This document is scheduled to be published in the Federal Register on 07/14/2023 and available online at **federalregister.gov/d/2023-14687**, and on **govinfo.gov**

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R09-OAR-2023-0263; FRL-10941-01-R9]

Air Quality State Implementation Plans; Approvals and Promulgations: California; 1997 Annual Fine Particulate Matter Serious and Clean Air Act Section 189(d) Nonattainment Area Requirements; San Joaquin Valley, CA

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to approve portions of state implementation plan (SIP) revisions submitted by the State of California to meet Clean Air Act (CAA or "Act") requirements for the 1997 annual fine particulate matter ($PM_{2.5}$) national ambient air quality standards (NAAQS or "standards") in the San Joaquin Valley $PM_{2.5}$ nonattainment area. Specifically, the EPA is proposing to approve those portions of the submitted SIP revisions as they pertain to the Serious nonattainment area and CAA section 189(d) requirements for the 1997 annual $PM_{2.5}$ NAAQS, except for the requirement for contingency measures. In addition, the EPA is proposing to approve 2020 and 2023 motor vehicle emissions budgets and the trading mechanism for use in transportation conformity analyses for the 1997 annual $PM_{2.5}$ NAAQS. The EPA will accept comments on this proposed rule during a 30-day public comment period.

DATES: Any comments on this proposal must be received by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-R09-OAR-2023-0263 at *https://www.regulations.gov*. For comments submitted at Regulations.gov, follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. The EPA may publish any comment received to its public docket. Do not

submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (e.g., audio or video) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e., on the web, cloud, or other file sharing system). For additional submission methods, please contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section. For the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets*. If you need assistance in a language other than English or if you are a person with a disability who needs a reasonable accommodation at no cost to you, please contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

FOR FURTHER INFORMATION CONTACT: Ashley Graham, Geographic Strategies and Modeling Section (AIR-2-2), EPA Region IX, 75 Hawthorne Street, San Francisco, CA 94105, (415) 972-3877, or by email at *graham.ashleyr@epa.gov*.

SUPPLEMENTARY INFORMATION: Throughout this document, "we," "us," and "our" refer to the EPA.

Table of Contents

I. Background for Proposed Action

A. $PM_{2.5}$ NAAQS

Under section 109 of the CAA, the EPA has established NAAQS for certain pervasive air pollutants (referred to as "criteria pollutants") and conducts periodic reviews of the NAAQS to determine whether the EPA should revise or establish new NAAQS to protect public health.

On July 18, 1997, the EPA revised the NAAQS for particulate matter by establishing new NAAQS for particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$).[1] The EPA established primary and secondary annual and 24-hour standards for $PM_{2.5}$.[2] The EPA set the annual primary and secondary standards at 15.0 micrograms per cubic meter ($\mu g/m^3$) based on a three-year average of annual mean $PM_{2.5}$ concentrations, and set the 24-hour primary and secondary standards at 65 $\mu g/m^3$ based on the three-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations at each monitoring site within an area.[3] Collectively, we refer herein to the 1997 annual and 24-hour $PM_{2.5}$ NAAQS as the "1997 $PM_{2.5}$ NAAQS" or "1997 $PM_{2.5}$ standards."

On October 17, 2006, the EPA revised the level of the 24-hour $PM_{2.5}$ NAAQS to 35 $\mu g/m^3$,[4] and on January 15, 2013, the EPA revised the level of the primary annual $PM_{2.5}$ NAAQS

[1] 62 FR 38652.
[2] For a given air pollutant, "primary" NAAQS are those determined by the EPA as requisite to protect the public health, allowing an adequate margin of safety, and "secondary" standards are those determined by the EPA as requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air. See CAA section 109(b).
[3] 40 CFR 50.7.
[4] 71 FR 61144.

to 12.0 μg/m^3.[5] Even though the EPA lowered the 24-hour and annual $PM_{2.5}$ NAAQS, the 1997 24-hour $PM_{2.5}$ NAAQS remain in effect and the 1997 primary annual $PM_{2.5}$ NAAQS remains in effect in areas designated nonattainment for that NAAQS.[6]

The EPA established each of the $PM_{2.5}$ NAAQS after considering substantial evidence from numerous health studies demonstrating that serious health effects are associated with exposures to $PM_{2.5}$ concentrations above these levels. Epidemiological studies have shown statistically significant correlations between elevated $PM_{2.5}$ levels and premature mortality. Other important health effects associated with $PM_{2.5}$ exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity dates), changes in lung function and increased respiratory symptoms, and new evidence for more subtle indicators of cardiovascular health. Individuals particularly sensitive to $PM_{2.5}$ exposure include older adults, people with heart and lung disease, and children.[7]

$PM_{2.5}$ can be particles emitted by sources directly into the atmosphere as a solid or liquid particle ("primary $PM_{2.5}$" or "direct $PM_{2.5}$"), or can be particles that form in the atmosphere as a result of various chemical reactions from $PM_{2.5}$ precursor emissions emitted by sources ("secondary $PM_{2.5}$"). The EPA has identified the precursors of $PM_{2.5}$ to be oxides of nitrogen ("NO_X"), sulfur oxides ("SO_X"), volatile organic compounds ("VOC"), and ammonia.[8]

B. San Joaquin Valley $PM_{2.5}$ Designations, Classifications, and SIP Revisions

Following promulgation of a new or revised NAAQS, the EPA is required under CAA section 107(d) to designate areas throughout the nation as attainment, nonattainment, or unclassifiable for the NAAQS. Effective April 5, 2005, the EPA established the initial air quality designations for the 1997 annual and 24-hour $PM_{2.5}$ NAAQS, using air quality monitoring data

---

[5] 78 FR 3086.
[6] 40 CFR 50.13(d).
[7] EPA, Air Quality Criteria for Particulate Matter, No. EPA/600/P–99/002aF and EPA/600/P–99/002bF, October 2004.
[8] For example, see 72 FR 20586, 20589 (April 25, 2007).

for the three-year periods of 2001–2003 and 2002–2004.[9] The EPA designated the San Joaquin Valley as nonattainment for both the 1997 annual $PM_{2.5}$ NAAQS (15.0 μg/m^3) and the 1997 24-hour $PM_{2.5}$ NAAQS (65 μg/m^3).[10]

The San Joaquin Valley $PM_{2.5}$ nonattainment area encompasses over 23,000 square miles and includes all or part of eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kings, and the valley portion of Kern.[11] The area is home to four million people and is one of the nation's leading agricultural regions. Stretching over 250 miles from north to south and averaging 80 miles wide, it is partially enclosed by the Coast Mountain range to the west, the Tehachapi Mountains to the south, and the Sierra Nevada range to the east. Under State law, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD or "District") has primary responsibility for developing plans to provide for attainment of the NAAQS in this area. The District works cooperatively with the California Air Resources Board (CARB) in preparing attainment plans. Authority for regulating sources under State jurisdiction in the San Joaquin Valley is split under State law between the District, which has responsibility for regulating stationary and most area sources, and CARB, which has responsibility for regulating most mobile sources.

At the time of the initial designations for the 1997 $PM_{2.5}$ NAAQS, the EPA interpreted the CAA to require implementation of the NAAQS under the general nonattainment plan requirements of subpart 1.[12] Under subpart 1, states were required to submit nonattainment plan SIP submissions within three years of the effective date of designations, that, among other things, provided for implementation of reasonably available control measures (RACM), reasonable further progress (RFP), contingency measures, and a modeled attainment demonstration showing attainment of the NAAQS as expeditiously as practicable but no later

[9] 70 FR 944 (January 5, 2005).
[10] 40 CFR 81.305.
[11] For a precise description of the geographic boundaries of the San Joaquin Valley nonattainment area, see 40 CFR 81.305.
[12] 72 FR 20586.

than five years from the designation (in this instance, no later than April 5, 2010) unless the state justified an attainment date extension of up to five years.[13]

Between 2007 and 2011, California submitted six nonattainment plan and supporting SIP revisions to address nonattainment area planning requirements for the 1997 $PM_{2.5}$ NAAQS in the San Joaquin Valley,[14] which we refer to collectively as the "2008 $PM_{2.5}$ Plan." On November 9, 2011, the EPA approved the portions of the 2008 $PM_{2.5}$ Plan, as revised in 2009 and 2011, that addressed attainment of the 1997 $PM_{2.5}$ NAAQS in the San Joaquin Valley nonattainment area, except for the attainment contingency measures, which we disapproved.[15] We also granted the State's request to extend the attainment deadline for the 1997 $PM_{2.5}$ NAAQS in the San Joaquin Valley to April 5, 2015.[16]

Following a January 4, 2013 decision of the U.S. Court of Appeals for the D.C. Circuit remanding the EPA's 2007 implementation rule for the 1997 $PM_{2.5}$ NAAQS,[17] the EPA published a final rule on June 2, 2014, classifying the San Joaquin Valley as a "Moderate" nonattainment area for the 1997 $PM_{2.5}$ NAAQS under subpart 4, part D of title I of the Act.[18] In that action, the EPA acknowledged that states must meet both subpart 1 and subpart 4 requirements in nonattainment plan SIP submissions for the 1997 24-hour and annual $PM_{2.5}$ NAAQS and provided states with additional time to supplement or withdraw and resubmit any pending nonattainment plan SIP submissions.

Effective May 7, 2015, the EPA reclassified the San Joaquin Valley as a "Serious" nonattainment area for the 1997 $PM_{2.5}$ NAAQS based on our determination that the State could

---

[13] CAA sections 172(a)(2), 172(c)(1), 172(c)(2), and 172(c)(9).
[14] 76 FR 69896, n. 2 (November 9, 2011).
[15] Id. at 69924.
[16] Id.
[17] *Natural Resources Defense Council v. EPA*, 706 F.3d. 428 (DC Cir. 2013) ("*NRDC*"). In *NRDC*, the court held that the EPA erred in implementing the 1997 $PM_{2.5}$ standards solely pursuant to the general implementation requirements of subpart 1, without also considering the requirements specific to nonattainment areas for particles less than or equal to 10 µm in diameter (PM_{10}) in subpart 4, part D of title I of the CAA. The court reasoned that the plain meaning of the CAA requires implementation of the 1997 $PM_{2.5}$ standards under subpart 4 because $PM_{2.5}$ falls within the statutory definition of PM_{10} and is thus subject to the same statutory requirements as PM_{10}. The court remanded the rule, without vacatur, and instructed the EPA "to repromulgate these rules pursuant to Subpart 4 consistent with this opinion."
[18] 79 FR 31566.

not practicably attain these NAAQS in the San Joaquin Valley nonattainment area by the latest statutory Moderate area attainment date, i.e., April 5, 2015.[19] Upon reclassification as a Serious area, the State became subject to the requirement of CAA section 188(c)(2) to attain the 1997 $PM_{2.5}$ NAAQS as expeditiously as practicable but no later than ten years after designation, i.e., by no later than December 31, 2015. California submitted its Serious area plan for the 1997 $PM_{2.5}$ NAAQS for the San Joaquin Valley in two submissions dated June 25, 2015, and August 13, 2015, including a request under section 188(e) to extend the attainment date for the 1997 24-hour $PM_{2.5}$ NAAQS by three years (to December 31, 2018) and to extend the attainment date for the 1997 annual $PM_{2.5}$ NAAQS by five years (to December 31, 2020). On February 9, 2016, the EPA proposed to approve most of the Serious area plan and to grant the State's request for extensions of the December 31, 2015 attainment date.[20] However, on October 6, 2016, after considering public comments, the EPA denied California's request for these extensions of the attainment dates.[21] Consequently, on November 23, 2016, the EPA determined that the San Joaquin Valley had failed to attain the 1997 24-hour and annual $PM_{2.5}$ NAAQS by the December 31, 2015 Serious area attainment date.[22] This determination triggered a requirement for California to submit a new SIP submission for the 1997 24-hour and annual $PM_{2.5}$ NAAQS for the San Joaquin Valley that satisfies the requirements of CAA section 189(d). The statutory deadline for this additional SIP submission was December 31, 2016. The EPA did not finalize the actions proposed on February 9, 2016, with respect to the submitted Serious area plan.[23]

On December 6, 2018, the EPA determined that California had failed to submit a complete section 189(d) attainment plan for the 1997 24-hour and annual $PM_{2.5}$ NAAQS, among other required SIP submissions for the San Joaquin Valley, by the statutory deadlines.[24] This

---

[19] 80 FR 18528 (April 7, 2015).
[20] 81 FR 6936. California's request for extension of the Serious Area attainment date for the San Joaquin Valley accompanied its Serious Area attainment plan for the 1997 $PM_{2.5}$ NAAQS and related motor vehicle emission budgets, submitted June 25, 2015 and August 13, 2015, respectively.
[21] 81 FR 69396.
[22] 81 FR 84481.
[23] 81 FR 69396, 69400.
[24] 83 FR 62720.

finding, which became effective on January 7, 2019, triggered clocks under CAA section 179(a) for the application of emissions offset sanctions 18 months after the finding, and highway funding sanctions 6 months thereafter, unless the EPA affirmatively determined that the State made a complete SIP submission addressing the identified failure to submit deficiencies.[25] The finding also triggered the obligation under CAA section 110(c) for the EPA to promulgate a federal implementation plan no later than two years after the finding, unless the State has submitted, and the EPA has approved, the required SIP submission.[26]

On May 10, 2019, CARB submitted the "2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards," adopted by the SJVUAPCD on November 15, 2018, and by CARB on January 24, 2019 ("2018 $PM_{2.5}$ Plan").[27] The 2018 $PM_{2.5}$ Plan addresses the Serious area nonattainment plan and CAA section 189(d) requirements for the 1997 24-hour and annual $PM_{2.5}$ NAAQS, among other requirements for the 2006 and 2012 $PM_{2.5}$ NAAQS.[28] The 2018 $PM_{2.5}$ Plan incorporates by reference the "San Joaquin Valley Supplement to the 2016 State Strategy for the State Implementation Plan" ("Valley State SIP Strategy"), a related plan adopted by CARB on October 25, 2018, and submitted to the EPA with the 2018 $PM_{2.5}$ Plan on May 10, 2019.[29] CARB clarified in its submittal letter that the 2018 $PM_{2.5}$ Plan superseded past submissions to the EPA that the agency had not yet acted on for the 1997 $PM_{2.5}$ NAAQS, including the 2015 Serious area attainment plan submissions.[30] On June 24, 2020, the EPA issued a letter finding

---

[25] Id. at 62723.
[26] Id.
[27] Letter dated May 9, 2019, from Richard Corey, Executive Officer, CARB, to Mike Stoker, Regional Administrator, EPA Region 9.
[28] The EPA previously acted on those portions of the 2018 $PM_{2.5}$ Plan that pertain to the 2006 24-hour $PM_{2.5}$ NAAQS (except for contingency measures) (85 FR 44192, July 22, 2020), and Moderate area planning requirements for the 2012 annual $PM_{2.5}$ NAAQS and 2006 24-hour $PM_{2.5}$ NAAQS contingency measures (86 FR 67343, November 26, 2021). On December 29, 2021, the EPA proposed action on those portions of the plan that pertain to the Serious area requirements for the 2012 annual $PM_{2.5}$ NAAQS (86 FR 74310). On October 5, 2022, the EPA issued a supplemental proposal with respect to the Serious area requirements for the 2012 $PM_{2.5}$ NAAQS (87 FR 60494), and on October 27, 2022, California withdrew those portions of the plan that pertained to those requirements (letter dated October 27, 2022, from Steven S. Cliff, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region IX).
[29] Id.
[30] The 2015 Serious area attainment plan submissions include the "2015 Plan for the 1997 Standard" (submitted by CARB on June 25, 2015) and motor vehicle emission budgets (submitted by CARB August 13, 2015)

these submissions complete and terminating the sanctions clocks under CAA section 179(a).[31]

On January 28, 2022, the EPA approved those portions of the 2018 $PM_{2.5}$ Plan that pertain to the 1997 24-hour $PM_{2.5}$ NAAQS, except for the contingency measure element, which the EPA disapproved.[32] As part of that action, the EPA also finalized a determination that the San Joaquin Valley attained the 1997 24-hour $PM_{2.5}$ NAAQS by the applicable attainment date of December 31, 2020 and that therefore the requirement for contingency measures no longer applies in the San Joaquin Valley nonattainment area for the 1997 24-hour $PM_{2.5}$ NAAQS.[33] Because the EPA found that the State has satisfied its planning obligations for the San Joaquin Valley with respect to the 1997 24-hour $PM_{2.5}$ NAAQS, this proposed action addresses only the requirements for the 1997 annual $PM_{2.5}$ NAAQS.

On July 22, 2021, the EPA proposed to partially approve and partially disapprove portions of the 2018 $PM_{2.5}$ Plan that address attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley nonattainment area.[34] The EPA proposed to approve the 2013 base year emissions inventories and disapprove the attainment demonstration and related elements, including the comprehensive precursor demonstration, five percent annual emissions reductions demonstration, best available control measures (BACM) demonstration, RFP demonstration, quantitative milestones, and motor vehicle emission budgets established for 2017, 2020, and 2023. We proposed to disapprove the attainment demonstration and related elements because certified air quality data were available that established that the San Joaquin Valley area did not attain the 1997 annual $PM_{2.5}$ NAAQS by December 31, 2020, as projected in the 2018 $PM_{2.5}$ Plan. The EPA also proposed to disapprove the contingency measures element because of several identified deficiencies, including that the measure did not address the potential for failures to

[31] Letter dated June 24, 2020, from Elizabeth J. Adams, Director, Air and Radiation Division, EPA Region IX, to Richard Corey, Executive Officer, CARB, Subject: "RE: Completeness Finding for State Implementation Plan (SIP) Submissions for San Joaquin Valley for the 1997, 2006, and 2012 Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS) and Termination of Clean Air Act (CAA) Sanction Clocks."
[32] 87 FR 4503 (January 28, 2022).
[33] Id at 4506.
[34] 86 FR 38652.

meet RFP, to meet a quantitative milestone, or to submit a quantitative milestone report.[35] On November 26, 2021, the EPA finalized the partial approval and partial disapproval of the 2018 $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS as proposed.[36]

As a result of the November 26, 2021 disapprovals, California was required to develop and submit a revised attainment plan for the San Joaquin Valley area that addresses the applicable CAA requirements, including the Serious area plan requirements and the requirements of CAA section 189(d), for the 1997 annual $PM_{2.5}$ NAAQS. In accordance with sections 179(d)(3) and 172(a)(2) of the CAA, the revised plan must demonstrate attainment of these NAAQS as expeditiously as practicable and no later than 5 years from the date of the EPA's prior determination that the area failed to attain (i.e., by November 23, 2021), except that the EPA may extend the attainment date to a date no later than 10 years from the date of this determination (i.e., to November 23, 2026), "considering the severity of nonattainment and the availability and feasibility of pollution control measures."[37]

On November 8, 2021, CARB submitted the "Attainment Plan Revision for the 1997 Annual $PM_{2.5}$ Standard" ("15 $\mu g/m^3$ SIP Revision"), adopted by the SJVUAPCD on August 19, 2021, and adopted by CARB on September 23, 2021.[38] In the letter accompanying the submission, CARB clarifies that the 15 $\mu g/m^3$ SIP Revision amends the 2018 $PM_{2.5}$ Plan and addresses all CAA requirements for the 1997 annual $PM_{2.5}$ NAAQS except for contingency measures, which CARB stated it will address at a later date.[39]

II. Summary and Completeness Review of the San Joaquin Valley $PM_{2.5}$ Plan

We are proposing action on those portions of the 15 $\mu g/m^3$ SIP Revision, 2018 $PM_{2.5}$

---

[35] Id. at 38669.
[36] 86 FR 67329.
[37] 81 FR 84481, 84482 (final EPA action determining that the San Joaquin Valley had failed to attain the 1997 $PM_{2.5}$ NAAQS by the December 31, 2015, Serious area attainment date).
[38] Letter dated November 8, 2021, from Richard W. Corey, Executive Officer, CARB, to Deborah Jordan, Acting Regional Administrator, EPA Region 9. The 15 $\mu g/m^3$ SIP Revision was developed jointly by CARB and the District.
[39] Id. at 1.

Plan, and Valley State SIP Strategy that pertain to the 1997 annual $PM_{2.5}$ NAAQS. Herein, we refer to these three submissions collectively as the "SJV $PM_{2.5}$ Plan" or "Plan." The SJV $PM_{2.5}$ Plan addresses Serious area nonattainment plan and CAA section 189(d) requirements for the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley, including the State's demonstration that the area will attain the 1997 annual $PM_{2.5}$ NAAQS by December 31, 2023.

A. 2018 $PM_{2.5}$ Plan and 15 µg/m³ SIP Revision

CARB and the District describe the 15 µg/m³ SIP Revision as an "administrative revision" to the 2018 $PM_{2.5}$ Plan that "has been prepared as a streamlined document that utilizes the existing emissions inventory, air quality analysis and modeling from the *2018 $PM_{2.5}$ Plan.*"[40] In its submission of the 15 µg/m³ SIP Revision to the EPA, the State included a redline strikeout version highlighting the updates that were made relative to the 2018 $PM_{2.5}$ Plan submitted on May 10, 2019, as well as final versions of those sections that were revised relative to the 2018 $PM_{2.5}$ Plan.

The State updated the following portions of the 2018 $PM_{2.5}$ Plan and resubmitted them to the EPA as the 15 µg/m³ SIP Revision to address both the Serious area requirements in CAA section 189(b) and the CAA section 189(d) requirements for the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley: (i) Chapter 4 ("Attainment Strategy for $PM_{2.5}$"); (ii) Chapter 5 ("Demonstration of Federal Requirements for 1997 $PM_{2.5}$ Standards"); (iii) Appendix D ("Mobile Source Control Measure Analyses"); (iv) Appendix H ("RFP, Quantitative Milestones, and Contingency"); and (v) Appendix K ("Modeling Attainment Demonstration"). The November 8, 2021 submittal package also included CARB's "Staff Report, Proposed SIP Revision for the 15 ug/m3 Annual $PM_{2.5}$ Standard for the San Joaquin Valley," release date August 13, 2021 ("August 2021 Staff Report"),[41] and the State's and District's board resolutions

[40] 15 µg/m³ SIP Revision, p. 5.
[41] CARB's August 2021 Staff Report includes CARB's review of, among other things, the control strategy in the 15 µg/m³ SIP Revision and assessment of the differences between the emissions inventories in the Plan and updated inventories more recently developed by CARB.

adopting the 15 μg/m^3 SIP Revision (CARB Resolution 21-21 and SJVUAPCD Governing Board Resolution 21-08-13).[42]

The portions of the Plan that address the requirements for the 1997 annual $PM_{2.5}$ NAAQS and that the State did not revise relative to the 2018 $PM_{2.5}$ Plan include: (i) Appendix A ("Ambient $PM_{2.5}$ Data Analysis"); (ii) Appendix B ("Emissions Inventory"); (iii) Appendix C ("Stationary Source Control Measure Analyses"); (iv) Appendix G ("Precursor Demonstration"); (v) Appendix I ("New Source Review and Emission Reduction Credits"); (vi) Appendix J ("Modeling Emission Inventory"); and (vii) Appendix L ("Modeling Protocol"). The May 10, 2019 submittal package also included CARB's "Staff Report, Review of the San Joaquin Valley 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards," release date December 21, 2018 ("December 2018 Staff Report");[43] and the State's and District's board resolutions adopting the 2018 $PM_{2.5}$ Plan (CARB Resolution 19-1 and SJVUAPCD Governing Board Resolution 18-11-16).[44]

As noted above, the 2018 $PM_{2.5}$ Plan incorporates by reference the Valley State SIP Strategy. For the purposes of this action, the relevant portions of the Valley State SIP Strategy are the mobile source control measure commitments associated with the quantitative milestones for the 1997 annual $PM_{2.5}$ NAAQS.

