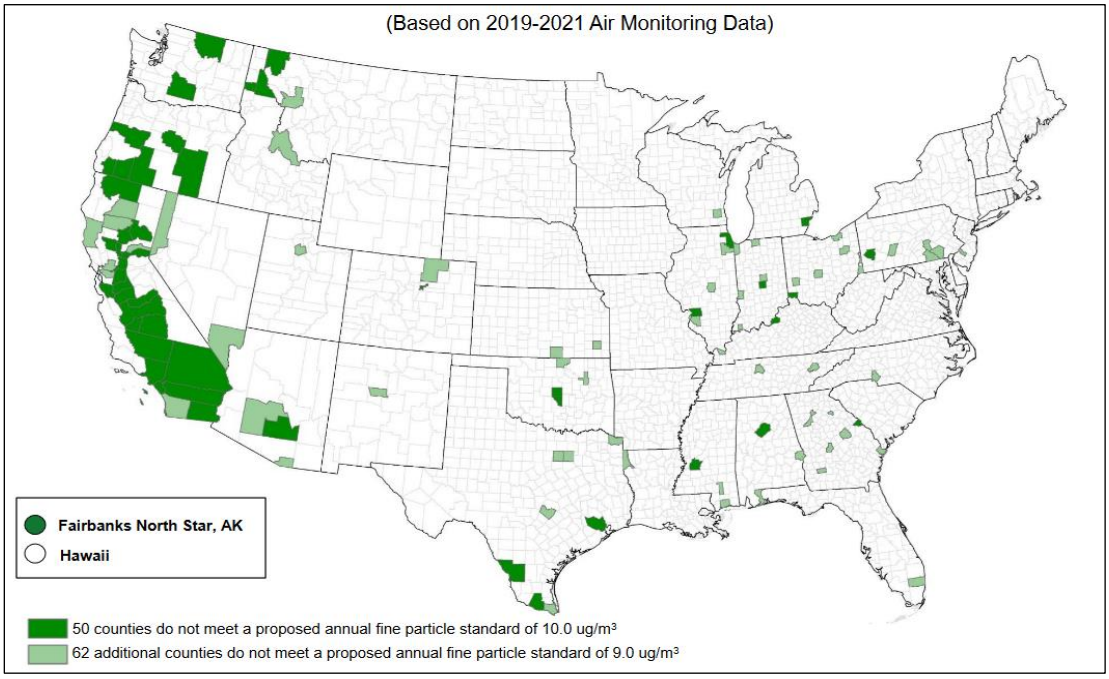
Available complete county-level $PM_{2.5}$ three-year design values (collected over 2019-2021) can be used to identify the counties that could possibly be affected by a reconsidered $PM_{2.5}$ annual NAAQS.[63] For example, **Figure 2** illustrates the location of counties listed in **Table B-1**, which

[63] A *design value* is a statistic that describes the air quality status of a given location relative to the level of the NAAQS (as described in 40 C.F.R. Part 50). The $PM_{2.5}$ design value is described in Appendix N of 40 C.F.R. Part 50.

lists the counties that exceed the proposed PM2.5 standard of 9.0 μg/m^3 based on their 2019-2021 design values.

These counties are highlighted for illustrative purposes only, and the figure is not intended to project or predict the outcome of any forthcoming designation process. Future area designations (attainment/nonattainment) will not be based on these data, but likely on monitoring data collected between 2021 and 2024.

Figure 2. Areas That Would Likely Not Meet the Proposed $PM_{2.5}$ NAAQS Based on Their 2019-2021 Design Values



Source: U.S. Environmental Protection Agency (EPA), Proposed Decision for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (PM), at https://www.epa.gov/system/files/documents/2023-01/PM%20Maps%20-%202022%20proposal%20%282%29.pdf.

Notes: Map reflects monitored counties with complete monitoring data. Future area designations will not be based on these data, but on future monitoring data. Of the 112 counties with 2019-2021 design values above 9.0 μg/m^3, 24 counties are totally or partially contained in nonattainment areas for the current 2012 $PM_{2.5}$ standards. These counties are highlighted for illustrative purposes only, and the figure is not intended to project or predict the outcome of any forthcoming designation process. Future area designations will not be based on these data, but likely on monitoring data collected between 2021 and 2024.

Counties meeting the current standard likely would not meet a lowered standard, based on current measurements. The number of counties not meeting a lowered standard would depend on the new standard, with more stringent standards having a higher number of nonattainment counties. For example, 88 counties meeting the current standard would not meet the proposed 9.0 μg/m^3 level based on their 2019-2021 $PM_{2.5}$ design values.

EPA SIP Requirements and Implementation Rules

After EPA finalizes a new or revised NAAQS, Section 110(a)(1) of the CAA requires states to submit new or revised SIPs that provide for implementation, maintenance, and enforcement of that NAAQS. All states are required to submit SIPs that include the basic program requirements

for managing air quality required in Section 110(a)(2) of the CAA showing that they have the capacity to attain, maintain, and enforce the revisions associated with a new or revised NAAQS.[64] These *infrastructure SIP* (iSIP) submissions must address several basic elements, including

- ambient air quality monitoring and data systems,
- programs for enforcement of control measures,
- adequate authority and resources to implement the plan, and
- prohibition of interstate pollution transport.

In the event EPA promulgates a new $PM_{2.5}$ annual standard, revised iSIPs must also demonstrate provisions adequate to ensure the states will not adversely affect other states' ability to attain the new NAAQS (known as the "good neighbor" provisions). EPA's implementation rule describes the requirements that states and tribes must meet in their implementation plans to achieve and maintain attainment. EPA typically issues a revised implementation rule after promulgating a new NAAQS.

Framework Used to Address the "Good Neighbor" Provisions

Section 110(a)(2)(D)(i) of the CAA contains elements that revised iSIPs must address. The first two elements require each state in its iSIP to demonstrate adequate provisions for the ability to prohibit air emissions within the state that (1) contribute significantly to another state's nonattainment of the NAAQS, or (2) interfere with another state's maintenance of the NAAQS.[65] These are often referred to as the good neighbor provisions.[66]

For the 2012 PM NAAQS, in March 2016, EPA issued a memorandum to provide guidance for states and tribes as they developed their PM iSIPs and addressed the required good neighbor provisions.[67] The memorandum was based on EPA's established framework previously used to address the good neighbor provisions and provided modeled potential future year $PM_{2.5}$ design values for $PM_{2.5}$ ambient monitors throughout the United States.[68] The memorandum also described how these projected potential design values could be used to help determine which air quality monitors should be further evaluated to potentially address situations where emissions from other states significantly contribute to nonattainment or interfere with maintenance of the 2012 $PM_{2.5}$ NAAQS at those monitoring sites.