B. Procedural Requirements for SIPs and SIP Revisions

CAA sections 110(a)(1) and (2) and 110(l) require each state to provide reasonable public notice and opportunity for public hearing prior to the adoption and submission of a SIP or SIP

---

[42] CARB Resolution 21-21, "San Joaquin Valley State Implementation Plan Revision for the 15 μg/m^3 Annual $PM_{2.5}$ Standard," September 23, 2021, and SJVUAPCD Governing Board Resolution 21-08-13, "Adopting the San Joaquin Valley Unified Air Pollution Control District *Proposed Attainment Plan Revision For the 1997 Annual $PM_{2.5}$ Standard*," August 19, 2021.

[43] Letter dated December 11, 2019, from Richard Corey, Executive Officer, CARB, to Mike Stoker, Regional Administrator, EPA Region 9, transmitting the December 2018 Staff Report. The December 2018 Staff Report includes CARB's review of, among other things, the 2018 $PM_{2.5}$ Plan's control strategy and attainment demonstration.

[44] CARB Resolution 19-1, "2018 $PM_{2.5}$ State Implementation Plan for the San Joaquin Valley," January 24, 2019, and SJVUAPCD Governing Board Resolution 18-11-16, "Adopting the [SJVUAPCD] 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards," November 15, 2018.

revision to the EPA. To meet this requirement, every SIP submission should include evidence that the State provided adequate public notice and an opportunity for a public hearing consistent with the EPA's implementing regulations in 40 CFR 51.102.

Both the District and CARB satisfied the applicable statutory and regulatory requirements for reasonable public notice and hearing prior to adoption and submission of the 2018 $PM_{2.5}$ Plan and 15 $\mu g/m^3$ SIP Revision. The District provided public notice and opportunity for public comment prior to its November 15, 2018 public hearing on and adoption of the 2018 $PM_{2.5}$ Plan.[45] CARB also provided public notice and opportunity for public comment prior to its January 24, 2019 public hearing on and adoption of the 2018 $PM_{2.5}$ Plan.[46] Subsequently, the District provided public notice and opportunity for public comment prior to its August 19, 2021 public hearing on and adoption of the 15 $\mu g/m^3$ SIP Revision.[47] CARB also provided public notice and opportunity for public comment prior to its September 23, 2021 public hearing on and adoption of the 15 $\mu g/m^3$ SIP Revision.[48] The SIP submissions include proof of publication of notices for the respective public hearings. They also include copies of the written and oral comments received during the State's and District's public review processes and the agencies' responses thereto.[49,50] Therefore, we find that the 2018 $PM_{2.5}$ Plan and 15 $\mu g/m^3$ SIP Revision meet the procedural requirements for public notice and hearing in CAA sections 110(a) and 110(l) and 40 CFR 51.102.

CAA section 110(k)(1)(B) requires the EPA to determine whether a SIP submission is

---

[45] SJVUAPCD, "Notice of Public Hearing for Adoption of Proposed 2018 $PM_{2.5}$ Plan for the 1997, 2006, and 2012 Standards," October 16, 2018, and SJVUAPCD Governing Board Resolution 18-11-16.
[46] CARB, "Notice of Public Meeting to Consider the 2018 $PM_{2.5}$ State Implementation Plan for the San Joaquin Valley," December 21, 2018, and CARB Resolution 19-1.
[47] SJVUAPCD, "Notice of Public Hearing: Adopt Attainment Plan Revision for the 1997 Annual $PM_{2.5}$ Standard," July 20, 2021, and SJVUAPCD Governing Board Resolution 21-08-13.
[48] CARB, "Notice of Public Meeting to Hear an Update on the 2018 $PM_{2.5}$ State Implementation Plan for the San Joaquin Valley and Consider a State Implementation Plan Revision for the 15 $\mu g/m^3$ Annual $PM_{2.5}$ Standard," September 23, 2021, and CARB Resolution 21-21.
[49] CARB, "Board Meeting Comments Log," March 29, 2019; J&K Court Reporting, LLC, "Meeting, State of California Air Resources Board," January 24, 2019 (transcript of CARB's public hearing), and 2018 $PM_{2.5}$ Plan, Appendix M ("Summary of Significant Comments and Responses").
[50] CARB, "Board Meeting Comments Log," September 23, 2021; J&K Court Reporting, LLC, "Videoconference Meeting, State of California Air Resources Board," September 23, 2021 (transcript of CARB's public hearing).

complete within 60 days of receipt. This section also provides that any plan that the EPA has not affirmatively determined to be complete or incomplete will become complete by operation of law six months after the date of submission. The EPA's SIP completeness criteria are found in 40 CFR part 51, Appendix V.

We have reviewed the 15 μg/m^3 SIP Revision for completeness and find that it meets the completeness criteria in 40 CFR part 51 Appendix V. On May 8, 2022, the 15 μg/m^3 SIP Revision was deemed complete by operation of law under CAA section 110(k)(1)(B). The 2018 $PM_{2.5}$ Plan and Valley State SIP Strategy became complete by operation of law on November 10, 2019, and the EPA subsequently issued a letter making an affirmative completeness finding and terminating the sanctions clocks under CAA section 179(a) on June 24, 2020.[51]

III. Clean Air Act Requirements for $PM_{2.5}$ Serious Area Plans and for Serious $PM_{2.5}$ Areas that Fail to Attain

A. Requirements for $PM_{2.5}$ Serious Area Plans

Upon reclassification of a Moderate nonattainment area as a Serious nonattainment area under subpart 4 of part D, title I of the CAA, the Act requires the state to make a SIP submission that addresses the following Serious nonattainment area requirements:[52]

1. A comprehensive, accurate, current inventory of actual emissions from all sources of $PM_{2.5}$ and $PM_{2.5}$ precursors in the area (CAA section 172(c)(3));
2. Provisions to assure that BACM, including best available control technology (BACT), for the control of direct $PM_{2.5}$ and $PM_{2.5}$ precursors shall be implemented no later than four years after the area is reclassified (CAA section 189(b)(1)(B)), unless the state elects to make an optional precursor demonstration that the EPA approves authorizing the state not

[51] Letter dated June 24, 2020, from Elizabeth J. Adams, Director, Air and Radiation Division, EPA Region IX, to Richard Corey, Executive Officer, CARB, Subject: "RE: Completeness Finding for State Implementation Plan (SIP) Submissions for San Joaquin Valley for the 1997, 2006, and 2012 Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS) and Termination of Clean Air Act (CAA) Sanction Clocks."
[52] 40 CFR 51.1003(b)(1); 81 FR 58010, 58074–58075 (August 24, 2016).

to regulate one or more of these pollutants;

3. A demonstration (including air quality modeling) that the plan provides for attainment as expeditiously as practicable but no later than the end of the tenth calendar year after designation as a nonattainment area (i.e., December 31, 2015, for the San Joaquin Valley for the 1997 $PM_{2.5}$ NAAQS);
4. Plan provisions that require RFP (CAA section 172(c)(2));
5. Quantitative milestones that are to be achieved every three years until the area is redesignated attainment and that demonstrate RFP toward attainment by the applicable date (CAA section 189(c));
6. Provisions to assure that control requirements applicable to major stationary sources of $PM_{2.5}$ also apply to major stationary sources of $PM_{2.5}$ precursors, except where the state demonstrates to the EPA's satisfaction that such sources do not contribute significantly to $PM_{2.5}$ levels that exceed the standard in the area (CAA section 189(e));
7. Contingency measures to be implemented if the area fails to meet RFP or to attain by the applicable attainment date (CAA section 172(c)(9)); and
8. A revision to the nonattainment new source review (NSR) program to lower the applicable "major stationary source"[53] thresholds from 100 tons per year (tpy) to 70 tpy (CAA section 189(b)(3)).

A state's Serious area plan must also satisfy the requirements for Moderate area plans in CAA section 189(a), to the extent the state has not already met those requirements in the Moderate area plan submitted for the area. In addition, the Serious area plan must meet the general requirements applicable to all SIP submissions under section 110 of the CAA, including the requirement to provide necessary assurances that the implementing agencies have adequate personnel, funding, and authority under section 110(a)(2)(E); and the requirements concerning

[53] For any Serious area, the terms "major source" and "major stationary source" include any stationary source that emits or has the potential to emit at least 70 tons per year of $PM_{2.5}$. CAA section 189(b)(3) and 40 CFR 51.165(a)(1)(iv)(A)(*1*)(*vii*) and (*viii*) (defining "major stationary source" in Serious $PM_{2.5}$ nonattainment areas).

enforcement provisions in section 110(a)(2)(C).

B. Requirements for Serious $PM_{2.5}$ Areas that Fail to Attain

In the event that a Serious area fails to attain the $PM_{2.5}$ NAAQS by the applicable attainment date, CAA section 189(d) requires that "the State in which such area is located shall, after notice and opportunity for public comment, submit within 12 months after the applicable attainment date, plan revisions which provide for attainment of the . . . standard…." An attainment plan under section 189(d) must, among other things, demonstrate expeditious attainment of the NAAQS within the time period provided under CAA section 179(d)(3) and provide for annual reductions in emissions of direct $PM_{2.5}$ or a $PM_{2.5}$ plan precursor pollutant within the area of not less than five percent per year from the most recent emissions inventory for the area until attainment.[54]

In addition to the requirement to submit control measures providing for a five percent reduction in emissions of certain pollutants on an annual basis, the EPA interprets CAA section 189(d) as requiring a state to submit an attainment plan that includes the same basic statutory plan elements that are required for other attainment plans.[55] Specifically, a state must submit to the EPA its plan to meet the requirements of CAA section 189(d) in the form of a complete attainment plan submission that includes the following elements:[56]

1. A comprehensive, accurate, current inventory of actual emissions from all sources of $PM_{2.5}$ and $PM_{2.5}$ precursors in the area;
2. A Serious area plan control strategy that ensures that BACM, including BACT, for the control of direct $PM_{2.5}$ and $PM_{2.5}$ precursors are implemented in the area, unless the state elects to make an optional precursor demonstration that the EPA approves authorizing the state not to regulate one or more of these pollutants;

[54] CAA section 189(d), 40 CFR 51.1004(a)(3), 40 CFR 51.1010(c).
[55] 81 FR 58010, 58098.
[56] 40 CFR 51.1003(c)(1).

3. Additional measures (beyond those already adopted in previous nonattainment plan SIP submissions for the area as RACM/RACT, BACM/BACT, and most stringent measures (MSM) (if applicable)[57]) that provide for attainment of the NAAQS as expeditiously as practicable and, from the date of such submission until attainment, demonstrate that the plan will, at a minimum, achieve an annual five percent reduction in emissions of direct $PM_{2.5}$ or any $PM_{2.5}$ plan precursor;
4. A demonstration (including air quality modeling) that the plan provides for attainment of the NAAQS at issue as expeditiously as practicable;
5. Plan provisions that require RFP;
6. Quantitative milestones that the state is to meet every three years until the area is redesignated attainment and that demonstrate RFP toward attainment by the applicable date;
7. Contingency measures to be implemented if the state fails to meet any requirement concerning RFP or quantitative milestones or to attain the NAAQS at issue by the applicable attainment date; and
8. Provisions to assure that control requirements applicable to major stationary sources of $PM_{2.5}$, also apply to major stationary sources of $PM_{2.5}$ precursors, except where the state demonstrates to the EPA's satisfaction that such sources do not contribute significantly to $PM_{2.5}$ levels that exceed the NAAQS at issue in the area.

A state's section 189(d) plan submission must demonstrate attainment as expeditiously as practicable, and no later than 5 years from the date of the EPA's determination that the area failed to attain, except that the Administrator may extend the attainment date to no later than 10 years from the failure to attain determination, consistent with sections 179(d)(3) and 172(a)(2) of the CAA.[58]

---

[57] MSM is applicable if the EPA has previously granted an extension of the attainment date under CAA section 188(e) for the nonattainment area and NAAQS at issue.
[58] 81 FR 84481, 84482.

A state with a Serious $PM_{2.5}$ nonattainment area that fails to attain the NAAQS by the applicable Serious area attainment date must also address any statutory requirements applicable to Moderate and Serious nonattainment area plans under CAA sections 172 and 189 of the CAA to the extent that those requirements have not already been met.[59] Because the EPA has not previously approved a SIP submission for the San Joaquin Valley as meeting the subpart 4 RACM Moderate area planning requirements under CAA section 189 for the 1997 annual $PM_{2.5}$ NAAQS, the EPA is evaluating relevant portions of the SJV $PM_{2.5}$ Plan for compliance with this requirement. In addition, as discussed above, the EPA has not previously approved a SIP submission for the San Joaquin Valley as meeting the Serious area planning requirements under CAA section 189(b)(1) for the 1997 annual $PM_{2.5}$ NAAQS. Some Serious area planning requirements operate on a timeline that is based on the outermost statutory Serious area attainment date of the end of the tenth calendar year following the area's designation to nonattainment. Because section 189(d) requires a state to address any applicable Serious area requirements that the state has not already met in the area, and the section 189(d) obligations do not come into effect until an area has failed to attain the NAAQS by the Serious area attainment date, the EPA is evaluating any previously unmet Serious area planning obligations based on the current, applicable attainment date appropriate under section 189(d), and not the original Serious area attainment date.[60]

The EPA provided its preliminary views on the CAA's requirements for particulate matter plans under part D, title I of the Act in the following guidance documents: (1) "State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990" ("General Preamble");[61] (2) "State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990;

---

[59] 81 FR 58010, 58098.
[60] See, e.g., 86 FR 53150 (September 24, 2021) and 87 FR 4503 (January 28, 2022) (proposed and final actions evaluating a previously unmet Serious area planning obligation based on the applicable attainment date under section 189(d), not the original Serious area attainment date).
[61] 57 FR 13498 (April 16, 1992).

Supplemental";[62] and (3) "State Implementation Plans for Serious PM–10 Nonattainment Areas, and Attainment Date Waivers for PM–10 Nonattainment Areas Generally; Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990" ("General Preamble Addendum").[63] More recently, in an August 24, 2016 final rule entitled, "Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements" ("$PM_{2.5}$ SIP Requirements Rule"), the EPA established regulatory requirements and provided further interpretive guidance on the statutory SIP requirements that apply to areas designated nonattainment for the $PM_{2.5}$ NAAQS.[64] We discuss these regulatory requirements and interpretations of the Act as appropriate in our evaluation of the SJV $PM_{2.5}$ Plan that follows.

IV. Review of the San Joaquin Valley $PM_{2.5}$ Plan for the 1997 Annual $PM_{2.5}$ NAAQS

The EPA is evaluating the SJV $PM_{2.5}$ Plan against the Serious area requirements for the 1997 annual $PM_{2.5}$ NAAQS and the section 189(d) requirements for the 1997 annual $PM_{2.5}$ NAAQS, as laid out in Section III of this document. Many requirements for both a Serious area plan and a section 189(d) plan are structured around the relevant statutory attainment date. The latest statutory Serious area attainment date for the San Joaquin Valley area was December 31, 2015.[65] On November 23, 2016, the EPA determined that the area failed to attain by the Serious area attainment date.

For the purposes of the section 189(d) requirements, the attainment date is the date by which a state can attain the NAAQS as expeditiously as practicable, but no later than 5 years from the publication date of the final determination of failure to attain, except that the EPA may extend the attainment date to a date no later than 10 years from the date of the determination

---

[62] 57 FR 18070 (April 28, 1992).
[63] 59 FR 41998 (August 16, 1994).
[64] 81 FR 58010.
[65] As discussed in Section I.B of this proposal, California submitted its Serious area plan for the 1997 annual $PM_{2.5}$ NAAQS in two submissions dated June 25, 2015 and August 13, 2015, including a request under section 188(e) to extend the attainment date for the 1997 annual $PM_{2.5}$ NAAQS by five years (to December 31, 2020). On October 6, 2016, the EPA denied the request for an extension, but did not finalize action on the Serious area plan submissions. Accordingly, the Serious area attainment date remained unchanged: as expeditiously as practicable but no later than December 31, 2015.

(i.e., to November 23, 2026), "considering the severity of nonattainment and the availability and feasibility of pollution control measures."[66] The SJV $PM_{2.5}$ Plan projects that attainment will be achieved by December 31, 2023, approximately seven years after the determination of failure to attain. The EPA is proposing to approve the SJV $PM_{2.5}$ Plan's attainment date in this action.

When the State submitted the 2018 $PM_{2.5}$ Plan in 2019, the State withdrew its previous Serious area plan that it had developed to meet the December 31, 2015 Serious area attainment date. Because the State submitted the 2018 $PM_{2.5}$ Plan and subsequent 15 $\mu g/m^3$ SIP Revision after the EPA's finding that the area had failed to attain by the applicable Serious area attainment date, the State could not demonstrate that the area would attain by the Serious area attainment date, nor could it address other requirements based on this attainment date, such as RFP and quantitative milestones, because many of the relevant dates had already passed. As described in Section III of this document, in a section 189(d) plan, a state must address any statutory requirements applicable to Moderate and Serious nonattainment area plans to the extent that it has not already met those requirements, but the EPA believes that it should base this evaluation on the current applicable attainment date under section 189(d). For example, it would be illogical to require a state to submit a Serious area modeled attainment demonstration that provided for attainment by December 31, 2015, after the EPA has already determined based on monitoring data that the state failed to attain by such date.

For the purposes of our evaluation of the Serious area plan requirements, although the State is required to submit a Serious area plan and it must structure such a plan based on the Serious area attainment date, it would serve no purpose to evaluate the SJV $PM_{2.5}$ Plan against the now-passed Serious area attainment date by which the area has already failed to attain. For example, RFP and quantitative milestones normally are dependent upon the attainment date. Accordingly, because the State must still meet all Serious area plan requirements, even if doing

[66] CAA section 172(a)(2) and 179(d)(3); 81 FR 84481, 84482. The determination of failure to attain published on November 23, 2016.

so later in conjunction with the section 189(d) plan and its later attainment date, we will evaluate the State's compliance with the Serious area plan requirements in light of the later section 189(d) attainment date, as appropriate. Where the State in the SJV $PM_{2.5}$ Plan applies the section 189(d) attainment date to a Serious area requirement, we will note the statutory Serious area timeline and accept the submission in fulfillment of the State's Serious area plan obligation but evaluate the submission in light of the section 189(d) attainment date.

A. Emissions Inventories

1. Statutory and Regulatory Requirements

CAA section 172(c)(3) requires that each SIP include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in the nonattainment area. The EPA discussed the emissions inventory requirements that apply to $PM_{2.5}$ nonattainment areas in the $PM_{2.5}$ SIP Requirements Rule and codified these requirements in 40 CFR 51.1008.[67] The EPA has also issued guidance concerning emissions inventories for $PM_{2.5}$ nonattainment areas.[68]

The base year emissions inventory for a Serious area attainment plan or a CAA section 189(d) plan must provide a state's best estimate of actual emissions from all sources of the relevant pollutants in the area, i.e., all emissions that contribute to the formation of a particular NAAQS pollutant. For the $PM_{2.5}$ NAAQS, the base year inventory must include direct $PM_{2.5}$ emissions, separately reported filterable and condensable $PM_{2.5}$ emissions,[69] and emissions of all chemical precursors to the formation of secondary $PM_{2.5}$, i.e., nitrogen oxides (NO_X), sulfur dioxide (SO_2), volatile organic compounds (VOC), and ammonia.[70]

---

[67] 81 FR 58010, 58098–58099.
[68] "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," U.S. EPA, May 2017 ("Emissions Inventory Guidance"), available at *https://www.epa.gov/air-emissions-inventories/air-emissions-inventory-guidance-implementation-ozone-and-particulate.*
[69] The Emissions Inventory Guidance identifies the types of sources for which the EPA expects states to provide condensable PM emissions inventories. Emissions Inventory Guidance, Section 4.2.1 ("Condensable PM Emissions"), pp. 63–65.
[70] 40 CFR 51.1008(b)(1) and (c)(1).

The emissions inventory base year for a Serious area attainment plan must be one of the three years for which monitoring data were used to reclassify the area to Serious, or another technically appropriate year justified by the state in its Serious area SIP submission.[71] The emissions inventory base year for a Serious $PM_{2.5}$ nonattainment area subject to CAA section 189(d) must be one of the three years for which the EPA used monitored data to determine that the area failed to attain the $PM_{2.5}$ NAAQS by the applicable Serious area attainment date, or another technically appropriate year justified by the state in its Serious area SIP submission.[72]

A state's SIP submission must include documentation explaining how it calculated emissions data for the inventory. In estimating mobile source emissions, a state should use the latest emissions models and planning assumptions available at the time the SIP is developed.

In addition to the base year inventory submitted to meet the requirements of CAA section 172(c)(3), the state must also submit a projected attainment year inventory and emissions projections for each RFP milestone year.[73] These future emissions projections are necessary components of the attainment demonstrations required under CAA sections 189(b)(1) and 189(d) and the demonstration of RFP required under section 172(c)(2).[74] Emissions projections for future years (referred to in the Plan as "forecasted inventories") should account for, among other things, the ongoing effects of economic growth and adopted emissions control requirements. The state's SIP submission should include documentation to explain how the state calculated the emissions projections. Where a state chooses to allow new major stationary sources or major modifications to use emissions reduction credits (ERCs) that were generated through shutdown or curtailed emissions units occuring before the base year of an attainment plan, the projected emissions inventory used to develop the attainment demonstration must explicitly include the emissions from such previously shutdown or curtailed emissions units.[75]

---

[71] 40 CFR 51.1008(b)(1).
[72] 40 CFR 51.1008(c)(1).
[73] 40 CFR 51.1008 and 51.1012. See also Emissions Inventory Guidance, Section 3 ("SIP Inventory Requirements and Recommendations").
[74] 40 CFR 51.1004, 51.1008, 51.1011, and 51.1012.
[75] 40 CFR 51.165(a)(3)(ii)(C)(1).

2. Summary of the State's Submission

The State included summaries of the planning emissions inventories for direct $PM_{2.5}$ and $PM_{2.5}$ precursors (NO_X, SO_X,[76] VOC,[77] and ammonia) and the documentation for the inventories for the San Joaquin Valley $PM_{2.5}$ nonattainment area in Appendix B ("Emissions Inventory") and Appendix I ("New Source Review and Emission Reduction Credits") of the 2018 $PM_{2.5}$ Plan. In addition, Appendix J ("Modeling Emission Inventory") of the 2018 $PM_{2.5}$ Plan contains inventory documentation specific to the air quality modeling inventories.

CARB and District staff worked together to develop the emissions inventories for the San Joaquin Valley $PM_{2.5}$ nonattainment area. The District worked with operators of the stationary facilities in the nonattainment area to develop the stationary source emissions estimates. The responsibility for developing emissions estimates for area sources such as agricultural burning and paved road dust was shared by the District and CARB. CARB staff developed the emissions inventories for both on-road and non-road mobile sources.[78]

The SJV $PM_{2.5}$ Plan includes winter (24-hour) average and annual average daily emissions inventories for the 2013 base year, which CARB derived from the 2012 emissions inventory, and estimated emissions for forecasted years from 2017 through 2028, as developed as part of the 2018 $PM_{2.5}$ Plan for the attainment and RFP demonstrations for the 1997, 2006, and 2012 $PM_{2.5}$ NAAQS.[79] In this proposal, we are evaluating those winter average and annual average emissions inventories necessary to support the Serious area and CAA section 189(d) nonattainment plans for the 1997 annual $PM_{2.5}$ NAAQS, i.e., the 2013 base year inventory,

---

[76] The SJV $PM_{2.5}$ Plan generally uses "sulfur oxides" or "SO_X" in reference to SO_2 as a precursor to the formation of $PM_{2.5}$. We use SO_X and SO_2 interchangeably throughout this document.

[77] The SJV $PM_{2.5}$ Plan generally uses "reactive organic gasses" or "ROG" in reference to VOC as a precursor to the formation of $PM_{2.5}$. We use ROG and VOC interchangeably throughout this document.

[78] The EPA regulations refer to "non-road" vehicles and engines whereas CARB regulations refer to "Other Mobile Sources" or "off-road" vehicles and engines. These terms refer to the same types of vehicles and engines. We refer herein to such vehicles and engines as "non-road" sources.

[79] 2018 $PM_{2.5}$ Plan, Appendix B, pp. B-18 to B-19. The winter average daily planning inventory corresponds to the months of November through April, when daily ambient $PM_{2.5}$ concentrations are typically highest. The base year inventory is from the California Emissions Inventory Development and Reporting System and future year inventories were estimated using the California Emission Projection Analysis Model (CEPAM), 2016 SIP Baseline Emission Projections, version 1.05.

forecasted inventories for the RFP milestone years of 2017, 2020, 2023 (attainment year), and 2026 (post-attainment milestone year), and additional forecasted emissions inventories for 2018, 2019, 2021, and 2022 to support the five percent annual emissions reduction demonstration as required by CAA section 189(d). Each inventory includes emissions from stationary, area, on-road, and non-road sources.

The State selected 2013 for the base year emissions inventory, building on the 2012 actual emissions inventory and considering available air quality data, trends, and field studies.[80] Specifically, the State worked with local air districts and selected 2012 for the actual emissions inventory as it aligned with the 2012 data collection year of the Multiple Air Toxics Exposure Study IV (MATES IV)[81] of the South Coast Air Quality Management District (SCAQMD) and to maintain consistency across various California air quality plans.[82] The State then projected the 2013 base year emissions inventory (also referred to as the planning emissions inventory), presented in Appendix B of the 2018 $PM_{2.5}$ Plan, from that 2012 actual emissions inventory. The State developed the modeling emissions inventory from the base year emissions inventory, and conducted its base case modeling using 2013 for several reasons: Analysis of air quality trends, adjusted for meteorology, that indicated 2013 as a year conducive to ozone and $PM_{2.5}$ formation; availability of research-grade measurements of two significant pollution episodes in the DISCOVER-AQ field study of January to February 2013; and the relatively high design values for 2013, making it a conservative choice for attainment modeling.[83]

CARB developed the base year inventories for stationary sources using actual emissions reports from facility operators. The State developed the base year emissions inventory for area

---

[80] 2018 $PM_{2.5}$ Plan, Appendix L, pp. 11–12.
[81] Additional information on the MATES IV study performed in 2012 is available at: *https://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-iv*. SCAQMD performed the subsequent MATES V study in 2018 and issued the MATES V final report in August 2021. See *https://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v*, and "MATES V, Multiple Air Toxics Exposure Study in the South Coast AQMD, Final Report," SCAQMD, August 2021.
[82] 2018 $PM_{2.5}$ Plan, Appendix B, p. B-18
[83] 2018 $PM_{2.5}$ Plan, Appendix L, p. 12. The State presents further information in the "APPENDIX: San Joaquin Valley $PM_{2.5}$ SIP (2018)" of Appendix L and highlights that 2013 was one of the worst years in the decade preceding 2018 for $PM_{2.5}$ pollution in the San Joaquin Valley, underscoring its use as a conservative base year for attainment modeling.

sources using the most recent models and methodologies available at the time the State was developing the 2018 $PM_{2.5}$ Plan.[84] The Plan also includes background, methodology, and inventories of condensable and filterable $PM_{2.5}$ emissions from stationary point and non-point combustion sources that are expected to generate condensable $PM_{2.5}$.[85]

CARB used EMFAC2014 to estimate on-road motor vehicle emissions based on transportation activity data from the 2017 Transportation Improvement Plan (2017 TIP) adopted by the transportation planning agencies in the San Joaquin Valley.[86] EMFAC2014 was the latest EPA-approved version of California's mobile source emission factor model for estimating tailpipe, brake, and tire wear emissions from on-road mobile sources that was available during the State's and District's development of the emissions inventories in the 2018 $PM_{2.5}$ Plan.[87] Re-entrained paved road dust emissions were calculated using a CARB methodology consistent with the EPA's AP-42 road dust methodology.[88] CARB also provided emissions inventories for non-road equipment, including aircraft, trains, recreational boats, construction equipment, and farming equipment, among others. CARB uses a suite of category-specific models to estimate non-road emissions for many categories and, where a new model was not available, used the

---

[84] 2018 $PM_{2.5}$ Plan, Appendix B, Section B.2 ("Emissions Inventory Summary and Methodology").
[85] Id. at B-42 to B-44.
[86] 2018 $PM_{2.5}$ Plan, Appendix D, p. D-123.
[87] 80 FR 77337 (December 14, 2015). EMFAC is short for *Em*ission *FAC*tor. The EPA announced the availability of the EMFAC2014 model, effective on the date of publication in the *Federal Register*, for use in state implementation plan development and transportation conformity in California. Upon that action, EMFAC2014 was required to be used for all new regional emissions analyses and CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses that were started on or after December 14, 2017, which was the end of the grace period for using the prior mobile source emissions model, EMFAC2011. On August 15, 2019, the EPA approved EMFAC2017, a revision to the mobile source emissions model (84 FR 41717). The grace period for new regional emissions analyses began on August 15, 2019, and ended on August 16, 2021, while the grace period for hot-spot analyses began on August 15, 2019, and ended on August 17, 2020. Id. at 41720. On November 15, 2022, the EPA approved EMFAC2021, a subsequent revision to the mobile source emissions model (87 FR 68483). The grace period for new regional emissions analyses began on November 15, 2022, and ends on November 15, 2024, while the grace period for hot-spot analyses began on November 15, 2022, and ends on November 15, 2023. Id. at 68487–68488.
[88] 2018 $PM_{2.5}$ Plan, Appendix B, p. B-28. AP-42 has been published since 1972 as the primary source of the EPA's emission factor information and is available at *https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors.* It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates. The EPA released an update to AP-42 in January 2011 that revised the equation for estimating paved road dust emissions based on an updated data regression that included new emissions tests results. 76 FR 6328 (February 4, 2011). CARB used the revised 2011 AP-42 methodology in developing on-road mobile source emissions; see *https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf.*

OFFROAD2007 model.[89]

CARB developed the emissions forecasts by applying growth and control profiles to the base year inventory. CARB's mobile source emissions projections take into account predicted activity rates and vehicle fleet turnover by vehicle model year and adopted controls.[90] In addition, the Plan states that the District is providing for use of pre-base year ERCs as offsets by accounting for such ERCs in the projected 2025 emissions inventory.[91] The 2018 $PM_{2.5}$ Plan identifies growth factors, control factors, and estimated offset use between 2013 and 2025 for direct $PM_{2.5}$, NO_X, SO_X, and VOC emissions by source category and lists all pre-base year ERCs issued by the District for PM_{10}, NO_X, SO_X, and VOC emissions, by facility.[92]

Table 1 provides a summary of the winter (24-hour) average inventories in tons per day (tpd) of direct $PM_{2.5}$ and $PM_{2.5}$ precursors for the 2013 base year. Table 2 provides a summary of annual average inventories of direct $PM_{2.5}$ and $PM_{2.5}$ precursors for the 2013 base year. For the purposes of this proposal, these annual average inventories provide the bases for our evaluation of the precursor demonstration, control measure analysis, attainment demonstration, RFP demonstration, and the motor vehicle emission budgets ("budgets") in the SJV $PM_{2.5}$ Plan with respect to the Serious area and CAA section 189(d) requirements for the 1997 annual $PM_{2.5}$ NAAQS.

Table 1 – San Joaquin Valley Winter Average Emissions Inventory for Direct $PM_{2.5}$ and $PM_{2.5}$ Precursors for the 2013 Base Year (tpd)

Category	Direct $PM_{2.5}$	NO_X	SO_X	VOC	Ammonia
Stationary Sources	8.5	35.0	6.9	86.6	13.9
Area Sources	41.4	11.5	0.5	156.8	291.5
On-Road Mobile Sources	6.4	188.7	0.6	51.1	4.4

[89] 2018 $PM_{2.5}$ Plan, Appendix B, pp. B-38 through B-40. The EPA regulations refer to "non-road" vehicles and engines whereas CARB regulations refer to "Other Mobile Sources" or "off-road" vehicles and engines. These terms refer to the same types of vehicles and engines. We refer herein to such vehicles and engines as "non-road" sources.
[90] Id. at B-18 and B-19.
[91] 2018 $PM_{2.5}$ Plan, Appendix I, pp. I-1 to I-5.
[92] Id. at tables I-1 to I-5.

Non-Road Mobile Sources	4.4	65.3	0.3	27.4	0.0
Totals [a]	60.8	300.5	8.4	321.9	309.8

Source: 2018 $PM_{2.5}$ Plan, Appendix B, tables B-1 to B-5.
[a] Totals reflect disaggregated emissions and may not add exactly as shown here due to rounding.

Table 2 – San Joaquin Valley Annual Average Emissions Inventory for Direct $PM_{2.5}$ and $PM_{2.5}$ Precursors for the 2013 Base Year (tpd)

Category	Direct $PM_{2.5}$	NO_X	SO_X	VOC	Ammonia
Stationary Sources	8.8	38.6	7.2	87.1	13.9
Area Sources	41.5	8.1	0.3	153.4	310.9
On-Road Mobile Sources	6.4	183.1	0.6	49.8	4.4
Non-Road Mobile Sources	5.8	87.4	0.3	33.8	0.0
Totals [a]	62.5	317.2	8.5	324.1	329.2

Source: 2018 $PM_{2.5}$ Plan, Appendix B, tables B-1 to B-5.
[a] Totals reflect disaggregated emissions and may not add exactly as shown here due to rounding.

CARB explains in its August 2021 Staff Report that although it has updated the emissions inventories since development of the 2018 $PM_{2.5}$ Plan, the 15 $\mu g/m^3$ SIP Revision "uses the same inventory as the one in the 2018 $PM_{2.5}$ Plan, which it amends, for consistency." To support this approach, CARB included in its August 2021 Staff Report comparisons between the estimated annual NO_X and $PM_{2.5}$ emissions in the 2013 base year inventory developed using EMFAC2014 with those developed using the more recent EPA-approved version of EMFAC, EMFAC2017. CARB subsequently provided similar comparisons for the 2020 RFP and 2023 attainment years, as well as comparisons with emissions derived using EMFAC2021.[93] Table 3 shows the comparisons between on-road mobile source emissions derived using EMFAC2014, EMFAC2017, and EMFAC2021 for NO_X and $PM_{2.5}$ in 2013, 2020, and 2023.

[93] Email dated March 29, 2022, from Nesamani Kalandiyur, CARB, to Karina O'Connor et al., EPA Region IX, Subject: "RE: EMFAC Discussion," ("March 2022 EMFAC Clarification"). The email also includes model results for the 2026 post-attainment milestone year. CARB initially released EMFAC2021 v1.0.0 on January 15, 2021. CARB released an updated version, EMFAC2021 v1.0.1, on April 30, 2021, and the EPA approved the use of EMFAC2021 for use in SIP development on November 15, 2022 (87 FR 68483).

Table 3 – On-Road Mobile Source NO_X and Direct $PM_{2.5}$ Emissions Derived Using EMFAC2014, EMFAC2017, and EMFAC2021 (tpd)

	NO_X			Direct $PM_{2.5}$		
	2013	2020	2023	2013	2020	2023
EMFAC2014	183.1	96.9	57.9	6.5	3.4	3.2
EMFAC2017	170.0	89.3	61.2	6.8	4.0	3.3
EMFAC2021	193.5	84.4	54.9	6.1	2.3	1.8
EMFAC2017/ EMFAC2014	93%	92%	106%	106%	116%	105%
EMFAC2021/ EMFAC2014	106%	87%	95%	95%	66%	56%

Source: CARB's March 2022 EMFAC Clarification.

CARB determined that $PM_{2.5}$ emissions estimates for 2013 derived using EMFAC2017 are approximately six percent higher than estimates derived using EMFAC2014, and that NO_X emissions estimates for 2013 derived using EMFAC2017 are seven percent lower than the emissions estimates derived using EMFAC2014. On-road $PM_{2.5}$ and NO_X estimates derived using EMFAC2021 are five percent lower and six percent higher, respectively, in 2013 as compared with estimates from EMFAC2014. In the 2023 attainment year, on-road $PM_{2.5}$ and NO_X emissions estimates derived using EMFAC2017 are approximately 5 percent and 6 percent higher, respectively, than estimates derived using EMFAC2014, whereas on-road $PM_{2.5}$ and NO_X emissions estimates derived using EMFAC2021 are approximately 44 percent and 5 percent lower, respectively, than in EMFAC2014.

Based on these model results, CARB concludes that the differences in emissions derived using the different EMFAC model versions are not significant enough to affect the modeled attainment demonstration in the 15 $\mu g/m^3$ SIP Revision.

3. The EPA's Review of the State's Submission

As part of our July 22, 2021 proposed and November 26, 2021 final rules,[94] we reviewed

[94] 86 FR 38652 and 86 FR 67329.

the emissions inventories in the 2018 $PM_{2.5}$ Plan that pertain to the 1997 annual $PM_{2.5}$ NAAQS and the emissions inventory estimation methodologies used by California for consistency with CAA requirements and the EPA's guidance. We found that the inventories were based on the most current and accurate information available to the State and District at the time they were developing the 2018 $PM_{2.5}$ Plan and inventories, including the latest version of California's mobile source emissions model that had been approved by the EPA at the time, EMFAC2014. We also found that the inventories comprehensively address all source categories in the San Joaquin Valley $PM_{2.5}$ nonattainment area and are consistent with the EPA's inventory guidance. In our November 26, 2021 final action, we approved the 2013 base year emissions inventories in the 2018 $PM_{2.5}$ Plan as meeting the requirements of CAA section 172(c)(3) and 40 CFR 51.1008 for purposes of both the Serious area and the CAA section 189(d) attainment plans for the 1997 annual $PM_{2.5}$ NAAQS.[95]

For purposes of evaluating the 15 $\mu g/m^3$ SIP Revision, we have reviewed the additional information comparing the emissions derived using EMFAC2014, EMFAC2017, and EMFAC2021 that was provided by CARB in its August 2021 Staff Report and subsequent email transmittal. The State modeled reductions of direct $PM_{2.5}$ and NO_X on-road mobile emissions and calculated the sensitivity of the $PM_{2.5}$ design value per tpd of emissions.[96] The EPA used those sensitivity results with the EMFAC emissions estimates to assess the effects of the various EMFAC model version results on the attainment demonstration in the Plan. We are proposing to find that although NO_X and $PM_{2.5}$ emissions estimates in the 2023 attainment year are slightly higher in EMFAC2017 than in EMFAC2014, the effect on $PM_{2.5}$ concentrations is small enough that the attainment demonstration in the 15 $\mu g/m^3$ SIP Revision remains valid.[97] Furthermore, more up-to-date emissions information from EMFAC2021 indicates lower emissions of NO_X and

---

[95] 86 FR 67329, 67341.

[96] 15 $\mu g/m^3$ SIP Revision, Appendix D, p. D-125. Transportation Conformity Budgets, Emissions Trading Mechanism, Table 21. These sensitivity simulations used the same modeling base case as the attainment demonstration for the 15 $\mu g/m^3$ SIP Revision.

[97] Spreadsheet "EMFAC update effect on annual 1997 $PM_{2.5}$ NAAQS attainment demonstration," EPA Region IX, May 1, 2023.

$PM_{2.5}$ in the attainment year, indicating that the attainment modeling results derived using EMFAC2014 are conservative and that the 2023 attainment year design values are expected to be lower than those modeled in the Plan.

With respect to future year emissions projections in the 15 $\mu g/m^3$ SIP Revision, we have reviewed the growth and control factors and are proposing to find them acceptable and thus conclude that the future baseline emissions projections in the SJV $PM_{2.5}$ Plan, which reflect ongoing emissions reductions from existing (i.e., "baseline") control measures as discussed in Section IV.C.2.a, reflect appropriate calculation methods and the latest planning assumptions. Also, as a general matter, the EPA will approve a SIP submission that takes emissions reduction credit for a control measure only where the EPA has approved the measure as part of the SIP. Thus, for example, to take credit for the emissions reductions from newly adopted or amended District rules for stationary sources, the related rules must be approved by the EPA into the SIP. Table 2 of the EPA's "Technical Support Document, San Joaquin Valley $PM_{2.5}$ Plan Revision for the 1997 Annual $PM_{2.5}$ NAAQS," April 2023 ("EPA's 1997 Annual $PM_{2.5}$ TSD") shows District rules with post-2013 compliance dates that are reflected in the future year baseline inventories, along with information on the EPA's approval of these rules, and shows that stationary source emissions reductions assumed by the SJV $PM_{2.5}$ Plan for future years are supported by rules approved as part of the California SIP for the San Joaquin Valley. With respect to mobile sources, the EPA has taken action in recent years to approve CARB mobile source regulations into the state-wide portion of the California SIP. We therefore find that the future year baseline projections in the SJV $PM_{2.5}$ Plan are properly supported by SIP-approved stationary and mobile source measures.

For these reasons, we are proposing to find that the 2013 base year emissions inventories in the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS continue to satisfy the requirements of CAA section 172(c)(3) and 40 CFR 51.1008 for purposes of both the Serious area and the CAA section 189(d) attainment plans. We are also proposing to find that the forecasted inventories in

the Plan for the years 2017, 2018, 2019, 2020, 2023, and 2026 provide an adequate basis for the BACM, RFP, and the modeled attainment demonstration analyses in the SJV $PM_{2.5}$ Plan.

B. $PM_{2.5}$ Precursors

1. Statutory and Regulatory Requirements

Under subpart 4 of part D, title I of the CAA and the $PM_{2.5}$ SIP Requirements Rule, each state containing a $PM_{2.5}$ nonattainment area must evaluate all $PM_{2.5}$ precursors for regulation unless, for any given $PM_{2.5}$ precursor, the state demonstrates to the Administrator's satisfaction that such precursor does not contribute significantly to $PM_{2.5}$ levels that exceed the NAAQS in the nonattainment area.[98] The provisions of subpart 4 do not define the term "precursor" for purposes of $PM_{2.5}$, nor do they explicitly require the control of any specifically identified PM precursor. The statutory definition of "air pollutant," in CAA section 302(g), however, provides that the term "includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used."[99] The EPA has identified NO_X, SO_2, VOC, and ammonia as precursors to the formation of $PM_{2.5}$.[100] Accordingly, the attainment plan requirements of subpart 4 apply to emissions of all four precursor pollutants and direct $PM_{2.5}$ from all types of stationary, area, and mobile sources, except as otherwise provided in the Act (e.g., in CAA section 189(e)).

Section 189(e) of the Act requires that the control requirements for major stationary sources of direct PM_{10} (which includes $PM_{2.5}$) also apply to major stationary sources of PM_{10} precursors, except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels that exceed the standard in the area. Section 189(e) contains the only express exception to the control requirements under subpart 4 (e.g., requirements for RACM, RACT, BACM, BACT, MSM, and nonattainment new source review (NSR)). Although section

[98] 81 FR 58010, 58017–58020.
[99] CAA section 302(g).
[100] 81 FR 58010, 58015.

189(e) explicitly addresses only major stationary sources, the EPA interprets the Act as authorizing it also to determine, under appropriate circumstances, that regulation of specific $PM_{2.5}$ precursors from other source categories in a given nonattainment area is not necessary.[101] For example, under the EPA's longstanding interpretation of the control requirements that apply to stationary and mobile sources of PM_{10} precursors in nonattainment areas under CAA section 172(c)(1) and subpart 4,[102] a state may demonstrate in a SIP submission that control of a certain precursor pollutant is not necessary because it does not contribute significantly to ambient PM_{10} levels in the nonattainment area and is not needed for attainment.[103]

Under the $PM_{2.5}$ SIP Requirements Rule, a state may elect to submit to the EPA a "comprehensive precursor demonstration" for a specific nonattainment area to show that emissions of a particular precursor from all existing sources located in the nonattainment area do not contribute significantly to $PM_{2.5}$ levels that exceed the standard in the area.[104] If the EPA determines that the contribution of the precursor to $PM_{2.5}$ levels in the area is not significant and approves the demonstration, the state is not required to control emissions of the relevant precursor from existing sources in the attainment plan.[105]

In addition, in May 2019, the EPA issued the "$PM_{2.5}$ Precursor Demonstration Guidance" ("$PM_{2.5}$ Precursor Guidance"),[106] which provides recommendations to states for analyzing nonattainment area $PM_{2.5}$ emissions and developing such optional precursor demonstrations,

---

[101] Id. at 58018–58019.
[102] General Preamble, 13539–13542.
[103] Courts have upheld this approach to the requirements of subpart 4 for PM_{10}. See, *e.g., Assoc. of Irritated Residents* v. *EPA, et al.,* 423 F.3d 989 (9th Cir. 2005).
[104] 40 CFR 51.1006(a)(1).
[105] Id. A state may also perform a separate, "NNSR precursor demonstration" to evaluate the sensitivity of $PM_{2.5}$ levels in the nonattainment area to an increase in emissions of a particular precursor and determine if new major stationary sources and major modifications of a precursor would contribute significantly to $PM_{2.5}$ levels that exceed the standard in the nonattainment area. 40 CFR 51.1006(a)(3).
[106] "$PM_{2.5}$ Precursor Demonstration Guidance," EPA–454/R–19–004, May 2019, including memorandum dated May 30, 2019, from Scott Mathias, Acting Director, Air Quality Policy Division and Richard Wayland, Director, Air Quality Assessment Division, Office of Air Quality Planning and Standards (OAQPS), EPA to Regional Air Division Directors, Regions 1–10, EPA. The $PM_{2.5}$ Precursor Guidance builds upon the draft version of the guidance, released on November 17, 2016 ("Draft $PM_{2.5}$ Precursor Guidance"), which CARB referenced in developing its precursor demonstration in the SJV $PM_{2.5}$ Plan. "$PM_{2.5}$ Precursor Demonstration Guidance, Draft for Public Review and Comments," EPA–454/P–16–001, November 17, 2016, including memorandum dated November 17, 2016, from Stephen D. Page, Director, OAQPS, EPA to Regional Air Division Directors, Regions 1–10, EPA.

consistent with the $PM_{2.5}$ SIP Requirements Rule. The EPA developed recommended contribution thresholds to help assess whether a precursor significantly contributes to $PM_{2.5}$ levels above the NAAQS. The thresholds are based on the size of $PM_{2.5}$ concentration increases that are statistically indistinguishable from the inherent variability in the measured atmospheric concentrations.[107] If the chemical component of $PM_{2.5}$ ambient concentrations corresponding to emissions of a precursor (e.g., the concentration of sulfate, which corresponds to SO_2 emissions) is below the threshold, that is evidence that the precursor does not significantly contribute. If the precursor is above the threshold in this concentration-based test, the State can use a sensitivity-based test, in which the modeled sensitivity or response of ambient $PM_{2.5}$ concentrations to changes in emissions of the precursor is estimated and then compared to the threshold. The EPA's recommended annual average contribution threshold for purposes of the 2012 annual $PM_{2.5}$ NAAQS is 0.2 $\mu g/m^3$.[108] The $PM_{2.5}$ Precursor Guidance explains that this threshold represents a percentage of the 2012 annual NAAQS and that "[d]ifferent thresholds may be applicable to other levels and/or forms of the NAAQS (either past or future)."[109] In addition to comparing the concentration or modeled response to the threshold, the State can consider other information in assessing whether the precursor significantly contributes.