EPA has developed a four-step framework to address states' good neighbor obligations. The four steps include

1. identifying downwind areas with monitors that are expected to have problems attaining or maintaining the NAAQS;

[64] 42 U.S.C. §7410.

[65] 40 C.F.R. §93.152. *Maintenance area* means any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under Section 175A of the CAA, as amended.

[66] 42 U.S.C. §7410(a)(2)(D)(i) also includes the provisions for the prevention of significant deterioration and protection of visibility that must be included in the iSIP.

[67] See EPA, "Information on the Interstate Transport 'Good Neighbor' Provision for the 2012 Fine Particulate Matter National Ambient Air Quality Standards Under Clean Air Act Section 110(a)(2)(D)(i)(I)," memorandum, March 17, 2016, at https://www.epa.gov/sites/default/files/2016-08/documents/good-neighbor-memo_implementation.pdf.

[68] Previous rulemakings applying this framework include the "Clean Air Interstate Rule Final Rule," 70 *Federal Register* 25162, May 12, 2005; and the "CSAPR Final Rule," 76 *Federal Register* 48208, August 8, 2011. The Supreme Court upheld CSAPR in *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489 (2014).

2. identifying which upwind states contribute to these identified problems in amounts sufficient to warrant further review and analysis;
3. for states identified as contributing to downwind air quality problems, identifying upwind emissions reductions necessary to prevent an upwind state from significantly contributing to nonattainment or interfering with maintenance of the NAAQS downwind; and
4. for states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, reducing the identified upwind emissions through adoption of permanent and enforceable measures.

For the 2012 $PM_{2.5}$ NAAQS, EPA noted that "with support from the modeling…, most states will be able to develop good neighbor SIPs that demonstrate that they do not contribute significantly to nonattainment or interfere with maintenance of the 2012 $PM_{2.5}$ NAAQS in any downwind state."[69]

Current PM NAAQS Requirements and Implementation Rule

EPA typically publishes an implementation rule that describes the requirements that states and tribes must meet in their implementation plans to achieve and maintain attainment. The rule also provides guidance and procedures for establishing controls to achieve and maintain attainment. In addition, the implementation rule generally includes guidance for submitting a SIP when reaching attainment within the required time frame is impractical. The implementation rule considers existing (and often pending) federal regulations that contribute to controlling criteria pollutants and their precursors.

The current PM implementation rule establishes planning requirements for states with areas that do not meet the NAAQS for the $PM_{2.5}$ standards. These states must develop plans that demonstrate how they will meet the standards.[70] Nonattainment areas are initially classified as Moderate. See **Appendix C** for a list of the Moderate plan requirements. EPA is not proposing to revise the $PM_{2.5}$ Implementation Rule (i.e., 40 C.F.R. §51, Subpart Z) at this time.

If a Moderate nonattainment area fails to attain by the applicable date or the extension date, or if EPA determines the area cannot practicably attain by that date, it is then likely reclassified as a Serious nonattainment area. See **Appendix C** for a list of the Serious plan requirements.

If an area is reclassified from Moderate nonattainment to Serious nonattainment, its major stationary source threshold, for sources subject to permitting and controls, is reduced from 100 tons per year (tpy) to 70 tpy.[71] In addition, Moderate nonattainment areas require Reasonably Available Control Measures and Technology (RACM/RACT) to be implemented as expeditiously as possible. When an area is reclassified to Serious, in addition to the threshold being lowered, the area implements Best Available Control Measures and Technology (BACM/BACT). BACM is more stringent than RACM, and it may achieve greater reductions in $PM_{2.5}$ and its precursor pollutants than do the RACM control measures. Finally, if the state requests an extension for an

[69] See Conclusion section on page 7 of EPA, "Information on the Interstate Transport 'Good Neighbor' Provision for the 2012 Fine Particulate Matter National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I)," memorandum, March 17, 2016, at https://www.epa.gov/sites/default/files/2016-08/documents/good-neighbor-memo_implementation.pdf.

[70] The provisions for implementation of the $PM_{2.5}$ NAAQS are codified at 40 C.F.R. §51, Subpart Z.

[71] A *major stationary source* is any stationary source of air pollutants that emits, or has the potential to emit, 100 tons per year or more of any regulated NSR pollutant, unless a lower threshold applies. 40 U.S.C. §51.165(a)(1)(iv)(A).

area's Serious nonattainment date, it must demonstrate that the SIP for the area includes the Most Stringent Measures (MSM). See **Appendix C** for further information on RACM, BACM, and MSM.

The implementation rule identifies sulfur dioxide (SO_2), oxides of nitrogen (NO_x), volatile organic compounds (VOC), and ammonia as $PM_{2.5}$ precursors that may be addressed in attainment planning and NNSR permitting. It also authorizes a state not to adopt control requirements to reduce emissions of a particular $PM_{2.5}$ precursor if the state adequately demonstrates that the precursor does not contribute significantly to $PM_{2.5}$ levels that exceed the NAAQS in a $PM_{2.5}$ nonattainment area.

Exceptional Events and the NAAQS

EPA's NAAQS regulations rely on ambient air quality data. Section 319(a) authorizes the establishment of a national ambient air quality network to provide data that EPA then uses in developing NAAQS. Congress has recognized that some data collected through that network may not be appropriate for consideration in developing the NAAQS. In 2005, Congress amended CAA Section 319 to include the exceptional events provision.[72] Section 319(b) defines an exceptional event, directs the EPA Administrator to establish exceptional events regulations, and lists the principles and requirements for establishing the exceptional events guidance. Section 319(b) also authorizes EPA to exclude air monitoring data influenced by exceptional events when making certain regulatory determinations, such as establishing area designations under a NAAQS.[73]

Exceptional events may include wildfires, prescribed fires, high-wind dust events, stratospheric ozone intrusions, and volcanic and seismic activities. If a state wishes to have EPA exclude air monitoring data, it must submit to EPA an "exceptional events demonstration," which documents how the exceptional event caused an exceedance of the NAAQS for any of the criteria pollutants.[74]

The 2016 Exceptional Events Rule (40 C.F.R. §50.14(c)(3)) states that an exceptional event demonstration must include the following elements:

- a narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s);
- a demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation;
- analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times (the EPA Administrator shall not require a state to prove a specific percentile point in the distribution of data);
- a demonstration that the event was both not reasonably controllable and not reasonably preventable;

[72] EPA finalized a rule to govern the review and handling of air quality monitoring data influenced by exceptional events in 2007; see 55 *Federal Register* 13560, March 22, 2007.