As explained in the $PM_{2.5}$ Precursor Guidance, and consistent with the $PM_{2.5}$ SIP Requirements Rule (40 CFR 51.1010(a)(2)(ii), 51.1006(a)(1)(ii)), the EPA may require an air agency to identify and evaluate potential control measures for a precursor to determine the potential emissions reductions achievable, in support of a precursor demonstration that relies on a sensitivity analysis.[110] The guidance states that such evaluation is particularly important for an area in which the $PM_{2.5}$ response to a 30 percent reduction in precursor emissions is close to the contribution threshold. In the case of a nonattainment area classified as Serious, this analysis

[107] $PM_{2.5}$ Precursor Guidance, p. 15.
[108] Id. at 17.
[109] Id. at fn. 20.
[110] Id. at 31.

would include identification and evaluation of measures that would constitute BACM/BACT level control for such pollutant.[111] Consistent with these regulations, the EPA requested that the State identify and evaluate potential control measures for ammonia to determine the potential emissions reductions achievable for purposes of the 1997 annual $PM_{2.5}$ NAAQS.

We are evaluating the SJV $PM_{2.5}$ Plan in accordance with the presumption embodied within subpart 4, that states must address all $PM_{2.5}$ precursors in the evaluation of potential control measures unless the state adequately demonstrates that emissions of a particular precursor or precursors do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the $PM_{2.5}$ NAAQS in the nonattainment area. In reviewing any determination by a state to exclude a $PM_{2.5}$ precursor from the required evaluation of potential control measures, we consider both the magnitude of the precursor's contribution to ambient $PM_{2.5}$ concentrations in the nonattainment area and, where the state has conducted sensitivity-based analyses, the sensitivity of ambient $PM_{2.5}$ concentrations in the area to reductions in emissions of that precursor in accordance with the $PM_{2.5}$ Precursor Guidance.

2. Summary of the State's Submission

The State presents some results and conclusions from its $PM_{2.5}$ precursor sensitivity analysis in Chapter 5 ("Demonstration of Federal Requirements for 1997 $PM_{2.5}$ Standards"), Section 5.3.1 ("Summary of Modeling Results") of the 15 $\mu g/m^3$ SIP Revision, and presents the full precursor demonstration in Appendix G ("Precursor Demonstration") of the 2018 $PM_{2.5}$ Plan.[112] CARB presents additional modeling results in Appendix K ("Modeling Attainment Demonstration") of the 15 $\mu g/m^3$ SIP Revision. CARB also provided clarifying information on its precursor assessment, including an Attachment A to its letter transmitting the 2018 $PM_{2.5}$ Plan

[111] Id.
[112] Appendix G was not changed relative to the 2018 $PM_{2.5}$ Plan for the 15 $\mu g/m^3$ SIP Revision.

to the EPA[113] and further clarifications in five email transmittals.[114] CARB's December 2018 Staff Report and August 2021 Staff Report contain additional discussion of the role of ammonia in the formation of ammonium nitrate and the role of VOC in the formation of ammonium nitrate and secondary organic aerosol.[115] Lastly, on March 30, 2023, CARB transmitted to the EPA a technical supplement titled "Ammonia: Supplemental Information for EPA in Support of 15 $\mu g/m^3$ Annual $PM_{2.5}$ Standard, March 2023" ("March 2023 Ammonia Supplement") in which CARB and the District "clarify CARB's assessment of ammonia as a precursor to fine particulate matter ($PM_{2.5}$) for the 15 $\mu g/m^3$ annual standard by summarizing information previously submitted to EPA and providing new detailed control measure analysis"[116] to assess potential ammonia emissions reductions achievable in the San Joaquin Valley through the implementation of best available controls.

The SJV $PM_{2.5}$ Plan provides both concentration-based and sensitivity-based analyses of precursor contributions to ambient $PM_{2.5}$ concentrations in the San Joaquin Valley. For the concentration-based analysis, CARB assessed the 2015 annual average concentration of each precursor in ambient $PM_{2.5}$ at Bakersfield, for which the necessary speciated $PM_{2.5}$ data are available and where the highest $PM_{2.5}$ design values have been recorded in most years. CARB concludes that the 2015 annual average contributions of ammonia, SO_X, and VOC are 5.2 $\mu g/m^3$, 1.6 $\mu g/m^3$, and 6.2 $\mu g/m^3$, respectively. Given that these levels are above the EPA's

---

[113] Letter dated May 9, 2019, from Richard Corey, Executive Officer, CARB, to Michael Stoker, Regional Administrator, EPA Region 9, Attachment A ("Clarifying information for the San Joaquin Valley 2018 Plan regarding model sensitivity related to ammonia and ammonia controls").

[114] Email dated June 20, 2019, from Jeremy Avise, CARB, to Scott Bohning, EPA Region IX, Subject: "RE: SJV model disbenefit from SO_X reduction," with attachment ("CARB's June 2019 Precursor Clarification"); email dated September 19, 2019, from Jeremy Avise, CARB, to Scott Bohning, EPA Region IX, Subject: "FW: SJV species responses," with attachments ("CARB's September 2019 Precursor Clarification"); email dated October 18, 2019, from Laura Carr, CARB, to Scott Bohning, Jeanhee Hong, and Rory Mays, EPA Region IX, Subject: "Clarifying information on ammonia," with attachment "Clarifying Information on Ammonia" ("CARB's October 2019 Precursor Clarification"); email dated April 19, 2021, from Laura Carr, CARB, to Rory Mays, EPA Region IX, Subject: "Ammonia update," with attachment "Update on Ammonia in the San Joaquin Valley" ("CARB's April 19, 2021 Precursor Clarification"); and email dated April 26, 2021, from Laura Carr, CARB, to Scott Bohning, EPA Region IX, Subject: "RE: Ammonia update," with attachment "Ammonia in San Joaquin Valley" ("CARB's April 26, 2021 Precursor Clarification").

[115] December 2018 Staff Report, Appendix C, pp. 9–16, and August 2021 Staff Report, pp. 8–9 and Attachment 1. Attachment 1 is identical to the attachment to CARB's April 19, 2021 Precursor Clarification.

[116] Letter dated March 29, 2023, from Steven S. Cliff, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region 9, with enclosures.

recommended contribution threshold, the State proceeded with a sensitivity-based analysis.

CARB's sensitivity-based analysis used the same Community Multiscale Air Quality (CMAQ) modeling platform as that used for the Plan's attainment demonstration, described in Section IV.D. of this proposal. The State modeled the sensitivity of ambient $PM_{2.5}$ concentration in the San Joaquin Valley to 30 percent and 70 percent reductions in anthropogenic emissions of each precursor pollutant for modeled years 2013, 2020, and 2024. The year 2013 is the 2018 $PM_{2.5}$ Plan's base year; 2020 is the modeled attainment year for the 1997 24-hour $PM_{2.5}$ NAAQS and former modeled attainment year for the 1997 annual $PM_{2.5}$ NAAQS; and 2024 is the modeled attainment year for the 2006 24-hour $PM_{2.5}$ NAAQS. For the 1997 annual $PM_{2.5}$ NAAQS, the revised modeled attainment year is 2023, but the State did not conduct precursor sensitivity modeling for that additional year. Instead, the State assumed that 2023 and 2024 would have very similar results;[117] and results for 2024 were used as a proxy for those in 2023.

In Appendix G of the 2018 $PM_{2.5}$ Plan, the State compared its sensitivity modeling results to the recommended annual average contribution threshold of 0.2 $\mu g/m^3$ in the $PM_{2.5}$ Precursor Guidance. As discussed in Section IV.B.1, the 0.2 $\mu g/m^3$ contribution threshold was derived based on the level of the 2012 annual $PM_{2.5}$ NAAQS (i.e., 12.0 $\mu g/m^3$). In the March 2023 Ammonia Supplement, the State explains that adjusting the contribution threshold to the level of the 1997 annual $PM_{2.5}$ NAAQS (i.e., 15.0 $\mu g/m^3$) results in a contribution threshold of 0.25 $\mu g/m^3$ and presents an updated evaluation of the modeled concentration-based and sensitivity-based analyses for ammonia using the 0.25 $\mu g/m^3$ threshold.[118]

In collaboration with the District, the State supplemented the sensitivity analysis, particularly for ammonia, with consideration of additional information such as emissions trends, the appropriateness of future year versus base year sensitivity, the severity of nonattainment, and a detailed controls analysis.[119] These factors were identified in the then-available Draft $PM_{2.5}$

[117] 15 $\mu g/m^3$ SIP Revision, Chapter 5, p. 5-8, and March 2023 Ammonia Supplement, fn. 35.
[118] The State did not provide an updated analysis using the 0.25 $\mu g/m^3$ threshold for SO_X or VOC.
[119] 2018 $PM_{2.5}$ Plan, Appendix G, pp. 8–10, and March 2023 Ammonia Supplement, pp. 13–96.

Precursor Guidance, as well as in the final $PM_{2.5}$ Precursor Guidance, as factors that may be relevant to a sensitivity-based contribution analysis.[120]

Taken together, these analyses led CARB to conclude that NO_X remains a plan precursor but that ammonia, SO_X, and VOC do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the $PM_{2.5}$ NAAQS in the San Joaquin Valley. We summarize the State's analysis and conclusions below. For a more detailed summary of the precursor demonstration in the Plan, please refer to the EPA's "Technical Support Document, EPA Evaluation of $PM_{2.5}$ Precursor Demonstration, San Joaquin Valley $PM_{2.5}$ Plan for the 2006 $PM_{2.5}$ NAAQS," February 2020 ("EPA's February 2020 Precursor TSD").

a. Ammonia

For the ammonia analysis presented in Appendix G of the 2018 $PM_{2.5}$ Plan, the State compared the annual precursor contributions to 0.2 $\mu g/m^3$, the contribution threshold recommended for the 2012 annual $PM_{2.5}$ NAAQS in the $PM_{2.5}$ Precursor Guidance. The State supplemented this analysis in the March 2023 Ammonia Supplement by comparing the annual ammonia contributions to the 0.25 $\mu g/m^3$ threshold it derived for the 1997 annual $PM_{2.5}$ NAAQS. For a modeled 30 percent ammonia emissions reduction, the ambient $PM_{2.5}$ responses in 2013 ranged from 0.20 to 0.72 $\mu g/m^3$ across 15 monitoring sites, with all of the sites at or above the 0.2 $\mu g/m^3$ contribution threshold and all but two of the sites above the 0.25 $\mu g/m^3$ contribution threshold. $PM_{2.5}$ responses in 2020 ranged from 0.12 to 0.42 $\mu g/m^3$, with nine sites above the 0.2 $\mu g/m^3$ contribution threshold and four sites above the 0.25 $\mu g/m^3$ contribution threshold. Responses in 2024 ranged from 0.08 to 0.26 $\mu g/m^3$, with two sites above the 0.2 $\mu g/m^3$ contribution threshold and one site above the 0.25 $\mu g/m^3$ contribution threshold. For a modeled 70 percent ammonia emissions reduction, the ambient $PM_{2.5}$ responses were above both thresholds at all 15 sites for all three modeled years.

[120] $PM_{2.5}$ Precursor Guidance, pp. 18–19 (consideration of additional information), p. 31 (available emission controls), and pp. 35–36 (appropriateness of future year versus base year sensitivity).

The State based its ammonia precursor determination on the sensitivity analysis for the future years, using a 30 percent ammonia emissions reduction. This was supported by its assessment of research studies and the Plan's projected emissions reductions, and its assessment of available emissions controls. As explained in the $PM_{2.5}$ Precursor Guidance, precursor responses may be above the recommended contribution threshold and yet not contribute significantly to levels that exceed the standard in the area.[121] Therefore, the State considered additional information to examine whether the identified $PM_{2.5}$ responses constituted a significant contribution to ambient $PM_{2.5}$ in the San Joaquin Valley. The additional information included emissions trends, support for the State's reliance on modeling results for a 30 percent ammonia emissions reduction, as well as conclusions from research studies.

The State estimates that NO_X emissions in the San Joaquin Valley are projected to decrease by 53 percent from 2013 to 2024, while ammonia emissions are projected to remain relatively flat, thereby increasing the relative abundance of ammonia.[122] Based on the Plan's emission reduction projections combined with the research study conclusions, the State relies on the modeled responses for the 2024 future year, rather than the 2013 base year, stating that the future year NO_X emissions are more representative of San Joaquin Valley emissions conditions.[123] The State references the Draft $PM_{2.5}$ Precursor Guidance, which notes that it may be appropriate to model future conditions that are more representative of current atmospheric conditions and those conditions expected closer to the attainment date.[124] The State concludes that this in fact applies to the San Joaquin Valley.[125]

The State also describes previous research studies that support its conclusion that ammonium nitrate $PM_{2.5}$ formation in the San Joaquin Valley is NO_X-limited rather than

[121] $PM_{2.5}$ Precursor Guidance, p. 18.
[122] March 2023 Ammonia Supplement, pp. 14–15.
[123] Id. at 15 and 17.
[124] Id. at 13 (referencing Draft $PM_{2.5}$ Precursor Guidance, p. 33). See also $PM_{2.5}$ Precursor Guidance, p. 35.
[125] Id. at 15.

ammonia-limited.[126] For example, based on aircraft-borne measurements during the 2013 DISCOVER-AQ campaign,[127] the State concluded that ammonium nitrate formation is NO_X-limited based on the large amount of "excess ammonia," which is defined as the amount of measured ammonia left over if all the nitrate and sulfate present were to combine with available ammonia to form particulate.[128] CARB's December 2018 Staff Report describes these conclusions in more detail and lists results from multiple other recent studies with similar conclusions.[129] The studies suggest a very low ambient sensitivity to ammonia, based on measured excess ammonia relative to NO_X, the abundance of particulate nitrate relative to gaseous NO_X, and the large abundance of ammonia relative to nitric acid. The studies all conclude that there is a large amount of ammonia left over after reacting with NO_X, so that ammonia emission reductions would be expected mainly to reduce the amount of ammonia excess, rather than to reduce the particulate amonium nitrate.

CARB also describes the results of two studies indicating that ammonia concentrations may be underestimated in modeling of the DISCOVER-AQ early 2013 study period, which would result in the response to ammonia reductions being overpredicted.[130] CARB conducted its own analysis comparing 2017 satellite observations with CMAQ model predictions and found that modeled ammonia concentrations were half of the magnitude of the satellite observations at some locations and that the modeled valley-wide average was approximately 25 percent less than observed. Taken together, CARB concludes that these studies provide evidence that $PM_{2.5}$ would respond only weakly to ammonia emissions reductions.

Finally, the State and District provided additional information, both in the SJV $PM_{2.5}$

---

[126] 2018 $PM_{2.5}$ Plan, Appendix G, pp. 9–10; December 2018 Staff Report, Appendix C, pp. 12–15; and Attachment A to CARB's May 9, 2019, submittal letter.
[127] Deriving Information on Surface conditions from COlumn and VERtically Resolved Observations Relevant to Air Quality," *https://www.nasa.gov/mission_pages/discover-aq/index.html.*
[128] 2018 $PM_{2.5}$ Plan, Appendix G, Figure 2.
[129] December 2018 Staff Report, Appendix C, p. 12; and Attachment A to CARB's May 9, 2019 submittal letter. These studies are also discussed in the EPA's February 2020 Precursor TSD.
[130] CARB's April 19, 2021 Precursor Clarification; CARB's April 26, 2021 Precursor Clarification. The modeling used for the attainment demonstration has enough excess ammonia to correctly predict ammonium nitrate and ammonium sulfate $PM_{2.5}$ concentrations, but likely less of an excess than indicated from ambient measurements of ammonia itself.

Plan and in the March 2023 Ammonia Supplement, to support its conclusion that 30 percent is a reasonable upper bound on the ammonia reductions that are practically available, and as a basis for its reliance on the modeling results for a 30 percent ammonia emissions reduction. This information includes a review of ammonia emission reductions achieved nationwide from 2011 to 2017 as summarized in the EPA's $PM_{2.5}$ Precursor Guidance,[131] an evaluation of the main ammonia source categories in the San Joaquin Valley,[132] a summary of existing control measures in the San Joaquin Valley that affect ammonia from these sources,[133] a review of existing control measures implemented by other air districts,[134] and an evaluation of additional mitigation options for ammonia sources in the Valley.[135] We briefly summarize the State's analyses and conclusions for relying on a 30 percent upper bound in the following paragraphs. For a more detailed summary of the State's ammonia control measure analysis, please refer to the EPA's 1997 annual $PM_{2.5}$ TSD.[136]

First, CARB and the District reason that trends in ammonia emissions provided in the $PM_{2.5}$ Precursor Guidance, which show a national increase of 0.8 percent in ammonia emissions between 2011–2017, are indicative of a lack of controls on ammonia sources nationwide.[137] The March 2023 Ammonia Supplement includes a comparison of the guidance trends in ammonia with trends in NO_X and SO_2 over the same period, which decreased by 63.6 percent and 31.8 percent, respectively, which CARB and the District attribute to control measures to reduce emissions of these pollutants. The State acknowledges that new controls for ammonia are being researched but states that the recent emissions trends suggest that a 30 percent reduction in ammonia is a conservative upper bound on what is achievable. To further support that statement, the District and State collaborated on an evaluation of potential control measures to reduce

---

[131] March 2023 Ammonia Supplement, p. 11. See also $PM_{2.5}$ Precursor Guidance, Section 4.1.1.
[132] March 2023 Ammonia Supplement, pp. 20–25.
[133] Id. at 25, and 2018 $PM_{2.5}$ Plan, Appendix C, Section C-25.
[134] March 2023 Ammonia Supplement, pp. 26–27, and 2018 $PM_{2.5}$ Plan, Appendix C, Section C-25.
[135] March 2023 Ammonia Supplement, pp. 28–96.
[136] EPA, Technical Support Document, "San Joaquin Valley $PM_{2.5}$ Plan Revision for the 1997 annual $PM_{2.5}$ NAAQS," April 2023.
[137] March 2023 Ammonia Supplement, p. 11.

ammonia emissions in the San Joaquin Valley for the March 2023 Ammonia Supplement.

The first step in the control measure evaluation was to characterize the key sources of ammonia in the Valley. The three main sources of ammonia emissions identified in the Plan are: (1) confined animal facilities (CAFs); (2) agricultural fertilizers; and (3) composting operations, which together account for 94 percent of the Valley's ammonia emissions.[138] CAFs are subject to District Rule 4570 ("Confined Animal Facilities"), and composting operations are subject to District Rule 4565 ("Biosolids, Animal Manure, and Poultry Litter Operations") and District Rule 4566 ("Organic Material Composting Operations"). Although these District rules explicitly apply only to VOC emissions from these sources, the State concludes that these rules have also resulted in significant reductions in ammonia emissions.[139] Appendix C of the 2018 $PM_{2.5}$ Plan cites a number of scientific studies that address the correlation between VOC and ammonia emissions from these emission sources.[140] Given that CAFs and agricultural fertilizers account for 92 percent of the ammonia emissions inventory in the San Joaquin Valley,[141] and that ammonia emissions from composting operations account for only 2 percent of the ammonia emissions inventory and have already been reduced through District Rules 4565 and 4566, the ammonia control measure evaluation focused primarily on potential controls for CAFs and agricultural fertilizers.

For CAFs, the District provides an inventory of the types of facilities operating in the Valley subject to Rule 4570 and the corresponding ammonia emissions from each facility type.[142] For dairy cattle, which accounts for an estimated 67.2 percent of ammonia emissions from CAFs, the District assessed how the different CAF operations contribute to the overall ammonia inventory. For example, the District estimates that 56.6 percent of dairy cattle ammonia emissions are from housing dairy cattle in corrals/pens, 11.1 percent of emissions are from

[138] Id. at 20.
[139] Id. at 26 and 96.
[140] 2018 $PM_{2.5}$ Plan, Appendix C, Section C-25.
[141] March 2023 Ammonia Supplement, Figure 4.
[142] Id. at Figure 5 and Table 7.

lagoons and storage ponds, and 12.0 percent of emissions occur during land application of liquid manure.[143]

Next, the District discusses ammonia mitigation measures that are already being implemented in the Valley. The District discusses in detail in Appendix C of the 2018 $PM_{2.5}$ Plan how Rule 4570 is structured (e.g., to address varying types of CAFs); the five main CAF operations/emission sources: feeding, housing (including distinctions for housing configurations), solid waste, liquid waste, and land application of manure; the control menu requirements for each of those five operations; and research papers that estimate ammonia emission reductions from some of the measures.[144] The District explains that some of the measures in Rule 4570 are required to be implemented but that the rule also requires additional measures to be selected from a menu of options.[145] The menu-based approach is intended to allow facilities flexibility to select measures that are the most practical and effective for their design and operation given the District's findings of variability within the industry.[146]

As a first step in assessing whether there are additional feasible control measures for CAFs that are not yet being implemented in the Valley, the District evaluated other district CAF rules with requirements comparable to those in Rule 4570.[147] The District reviewed CAF rules implemented by the South Coast Air Quality Management District (AQMD), Bay Area AQMD, Ventura County Air Pollution Control District (APCD), Sacramento Metropolitan AQMD, Imperial County APCD, and the State of Idaho.[148] The District also points to comparisons between Rule 4570 and two additional sets of requirements imposed by Butte County APCD and Yakima Regional Clean Air Agency, as conducted for the "2016 Plan for the 2008 8-hour Ozone Standard."[149] Based on comparisons between specific requirements, the State concludes that

---

[143] Id. at Figure 7.
[144] 2018 $PM_{2.5}$ Plan, Appendix C, pp. C-312 to C-323.
[145] Id. and March 2023 Ammonia Supplement, pp. 25–26.
[146] Id.
[147] March 2023 Ammonia Supplement, pp. 26–27.
[148] 2018 $PM_{2.5}$ Plan, Appendix C, Section C-25.
[149] March 2023 Ammonia Supplement, p. 27.

Rule 4570 is more stringent than other district rules and no additional requirements are currently being implemented in other areas.[150]

The second step in the control measure analysis was to review scientific research studies on mitigating ammonia emissions from CAFs. In Appendix A of the March 2023 Ammonia Supplement, the District provides a list of research studies and potential ammonia control measures it considered. For each of the 46 mitigation measures identified in the literature, the State provides a narrative detailing its evaluation of the feasibility of implementation of the measure in the San Joaquin Valley.[151] The State's analysis covers a broad range of CAF activities, including animal feeding and housing, and the storage, handling, and land application of manure. The analysis also addresses a number of other mitigation options, such as pasture and range land management, land use changes, and planting a tree shelter belt near CAFs.[152] Based on these evaluations, the State identified three measures that could provide further reductions in ammonia emissions in the San Joaquin Valley. These measures include 1) reducing the crude protein content in feed for beef finishing cattle, 2) incorporating solid manure into the soil within 24-hours, and 3) adding acidifying amendments to poultry litter and manure.[153] Based on control efficiencies cited in the literature, the District estimates that the total emissions reductions achievable from these measures is 6.6 tons per day (tpd), which is approximately two percent of the 2023 inventory. For those measures it found to be infeasible in the San Joaquin Valley, the District includes a narrative explaining its conclusion.

Regarding fertilizer application, the State provides an estimate of 111.2 tpd of ammonia emissions in 2023.[154] In the 2018 $PM_{2.5}$ Plan, the District describes key research assessing nitrogen in California, as well as regulations adopted by the California Water Resources Control Board, including orders adopted by the Central Valley Regional Water Quality Control Board

[150] Id.
[151] Id. at 28–85.
[152] Id. at 86–88.
[153] Id. at 88–89.
[154] Id. at 89.

(e.g., a Nutrient Management Plan), the Irrigated Lands Regulatory Program (e.g., a Nitrogen Management Plan), and other individual orders on agricultural operations not subject to those programs.[155] These orders subject agricultural operators, including dairies, bovine feedlots, poultry operations, and crop farmers to "waste discharge requirements that protect both surface water and groundwater."[156]

In the March 2023 Ammonia Supplement, the State supplemented its prior analysis by explaining how various state agencies are engaged in fertilizer use and application and discussing its efforts to identify any existing rules or regulations in the nation controlling ammonia emissions from this source category.[157] CARB states that it has not identified any measures that are being implemented to reduce ammonia and thus, again turns to scientific research studies on ammonia mitigation measures to assess the potential emissions reductions that could be achieved from fertilizer application. The measures identified in the literature for reducing ammonia emissions from fertilizer application include optimizing fertilizer use, adding a urease inhibitor, mixing and injecting fertilizer into the soil quickly, and applying fertilizer during optimal weather conditions. Based on its review, the State finds that several of the strategies identified in the literature are consistent with strategies recommended by the California Department of Food and Agriculture Fertilizer Research and Education Program as part of its Irrigation and Nitrogen Management training program, which includes overviews of the "4 R's" of nitrogen management: "Right source" of nitrogen at the "right rate," "right time," and "right place."[158] However, the State concludes that more research is needed to explore the feasibility and effectiveness of requiring some of the identified strategies in California, due in part to the warmer and dryer climate conditions in the San Joaquin Valley compared to, for example, the European climate in which many of the research studies were conducted, and due to the need to

[155] 2018 $PM_{2.5}$ Plan, Appendix C, pp. C-339 to C-343.
[156] Id. at C-341.
[157] March 2023 Ammonia Supplement, pp. 89–92.
[158] Id. at 92.

explore any potential adverse consequences. Thus, the State concludes that additional reductions in ammonia from fertilizer application are not feasible at this time.[159]

For composting operations and other ammonia sources, the District notes that it currently regulates ammonia emissions from composting though Rules 4565 and 4566 and states that these rules have reduced ammonia emissions by 44 percent. Given that composting amounts to only two percent of the total ammonia emissions, the District did not provide any further evaluation for this source category. For the remaining ammonia sources in the Valley covered under "other" source category, which amounts to 6 percent of the total inventory, the District notes that ammonia emissions are primarily from mobile sources and fuel combustion, which it asserts are also already controlled. The District concludes that no additional reductions are available from composting operations or other ammonia sources.[160]

Taken together, the State estimates that ammonia emissions could be reduced by 6.6 tpd in the San Joaquin Valley through three additional mitigation measures for CAFs, which would amount to a total ammonia reduction of 2 percent. Based on this analysis, the State concludes that ammonia control measures achieving even the low end of the modeled range (i.e., 30 percent) are not feasible for implementation in the San Joaquin Valley, and that it is therefore reasonable to treat a 30 percent ammonia reduction as a conservative upper bound on the reductions that are achievable, and to base the analysis in the precursor demonstration on the model response to a 30 percent reduction.

In summary, the State's sensitivity analysis presents a range of $PM_{2.5}$ responses to ammonia emissions reductions in multiple modeled years. The State describes in the Plan its bases for finding that the 2024 future year sensitivity results better represent conditions in the San Joaquin Valley than the 2013 base year, and for finding a 30 percent ammonia reduction to be a reasonable upper bound on the ammonia emissions reductions available for assessing the

[159] Id. at 96.
[160] Id.

ammonia contribution. Based on these analyses of the modeled response to ammonia reductions below the threshold, additional ambient evidence, and the amount of reductions available from controls, the State concludes that ammonia does not contribute significantly to ambient $PM_{2.5}$ levels above the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

b. SO_X

For SO_X, the State compares the annual precursor contributions to the contribution threshold of 0.2 $\mu g/m^3$ recommended for the 2012 annual $PM_{2.5}$ NAAQS in the $PM_{2.5}$ Precursor Guidance. For modeled SO_X emissions reductions of 30 percent and 70 percent, the ambient $PM_{2.5}$ responses in 2013 ranged from -0.05 $\mu g/m^3$ to 0.15 $\mu g/m^3$ across 15 monitoring sites, which all fall below the 0.20 $\mu g/m^3$ contribution threshold.[161] The response was below zero in select cases, indicating an increase, rather than a decrease, in ambient $PM_{2.5}$ in response to SO_X emissions reductions (i.e., a disbenefit). For 2020, the responses to 30 percent and 70 percent emissions reductions ranged from -0.01 $\mu g/m^3$ to 0.16 $\mu g/m^3$ while for 2024, the responses ranged from 0.01 $\mu g/m^3$ to 0.08 $\mu g/m^3$; these are also all below the 0.2 $\mu g/m^3$ contribution threshold.[162]

To explain the SO_X emissions reduction disbenefit that is observed in some cases, CARB refers to the non-linearity of inorganic aerosol thermodynamics, as described in a study by West et al.[163] The paper discusses how, under certain conditions, reducing SO_X could free ammonia to combine with nitrate, increasing overall $PM_{2.5}$ mass. To investigate this issue further, CARB conducted simulations with the ISORROPIA inorganic aerosol thermodynamic equilibrium model used within the CMAQ model and provided clarifications to the EPA.[164] In essence, CARB states that for some conditions typical of San Joaquin Valley, ISORROPIA switches to a

[161] 2018 $PM_{2.5}$ Plan, Appendix G, tables 8 and 9.
[162] CARB's September 2019 Precursor Clarification, 2020 analysis tables 7 and 8, and 2024 analysis tables 7 and 8.
[163] 15 $\mu g/m^3$ SIP Revision, Appendix K, Section 5.7 ("$PM_{2.5}$ Precursor Sensitivity Analysis"); and West, J.J., Ansari, A.S., Pandis, S.N., 1999, Marginal $PM_{2.5}$: Nonlinear aerosol mass response to sulfate reductions in the eastern United States, *Journal of the Air & Waste Management Association*, 49, 1415–1424. *https//doi.org/10.1080/10473289.1999.10463973*.
[164] CARB's June 2019 Precursor Clarification.

different chemical regime in which the disbenefit occurs. CARB states that it is not known how well this model behavior reflects the actual atmosphere, but CARB accepts the results because it is a well-known and widely used chemical model.

The State also provides an emissions trend chart that shows that SO_X emissions are approximately constant at 8 tpd from 2013 through 2024. Given that the relative levels of estimated SO_X and ammonia emissions over the timeframe remain similar, the State concludes that 2013 sensitivities are also representative of future years.[165]

Based on the small modeled response of ambient $PM_{2.5}$ to SO_X emissions reductions, the constant SO_X emissions over time, and its scientific understanding of sulfate interactions with other molecules in the air, the State concludes that SO_X does not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

c. VOC

For VOC, CARB compared the annual precursor contributions to the EPA's recommended contribution threshold for the 2012 $PM_{2.5}$ NAAQS of 0.2 $\mu g/m^3$. For a modeled 30 percent VOC emissions reduction, the ambient $PM_{2.5}$ responses in 2013 ranged from 0.01 $\mu g/m^3$ to 0.16 $\mu g/m^3$ across 15 monitoring sites, with all sites below the 0.2 $\mu g/m^3$ contribution threshold.[166] The 2020 and 2024 responses ranged from -0.07 $\mu g/m^3$ to 0.06 $\mu g/m^3$, with all monitoring sites below the 0.2 $\mu g/m^3$ contribution threshold for both years. For a modeled 70 percent VOC emissions reduction, the $PM_{2.5}$ responses in 2013 ranged from 0.05 $\mu g/m^3$ to 0.40 $\mu g/m^3$, including responses at or above the 0.2 $\mu g/m^3$ contribution threshold at 8 of the 15 sites. However, for 2020 and 2024 all responses were below the 0.2 $\mu g/m^3$ contribution threshold; 2020 responses ranged from -0.10 $\mu g/m^3$ to 0.16 $\mu g/m^3$ and the 2024 responses ranged from

[165] 2018 $PM_{2.5}$ Plan, Appendix G, p. 15. The State includes modeling of 30 percent and 70 percent reductions of SO_X for 2013 only, finding that the sensitivity of ambient $PM_{2.5}$ to such changes were below the EPA's recommended threshold, and that the 2020 and 2024 results would differ little from 2013 due to the similarity of emissions conditions over time. Appendix G, p. 17. CARB's September 2019 Precursor Clarification provides the 2020 and 2024 sensitivity results, which are indeed very close to those for 2013.

[166] 2018 $PM_{2.5}$ Plan, Appendix G, Table 10.

-0.18 μg/m^3 to 0.08 μg/m^3. The negative responses to VOC reductions represent an increase in $PM_{2.5}$ levels, i.e., a disbenefit. The 2024 results show a disbenefit at 11 of the 15 sites for both the 30 percent and the 70 percent VOC emissions reductions scenarios.

CARB then considered additional information to assess whether these $PM_{2.5}$ responses constituted a significant contribution to ambient $PM_{2.5}$ in the San Joaquin Valley, including emissions trends and an assessment of the modeled disbenefit of VOC emissions reductions. VOC emissions are projected to decrease approximately 30 tpd (or 9 percent) from 2013 to 2024, with approximately 28 out of the 30 tpd reduction taking place by 2020.[167] The State concludes that the formation of ambient $PM_{2.5}$ from VOC may therefore differ in base and future years and that the sensitivity analysis for 2013, which showed some contributions above 0.2 μg/m^3, is not representative of current or future conditions.

CARB explained the modeled disbenefit of VOC reductions as follows: emissions of VOC and NO_X react in the atmosphere to form organic nitrate species, such as peroxyacetyl nitrate, meaning that some portion of the NO_X emissions is not available to react with ammonia to form ammonium nitrate particulate matter. In other words, VOC emissions can be a "sink" for NO_X emissions. Reducing VOC emissions therefore reduces the formation of organic nitrates, so the sink is smaller and nitrate molecules are freed to react with ammonia to form particulate ammonium nitrate.[168] The State further explored the VOC disbenefit based on a 2016 CARB modeling assessment provided in Appendix A ("Air Quality Modeling") of the "2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard" for the San Joaquin Valley ("2016 $PM_{2.5}$ Plan"), which CARB submitted to the EPA as a SIP revision on May 10, 2019.[169]

Based on its sensitivity-based analysis of VOC emissions reductions, VOC emissions trends, and the scientific understanding of VOC chemistry in the San Joaquin Valley, CARB

---

[167] Id. at p. 19 and Figure 5.
[168] 15 μg/m^3 SIP Revision, Appendix K, pp. 81–82 (citing Meng, Z., D. Dabdub, D., Seinfeld, J. H., Chemical Coupling Between Atmospheric Ozone and Particulate Matter, *Science* 277, 116 (1997). DOI: 10.1126/science.277.5322.116).
[169] 2016 $PM_{2.5}$ Plan, Appendix A, p. A-57. See also 15 μg/m^3 SIP Revision, Appendix K, Section 5.7 ("$PM_{2.5}$ Precursor Sensitivity Analysis").

concludes that VOC emissions do not contribute significantly to $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

3. The EPA's Review of the State's Submission

The EPA has evaluated the State's precursor demonstration in the SJV $PM_{2.5}$ Plan, consistent with the $PM_{2.5}$ SIP Requirements Rule and the recommendations in the $PM_{2.5}$ Precursor Guidance. The State did not present a precursor demonstration for NO_X, and indeed stated that controlling it is essential for the attainment strategy;[170] NO_X emission sources, therefore, remain subject to control requirements under subparts 1 and 4 of part D, title I of the Act. For the reasons provided in the following paragraphs, the EPA proposes to approve the State's comprehensive demonstrations for ammonia, SO_X, and VOC based on a conclusion that emissions of these precursor pollutants do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. For further discussion of the EPA's evaluation of the precursor demonstration, please see the EPA's February 2020 Precursor TSD, which provides the EPA's summary of the State's precursor analyses for all four $PM_{2.5}$ precursors.[171]

The State based its analyses on the latest available data and studies concerning ambient $PM_{2.5}$ formation in the San Joaquin Valley from precursor emissions. For the required concentration-based analysis, the State assessed the absolute annual average contribution of each precursor to ambient $PM_{2.5}$ in 2015. Given that the absolute concentrations in 2015 were above the EPA's recommended contribution thresholds for both the 2006 24-hour and 2012 annual average NAAQS, the State proceeded with a sensitivity-based analysis, consistent with the

[170] 2018 Plan Appendix G, p. 2.

[171] Much of the analysis in the EPA's February 2020 Precursor TSD is applicable to SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS. For example, the State's precursor demonstration used 2015 annual average concentration data for its concentration-based analysis, examined annual average sensitivities of ambient $PM_{2.5}$ concentrations to reductions in each precursor in 2013, 2020, and 2024, and presented information on research studies and emission trends that are relevant for assessing the sensitivity of annual average ambient $PM_{2.5}$ concentrations to emission reductions of each $PM_{2.5}$ precursor. Our evaluation of such factors is similarly applicable for the 1997 annual $PM_{2.5}$ NAAQS and we expand on such evaluation for purposes of those NAAQS specifically herein.

recommendations in the $PM_{2.5}$ SIP Requirements Rule.

For the sensitivity-based analysis, the State performed its analyses based on the EPA's recommended approach—i.e., for each modeled year and level of precursor emissions reduction (in percentages), the State estimated the ambient $PM_{2.5}$ response using the procedure recommended in the $PM_{2.5}$ Precursor Guidance. In particular, the State considered the EPA's recommended range of emissions reductions (30 percent to 70 percent) for the 2013 base year, 2020 interim year, and 2024 future year, and quantified the estimated response of ambient $PM_{2.5}$ concentrations to precursor emission changes in the San Joaquin Valley.

The State's emissions projections in the 2018 $PM_{2.5}$ Plan show that baseline emissions of each of these precursors will decrease from the 2013 base year to the 2023 attainment year. These decreases are included in the State's modeled projections of ambient $PM_{2.5}$ levels in the San Joaquin Valley for purposes of demonstrating attainment and RFP. The State's sensitivity analyses are consistent with these projections, in accordance with the EPA's recommendations in the $PM_{2.5}$ Precursor Guidance.[172]

The EPA is proposing to find that such quantification and CARB's consideration of additional information provide an informed basis on which to make a determination as to whether ammonia, SO_X, and VOC contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.[173] If we finalize this proposal to approve the State's precursor demonstrations, the State will not be required to implement BACM/BACT level controls for sources of ammonia, SO_X, and VOC for purposes of the SJV $PM_{2.5}$ Plan for 1997 annual $PM_{2.5}$ NAAQS that is the subject of this proposed action. Under 40 CFR 51.1006(b), such precursor demonstration approval would apply only to this attainment plan. For any new $PM_{2.5}$ attainment plan that the State is required to submit in accordance with

[172] $PM_{2.5}$ Precursor Guidance, p. 35.

[173] The State did not evaluate the 2015 Serious area attainment year. Because the year has passed and the area failed to attain by the Serious area attainment date, we will evaluate the precursor analysis for the Serious area plan based on the current section 189(d) projected attainment date of December 31, 2023.

40 CFR 51.1003 for purposes of any $PM_{2.5}$ NAAQS, the State will be required to submit an updated precursor demonstration if it seeks to exempt sources of a particular precursor from control requirements in that attainment plan. In the subsections that follow, we summarize our evaluation of the State's precursor demonstrations for each of these three precursor pollutants.

a. Ammonia

We have evaluated CARB's sensitivity-based contribution analyses for 2013, 2020, and 2024 in the 2018 $PM_{2.5}$ Plan and supplemental materials provided by the State, as well as CARB's determination that the 2024 results are representative of conditions in the San Joaquin Valley for purposes of a sensitivity-based analysis for the 1997 annual $PM_{2.5}$ NAAQS. The EPA's $PM_{2.5}$ Precursor Guidance explicitly provides for consideration of a future year, and we are proposing to find that the State provided sufficient justification for relying on modeling results for 2024.[174]

We also consider it appropriate for the State to take into account additional information as part of its evaluation of whether the ammonia contribution is significant and to rely on the responses to the 30 percent modeled ammonia emissions reduction in its precursor demonstration for ammonia. The modeled $PM_{2.5}$ response to the 30 percent reduction is only marginally above the contribution threshold at a single monitoring site in 2024, and the EPA has evidence from the State and elsewhere that the response was overestimated, as discussed below. Together these suggest that ammonia does not contribute significantly to ambient $PM_{2.5}$ levels. However, because the response is so close to the threshold at a 30 percent reduction, such a conclusion strongly depends on the emission reduction benefit of potential controls being 30 percent or less; larger reductions could give responses above the threshold. Therefore, per 40 CFR 51.1010(a)(2)(ii), the EPA required an analysis of potential controls to aid the EPA in its evaluation of the precursor demonstration, which the State provided in the March 2023

[174] $PM_{2.5}$ Precursor Guidance, p. 35.

Ammonia Supplement. The response of ambient $PM_{2.5}$ to an actual assessment of the benefit from potential controls could then be used by the State to determine whether controlling ammonia would significantly affect $PM_{2.5}$ levels.

The State relied on the 2024 modeled ambient $PM_{2.5}$ responses to a 30 percent reduction in ammonia after concluding that 30 percent was a reasonable upper bound on potential ammonia reductions, based on past research on ammonia emissions and its evaluation of potential control options. Based on the EPA's review of the State's rationale, including its ammonia control measure analysis, the EPA agrees that the reductions that the State could achieve through additional available BACM/BACT level controls on ammonia sources would be below 30 percent, and thus that the $PM_{2.5}$ response to the ammonia emission reductions available would be below the contribution threshold at all sites for purposes of this plan, as discussed in the following paragraphs.[175]

The State compared the ammonia modeled sensitivity results in Appendix G of the 2018 $PM_{2.5}$ Plan to the 0.2 $\mu g/m^3$ contribution threshold recommended by the EPA for the 2012 annual $PM_{2.5}$ NAAQS in the $PM_{2.5}$ Precursor Guidance. However, in the March 2023 Ammonia Supplement, the State also compared the model results against the 0.25 $\mu g/m^3$ contribution threshold it calculated based on the level of the 1997 annual $PM_{2.5}$ NAAQS. We find that the State's use of a 0.25 $\mu g/m^3$ threshold is consistent with the recommendations in the $PM_{2.5}$ Precursor Guidance,[176] and is appropriate for purposes of evaluating the modeling results for the 1997 annual $PM_{2.5}$ NAAQS, given the EPA's method of calculating the threshold and the level of the 1997 annual $PM_{2.5}$ NAAQS (15.0 $\mu g/m^3$).

The precursor demonstration in the SJV $PM_{2.5}$ Plan indicates that the ambient response to

[175] Note that the task for the State is not to show whether controls could reduce ammonia by 30 percent, though that is the focus of the State's March 2023 Ammonia Supplement. The SIP requirements rule and the $PM_{2.5}$ Precursor Guidance do not establish potential reductions of 30 percent as a "bright line" test for determining precursor significance. Rather, information from the control evaluation is to be used in conjunction with other information to determine whether ammonia reductions are effective in reducing $PM_{2.5}$ levels, and so whether ammonia contributes significantly to $PM_{2.5}$.

[176] $PM_{2.5}$ Precursor Guidance, fn. 20.

a 30 percent ammonia emission reduction would exceed the 0.25 $\mu g/m^3$ contribution threshold for 13 out of 15 monitoring sites in the 2013 analysis year, and at 4 out of 15 for the 2020 analysis year. For the 2024 analysis year, 1 of the 15 sites (Hanford) would exceed the contribution threshold. In absolute terms, the ambient $PM_{2.5}$ response declines from 0.24 $\mu g/m^3$ in 2020 to 0.12 $\mu g/m^3$ in 2024 at Bakersfield-Planz, the highest concentration site. The Hanford responses decline from 0.42 $\mu g/m^3$ in 2020 to 0.26 $\mu g/m^3$ in 2024. The average response over all monitoring sites declines from 0.23 $\mu g/m^3$ to 0.14 $\mu g/m^3$, with the decline being generally larger for the sites with the highest projected $PM_{2.5}$ levels.

While the 2024 Hanford modeled response to a 30 percent ammonia reduction is above the contribution threshold, additional information about this location leads the EPA to give the response lower weight in the overall assessment of whether ammonia contributes significantly to $PM_{2.5}$ levels. An independent study using aircraft and surface data from the winter 2013 DISCOVER-AQ[177] campaign, a key period in the SJV $PM_{2.5}$ Plan's 2013 model base case, found that the CMAQ model underestimated ammonia at Hanford by roughly a factor of five; Hanford is just outside a region with high ammonia emissions in the model (western Tulare County).[178] If the modeled ammonia concentrations were higher to better match observations, there would be relatively more ammonia per NO_X and the model response to ammonia reductions would be lower. This is consistent with CARB's conclusions regarding ammonia as described earlier.

In choosing which year's modeled response to ammonia to rely on, the EPA considered the State's point that the $PM_{2.5}$ benefit of ammonia emission reductions is projected to decline steeply over time. We believe it is appropriate to consider changes in atmospheric chemistry that may occur between the base or current year and the attainment year because the changes may

[177] NASA, "Deriving Information on Surface conditions from Column and VERtically Resolved Observations Relevant to Air Quality," described at *https://www.nasa.gov/mission_pages/discover-aq/index.html*.
[178] Kelly, J. T. *et al*. 2018, "Modeling NH_4NO_3 over the San Joaquin Valley during the 2013 DISCOVER-AQ campaign," Journal of Geophysical Research: Atmospheres, 123, pp. 4727–4745, *https://doi.org/10.1029/2018JD028290* at 4733. The paper notes that, despite the ammonia underestimation, model performance was good for particulate ammonium nitrate and the ammonium nitrate was not sensitive to the ammonia underestimate since its formation was NO_X-limited.

ultimately affect the nonattainment area's progress toward expeditious attainment. The $PM_{2.5}$ Precursor Guidance explicitly states that a future year may be used, and that there are a multitude of considerations in choosing the analysis year.[179] The "anticipated growth or loss of sources... or trends in ambient speciation data and precursor emissions"[180] are among the "facts and circumstances of the area"[181] to consider in determining the significance of a precursor. The Guidance states that a future year could be more appropriate if it better represents the period that sources will operate in. As discussed in more detail below, the 2024 model results better represent the period that ammonia sources will operate in than 2013 and 2020 because of the steep decline in NO_X emissions projected to occur by 2023 and 2024. We consider it reasonable for the State to focus on the ambient $PM_{2.5}$ response to ammonia emission reductions in 2024, rather than 2013 or 2020, as the modeled response in 2024 in the San Joaquin Valley better reflects the potential benefit of ammonia control measures for purposes of expeditious attainment of the 1997 annual $PM_{2.5}$ NAAQS.