[73] 42 U.S.C. §7619(b)(3)(B) states regulations shall provide criteria and procedures for the governor of a state to petition the EPA Administrator to exclude air quality monitoring data that is directly affected by an exceptional event from use in determinations with respect to exceedances or violations of the NAAQS.

[74] For more information, see CRS Insight IN12194, *Wildfire Smoke and Air Quality*, by James D. Werner.

- a demonstration that the event was caused by human activity that is unlikely to recur at a particular location or was a natural event; and
- documentation that the submitting air agency followed the public comment process.

If the current annual $PM_{2.5}$ NAAQS is revised, certain exceptional events, which would otherwise not have regulatory significance, would require an exceptional events demonstration and concurrence by EPA.[75] In establishing area designations, EPA concurrence on an exceptional events demonstration means the air quality data affected by the event will be excluded from the NAAQS designation process.

Prescribed Fires and Wildfire Exceptional Events

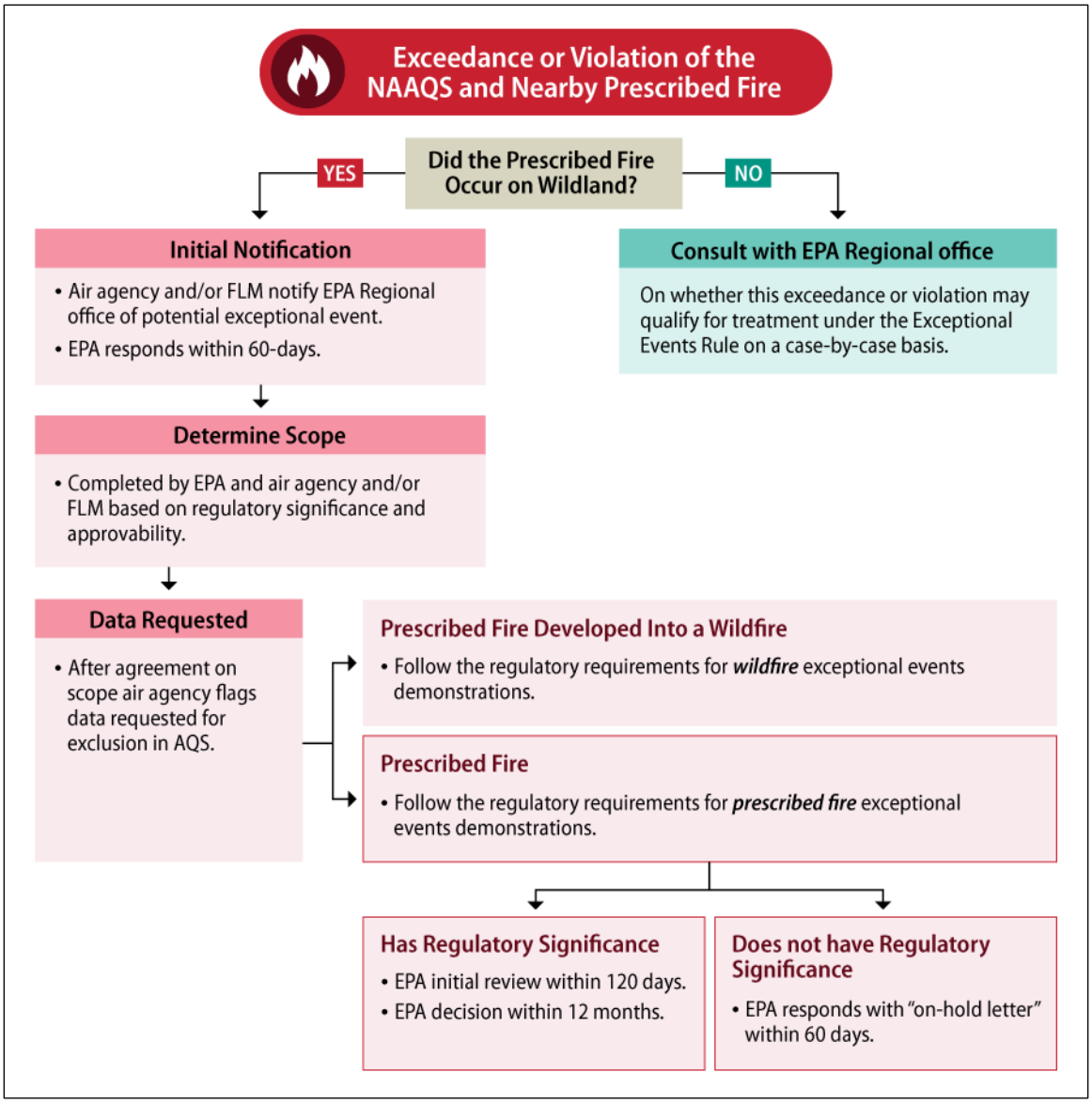
In addition to the 2016 Exceptional Events Rule, EPA published 2019 exceptional events guidance for prescribed fires on wildlands that may influence PM concentrations.[76] In that guidance, EPA explained when it is appropriate to develop an exceptional events demonstration for prescribed fires. The air quality impacts of prescribed fires are often less severe than uncontrolled wildfires, because prescribed fires are conducted under specific conditions on specific days.[77]

[75] The 2016 Exceptional Events Rule applies to several types of regulatory determinations made by the EPA Administrator, as specified in 40 C.F.R. §50.14(a)(1). Among the determinations that would have regulatory significance is an action to designate an area, pursuant to Clean Air Act Section 107(d)(1), or redesignate an area, pursuant to Clean Air Act Section 107(d)(3), for a particular NAAQS.

[76] EPA, "Exceptional Events Guidance for Prescribed Fires," August 2019, at https://www.epa.gov/sites/default/files/2019-08/documents/ee_prescribed_fire_final_guidance_-_august_2019.pdf.

[77] For more information on prescribed fires, see CRS Report R40811, *Wildfire Fuels and Fuel Reduction*, by Katie Hoover.

Figure 3. Prescribed Fire Exceptional Events Process



Source: Congressional Research Service, based on data adapted from the U.S. Environmental Protection Agency (EPA), *"Exceptional Events* Guidance for Prescribed Fires," August 2019, at https://www.epa.gov/sites/default/files/2019-08/documents/ee_prescribed_fire_final_guidance_-_august_2019.pdf.

Notes: FLM = Federal Land Manager. AQS = Air Quality System.

Figure 3 illustrates that the process begins if there is an exceedance or violation of the PM NAAQS and a nearby prescribed fire. Because the $PM_{2.5}$ NAAQS annual standard is an annual average, air agencies and/or Federal Land Managers (FLMs) must track these prescribed burns and determine if they had any regulatory significance.[78] If the prescribed fire did not occur on wildlands, the air agency consults with its EPA regional office to complete the exceptional events

[78] 16 U.S.C. §470bb. A *Federal Land Manager* (FLM) means, with respect to any public lands, the Secretary of the department, or the head of any other agency or instrumentality of the United States, having primary management authority over such lands.

process.[79] If prescribed burn is on wildlands, the air agency and/or FLM provide initial notification to the EPA regional office and work collaboratively to determine the scope of the exceptional event. This includes the relevant dates, monitors that have regulatory significance, and EPA approvability considerations. Next, the air agency flags the data in AQS and completes the demonstration in accordance with the exceptional events guidance. The demonstration is submitted to EPA, and EPA responds either with an "on-hold letter" within 60 days or an initial review within 120 days for demonstrations that are deemed to have regulatory significance. If there is regulatory significance, EPA issues its decision on the demonstration within 12 months, either concurring with the AQS flagged data or not concurring.

The need for an exceptional events demonstration is dependent on the time, duration, location, and impact of the prescribed fire, in addition to the regulatory significance and the status of the affected monitor(s). EPA has issued updates to its "Exceptional Events Rule: Frequently Asked Questions" document,[80] "Exceptional Events Guidance: Prescribed Fire on Wildland,"[81] and its "Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events."[82]

Issues for Consideration

Because the health and economic consequences of PM standards are potentially significant, the PM NAAQS are likely to remain an issue of interest during the 118th Congress.

Issues Regarding the PM NAAQS

EPA actions to establish or modify NAAQS have no direct impact on air pollution control or costs. EPA is mandated to issue primary NAAQS based solely on scientific considerations "allowing an adequate margin of safety…requisite to protect the public health." Nonetheless, the values established for NAAQS have a cascading series of indirect impacts, including requirements and associated costs for pollution control equipment, State Implementation Plans, individual facility and emissions unit permits, and morbidity and mortality impacts resulting from decreased ambient concentrations of certain air pollutants.

Analyses indicate a revised PM NAAQS could result in fewer adverse health effects among the general population—particularly within sensitive populations such as children, asthmatics, and the elderly—as well as improved welfare effects.[83] However, concerns remain regarding the associated compliance costs of a more stringent standard.

[79] EPA has 10 regional offices, each of which is responsible for the execution of their programs within several states and territories in their jurisdiction. See EPA, "Regional and Geographic Offices," at https://www.epa.gov/aboutepa/regional-and-geographic-offices.

[80] See EPA, "2016 Revisions to the Exceptional Events Rule: Update to Frequently Asked Questions", at https://www.epa.gov/sites/default/files/2019 07/documents/updated_faqs_for_exceptional_events_final_2019_july_23.pdf.

[81] See EPA, "Exceptional Events Guidance: Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations," at https://www.epa.gov/sites/default/files/2019-08/documents/ee_prescribed_fire_final_guidance_ _august_2019.pdf.

[82] See EPA, "Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations," at https://www.epa.gov/sites/default/files/2018-10/documents/exceptional_events_guidance_9-16-16_final.pdf.

[83] See Section 3.3, "Health Effects Evidence," in EPA's final "Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter," at https://www.epa.gov/system/files/documents/2022-05/Final%20Policy%20Assessment%20for%20the%20Reconsideration%20of%20the%20PM%20NAAQS_May2022_0.pdf.

The evolution and development of the PM NAAQS have been the subject of extensive congressional oversight.[84] EPA not performing timely review and revision of the NAAQS as required under the CAA has also been an area of concern to some in Congress and others.

Commenters had a wide range of feedback on the proposed reconsideration of the $PM_{2.5}$ NAAQS. Some commenters called for the annual standard to remain unchanged, citing "harm to businesses and workers up and down the supply chain."[85] Some commenters called for the annual standard to be set at 11.0 $\mu g/m^3$, arguing that "uncertainties remain in the current epidemiological evidence."[86]

Some commenters agreed with the proposal, stating that "a move to reduce the burden of fine particulate matter pollution is a move towards justice."[87] Others called for the annual standard to be set at the higher end of the proposed range of 9.0 to 10.0 $\mu g/m^3$, stating that "our preference for the 10 $\mu g/m^3$ standard reflects the concerns expressed by CASAC members about the scientific and technical bases for a more substantial reduction of the current 12 $\mu g/m^3$ standard. Our views also are influenced by the potential adverse job impacts of creating new or expanded nonattainment areas under a standard of 8 or 9 $\mu g/m^3$."[88]

Some commenters noted that the proposed reconsideration is "neither stringent enough to promote ... health and safety ... nor establish clean air," arguing that the annual standard should be set at 8.0 $\mu g/m^3$ and the 24-hour standards should be no higher than 25.0 $\mu g/m^3$.[89] Similarly, a coalition of 18 state attorneys general called for the annual standard to be set at 8.0 $\mu g/m^3$ and the 24-hour standards to be in a range of 25.0 to 30.0 $\mu g/m^3$.[90] Some noted that if the EPA does not lower the annual standard to 8.0 $\mu g/m^3$ and the 24-hour standards to 25.0 $\mu g/m^3$, then "the Agency should at least lower the standard for communities of color and communities with low income,

[84] U.S. Congress, Senate Committee on Environment and Public Works, *The Science and Risk Assessment Behind the EPA's Proposed Revisions to the Particulate Matter Air Quality Standards*, July 19, 2006; U.S. Congress, Senate Committee on Environment and Public Works, Subcommittee on Clean Air, Climate Change, and Nuclear Safety, *EPA's Proposed Revisions to the Particulate Matter Air Quality Standards*, July 13, 2006; U.S. Congress, Senate Committee on Environment and Public Works, Subcommittee on Clean Air, Climate Change, and Nuclear Safety, *Implementation of the Existing Particulate Matter and Ozone Air Quality Standards*, November 10, 2005; and U.S. Congress, House Energy and Commerce, Subcommittee on Energy and Power, *The American Energy Initiative, Part 21: A Focus on the New Proposal by the Environmental Protection Agency To Tighten National Standards for Fine Particulate Matter in the Ambient Air*, June 28, 2012. See also Letter from 47 Members of the House of Representatives to the U.S. EPA Administrator, November 21, 2012, at http://latta.house.gov/uploadedfiles/2012_11_29_final_pm2_5_letter_signed_w_attchmt.pdf.