The State's precursor demonstration in the SJV $PM_{2.5}$ Plan shows that ambient sensitivity to ammonia emissions reductions in the San Joaquin Valley declines steeply over time. Between 2020 and 2024, the modeled response to a 30 percent ammonia emissions reduction declines by 50 percent at the Bakersfield-Planz monitoring site, which has the highest projected $PM_{2.5}$ level, and by 37 percent averaged over all monitoring sites. As noted above, in absolute terms, the ambient $PM_{2.5}$ response declines from 0.24 $\mu g/m^3$ in 2020 to 0.12 $\mu g/m^3$ in 2024 at Bakersfield-Planz, and from 0.23 $\mu g/m^3$ to 0.14 $\mu g/m^3$ as averaged over all monitoring sites, with the decline being generally larger for the sites with the highest projected $PM_{2.5}$ levels. Thus, between 2020 and 2024, the number of sites at which modeled sensitivity exceeds the 0.25 $\mu g/m^3$ threshold for the 1997 annual $PM_{2.5}$ NAAQS declines from 4 out of 15 down to 1 out of 15.[182] As discussed

[179] $PM_{2.5}$ Precursor Guidance, p. 35.
[180] Id. at 18.
[181] $PM_{2.5}$ SIP Requirements Rule, 40 CFR 51.1006(a)(1)(ii).
[182] 2018 $PM_{2.5}$ Plan, Appendix G, tables 4 and 5.

earlier, ammonia sensitivity declines because of the shifting atmospheric chemistry caused by NO_X emissions decreases. NO_X emissions are projected to decrease by 27 percent between 2020 and 2024 due to baseline measures (e.g., existing motor vehicle controls), with 91 percent of those emissions reductions occurring between 2020 and 2023.[183] That is, NO_X emissions in 2023 are 24 percent lower than NO_X emissions in 2020 and 3 percent higher than NO_X emissions in 2024. Thus, conditions in 2024 are anticipated to be much more similar to those in 2023 compared to 2020. The decreased NO_X emissions will make ammonia more abundant relative to NO_X, and even less of a limiting factor on $PM_{2.5}$ formation. In other words, the model response in the future year 2024 gives a more realistic assessment of the potential effect of ammonia controls than past conditions.[184]

Additionally, the ambient studies described by the State and in independent research studies provide strong evidence that $PM_{2.5}$ would respond only weakly to ammonia emissions reductions. As described above, those include a large measured excess of ammonia relative to the amount of nitrate available to interact with it to form $PM_{2.5}$, and satellite and aircraft measurements indicating a larger amount of ammonia than is derived in model predictions. This evidence reflects actual measurements of the atmosphere, independent of uncertainties in the modeling and independent of estimates of ammonia and other emissions that are input to the model.

Finally, the EPA has reviewed the additional information provided by the State to support its assertion that 30 percent is a reasonable upper bound on the ammonia reductions that could be achieved in the San Joaquin Valley and the State's reliance on the 30 percent sensitivity modeling results for the precursor demonstration for the 1997 annual $PM_{2.5}$ NAAQS. The EPA

---

[183] NO_X emissions in 2020, 2023, and 2024 are 203.3 tpd, 153.6 tpd, and 148.9 tpd, respectively.

[184] Since precursor sensitivity modeling results were not available for the specific year of 2023, the EPA estimated the 2023 $PM_{2.5}$ response to a 30 percent ammonia reduction using the modeling results for 2020 and 2024. As for the 2024 modeled sensitivities, we found that Hanford was the only site that would be above the 0.25 $\mu g/m^3$ contribution threshold for 2023, with a response of 0.27 $\mu g/m^3$. Thus, the results of this exercise do not change our conclusions. Spreadsheet "Estimated 2023 annual $PM_{2.5}$ sensitivity to ammonia reductions.xlsx," EPA Region IX, June 26, 2023.

proposes to find that the additional information adequately supports the conclusion that potential ammonia controls would yield less than a 30 percent reduction, such that the resulting decrease in ambient $PM_{2.5}$ concentration would be below the contribution threshold. As discussed in Section IV.B.1 of this document, the $PM_{2.5}$ Precursor Guidance indicates that the EPA may require air agencies to identify and evaluate potential emissions controls in support of a precursor demonstration that relies on a sensitivity analysis, particularly for an area in which the $PM_{2.5}$ response to a 30 percent reduction in precursor emissions is close to the contribution threshold. For the San Joaquin Valley, the modeled response to a single site, Hanford, is just above the 0.25 $\mu g/m^3$ threshold for the 1997 annual $PM_{2.5}$ NAAQS at 0.26 $\mu g/m^3$. Furthermore, several analyses show ambient ammonia concentrations are underestimated at Hanford and so we believe that the 2024 modeled response of 0.26 $\mu g/m^3$ is likely overestimated. Supporting that conclusion is the evidence of the large ambient excess of ammonia relative to nitrate, which suggests that the actual $PM_{2.5}$ response to reductions in ammonia emissions would be very small, and less than the response seen in the modeling. Thus, we conclude that in the San Joaquin Valley, the $PM_{2.5}$ response to a 30 percent reduction in ammonia emissions is close to the contribution threshold and that the State's approach to evaluate additional information in support of the precursor demonstration sensitivity analysis, including additional potential ammonia control measures, is consistent with the EPA's recommendations in the $PM_{2.5}$ Precursor Guidance and responsive to the EPA's request for such additional information and analysis.

As discussed in Section IV.B.2.a of this document, the State began its analysis to identify and evaluate potential emissions controls for ammonia by characterizing key ammonia source categories in the Valley (i.e., CAFs, agricultural fertilizers, and composting operations), and identifying existing rules that have resulted in ammonia emission reductions from these sources. Specifically, the State discusses the ammonia control effectiveness of a number of existing rules designed to reduce VOC emissions from these sources.[185] While there are no ammonia-specific

[185] 2018 $PM_{2.5}$ Plan, Appendix C, pp. C-311 to C-358.

controls in place for these source categories, the EPA agrees with the District's information indicating that some of the management practices in the District's rules to reduce VOC emissions also reduce ammonia emissions by limiting ammonia formation and volatilization.[186]

Regarding the analysis for CAFs, we find that the District provided a thorough evaluation of potential ammonia mitigation measures by CAF type and activity through its comparison of the applicability and requirements of Rule 4570 with comparable rules that are being implemented in other air districts and its review of scientific research studies. In considering the technical feasibility of each identified measure, the District assessed factors such as how the measure compares with requirements already being implemented under District Rule 4570, the compatibility of the measure with the types of CAFs operating in the Valley (considering, for example, CAF size and common practices employed), compatibility of the measure with the climate conditions in the Valley, and any cobenefits and/or undesirable consequences of implementing the measure.

Based on its evaluation, the District determined that several measures identified in the literature are already required in the San Joaquin Valley by Rule 4570 (e.g., washing floors and other soiled areas in livestock facilities), or by other State regulations (e.g., requirements to carefully time manure application as required by the California Regional Water Quality Control Board).[187,188] For measures that the District identified as feasible for implementation in the San Joaquin Valley, the District provided information detailing how it estimated the potential ammonia emission reductions that could be achieved based on control efficiencies cited in the literature. For measures that the State determined to be infeasible in the San Joaquin Valley, the District provided a narrative justification for its conclusion.

Reasons for concluding that a particular measure is infeasible included that the measure is not conducive to the type, size, or standard practices of CAFs operating in the Valley; the

---

[186] For example, see 2018 $PM_{2.5}$ Plan, Appendix C, p. C-313 (for CAFs).
[187] March 2023 Ammonia Supplement, pp. 47–49.
[188] Id. at 77.

measure is not compatible with the hot, dry, drought climate conditions in the Valley; the measure is not economically feasible; or that the measure would have undesirable consequences (e.g., adverse effects on water quality, reduced dairy cattle milk production). The District also concluded that more research is needed to examine the technical and/or economic feasibility of implementing some of the measures in the Valley specifically. For those measures that the District found to be economically infeasible (e.g., biofilters and wet scrubbers, oxygenation of liquid manure lagoons), it provided detailed cost analyses to support its assertion.[189] Based on our review of the District's controls analysis for CAFs, we find that the District provided a robust analysis of its Rule 4570 and a thorough review of 46 possible mitigation measures for reducing ammonia emissions from CAFs in the San Joaquin Valley.

For fertilizer application, the State emphasizes that it has not identified any SIP-approved requirements that are being implemented in other areas. Thus, it describes regulations adopted by other California State agencies to control fertilizer application, such as regulations adopted by the California Water Resources Board, and otherwise focuses its review on several research studies on reducing ammonia emissions from synthetic fertilizer application. Based on its review of mitigation options in the literature, the State concludes that some of the mitigation strategies are already required by current State regulations, and that further research is needed to explore the feasibility and effectiveness of those measures that are not currently in practice.

Regarding State regulations that are currently in place to control fertilizer application, we generally agree with the State that those regulations are likely to enhance the retention of nitrogen from manure and nitrogen-based chemical fertilizers in the San Joaquin Valley and to limit the loss of nitrogen as pollution to water and air, thereby potentially reducing ammonia emissions. Additionally, as discussed earlier, District Rules 4570 and 4565 have provisions that reduce ammonia emissions by addressing the land application of manure from CAFs and of biosolids, animal manure, and poultry litter from composting operations. The EPA believes that

[189] Id. at 59–60 and Appendix B.

the State's review of both existing ammonia mitigation measures and the research literature is an appropriate and thorough method for identifying potential measures. We also believe it reasonable that the State concludes that several of the specific mitigation strategies identified in the literature, such as optimizing fertilizer use, are already being implemented in the San Joaquin Valley due to these current State regulations and co-benefits such as reduced cost to farmers, and that more research is needed to assess the feasibility of other additional measures identified. Based on our review, and the fact that the State did not identify any ammonia mitigation measures for fertilizer application being implemented in other areas, we conclude that the State's overall conclusions are reasonable.

For composting and other sources, the District notes that significant ammonia reductions are already being achieved by existing rules, including a 44 percent reduction from composting operations from Rules 4565 and 4566, and reductions from mobile source and fuel combustion measures. As discussed earlier, the EPA agrees that Rules 4565 and 4566 have reduced ammonia emissions in the Valley. We also agree that the State's stringent controls for on-road mobile sources have resulted in ammonia reductions from those sources. While the State continues to work to reduce emissions from mobile sources to reduce NO_X and other pollutants in the Valley, since on-road mobile sources account for approximately one percent of the ammonia emissions inventory,[190] any ammonia reductions achievable through additional on-road mobile source controls would be small. The District states that it did not identify any additional potential mitigation measures for these source categories.

While we generally find that the State provided a robust review of existing regulations and potential additional mitigation measures in the research literature, we note that a limitation of the District's analysis is that there remains some uncertainty as to how much reduction is currently being achieved by State and District rules and thus if some incremental additional reduction may be available. For fertilizer application specifically, the District does not attempt to

[190] 2018 $PM_{2.5}$ Plan, Appendix B, Table B-5.

quantify or otherwise substantiate the scale of ammonia emission reductions from existing regulations, nor their enforceability, which confounds the prospects for quantifying how much additional reductions may be available. Furthermore, while the District provides a detailed controls analysis for CAFs, with regard to Rule 4570, as the EPA has previously noted,[191] the State has not sufficiently substantiated its calculation of the 100 tpd of ammonia emission reductions attributed to Rule 4570. In the 2018 $PM_{2.5}$ Plan, the State references an analysis from 2006 that relied on a different baseline emissions inventory, but has not supplemented this analysis, or reconciled it with more recent emissions inventory data.[192] While the EPA agrees that meaningful ammonia reductions have been achieved from Rule 4570, there remains some uncertainty as to the precise magnitude of those reductions. Notwithstanding this uncertainty, as discussed in more detail below, given the scarcity of additional feasible measures identified by the State, and the scale of potential additional emissions reductions available in the context of the sensitivity of $PM_{2.5}$ to ammonia reductions in the nonattainment area for the 1997 annual $PM_{2.5}$ NAAQS, we find that the controls analysis provided by the State is sufficient to support its conclusion that that ammonia emissions do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

Based on its analysis, the State concludes that significant ammonia reductions have already been achieved in the San Joaquin Valley through existing State regulations and standard practices, and that the potential additional ammonia emissions reductions achievable through the implementation of additional best available controls is two percent of the total ammonia emissions in the San Joaquin Valley. This value is well below the lower end (i.e., 30 percent) of the ammonia reductions that the State modeled for analytical purposes for its sensitivity-based analysis. While there remains some uncertainty as to the ammonia reductions that are currently

---

[191] 81 FR 69396, 69397–69398 (October 6, 2016) and 87 FR 60494, 60503–60504 (October 5, 2022).

[192] 2018 $PM_{2.5}$ Plan, Appendix C, pp. C–311 to C–339 and SJVUAPCD, "Final Draft Staff Report, Proposed Re-Adoption of Rule 4570 (Confined Animal Facilities)," June 18, 2009, at Appendix F, "Ammonia Reductions Analysis for Proposed Rule 4570 (Confined Animal Facilities)," June 15, 2006 (discussing various assumptions underlying the District's calculation of ammonia emission factors without identifying relevant emissions inventories).

being achieved by existing rules and standard practices, and thus the additional reductions that could be achieved by those rules and practices, we believe the State has provided sufficient evidence to support its assertion that the additional available reductions are less than 30 percent.

Specifically, the District has made a convincing case that significant ammonia reductions have already been achieved through District Rule 4570 and that few additional mitigation measures could provide only modest further reductions from CAFs, which account for 58 percent of the total ammonia inventory. Similarly, the State has provided support for its assertion that additional reductions are not feasible from the fertilizer, composting, and other smaller source categories through its analysis of potential fertilizer controls, in particular, in addition to information regarding controls that are already in place for these source categories.[193] Based on our review of the analysis, we conclude that the potential reduction from available controls would be well below 30 percent. Given that the State's modeled sensitivities of $PM_{2.5}$ concentrations to a 30 percent ammonia reduction are approximately at or below the threshold used for identifying an impact that is significant for the 1997 annual $PM_{2.5}$ NAAQS, and that potential reductions would be below 30 percent, the EPA agrees that the response of $PM_{2.5}$ to an ammonia reduction of a percentage smaller than 30 percent would be below the contribution threshold, indicating that ammonia does not contribute significantly to ambient $PM_{2.5}$ concentrations for purposes of the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS.

In summary, we conclude that the State quantified the sensitivity of ambient $PM_{2.5}$ levels to reductions in ammonia emissions using appropriate modeling techniques, the modeled response to ammonia reductions is likely lower than reported, and the State's choice of 2024 as the reference point for purposes of evaluating the sensitivity of ambient $PM_{2.5}$ levels to ammonia emissions reductions is well-supported. The State also provided strong evidence to support its

[193] The State has not provided an estimate of the reductions that are currently being achieved for the fertilizer category, which accounts for 34 percent of the total ammonia emissions inventory. Nevertheless, even if ammonia emissions from fertilizers could be reduced by a very high percentage (e.g., 70 percent), that would correspond to a smaller percentage reduction of the total ammonia emissions. Such conservatively high reductions from fertilizers added to the potential ammonia reductions from CAFs identified by the State would still amount to less than a 30 percent reduction of the total ammonia emissions.

conclusion that additional controls on ammonia sources would achieve ammonia emissions reductions well below 30 percent, including its estimate, following review of the measures the State and District consider feasible, that the reductions available are approximately 2 percent. Since the modeled ambient $PM_{2.5}$ response to a 30 percent ammonia reduction is only marginally above the contribution threshold at a single monitoring site, that response may be overestimated, and potential reductions are below 30 percent, the $PM_{2.5}$ response to additional ammonia controls would be below the contribution threshold. Based on these considerations, the EPA proposes to approve the State's demonstration that ammonia emissions do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

We note that this proposed determination is specific to the facts and circumstances of this particular plan—including but not limited to the specific level of the 1997 annual $PM_{2.5}$ NAAQS and the proportional modeling response needed to be considered significant, the State's modeling indicating that ammonia levels the San Joaquin Valley are at or below the contribution threshold for the 1997 annual $PM_{2.5}$ NAAQS, the unique atmospheric conditions in the Valley in which the $PM_{2.5}$ response to reductions in ammonia emissions would be relatively small, the demonstration that the potential reductions from additional control measures that are not currently being implemented would be below 30 percent, and the current limited research in key areas of ammonia controls—and that it does not pre-determine the outcome of significance determinations of precursors in the future.

b. SO_X

For SO_X, the 2018 $PM_{2.5}$ Plan's sensitivity estimates for 2013 are well below the EPA's recommended threshold for both the 30 percent and 70 percent emission reduction scenarios and are even negative for some monitoring sites. Given those results and the steady SO_X emission levels over 2013 to 2023 (as opposed to increases), the EPA agrees with the State's conclusion that the 2013 modeled sensitivities provide a sufficient basis for the SO_X precursor demonstration. The supplemental results provided by the State for 2020 and 2024 support this

conclusion.

Therefore, based on these modeled ambient $PM_{2.5}$ responses to SO_X emissions reductions in the San Joaquin Valley, and on the facts and circumstances of the area, the EPA proposes to approve the State's demonstration that SO_X emissions do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. We note that this proposed determination is specific to the facts and circumstances of this particular plan and that it does not pre-determine the outcome of significance determinations of precursors in the future.

c. VOC

For VOC, the State found that the ambient $PM_{2.5}$ response to VOC emissions reductions were generally below the EPA's recommended contribution threshold of 0.2 $\mu g/m^3$, and predicted an increase in ambient $PM_{2.5}$ levels in response to VOC reductions (i.e., a disbenefit) at 2 out of 15 monitoring sites in 2020, and at 11 out 15 sites in 2024. Only for a 70 percent emissions reduction for the 2013 base year did the State predict the ambient $PM_{2.5}$ response to be above the threshold at a majority of sites.[194]

The EPA has evaluated and agrees with the State's determination in the 2018 $PM_{2.5}$ Plan that the modeling for future years is more representative of conditions in the San Joaquin Valley than the 2013 modeling for sensitivity-based analyses and the State's resulting conclusion that the contribution from VOC emissions is not significant. The EPA agrees that the 8.6 percent decrease in VOC emissions from 2013 to 2020 and the 9.2 percent projected decrease from 2013 to 2024 favors reliance on the future year modeling results. Furthermore, there is a large decrease in NO_X emissions over this period, as discussed in Section IV.B.2 of this proposed rule, that affects the atmospheric chemistry with respect to ambient $PM_{2.5}$ formation from VOC emissions. The 9.2 percent VOC emissions reductions and the vast majority of NO_X emissions reductions

[194] 2018 $PM_{2.5}$ Plan, Appendix G, tables 10 and 11.

are expected to result from baseline measures already in effect. Therefore, we conclude that it is reasonable to rely on future year 2020 or 2024 modeled responses to VOC emissions reductions. The EPA also concludes that the State provided a reasonable explanation for the VOC emissions reduction disbenefit and evidence that it occurs in the San Joaquin Valley.

For these reasons, we propose to approve the State's demonstration that VOC emissions do not contribute significantly to ambient $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. We note that this proposed determination is specific to the facts and circumstances of this particular plan and that it does not pre-determine the outcome of significance determinations of precursors in the future.

C. Attainment Plan Control Strategy

1. Statutory and Regulatory Requirements

Section 189(b)(1)(B) of the Act requires for any Serious $PM_{2.5}$ nonattainment area that the state submit provisions to assure that best available control measures (BACM), including controls that reflect best available control technology (BACT), for the control of $PM_{2.5}$ and $PM_{2.5}$ precursors shall be implemented no later than four years after the date the area is reclassified as a Serious area. The EPA has defined BACM in the $PM_{2.5}$ SIP Requirements Rule to mean "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 best available control technology (BACT)."[195]

Because the 2015 Serious area attainment date has passed, and the EPA found that the

[195] 40 CFR 51.1000 (definitions). In longstanding guidance, the EPA has similarly defined BACM to mean, "among other things, the maximum degree of emissions reduction achievable for a source or source category, which is determined on a case-by-case basis considering energy, environmental, and economic impacts." General Preamble Addendum, 42010, 42013.

area failed to attain by the Serious area attainment date, we are evaluating the submission for compliance with the BACM/BACT requirements now, in conjunction with the State's SIP submission intended to meet both the Serious area and section 189(d) plan requirements.

The EPA generally considers BACM a control level that goes beyond existing RACM-level controls, for example by expanding the use of RACM controls or by requiring preventative measures instead of remediation.[196] Indeed, because states are required to implement BACM and BACT when a Moderate nonattainment area is reclassified as Serious due to its inability to attain the NAAQS through implementation of "reasonable" measures, it is logical that "best" control measures should represent a more stringent and potentially more technologically advanced or more costly level of control.[197] If RACM and RACT level controls of emissions have been insufficient to reach attainment, then the CAA title I, part D, subpart 4 provisions for $PM_{2.5}$ nonattainment plans contemplate the implementation of more stringent controls, controls on more sources, or other adjustments to the control strategy are necessary to attain the NAAQS in the area. Thus, BACM/BACT determinations are to be "generally independent" of attainment for purposes of implementing the $PM_{2.5}$ NAAQS.[198]

Under the $PM_{2.5}$ SIP Requirements Rule, those control measures that otherwise meet the definition of BACM/BACT but "can only be implemented in whole or in part beginning four years after reclassification" are referred to as "additional feasible measures."[199] In accordance with the requirements of CAA section 172(c)(6), a Serious area plan must include any additional feasible measures to control emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors that are necessary and appropriate to provide for attainment of the relevant NAAQS as expeditiously as practicable and no later than the applicable attainment date.[200]

---

[196] 81 FR 58010, 58081 and General Preamble Addendum, 42011, 42013.
[197] Id. and General Preamble Addendum, 42009–42010.
[198] $PM_{2.5}$ SIP Requirements Rule, 58081–58082. See also, General Preamble Addendum, 42011.
[199] 40 CFR 51.1000, 40 CFR 51.1010(a)(4)(ii).
[200] Because the Serious area attainment year has passed and the area failed to attain by the Serious area attainment date, we will evaluate the BACM/BACT and additional feasible measure analysis for the Serious area plan with respect to the current section 189(d) projected attainment date of December 31, 2023.

Consistent with longstanding guidance provided in the General Preamble Addendum, the preamble to the $PM_{2.5}$ SIP Requirements Rule discusses the following steps for states to follow to identify and select emission controls needed to meet the BACM/BACT and additional feasible measures requirements of 40 CFR 51.1010:

1) Develop a comprehensive emissions inventory of all sources of $PM_{2.5}$ and $PM_{2.5}$ precursors from major and non-major stationary point sources, area sources, and mobile sources;
2) Identify potential control measures for all sources or source categories of emissions of $PM_{2.5}$ and relevant $PM_{2.5}$ plan precursors;
3) Determine whether an available control measure or technology is technologically feasible;
4) Determine whether an available control measure or technology is economically feasible; and
5) Determine the earliest date by which a control measure or technology can be implemented in whole or in part.[201]

The EPA allows states to consider factors such as a source's processes and operating procedures, raw materials, physical plant layout, and potential environmental effects such as increased water pollution, waste disposal, and energy requirements when considering technological feasibility.[202] For purposes of evaluating economic feasibility, the EPA allows states to consider factors such as the capital costs, operating and maintenance costs, and cost effectiveness (i.e., cost per ton of pollutant reduced by a measure or technology) associated with the measure or control.[203] For any potential control measure identified through the process described above that is eliminated from consideration, states are required to provide detailed written justification for doing so on the basis of technological or economic feasibility, including

[201] 81 FR 58010, 58083–58085.
[202] 40 CFR 51.1010(a)(3)(i).
[203] 40 CFR 51.1010(a)(3)(ii).

how its criteria for determining such feasibility are more stringent than those used for determining RACM/RACT.[204]

Once these analyses are complete, the state must use this information to develop enforceable control measures for all relevant source categories in the nonattainment area and submit them to the EPA for evaluation as SIP provisions to meet the basic requirements of CAA section 110 and any other applicable substantive provisions of the Act. The EPA is using these steps as guidelines in the evaluation of the BACM and BACT measures and related analyses in the SJV $PM_{2.5}$ Plan. Furthermore, because the EPA has not previously taken action to approve the California SIP as meeting the subpart 4 Moderate area planning requirements under CAA section 189 for the 1997 annual $PM_{2.5}$ NAAQS for the San Joaquin Valley area, the EPA is reviewing the SJV $PM_{2.5}$ Plan for compliance with those requirements.[205]

The overarching requirement for the CAA section 189(d) attainment control strategy is that it provides for attainment of the NAAQS as expeditiously as practicable.[206] The control strategy must include any additional measures (beyond those already adopted in previous nonattainment plans for the area as RACM/RACT or BACM/BACT) that are needed for the area to attain expeditiously. This includes reassessing any measures previously rejected during the development of any Moderate area or Serious area attainment plan control strategy.[207] The state must also demonstrate that it will, at a minimum, achieve an annual five percent reduction in emissions of direct $PM_{2.5}$ or any $PM_{2.5}$ plan precursor from sources in the area, based on the most recent emissions inventory for the area.[208]

In the $PM_{2.5}$ SIP Requirements Rule, the EPA clarified its interpretation of the statutory

---

[204] 40 CFR 51.1010(a)(3)(iii).
[205] The EPA does not normally conduct a separate evaluation to determine whether a Serious area plan's measures also meet the RACM requirements. As explained in the General Preamble Addendum, we interpret the BACM requirement as generally subsuming the RACM requirement—i.e., if we determine that the measures are indeed the "best available," we have necessarily concluded that they are "reasonably available." (General Preamble Addendum, 42010). Therefore, a separate analysis to determine if the measures represent a RACM level of control is not necessary. A proposed approval of a Plan's provisions concerning implementation of BACM is also a proposed finding that the Plan provides for the implementation of RACM.
[206] 81 FR 58010, 58100.
[207] 40 CFR 50.1010(c)(2)(ii).
[208] CAA section 189(d) and 40 CFR 51.1010(c).

language in CAA section 189(d) requiring a state to submit a new attainment plan to achieve annual reductions "from the date of such submission until attainment," to mean annual reductions beginning from the due date of such submission until the new projected attainment date for the area based on the new or additional control measures identified to achieve at least five percent emissions reductions annually.[209] This interpretation is intended to make clear that even if a state is late in submitting its CAA section 189(d) plan, the area must still achieve its annual five percent emissions reductions beginning from the date by which the state was required to make its CAA section 189(d) submission, not by some later date. Because the deadline for California to submit a section 189(d) plan for the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley was December 31, 2016, one year after the December 31, 2015 attainment date for these NAAQS under CAA section 188(c)(2), the starting point for the five percent emissions reduction requirement under section 189(d) for this area is 2017.