[85] See Comment from Georgia State Representative Doug Stoner to Members of the Environmental Protection Agency (EPA), March 29, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1958.

[86] See Letter from the Alamo Area Council of Governments (AACOG) to the EPA Administrator Michael S. Regan, February 22, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1891.

[87] See Letter from Mass Comment Campaign sponsored by National Religious Partnership for the Environment to Mr. Michael S. Regan, Administrator, March 23, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1921.

[88] See Letter from Unions for Jobs & Environmental Progress (UJEP) to U.S. Environmental Protection Agency, February 10, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1748.

[89] See Letter from District of Columbia Department of Energy and Environment to U.S. Environmental Protection Agency, March 29, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1995.

[90] See Letter from the Attorneys General for the States of California, Connecticut, Delaware, Illinois, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Washington, and Wisconsin, the District of Columbia, and the City of New York on the EPA Administrator's Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, March 28, 2023, at https://oag.ca.gov/system/files/attachments/press-docs/2023-03-28%20AGO%20Coalition%20-%20PM%20NAAQS%20Comment%20Letter.pdf.

i.e., EJ communities."[91] Other commenters noted that the proposed standard "is too high to protect health," and, according to World Health Organization (WHO) guidelines, the annual $PM_{2.5}$ NAAQS should be no more than 5.0 $\mu g/m^3$.[92]

Changes to the NAAQS have historically triggered litigation alleging that the standards are too stringent or not stringent enough, often resulting in delays in implementation. The agency's final designations of nonattainment areas and the proposed $PM_{2.5}$ NAAQS are expected to generate further interest and oversight.

Issues Regarding Exceptional Events

Persistent drought in some areas and changes to the timing, duration, and intensity of wildfire seasons have occurred.[93] The number of acres affected annually by wildfires, while variable, generally has increased.[94] This has raised concerns about the emissions from these fires affecting air quality, and whether EPA air quality protection programs address these emissions effectively. EPA's implementation of the exceptional events provision has received criticism and attention from some stakeholders. For example, states raised several concerns about implementation of the rule, such as administrative burden on state agencies, consistency across EPA regions, complexities of documenting evidence, and the clarity of requirements and definitions.[95]

Some in Congress and some state and local air agencies have expressed concern regarding the resources expected to be needed for documenting exceptional events should EPA promulgate a lower annual standard for $PM_{2.5}$. If the $PM_{2.5}$ NAAQS is lowered, more wildfires would qualify as regulatorily significant and require exceptional event demonstrations. Some commenters noted the following:

> If the annual standard for $PM_{2.5}$ is lowered to 10 $\mu g/m^3$or lower, Maricopa County will spend considerable resources documenting the effect of exceptional events on air quality, to have those events excluded from regulatory consideration. In the past, it has cost tens of thousands of dollars in staff time to complete a single demonstration that an exceedance was caused by wildfire smoke, rather than inadequate local controls. Lowering the annual standard will require more exceptional event demonstrations, resulting in a significant increase in workload for the State of Arizona and Maricopa County, with no benefit to air quality or public health. These resources would be better spent on local programs to reduce $PM_{2.5}$ concentrations and to protect human health when the area is impacted by wildfire smoke and dust storms.[96]

[91] See Draft Letter from the White House Environmental Justice Advisory Council to The Honorable Ms. Brenda Mallory, Chair, The Council on Environmental Quality, June 15, 2023, at https://insideepa.com/sites/insideepa.com/files/documents/2023/jun/epa2023_1106.pdf.

[92] See Letter from District of Physicians for Social Responsibility (PSR) to U.S. Environmental Protection Agency, March 15, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1935.

[93] See CRS Report R43429, *Federal Lands and Related Resources: Overview and Selected Issues for the 118th Congress*, coordinated by Katie Hoover.

[94] See CRS In Focus IF10244, *Wildfire Statistics*, by Katie Hoover and Laura A. Hanson.

[95] See comments from Arizona Department of Environmental Quality (ADEQ), Alabama Prescribed Fire Council (ALPFC), Washington State Department of Ecology**,** Texas Commission on Environmental Quality (TCEQ), Nevada Division of Environmental Protection (NDEP), Georgia Environmental Protection Division (EPD), and Virginia Department of Environmental Quality (DEQ) to the Environmental Protection Agency, at https://www.regulations.gov/document/EPA-HQ-OAR-2015-0229-0001/comment.

[96] See Letter from the Maricopa County Air Quality Department (MCAQD) to U.S. Environmental Protection Agency, "Re: Docket EPA-HQ-OAR-2015-0072, Proposed Rule, Reconsideration of the 2020 National Ambient Air Quality Standards for Particulate Matter (88 *Federal Register* 5558, January 27, 2023)," March 8, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-1898.

Some have also called for "expanding the EPA Exceptional Events Rule for prescribed fire" to include a wider range of prescribed fires that are currently regulatorily significant under the rule.[97] Not all prescribed fire exceptional event demonstrations are deemed to have regulatory significance. Some commenters noted the following:

> Prescribed fire, which is being used more frequently with the aim of preventing or curbing more dangerous fires, also poses $PM_{2.5}$ problems in some areas. It is important that EPA's exceptional events rule and guidance be viewed through the lens of state and local air agencies' struggles and that a concerted collaborative initiative be undertaken right away by EPA and state and local air agencies to identify and discuss issues of concern and approaches for addressing them in a way that facilitates reasonable exceptional events demonstrations and EPA approval of them and, at the same time, ensures protection of public health.[98]

Some commenters noted that the proposed $PM_{2.5}$ NAAQS would "impede the use of beneficial fire in fire-dependent ecosystems, countering EPA's own support, by limiting the number of weather-appropriate days available to public, private, and tribal fire practitioners to implement beneficial fire across the United States."[99] They note that a revised $PM_{2.5}$ NAAQS could affect and jeopardize the use of prescribed fires used to maintain tallgrass prairies in the Flint Hills of Kansas and Oklahoma and prescribed fires in Idaho, Iowa, and Georgia where officials rely on the $PM_{2.5}$ NAAQS to decide prescribed burn days. They also note that the proposed $PM_{2.5}$ NAAQS could "place undue burden upon fire practitioners and state air quality regulatory agencies to submit technically demanding and expensive Exceptional Event Demonstrations."[100]

Congress may wish to ask EPA to revisit the 2016 Exceptional Events Rule and subsequent guidance documents to address process-based concerns regarding wildfire- and prescribed-fire-related exceptional events.

[97] See Letter from the Georgia Prescribed Fire Council (GPFC) to the Honorable Michael S. Regan, Administrator, March 27, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-2086.

[98] See Letter from the National Association of Clean Air Agencies (NACAA) to the U.S. Environmental Protection Agency, March 28, 2023, at https://www.4cleanair.org/wp-content/uploads/NACAA_Comments-EPA_Proposed_PM_NAAQS_Recon-032823-lh.pdf.

[99] *Beneficial fire* is defined as prescribed fire, cultural burning practiced by Indigenous peoples and tribes, and managed wildfire; see Letter from The Nature Conservancy (TNC) to the Honorable Michael Regan, Administrator, March 28, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-2219.

[100] See Letter from The Nature Conservancy (TNC) to the Honorable Michael Regan, Administrator, March 28, 2023, at https://www.regulations.gov/comment/EPA-HQ-OAR-2015-0072-2219.

Appendix A. PM NAAQS Chronology

Table A-1. Timeline of Particulate Matter (PM) National Ambient Air Quality Standards (NAAQS)

History of the NAAQS for Particulate Matter, from 1971 to 2023

Year	Final Rule/Decision	Primary/ Secondary	Indicator	Averaging Time	Level[a]	Form
1971[b]	36 *Federal Register* 8186 April 30, 1971	Primary[c]	TSP[d]	24-hour	260	Not to be exceeded more than once per year
				Annual	75	Annual geometric mean
		Secondary	TSP	24-hour	150	Not to be exceeded more than once per year
				Annual	60	Annual geometric mean
1987	52 *Federal Register* 24634 July 1, 1987	Primary and Secondary	PM_{10}	24-hour	150	Not to be exceeded more than once per year on average over a three-year period
				Annual	50	Annual arithmetic mean, averaged over three years
1997	62 *Federal Register* 38652 July 18, 1997	Primary and Secondary	$PM_{2.5}$	24-hour	65	98th percentile, averaged over three years
				Annual	15.0	Annual arithmetic mean, averaged over three years[ef]
			PM_{10}	24-hour	150	Not to be exceeded more than once per year on average over a three-year period[g]
				Annual	50	Annual arithmetic mean, averaged over three years
2006	71 *Federal Register* 61143 December 18, 2006	Primary and Secondary	$PM_{2.5}$	24-hour	35	98th percentile, averaged over three years[h]
				Annual	15.0	Annual arithmetic mean, averaged over three years
			PM_{10}	24-hour	150	Not to be exceeded more than once per year on average over a three-year period
				Annual	—	EPA revoked the annual PM_{10} NAAQS
2012	78 *Federal Register* 3085	Primary	$PM_{2.5}$	Annual	12.0	Annual arithmetic mean, averaged over three years

Year	Final Rule/Decision	Primary/ Secondary	Indicator	Averaging Time	Level[a]	Form
	January 15, 2013	Secondary		Annual	15.0	Annual arithmetic mean, averaged over three years
		Primary and Secondary		24-hour	35	98th percentile, averaged over three years
		Primary and Secondary	PM_{10}	24-hour	150	Not to be exceeded more than once per year on average over a three-year period
2020	Primary and secondary standards retained without revision 85 *Federal Register* 82684 December 18, 2020					
2023[i]	88 *Federal Register* 5558[j] January 27, 2023	Primary	$PM_{2.5}$	Annual	8.0 to 11.0[k]	Annual arithmetic mean, averaged over three years
		Secondary		Annual	15.0	Annual arithmetic mean, averaged over three years (proposed unchanged)
		Primary and Secondary		24-hour	35	98th percentile, averaged over three years (proposed unchanged)
		Primary and Secondary	PM_{10}	24-hour	150	Not to be exceeded more than once per year on average over a three-year period (proposed unchanged)

Source: CRS, based on data adapted from the U.S. Environmental Protection Agency, (EPA), "Timeline of Particulate Matter (PM) National Ambient Air Quality Standards (NAAQS)," at https://www.epa.gov/pm-pollution/timeline-particulate-matter-pm-national-ambient-air-quality-standards-naaqs.

a. Units of measure are micrograms per cubic meter of air, $\mu g/m^3$.

b. EPA set its first particulate matter standards in 1971. The first standards were based on total suspended particulate matter (TSP). Monitors for TSP detected particles up to 45 micrometers (μm) in diameter. State-specific smoke and soot regulations date as far back as the 1930s and helped inform EPA's first standard. For example, see Missouri Department of Natural Resources, "Missouri Skies Now and Then," at https://dnr.mo.gov/air/hows-air/missouri-skies-now-then.

c. *Primary standards* are those whose attainment and maintenance, "in the judgment of the [EPA] Administrator ... are requisite to protect the public health" with "an adequate margin of safety." *Secondary standards* are those necessary to protect *public welfare*, a broad term that includes visibility impairment as well as damage to crops and vegetation, and effects on soil and nutrient cycling, water, wildlife, property, and building materials, among other things (42 U.S.C. §7409).

d. TSP = total suspended particles.

e. The level of the annual standard is defined to one decimal place (i.e., 15.0 $\mu g/m^3$) as determined by rounding. For example, a three-year average annual mean of 15.04 $\mu g/m^3$ would round to 15.0 $\mu g/m^3$ and thus meet the annual standard, and a three-year average of 15.05 $\mu g/m^3$ would round to 15.1 $\mu g/m^3$ and hence violate the annual standard (40 C.F.R. Part 50, Appendix N).

f. The level of the standard was to be compared to measurements made at sites that represent "community-wide air quality" recording the highest level, or, if specific requirements were satisfied, to average measurements from multiple community-wide air quality monitoring sites ("spatial averaging").

g. Initially promulgated as 99th percentile, averaged over three years; when 1997 standards for PM_{10} were vacated, the form of 1987 standards remained in place. See 69 *Federal Register* 45592, July 30, 2004.

h. The level of the 24-hour standard is defined as an integer (zero decimal places) as determined by rounding. For example, a three-year average 98th percentile concentration of 35.49 μg/m^3 would round to 35 μg/m^3 and thus meet the 24-hour standard, and a three-year average of 35.50 μg/m^3 would round to 36 μg/m^3 and hence violate the 24-hour standard (40 C.F.R. Part 50, Appendix N).

i. This is a proposed reconsideration of the 2020 PM NAAQS Final Action.

j. Proposed rule.

k. The proposed rule would lower the standard to a range between 9.0 and 10.0 μg/m^3 while taking comment on alternative annual standard levels from 8.0 μg/m^3 to 11.0 μg/m^3.