2. Summary of the State's Submission and the EPA's Evaluation and Proposed Action

a. Control Strategy

i. Baseline Measures

The control strategy in the SJV $PM_{2.5}$ Plan is based largely on ongoing emissions reductions from baseline control measures, which amount to approximately 98.2 percent of total NO_X emissions reductions and 93.3 percent of total direct $PM_{2.5}$ emissions reductions modeled to result in attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.[210,211] As we use the term here, baseline measures are State and District regulations adopted prior to the development of the 2018 $PM_{2.5}$ Plan that continue to achieve emissions reductions through the

[209] 81 FR 58010, 58101.

[210] Because the 2015 Serious area attainment date has passed, and the EPA found that the area failed to attain by the Serious area attainment date, we are evaluating the control strategy for the Serious area requirements based on the timeline associated with the current section 189(d) projected attainment date of December 31, 2023.

[211] The EPA calculated these percentages as follows: annual average baseline NO_X reductions from 2013 to 2023 are 163.6 tpd of 166.6 tpd modeled to result in attainment (98.2 percent) and annual average baseline direct $PM_{2.5}$ reductions are 4.2 tpd of 4.5 tpd modeled to result in attainment (93.3 percent). 2018 $PM_{2.5}$ Plan, Appendix B; and 15 $\mu g/m^3$ SIP Revision, Chapter 4 and Appendix K.

projected 2023 attainment year for the 1997 annual $PM_{2.5}$ NAAQS and beyond. The State describes these baseline measures in the 15 µg/m^3 SIP Revision in Chapter 4 ("Attainment Strategy for $PM_{2.5}$")[212] and Appendix D ("Mobile Source Control Measure Analyses"), and in Appendix C ("Stationary Source Control Measure Analyses") of the 2018 $PM_{2.5}$ Plan. The State incorporates reductions generated by these baseline measures into the projected baseline inventories, and reductions resulting from District measures are individually quantified in Appendix C. Table 4 provides a summary of the 2013 base year emissions and the reductions from baseline measures, additional State measures, and additional District measures that the Plan projects will result in attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by December 31, 2023.

Table 4 – Summary of the SJV $PM_{2.5}$ Plan's Annual Average Emission Reductions to Attain the 1997 Annual $PM_{2.5}$ NAAQS by December 31, 2023

		NO_X (tpd)	% of 2013 base year NO_X emissions	Direct $PM_{2.5}$ (tpd)	% of 2013 base year $PM_{2.5}$ emissions
A	2013 Base Year Emissions	317.2	-	62.5	-
B	Baseline Measure Emissions Reductions (2013-2023)	163.6	51.6	4.2	6.7
C	Additional CARB Measures	3.0	0.9	0.1	0.2
D	Additional District Measures	0.0	0.0	0.2	0.3
E	Total 2013-2023 Emissions Reductions (B+C+D)	166.6	52.5	4.5	7.2

Source: 2018 $PM_{2.5}$ Plan, Appendix B, tables B-1 and B-2; and 15 µg/m^3 SIP Revision, Appendix K, Table 32.

In the SJV $PM_{2.5}$ Plan, the State explains that mobile sources emit over 85 percent of the NO_X emissions in the San Joaquin Valley and that CARB has adopted and amended regulations to reduce public exposure to emissions from diesel vehicles and engines, which include direct $PM_{2.5}$ and NO_X, from "fuel sources, freight transport sources like heavy-duty diesel trucks, transportation sources like passenger cars and buses, and non-road sources like large

[212] 15 µg/m^3 SIP Revision, Chapter 4, Table 4-2.

construction equipment."[213]

Given the need for substantial emissions reductions from mobile and area sources to meet the NAAQS in California nonattainment areas, the State of California has developed stringent control measures for on-road and non-road mobile sources and the fuels that power them. California has unique authority under CAA section 209 (subject to a waiver by the EPA) to adopt and implement new emissions standards for many categories of on-road vehicles and engines and new and in-use non-road vehicles and engines. The EPA has issued numerous waivers and authorizations for California's mobile source regulations and has approved many such mobile source regulations as revisions to the California SIP.[214]

CARB's mobile source program extends beyond regulations that are subject to the waiver or authorization process set forth in CAA section 209 to include standards and other requirements to control emissions from in-use heavy-duty trucks and buses, gasoline and diesel fuel specifications, and many other types of mobile sources. Generally, these regulations have also been submitted by the State and approved by the EPA as revisions to the California SIP.[215]

As to stationary and area sources, the State asserts in the SJV $PM_{2.5}$ Plan that stringent regulations adopted for prior attainment plans continue to reduce emissions of NO_X and direct $PM_{2.5}$.[216] Specifically, Table 4-1 of the 15 µg/m^3 SIP Revision identifies 33 District measures that limit NO_X and direct $PM_{2.5}$ emissions.[217] The EPA has approved each of the identified measures into the California SIP,[218] with two exceptions.

---

[213] 15 µg/m^3 SIP Revision, Chapter 4, p. 4-9. For CARB's BACM analysis for mobile source measures, see 15 µg/m^3 SIP Revision, Appendix D, including analyses for on-road light-duty vehicles and fuels (starting on page D-17), on-road heavy-duty vehicles and fuels (starting on page D-35), and non-road sources (starting on page D-64).
[214] For example, see 81 FR 39424 (June 16, 2016); 82 FR 14446 (March 21, 2017); 83 FR 23232 (May 18, 2018); and 88 FR 20688 (April 6, 2023).
[215] For example, see the EPA's approval of standards and other requirements to control emissions from in-use heavy-duty diesel trucks (77 FR 20308, April 4, 2012) and revisions to the California on-road reformulated gasoline and diesel fuel regulations (75 FR 26653, May 12, 2010).
[216] 15 µg/m^3 SIP Revision, Chapter 4, p. 4-3. For the District's BACM analysis of stationary and area source measures, see 2018 $PM_{2.5}$ Plan, Appendix C.
[217] 15 µg/m^3 SIP Revision, Chapter 4, Table 4-1.
[218] See EPA Region IX's website for information on District control measures that have been approved into the California SIP, available at: *https://www.epa.gov/sips-ca/epa-approved-san-joaquin-valley-unified-air-district-regulations-california-sip.*

First, the District amended Rule 4905 ("Natural Gas-fired, Fan-type, Residential Central Furnaces") on June 21, 2018, to extend the period during which manufacturers may pay emissions fees in lieu of meeting the rule's NO_X emissions limits.[219] CARB submitted the amended rule to the EPA on November 21, 2018. However, the District amended Rule 4905 again on October 15, 2020, to further extend the period during which manufacturers of weatherized furnaces must pay emission fees in lieu of meeting the rule's NO_X emissions limits.[220] CARB submitted the rule as amended on October 15, 2020, to the EPA on December 30, 2020, and simultaneously withdrew the rule as amended June 21, 2018.[221] The District amended Rule 4905 once more on December 16, 2021, to further extend the implementation period and CARB submitted the amended version to the EPA on March, 9, 2022.[222] The EPA has not yet proposed any action on either the December 30, 2020 or the March 9, 2022 versions.

The EPA approved a prior version of Rule 4905 into the California SIP on March 29, 2016.[223] As part of that rulemaking, the EPA noted that because of the option in Rule 4905 to pay mitigation fees in lieu of compliance with emissions limits, emissions reductions associated with the rule's emissions limits would not be creditable in any attainment plan without additional documentation.[224] Until the District submits the necessary documentation to credit emissions reductions achieved by Rule 4905 toward an attainment control strategy, this rule is not creditable for SIP purposes. The Plan indicates that the District attributed annual average emission reductions of 0.2 tpd of NO_X reductions between 2013 and 2023 to Rule 4905.[225] These

---

[219] SJVUAPCD, Final Draft Staff Report, "Proposed Amendments to Rule 4905 (Natural Gas-fired, Fan-type Central Furnaces)," June 21, 2018, p. 2.
[220] SJVUAPCD, "Item Number X: Adopt Proposed Amendments to Rule 4905 (Natural Gas-Fired, Fan-Type Furnaces)," October 15, 2020, p. 3, including Final Draft Staff Report, "Proposed Amendments to Rule 4905 (Natural Gas-Fired, Fan-Type Furnaces)."
[221] Letter dated December 28, 2020, from Richard W. Corey, Executive Officer, CARB, to John Busterud, Regional Administrator, EPA Region 9.
[222] Letter dated March 9, 2022, from Richard W. Corey, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region IX.
[223] 81 FR 17390 (March 29, 2016) (approving Rule 4905 as amended January 22, 2015).
[224] EPA, Region IX Air Division, "Technical Support Document for EPA's Proposed Rulemaking for the California State Implementation Plan (SIP), San Joaquin Valley Unified Air Pollution Control District's Rule 4905, Natural Gas-Fired, Fan-Type Central Furnaces," October 5, 2015, n. 8.
[225] 2018 $PM_{2.5}$ Plan, Appendix C, p. C-290.

emissions reductions would not materially affect the attainment demonstration for the 1997 annual $PM_{2.5}$ NAAQS in the SJV $PM_{2.5}$ Plan.

Second, the SJV $PM_{2.5}$ Plan lists Rule 4203 ("Particulate Matter Emissions from Incineration of Combustible Refuse") as a baseline measure. This rule has not been approved into the California SIP.[226] Appendix C of the 2018 $PM_{2.5}$ Plan indicates, however, that the emissions inventory for incineration of combustible refuse is 0.00 tpd of NO_X and 0.00 tpd direct $PM_{2.5}$ from 2013 through 2023.[227] Thus, although the District included this rule as a baseline measure, there are no meaningful reductions associated with this rule that would affect the attainment demonstration in the SJV $PM_{2.5}$ Plan.

In sum, although Table 4-1 of the 15 $\mu g/m^3$ SIP Revision identifies two baseline measures that are not creditable for SIP purposes at this time, we conclude that the total emissions reductions attributed to these two measures in the future baseline inventories would not materially affect the attainment demonstration in the Plan.

ii. Additional Measures and CARB Commitment

In addition to baseline control measures, the SJV $PM_{2.5}$ Plan identifies several additional control measures that will contribute to expeditious attainment of the 1997 annual $PM_{2.5}$ NAAQS. These measures include three regulatory measures adopted by CARB or the District following development of the 2018 $PM_{2.5}$ Plan, and a commitment by CARB to adopt and implement an additional regulatory measure to meet an enforceable commitment. The three regulatory measures adopted following development of the 2018 $PM_{2.5}$ Plan include CARB's "Lower Opacity Limits for Heavy-Duty Vehicles" regulation,[228] CARB's "Amended Warranty Requirements for Heavy-Duty Vehicles" regulation,[229] and the District's 2019 amendments to

[226] The EPA does not have any pending SIP submission for Rule 4203.
[227] 2018 $PM_{2.5}$ Plan, Appendix C, p. C-46.
[228] Initially adopted via CARB Resolution 18-20 (May 25, 2018). CARB Resolution 18-20 was repealed on July 26, 2018 via CARB Resolution 18-28, which included a modified version of the regulation to address public comments. Per direction from CARB Resolution 18-28, the regulation was adopted via Executive Order R19-001 (March 12, 2019).
[229] CARB Resolution 18-24, June 28, 2018.

Rule 4901 ("Wood Burning Fireplaces and Wood Burning Heaters").[230] In addition to these three adopted measures, the 15 µg/m^3 SIP Revision includes a commitment by CARB to achieve aggregate emissions reductions of 3.0 tpd of NO_X and 0.04 tpd of direct $PM_{2.5}$ (referred to as an "aggregate tonnage commitment") through adoption of CARB's "Heavy-Duty Vehicle Inspection and Maintenance Program" ("Heavy-Duty I/M") (referred to as a "control measure commitment") and/or substitute measures.[231] Table 5 summarizes the NO_X and direct $PM_{2.5}$ emissions reductions associated with these additional measures in the 15 µg/m^3 SIP Revision .

Table 5 – Additional NO_X and Direct $PM_{2.5}$ Emission Reductions

Additional Measures Relied Upon for Attainment (Beyond Baseline Measures)	NO_X Emissions Reductions in 2023 (tpd)	$PM_{2.5}$ Emissions Reductions in 2023 (tpd)
District's 2019 Revisions to Rule 4901	-	0.2
CARB's Lower Opacity Limits for Heavy-Duty Vehicles	-	0.09
CARB's Warranty Requirements for Heavy-Duty Vehicles	0.01	-
CARB's Heavy-Duty I/M	3	0.04

Source: 15 µg/m^3 SIP Revision, Appendix K, Table 32.

Following CARB's submission of the 15 µg/m^3 SIP Revision, on October 20, 2021, CARB and the District submitted to the EPA the "Progress Report and Technical Submittal for the 2012 $PM_{2.5}$ Standard San Joaquin Valley" (2021 Progress Report).[232] The 2021 Progress Report describes the State's progress to date in developing and adopting the additional measures identified in their control measure commitments in the 2018 $PM_{2.5}$ Plan for purpose of attaining the 2012 annual $PM_{2.5}$ NAAQS.[233] These measures include the additional measures identified in the 15 µg/m^3 SIP Revision (i.e., the measures in Table 5 of this proposal). The 2021 Progress Report provides status updates on the substance of each measure and the timing of board consideration for both adopted and remaining control measure commitments. The report also

[230] SJVUAPCD Resolution 19-06-22, June 20, 2019.
[231] CARB Resolution 21-21, September 23, 2021, p. 6; and August 2021 Staff Report, pp. 4–5.
[232] "Progress Report and Technical Submittal for the 2012 $PM_{2.5}$ Standard San Joaquin Valley," October 19, 2021. Transmitted to the EPA by letter dated October 20, 2021, from Richard W. Corey, Executive Officer, CARB, to Deborah Jordan, Acting Regional Administrator, EPA Region IX. See sections of 2021 Progress Report entitled "Progress in Implementing District Measures" and "Progress in Implementing CARB Measures."
[233] As discussed in fn. 28 of this document, the Serious area plan for the 2012 $PM_{2.5}$ NAAQS has since been withdrawn by the State.

provides a side-by-side comparison of the original emission reduction estimates in the 2018 $PM_{2.5}$ Plan for each control measure commitment and updated emission reduction estimates for each measure based on technical analyses for adopted measures and draft measures and/or documentation in development for forthcoming regulations.[234] Although the purpose of the 2021 Progress Report was to provide an update on the progress that CARB and the District have made towards implementing the attainment strategy for the 2012 annual $PM_{2.5}$ NAAQS, some of the information provided in the report is relevant to the State's progress towards attaining the 1997 annual $PM_{2.5}$ NAAQS, as discussed below.

First, on July 22, 2020, the EPA published its final approval of the District's 2019 amendment to Rule 4901[235] and concurrently credited this measure with annual average emission reductions of 0.2 tpd direct $PM_{2.5}$ towards the District's $PM_{2.5}$ tonnage commitment in the 2018 $PM_{2.5}$ Plan for 2024.[236] As described in the EPA's March 27, 2020 proposed rule, this amount of SIP credit corresponded to a 75 percent compliance rate (referred to as a "rule effectiveness rate"), consistent with EPA guidance on wood burning curtailment programs,[237] rather than a higher 100 percent rule effectiveness rate used in the District's original calculations.[238] In the 2021 Progress Report, the State notes this conclusion in the EPA's July 22, 2020 final rule approving this measure into the SIP and now estimates emission reductions of 0.2 tpd direct $PM_{2.5}$ from this measure, both in the report[239] and in the 15 $\mu g/m^3$ SIP Revision.[240] Consistent with the EPA's July 22, 2020 final rule, we propose to credit this measure with annual average emission reductions of 0.2 tpd direct $PM_{2.5}$ for purposes of attaining the 1997 annual $PM_{2.5}$ NAAQS by December 31, 2023.

Second, in 2018, CARB adopted the Lower Opacity Limits for Heavy-Duty Vehicles

---

[234] 2021 Progress Report, tables 2 and 3.
[235] 85 FR 44206.
[236] 85 FR 44192, 44204.
[237] Strategies for Reducing Wood Smoke, EPA-456/B-13-01, March 2013, p. 42.
[238] 85 FR 17382, 17415.
[239] 2021 Progress Report, p. 7 and Table 3.
[240] 15 $\mu g/m^3$ SIP Revision, Appendix K, Table 32.

regulation as a revision to the Heavy-Duty Vehicle Inspection Program (HDVIP) and Periodic Smoke Inspection Program (PSIP). CARB submitted the measure to the EPA on February 13, 2020, and on May 10, 2022, the EPA approved the measure into the California SIP.[241] CARB initially estimated in its staff report for the measure that it would achieve 1,170 tons of PM emissions benefits from the heavy-duty trucking transportation sector from 2019 to 2025.[242] In the 15 $\mu g/m^3$ SIP Revision, CARB estimates that the Lower Opacity Limits for Heavy-Duty Vehicles regulation will achieve 0.09 tpd direct $PM_{2.5}$ reductions in 2023. CARB later clarified via email that it derived this estimate using EMFAC2017 and that if it instead used EMFAC2014, consistent with the 15 $\mu g/m^3$ SIP Revision, the estimated reductions are 0.01 tpd of direct $PM_{2.5}$ by 2023.[243] However, CARB has not yet provided its analysis of the basis for this emissions reduction estimate for the San Joaquin Valley. Therefore, the EPA is not proposing at this time to credit this measure with any particular amount of emissions reductions toward attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. While the Plan indicates that the State attributed annual average emission reductions of 0.09 tpd of $PM_{2.5}$ reductions between 2013 and 2023 to the Lower Opacity Limits for Heavy-Duty Vehicles regulation, these emissions reductions would not materially affect the attainment demonstration for the 1997 annual $PM_{2.5}$ NAAQS in the SJV $PM_{2.5}$ Plan.

Third, CARB adopted the Amended Warranty Requirements for Heavy-Duty Vehicles regulation on June 28, 2018 ("2018 HD Warranty Amendments"). CARB estimates that the measure will achieve 0.01 tpd of NO_X emissions reductions in 2023. By letter dated October 22, 2021, CARB submitted a request that the EPA determine that the 2018 HD Warranty Amendments are within the scope of the previously-granted waiver for California's emissions

---

[241] 87 FR 27949.

[242] CARB, "Proposed Amendments to the Heavy-Duty Vehicle Inspection Program and Periodic Smoke Inspection Program, Staff Report: Initial Statement of Reasons," release date April 3, 2018, p. 15. See also, EPA Region IX, "Technical Support Document for EPA's Rulemaking for the California State Implementation Plan, California Air Resources Board – Title 13, Division 3, Chapter 3.5; Opacity Testing of Heavy-Duty Diesel Vehicles," July 2021, p. 4.

[243] Email dated March 3, 2022, from Laura Carr, CARB, to Ashley Graham, EPA Region IX, Subject: "Lower Opacity regulation reductions." This email is in the docket for this proposed action,

standards and associated test procedures for 2007 and subsequent model year heavy-duty diesel vehicle engines. Alternatively, CARB requested that the EPA grant California a new waiver of preemption for the 2018 HD Warranty Amendments. The EPA published a notice of opportunity for public hearing and comment concerning CARB's request on June 13, 2022, and the EPA held a public hearing on June 29, 2022.[244] On April 5, 2023, the EPA determined that the 2018 HD Warranty Amendments meet the criteria for a new waiver under section 209(b) of the CAA.[245] However, because the measure has not been approved into the California SIP, the EPA is not proposing at this time to credit this measure with any particular amount of emissions reductions toward attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. Given the relatively small quantity of reductions from this measure, these emissions reductions would not materially affect the attainment demonstration for the 1997 annual $PM_{2.5}$ NAAQS in the SJV $PM_{2.5}$ Plan.

Finally, the 15 $\mu g/m^3$ SIP Revision includes an aggregate emissions reduction commitment by CARB to achieve reductions of 3.0 tpd of NO_X and 0.04 tpd of direct $PM_{2.5}$ through adoption of CARB's Heavy-Duty I/M program and/or substitute measures.[246] These reductions amount to 1.8 percent and 0.9 percent of the total NO_X and direct $PM_{2.5}$ reductions, respectively, needed to attain the 1997 annual $PM_{2.5}$ NAAQS. CARB adopted the Heavy-Duty I/M measure on December 9, 2021, fulfilling CARB's control measure commitment in the 15 $\mu g/m^3$ SIP Revision. Implementation of the program began on January 1, 2023. On December 14, 2022, CARB submitted the measure to the EPA as a revision to the California SIP.[247] The EPA is not proposing to credit the emission reductions from the Heavy-Duty I/M program towards the aggregate tonnage commitment at this time. The EPA will take such action in a separate future rulemaking.

---

[244] 87 FR 35760.
[245] 88 FR 20688.
[246] CARB Resolution 21-21, pp. 4–5.
[247] Letter dated December 7, 2022, from Steven S. Cliff, Ph.D., Executive Officer, to Martha Guzman, Regional Administrator, EPA Region IX, with enclosures.

In addition to the baseline and additional measures discussed above, CARB notes in its August 2021 Staff Report accompanying the 15 μg/m^3 SIP Revision that two additional measures are expected to provide for more emissions reductions by the 2023 attainment year for the 1997 annual $PM_{2.5}$ NAAQS.[248] While the EPA is not proposing to credit either of these measures at this time towards the aggregate tonnage commitment for the 1997 annual $PM_{2.5}$ NAAQS, we agree with the State that they will further reduce ambient $PM_{2.5}$ levels and exposure to $PM_{2.5}$ pollution for communities in the San Joaquin Valley.