Appendix B. PM Design Values

Table B-1 illustrates the counties that exceed the proposed $PM_{2.5}$ standard of 9.0 μg/m^3 based on their 2019-2021 design values.

Table B-1. Fine Particle Annual Design Values for Counties with Monitoring Data

(based on air quality data from 2019 to 2021)

State	County	2019-2021 Annual Design Value (μg/m^3)[a]	Currently in a $PM_{2.5}$ Nonattainment Area[b]
Alabama	**Jefferson**	**11.0**	**No**
Alabama	Russell	9.3	No
Alaska	**Fairbanks North Star**	**13.2**	**Yes**
Arizona	Maricopa	9.8	No
Arizona	Santa Cruz	10.0	No
Arizona	**Pinal**	**13.0**	**Yes**
California	**Butte**	**11.4**	**No**
California	**Colusa**	**10.4**	**No**
California	Mendocino	9.2	No
California	Nevada	9.7	No
California	San Diego	9.6	No
California	Shasta	9.5	No
California	**Siskiyou**	**10.5**	**No**
California	**Sutter**	**13.1[c]**	**No**
California	Tehama	9.8	No
California	Contra Costa	9.3	Yes
California	**Fresno**	**15.3**	**Yes**
California	**Imperial**	**11.0**	**Yes**
California	**Kern**	**17.8**	**Yes**
California	**Kings**	**15.9**	**Yes**
California	**Los Angeles**	**13.0**	**Yes**
California	**Madera**	**13.0**	**Yes**
California	**Merced**	**11.9**	**Yes**
California	**Orange**	**11.1**	**Yes**
California	**Placer**	**10.4**	**Yes**
California	**Plumas**	**16.5**	**Yes**
California	**Riverside**	**13.9**	**Yes**

State	County	2019-2021 Annual Design Value ($\mu g/m^3$)[a]	Currently in a $PM_{2.5}$ Nonattainment Area[b]
California	**Sacramento**	**11.1**	**Yes**
California	**San Bernardino**	**14.2**	**Yes**
California	**San Joaquin**	**11.8**	**Yes**
California	**Santa Clara**	**10.3**	**Yes**
California	Solano	9.7	Yes
California	**Stanislaus**	**13.0**	**Yes**
California	**Tulare**	**17.8**	**Yes**
Colorado	**Denver**	**10.2**	**No**
Colorado	Weld	9.5	No
Florida	Broward	9.2	No
Florida	Escambia	9.2	No
Georgia	Chatham	9.3	No
Georgia	Clarke	9.4	No
Georgia	Dougherty	9.5	No
Georgia	Fulton	9.6	No
Georgia	Houston	9.4	No
Georgia	**Richmond**	**11.1**	**No**
Georgia	Washington	9.2	No
Idaho	**Benewah**	**10.2**	**No**
Idaho	Lemhi	9.8	No
Idaho	**Shoshone**	**10.6**	**No**
Illinois	**Cook**	**10.4**	**No**
Illinois	Macon	9.4	No
Illinois	**Madison**	**10.2**	**No**
Illinois	Saint Clair	9.7	No
Illinois	Will	9.9	No
Indiana	Hamilton	9.8	No
Indiana	Lake	9.7	No
Indiana	**Marion**	**12.0**	**No**
Indiana	St. Joseph	9.2	No
Indiana	Vanderburgh	9.1	No
Indiana	Vigo	9.1	No
Kansas	Neosho	9.3	No

State	County	2019-2021 Annual Design Value (µg/m³)[a]	Currently in a $PM_{2.5}$ Nonattainment Area[b]
Kansas	Sumner	9.2	No
Kentucky	**Jefferson**	**10.5**	**No**
Kentucky	McCracken	9.2	No
Louisiana	Caddo	9.9	No
Michigan	**Wayne**	**11.5**	**No**
Mississippi	Forrest	9.4	No
Mississippi	Harrison	9.2	No
Mississippi	**Hinds**	**10.1**	**No**
Missouri	St. Louis City	9.2	No
Montana	**Lincoln**	**13.3**	**No**
Montana	Missoula	9.3	No
Nevada	Clark	10.0	No
Nevada	Washoe	9.7	No
New Jersey	Camden	9.4	No
New Mexico	Bernalillo	9.1	No
North Carolina	Mecklenburg	9.1	No
Ohio	Cuyahoga	9.5	No
Ohio	Franklin	9.1	No
Ohio	**Hamilton**	**11.0**	**No**
Ohio	Montgomery	9.6	No
Ohio	Stark	9.5	No
Oklahoma	**Cleveland**	**10.3**	**No**
Oklahoma	Kay	9.7	No
Oklahoma	**Oklahoma**	**10.1**	**No**
Oklahoma	Tulsa	9.1	No
Oregon	**Crook**	**10.4**	**No**
Oregon	**Harney**	**11.1**	**No**
Oregon	**Jackson**	**13.0**	**No**
Oregon	**Josephine**	**11.3**	**No**
Oregon	**Lane**	**11.1**	**No**
Oregon	**Klamath**	**16.2**	**Yes**
Pennsylvania	Cambria	9.2	No
Pennsylvania	Dauphin	9.5	No

State	County	2019-2021 Annual Design Value ($\mu g/m^3$)[a]	Currently in a $PM_{2.5}$ Nonattainment Area[b]
Pennsylvania	Lancaster	9.5	No
Pennsylvania	York	9.6	No
Pennsylvania	**Allegheny**	**11.2**	**Yes**
Tennessee	Davidson	9.1	No
Tennessee	Knox	9.1	No
Texas	Bowie	9.6	No
Texas	Cameron	9.7	No
Texas	Dallas	9.1	No
Texas	**Harris**	**11.1**	**No**
Texas	**Hidalgo**	**10.6**	**No**
Texas	Tarrant	9.2	No
Texas	Travis	9.5	No
Texas	**Webb**	**10.4**	**No**
Utah	Salt Lake	9.9	Yes
Washington	**Okanogan**	**12.4**	**No**
Washington	**Yakima**	**11.8**	**No**
West Virginia	Brooke	9.1	No
West Virginia	Marshall	9.3	No
Wisconsin	Waukesha	9.4	No

Source: CRS, based on data adapted from the U.S. Environmental Protection Agency (EPA), "Fine Particle Concentrations for Counties with Monitors Based on Air Quality Data from 2019 – 2021," at https://www.epa.gov/system/files/documents/2023-01/Fine%20Particle%20Concentrations%20for%20Counties%20with%20Monitors.pdf.

Notes: Bold typeface represents areas that would not meet a proposed annual primary fine particle ($PM_{2.5}$) standard of 10.0 $\mu g/m^{3;}$ nonbold typeface represents areas that would not meet a proposed annual primary fine particle ($PM_{2.5}$) standard of 9.0 $\mu g/m^3$. This information is provided for illustrative purposes only and is not intended to project or predict the outcome of any forthcoming designation process. Future area designations will not be based on these data, but likely on monitoring data collected between 2021 and 2024.

a. Design values included for counties with monitors and with complete design value data. The design values shown here are computed using Federal Reference Method or equivalent data reported by state, tribal, and local monitoring agencies to EPA's Air Quality System (AQS) as of May 24, 2022. *Federal Reference Methods* are methods developed and evaluated by EPA for accurately and reliably measuring these pollutants in outdoor air. Concentrations flagged by state, tribal, or local monitoring agencies as having been affected by an exceptional event (e.g., wildfire, volcanic eruption) and concurred by the associated EPA Regional Office are not included in these calculations.

b. The *design value* is the annual mean concentration, averaged over three consecutive years. The design value listed for each area is the highest annual mean concentration among monitors with valid design values that meet the completeness requirements in accordance with 40 C.F.R. Part 50 Appendix N. Current $PM_{2.5}$ nonattainment areas are those that were designated as violating a promulgated $PM_{2.5}$ NAAQS.

c. Counties that have areas that exceed the PM2.5 NAAQS are not automatically assumed to be nonattainment. In the event an area violates the NAAQS after initial designation as attainment or

redesignation, the area is not immediately subject to redesignation back to nonattainment. For more information, see EPA, "Regional Consistency for the Administrative Requirements of State Implementation Plan Submittals," at https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20110406_mccabe_regional_consistancy_admin_requirements.pdf.

Appendix C. PM Implementation Rule Requirements

For any area designated as nonattainment and initially classified as Moderate for a $PM_{2.5}$ NAAQS, the state(s) shall submit a Moderate area attainment plan that meets all the following requirements:

- base year emissions inventory requirements;[101]
- attainment projected emissions inventory requirements;[102]
- Moderate area attainment plan control strategy requirements;[103]
- attainment demonstration and modeling requirements;[104]
- reasonable further progress (RFP) requirements;[105]
- quantitative milestone reporting;[106]
- contingency measure requirements;[107] and
- nonattainment new source review plan requirements.[108]

When designated, each PM 2.5 nonattainment area is initially classified as Moderate. The area submits its Moderate area attainment plan to EPA no later than 18 months from the effective date of designation of the area. The Moderate area attainment plan control strategy includes the implementation schedule of reasonably available control measures/reasonably available control technology (RACM/RACT). *RACM* is any technologically and economically feasible measure that can be implemented in whole or in part within four years after the effective date of designation of a $PM_{2.5}$ nonattainment area and that achieves permanent and enforceable reductions in direct $PM_{2.5}$ emissions and/or $PM_{2.5}$ plan precursor emissions from sources in the area. RACM includes RACT.

Each state in which all or part of a Serious nonattainment area is located shall submit an implementation plan for that area that includes each of the following:

- base year emissions inventory requirements;[109]
- attainment projected emissions inventory requirements;[110]
- Serious area attainment plan control strategy requirements;[111]
- attainment demonstration and modeling requirements;[112]

[101] Set forth at 40 C.F.R. §51.1008(a)(1).

[102] Set forth at 40 C.F.R. §51.1008(a)(2).

[103] Set forth at 40 C.F.R. §51.1009, "Moderate area attainment plan control strategy requirements."

[104] Set forth at 40 C.F.R. §51.1011, "Attainment demonstration and modeling requirements."

[105] Set forth at 40 C.F.R. §51.1012, "Reasonable further progress (RFP) requirements."

[106] Set forth at 40 C.F.R. §51.1013, "Quantitative milestone requirements."

[107] Set forth at 40 C.F.R. §51.1014, "Contingency measure requirements."

[108] Pursuant to 40 C.F.R. §51.165, "Permit requirements."

[109] Set forth at 40 C.F.R. §51.1008(b)(1).

[110] Set forth at 40 C.F.R. §51.1008(b)(2).

[111] Set forth at 40 C.F.R. §51.1010, "Serious area attainment plan control strategy requirements."

[112] Set forth at 40 C.F.R. §51.1011, "Attainment demonstration and modeling requirements."

- RFP requirements;[113]
- quantitative milestone reporting;[114]
- contingency measure requirements;[115] and
- nonattainment new source review plan requirements.[116]

Serious area attainment plan control strategies include provisions to assure that best available control measures/best available control technology (BACM/BACT) shall be implemented no later than four years after the date the area is reclassified as a Serious nonattainment area. *BACM* is any technologically and economically feasible control measure that can be implemented in whole or in part within four years after the date of reclassification of a Moderate $PM_{2.5}$ nonattainment area to Serious and that generally can achieve greater permanent and enforceable emissions reductions in direct $PM_{2.5}$ emissions and/or emissions of $PM_{2.5}$ plan precursors from sources in the area than can be achieved through the implementation of RACM on the same source(s). BACM includes BACT.

If the state requests an extension of an area's Serious nonattainment date, it must demonstrate that the SIP for the area includes the most stringent measures (MSM). *MSM* is any permanent and enforceable control measure that achieves the most stringent emissions reductions in direct $PM_{2.5}$ emissions and/or emissions of $PM_{2.5}$ plan precursors from among those control measures that are either included in the SIP for any other NAAQS, or have been achieved in practice in any state, and that can feasibly be implemented in the relevant $PM_{2.5}$ NAAQS nonattainment area.

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Disclaimer

[113] Set forth at 40 C.F.R. §51.1012, "Reasonable further progress (RFP) requirements."

[114] Set forth at 40 C.F.R. §51.1013, "Quantitative milestone requirements."

[115] Set forth at 40 C.F.R. §51.1014, "Contingency measure requirements."

[116] Pursuant to 40 C.F.R. §51.165, "Permit requirements."