The first measure is the Accelerated Turnover of Agricultural Equipment Incentive Projects ("Agricultural Equipment Incentive Measure"), which includes commitments by CARB to monitor, assess, and report on emission reductions, and to achieve emission reductions of 5.1 tpd NO_X and 0.3 tpd direct $PM_{2.5}$ from the 2025 baseline inventory in the 2018 $PM_{2.5}$ Plan by December 31, 2024.[249] The State asserts in the August 2021 Staff Report that a large portion of those emissions reductions will be achieved by 2023.[250] The EPA finalized a partial approval of this measure on December 16, 2021, wherein the EPA credited 4.83 tpd NO_X and 0.24 tpd direct $PM_{2.5}$ towards CARB's tonnage commitments for 2024 (for attaining the 2006 24-hour $PM_{2.5}$ NAAQS), and calculated 4.46 tpd NO_X and 0.26 tpd direct $PM_{2.5}$ for 2025 (for attaining the 2012 annual $PM_{2.5}$ NAAQS).[251]

The second measure is the Agricultural Burning Phase-out Measure, which for purposes of state law, was adopted by the District on June 17, 2021,[252] and concurred on by CARB on June 18, 2021,[253] and later adopted by the District on November 18, 2021, as a revision to the

---

[248] August 2021 Staff Report, pp. 3–4.
[249] EPA Region IX "Technical Support Document for EPA's Rulemaking for the California State Implementation Plan California Air Resources Board Resolution 19–26 San Joaquin Valley Agricultural Equipment Incentive Measure," February 2020, pp. 4–5, 24–25, and 31.
[250] CARB's August 2021 Staff Report, p. 3.
[251] 86 FR 73106 (December 27, 2021). The EPA deferred action on the NRCS portion of the Agricultural Equipment Incentive Measure.
[252] SJVUAPCD Resolution 21–06–12, June 17, 2021.
[253] Letter dated June 18, 2021, from Richard W. Corey, Executive Officer, CARB, to Samir Sheikh, Executive Director, SJVUAPCD.

California SIP.[254] Previously, through Rule 4103 ("Open Burning"), as amended April 15, 2010, the District restricted the type of materials that may be burned and established other conditions and procedures for open burning in conjunction with the District's Smoke Management Program.[255] The EPA approved Rule 4103 and the associated table of the restrictions on open burning by crop category into the California SIP on January 4, 2012.[256] The District identifies Rule 4103 as a baseline measure in the 2018 $PM_{2.5}$ Plan.[257] The Agricultural Burning Phase-out Measure, in turn, includes a schedule to phase-out (i.e., introduce prohibitions of) agricultural burning for additional crop categories or materials accounting for a vast majority of the tonnage of agricultural waste in phases starting January 1, 2022, and becoming fully implemented by January 1, 2025.[258] Thus, the State asserts that the measure will provide for additional reductions in 2023 not accounted for in the attainment demonstration for the in the 15 $\mu g/m^3$ SIP Revision for 1997 annual $PM_{2.5}$ NAAQS.[259] The EPA approved the Agricultural Burning Phase-out Measure into the California SIP on June 16, 2022.[260]

iii. Three Factor Test for Enforceable Commitments

The EPA interprets the CAA to allow for approval of enforceable commitments that are limited in scope where circumstances exist that warrant the use of such commitments in place of adopted and submitted measures.[261] Specifically, CAA section 110(a)(2)(A) provides that each

---

[254] SJVUAPCD Resolution 21–11–7, November 18, 2021. See also, Letter dated October 20, 2021, from Richard W. Corey, Executive Officer, CARB, to Deborah Jordan, Acting Regional Administrator, EPA Region IX.
[255] SJVUAPCD Rule 4103, as amended April 15, 2010.
[256] 77 FR 214 (January 4, 2012). The table of open burning restrictions by crop category is codified at 40 CFR 52.220(c)(388)(i)(B)(*3*) Table 9–1, Revised Proposed Staff Report and Recommendations on Agricultural Burning, approved by the District on May 20, 2010.
[257] 2018 $PM_{2.5}$ Plan, Chapter 4, tables 4-2 and 4-3, and Appendix C.
[258] 2021 Supplemental Report and Recommendations, Table 2–1 ("Accelerated Reductions by Crop Category").
[259] CARB's August 2021 Staff Report, pp. 3–4.
[260] 87 FR 36222.
[261] Commitments approved by the EPA under CAA section 110(k)(3) are enforceable by the EPA and citizens under CAA sections 113 and 304, respectively. In the past, the EPA has approved enforceable commitments and courts have enforced these actions against states that failed to comply with those commitments. See, e.g., *American Lung Ass'n of N.J. v. Kean*, 670 F. Supp. 1285 (D.N.J. 1987), aff'd, 871 F.2d 319 (3rd Cir. 1989); *NRDC v. N.Y. State Dept. of Env. Cons.*, 668 F. Supp. 848 (S.D.N.Y. 1987); *Citizens for a Better Env't v. Deukmejian*, 731 F. Supp. 1448, recon. granted in par, 746 F. Supp. 976 (N.D. Cal. 1990); *Coalition for Clean Air v. South Coast Air Quality Mgt. Dist.*, No. CV 97-6916-HLH, (C.D. Cal. Aug. 27, 1999). Further, if a state fails to meet its commitments, the EPA could make a finding of failure to implement the SIP under CAA section 179(a), which starts an 18-month period for the State to correct the non-implementation before mandatory sanctions are imposed.

SIP "shall include enforceable emission limitations and other control measures, means or techniques…as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of [the Act]." Section 172(c)(6) of the Act, which applies to nonattainment SIPs, is virtually identical to section 110(a)(2)(A). The language in these sections of the CAA is broad, allowing a SIP to contain any "means or techniques" that the EPA determines are "necessary or appropriate" to meet CAA requirements, such that the area will attain as expeditiously as practicable, but no later than the designated date. Furthermore, the express allowance for "schedules and timetables" demonstrates that Congress understood that all required controls might not have to be in place before a SIP could be fully approved.

Once the EPA determines that circumstances warrant consideration of an enforceable commitment to satisfy a CAA requirement, it considers three factors in determining whether to approve the enforceable commitment: (1) does the commitment address a limited portion of the CAA requirement; (2) is the state capable of fulfilling its commitment; and (3) is the commitment for a reasonable and appropriate period of time.[262]

With respect to the SJV $PM_{2.5}$ Plan, circumstances warrant the consideration of enforceable commitments as part of the attainment demonstration for this area. As discussed in Section IV.C.2.a.i of this proposed rule, the majority of the emissions reductions needed to demonstrate attainment and RFP in the San Joaquin Valley are achieved by rules and regulations adopted prior to the State's development of the SJV $PM_{2.5}$ Plan, i.e., baseline measures. As a result of these already-adopted CARB and District measures, most air pollution sources in the San Joaquin Valley were already subject to stringent rules prior to the development of the SJV $PM_{2.5}$ Plan, leaving fewer and more technologically challenging opportunities to reduce

[262] The Fifth Circuit Court of Appeals upheld the EPA's interpretation of CAA sections 110(a)(2)(A) and 172(c)(6) and the Agency's use and application of the three factor test in approving enforceable commitments in the 1-hour ozone SIP for Houston-Galveston. *BCCA Appeal Group v. EPA*, 355 F.3d 817 (5th Cir. 2003). More recently, the Ninth Circuit Court of Appeals upheld the EPA's approval of enforceable commitments in ozone and $PM_{2.5}$ SIPs for the San Joaquin Valley, based on the same three factor test. *Committee for a Better Arvin v. EPA*, 786 F.3d 1169 (9th Cir. 2015). But see, *Medical Advocates for Healthy Air v. EPA*, Case No. 20-72780, (9th Cir., Apr. 13, 2022) (finding that the EPA did not adequately show the State was capable of fulfilling its commitment with respect to incentive-based control measure commitments).

emissions. Despite these significant emission reductions, as shown in Table 4 of this proposed rule, the State needs to reduce NO_X and direct $PM_{2.5}$ emission levels by a total of 52.5 percent and 7.2 percent, respectively, from 2013 base year levels in order to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

As part of CARBs control measure commitment in the 15 $\mu g/m^3$ SIP Revision, it identifies the control measure (i.e., Heavy-Duty I/M) that it expects to achieve the additional emissions reductions needed for attainment. The timeline needed to develop, adopt, and implement the measure extended beyond the timeline for Plan adoption, with board consideration scheduled for December 2021 at the time the Plan was developed.[263] As discussed in Section IV.C.2.a.ii of this document, CARB adopted the Heavy-Duty I/M measure on December 9, 2021, fulfilling CARB's control measure commitment per the schedule in the Plan. Given these circumstances, we conclude that reliance on enforceable commitments in the SJV $PM_{2.5}$ Plan is warranted. Therefore, we have considered the three factors the EPA uses to determine whether the use of enforceable commitments in lieu of adopted measures satisfies CAA planning requirements.

(1) The Commitment Represents a Limited Portion of Required Reductions

For the first factor, we look to see if the commitment addresses a limited portion of a statutory requirement, such as the amount of emissions reductions needed to attain the NAAQS in a nonattainment area. As discussed in Section IV.C.2.a.i of this proposed rule, most of the total emission reductions needed to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by the end of 2023 will be achieved through implementation of baseline measures and additional measures for which the EPA has finalized approval, leaving 1.8 percent (3 tpd) of the necessary NO_X reductions and 0.9 percent (0.04 tpd) of the necessary direct $PM_{2.5}$ reductions as aggregate tonnage commitments.

Given the nature of the $PM_{2.5}$ challenge in the San Joaquin Valley, the significant

[263] August 2021 Staff Report, p. 4.

reductions in NO_X and direct $PM_{2.5}$ emission levels achieved through implementation of baseline measures over the past several decades, and the difficulty of identifying additional control measures that are feasible for implementation in the area, we consider it reasonable for CARB and the District to seek additional time to develop and adopt the last increment of emission reductions necessary for attainment by 2023. Therefore, we conclude that the emission reductions remaining as enforceable commitments in the SJV $PM_{2.5}$ Plan represent a limited portion of the total emissions reductions needed to demonstrate attainment of the 1997 annual $PM_{2.5}$ NAAQS by December 31, 2023.

(2) The State Is Capable of Fulfilling Its Commitment

For the second factor, we consider whether the State is capable of fulfilling its commitments. As discussed in Section IV.C.2.a.ii of this document, CARB has already adopted the regulatory measure (i.e., Heavy-Duty I/M) it committed to in the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS. The aggregate tonnage commitments associated with this measure are 3 tpd of NO_X and 0.04 tpd of direct $PM_{2.5}$ in 2023, less than 2 percent of the NO_X and direct $PM_{2.5}$ emissions reductions needed for attainment by December 31, 2023.[264]

Given CARB's progress in adopting the Heavy-Duty I/M measure it committed to in the 15 $\mu g/m^3$ SIP Revision per the schedule in the Plan and its continuing efforts to develop additional control measures to further reduce NO_X and $PM_{2.5}$ emissions in the San Joaquin Valley, we propose that CARB is capable of fulfilling the remaining increment of NO_X emission reductions necessary to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by December 31, 2023.

More broadly, we note that CARB will have to submit to the EPA, for SIP approval, any control measure that it intends to rely on to satisfy the aggregate tonnage commitments in the

[264] Unlike the aggregate commitments at issue in the *Medical Advocates* case, which relied in-part on incentive-based control measure commitments, the aggregate commitment the EPA is proposing to approve in this action consists solely of a regulatory measure that has already been adopted and submitted by the State and for which implementation began on January 1, 2023.

Plan. Furthermore, if CARB intends to substitute reductions in one pollutant to achieve a tonnage commitment concerning a different pollutant (e.g., substituting direct $PM_{2.5}$ reductions to satisfy a NO_X reduction commitment), it must include an appropriate inter-pollutant trading (IPT) ratio and the technical basis for such ratio. The EPA will review any such IPT ratio and its bases before approving or disapproving the measure.

(3) The Commitment Is for a Reasonable and Appropriate Timeframe

For the third factor, we consider whether the commitment is for a reasonable and appropriate period of time. The SJV $PM_{2.5}$ Plan includes specific rule adoption and implementation schedules for the Heavy-Duty I/M measure to meet CARB's commitment to reduce emissions to the levels needed to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by 2023. CARB has already met its control measure commitment through its December 2021 adoption of the Heavy-Duty I/M measure and implementation ahead of the December 31, 2023 projected attainment date. We consider that these schedules provide a reasonable and appropriate amount of time for CARB to achieve the remaining emission reductions necessary to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by December 31, 2023. We therefore propose to conclude that the third factor is satisfied.

b. Best Available Control Measures

We are evaluating the State's BACM demonstration for the 1997 annual $PM_{2.5}$ NAAQS against the section 189(b)(1)(B) Serious area plan BACM requirement, and the section 189(d) plan requirement to address all Serious area plan requirements that the State has not already met. Because we have already found that the State failed to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley area by the Serious area attainment date, and because we have not previously found that the state has met the BACM requirement for purposes of the 1997 annual $PM_{2.5}$ NAAQS, we are evaluating the State's submission against the Serious area BACM requirement in light of the section 189(d) control plan timeline.

i. Summary of the State's Submission

The State's BACM demonstration is presented in Appendix C ("Stationary Source Controls") of the 2018 $PM_{2.5}$ Plan and Appendix D ("Mobile Source Control Measure Analyses") of the 15 μg/m^3 SIP Revision.[265] The State also provided additional information regarding building heating appliances, including residential natural gas-fired water heaters and furnaces, in a document titled "Building Electrification Technical Supplement for the 1997 Annual $PM_{2.5}$ NAAQS" ("March 2023 Building Heating Supplement"), submitted to the EPA on March 30, 2023.[266]

As discussed in Section IV.A of this proposed rule, Appendix B ("Emissions Inventory") of the 2018 $PM_{2.5}$ Plan contains the planning inventories for direct $PM_{2.5}$ and all $PM_{2.5}$ precursors (NO_X, SO_X, VOC, and ammonia) for the San Joaquin Valley nonattainment area together with documentation to support these inventories. Each inventory includes emissions from stationary, area, on-road, and non-road emissions sources, and the State specifically identifies the condensable component of direct $PM_{2.5}$ for relevant stationary source and area source categories. As discussed in Section IV.B of this proposed rule, the State concluded that the Plan should control emissions of $PM_{2.5}$ and NO_X to reach attainment. Accordingly, the BACM and BACT evaluation in the Plan addresses potential controls for sources of those pollutants.

Stationary and Area Sources

For stationary and area sources, the District identifies the sources of direct $PM_{2.5}$ and NO_X in the San Joaquin Valley that are subject to District emissions control measures and provides its evaluation of these regulations for compliance with BACM requirements in Appendix C of the 2018 $PM_{2.5}$ Plan. As part of its process for identifying candidate BACM and

[265] Appendices C and D also present an MSM analysis for the purposes of meeting a precondition for an extension of the Serious area attainment date under CAA section 188(e) for the 2006 $PM_{2.5}$ NAAQS. The San Joaquin Valley area is not subject to the MSM requirement for the 1997 annual $PM_{2.5}$ NAAQS. Thus, the EPA is evaluating the Plan's control strategy for implementation of BACM and BACT only.
[266] Letter dated March 29, 2023, from Steven S. Cliff, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region 9, with enclosures. This letter is in the docket for this proposed action.

considering the technical and economic feasibility of additional control measures, the District reviewed the EPA's guidance documents on BACM, additional guidance documents on control measures for direct $PM_{2.5}$ and NO_X emissions sources, and control measures implemented in other ozone and $PM_{2.5}$ nonattainment areas in California and other states.[267] Based on these analyses, the District concludes that all best available control measures for stationary and area sources are in place in the San Joaquin Valley for NO_X and directly emitted $PM_{2.5}$ for purposes of meeting the BACM/BACT requirement for the 1997 annual $PM_{2.5}$ NAAQS. We provide an evaluation of many of the District's control measures for stationary sources and area sources in Section IV of the EPA's 1997 Annual $PM_{2.5}$ TSD together with recommendations for possible future improvements to these rules.

As noted earlier, the State provided additional information to the EPA to support its BACM analysis for building heating appliances in its March 2023 Building Electrification Supplement.[268] We provide a summary of the State's BACM analysis for building heating appliances in the paragraphs that follow.

The State provides a summary of its existing rules governing building heating appliances, including Rule 4902 ("Residential Water Heaters") and Rule 4905 ("Natural Gas-Fired, Fan-Type Central Furnaces"), in Appendix C of the 2018 $PM_{2.5}$ Plan.[269] The rules are point of sale rules that limit the types of water heaters and furnaces that may be sold in the San Joaquin Valley.[270] The District also provides comparisons of its rules with rules in other California air districts.[271] Based on the District's analysis at that time, it determined that it was implementing the most stringent requirements feasible for such building heating appliances.

The EPA has previously provided our evaluation of the District's BACM demonstration

---

[267] 15 $\mu g/m^3$ SIP Revision, Chapter 4, Section 4.3.1.
[268] Letter dated March 29, 2023, from Steven S. Cliff, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region 9, with enclosures.
[269] 2018 $PM_{2.5}$ Plan, Appendix C, sections C.20 and C.21.
[270] SJVUAPCD Rule 4902 ("Residential Water Heaters"), amended March 19, 2009, and SJVUAPCD Rule 4905 ("Natural Gas-Fired, Fan-Type Central Furnaces"), amended January 22, 2015.
[271] 2018 $PM_{2.5}$ Plan, Appendix C, sections C.20 and C.21.

in the 2018 $PM_{2.5}$ Plan for stationary and area sources in general, and several source categories in more detail, for purposes of other $PM_{2.5}$ NAAQS in three documents: (1) the EPA's "Technical Support Document, EPA Evaluation of BACM/MSM, San Joaquin Valley $PM_{2.5}$ Plan for the 2006 $PM_{2.5}$ NAAQS," February 2020 ("EPA's BACM/MSM TSD"); (2) the EPA's "Response to Comments Document for the EPA's Final Action on the San Joaquin Valley Serious Area Plan for the 2006 $PM_{2.5}$ NAAQS," June 2020 ("EPA's 2020 Response to Comments"); and (3) Section II of the EPA's "Technical Support Document, San Joaquin Valley $PM_{2.5}$ Plan for the 1997 24-hour $PM_{2.5}$ NAAQS," August 2021 ("EPA's 1997 24-hour $PM_{2.5}$ TSD"). In particular, the EPA's 2020 Response to Comments presented our evaluation of the District's BACM demonstration for residential water heaters and residential and commercial, natural gas-fired, fan-type central furnaces.[272] At that time we found that the requirements for residential fuel combustion sources covered by Rules 4902 and 4905 represented BACM.[273] In addition, the EPA concluded that setting a zero-NO_X standard for heating appliances in new buildings reasonably requires additional consideration and analysis of technological and economic feasibility by the District because, per the 2018 $PM_{2.5}$ Plan, the most common types of residential water heaters and furnaces are those that use natural gas as fuel.

We also noted in the EPA's 2020 Response to Comments that the building codes referenced by commenters at that time appeared to be green building code ordinances that restrict or prohibit installation of natural gas or propane appliances in new construction.[274] Such ordinances, most of which appeared to have been adopted in late 2019 and early 2020, fell within a category known as "reach codes," which are city and county building code standards for energy efficiency that exceed California's statewide standards. We stated that California law requires local governments to submit proposed ordinances to the California Energy Commission for a determination that they will be both cost effective and more energy efficient than statewide

[272] EPA's 2020 Response to Comments, pp. 142–148, Comment 6.O and Response 6.O.
[273] Id. at 146–147.
[274] Id. at 147–148.

standards, and that compliance with this procedure is necessary for such measures to be enforceable.[275] We also noted that ordinances adopted by city councils and county officials are legally distinct from measures adopted by the governing boards of the respective air districts and that it did not appear at the time that California air districts had adopted similar restrictions.

Since the time of the EPA's actions on the San Joaquin Valley plans for the 2006 24-hour and 1997 24-hour $PM_{2.5}$ standards (i.e., 2020–2021), additional jurisdictions have adopted natural gas bans, appliance standards, and other strategies to reduce emissions from building heating devices.[276] Furthermore, CARB and the Bay Area AQMD are moving forward in developing measures to set zero-emission standards for space heaters and water heaters. Given these factors, the State has supplemented its evaluation of the feasibility of strengthening its rules for building heating sources for purposes of the EPA's evaluation of the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS.[277]

The March 2023 Building Electrification Supplement includes analyses from both CARB and the District regarding the stringency of the District's current rules, recent efforts across the State of California to further reduce emissions from building heating appliances, and information supporting the State's assertion that it is infeasible, and therefore not required for BACM, to implement a zero-emission regulation for building heating appliances within the timeframe of the Plan for the 1997 annual $PM_{2.5}$ NAAQS.

First, the District asserts that its Rules 4902 ("Residential Water Heaters"), 4308

---

[275] California 2019 Building Energy Standards, at California Code of Regulations (CCR), title 24, part 1, article 1, sec. 10–106 (''Locally Adopted Energy Standards''); see also *https://ww2.energy.ca.gov/title24/2016standards/ordinances.*

[276] We note, for awareness only, that the City of Berkeley introduced an ordinance in 2019 prohibiting the installation of natural gas infrastructure in most new buildings. In April 2023, the Ninth Circuit Court of Appeals reversed and remanded the prior district court's rule that upheld the ordinance on the grounds that the federal Energy Policy and Conservation Act expressly preempted the local ordinance's regulation of "energy use" of a product covered by the statute. *California Restaurant Association v. City of Berkeley,* No. 21-16278 (9th Cir. 2023).

[277] The EPA's evaluation of BACM for NO_X emissions from building heating appliances in its proposed rule on the State's Serious area plan for the 2012 annual $PM_{2.5}$ NAAQS was the subject of adverse comments. (86 FR 74310, December 29, 2021); and comment letter dated and received January 28, 2022, from Brent Newell, Public Justice, et al., to Rory Mays, EPA, including Exhibits 1 through 47. The EPA re-proposed action on portions of that Serious area plan, including BACM for building heating appliances based on the record available at the time. (87 FR 60494, October 5, 2022). However, the State withdrew that original Serious area plan on October 27, 2022, and has since supplemented its analysis of BACM for this source category, as described herein.

("Boilers, Steam Generators, and Process Heaters – 0.075 MMBtu/HR to Less Than 2.0 MMBtu/HR"), and 4905 ("Natural Gas-Fired, Fan-Type Central Furnaces") include the most stringent requirements currently being implemented for water and space heaters in the nation and are the most stringent measures feasible for implementation in the San Joaquin Valley as of March 2023.[278] Specifically, the District notes that its NO_X limits of 10 and 14 nanograms of NO_X per joule of useful heat (ng/J) for water and space heaters, respectively, are the same as those implemented by the South Coast AQMD and are the most stringent in the country.[279] The District also points to its efforts to reduce emissions from home heating through its Fireplace and Woodstove Change-Out incentive program, which offers support for purchasing and installing cleaner space heating appliances.[280] The District notes that the program has helped replace over 21,000 wood burning appliances with natural gas inserts, stoves, and fireplaces and that recent changes to the program are providing larger incentives for electric space heating and cooling heat pumps in Valley homes.[281]

Next, CARB and the District discuss CARB's commitment and ongoing work to develop a statewide zero-emission space and water heater regulation. CARB included in its 2022 State SIP Strategy for the State Implementation Plan ("2022 State SIP Strategy"), among other measures, a commitment to develop a zero-emission standard for space and water heaters.[282] CARB submitted the 2022 State SIP Strategy to the EPA for approval into the California SIP on February 23, 2023.[283] CARB reiterated its commitment for a zero-emission standard in the Final 2022 Scoping Plan for Achieving Carbon Neutrality ("2022 Scoping Plan").[284] The 2022 State SIP Strategy and 2022 Scoping Plan anticipate implementation of a zero-emission standard for

[278] March 2023 Building Electrification Supplement, p. 1.
[279] Id.
[280] Id. at 1–2. The EPA proposed to approve the District's "Burn Cleaner Fireplace and Woodstove Change-out Incentive Measure" into the California SIP on April 14, 2023 (88 FR 22978).
[281] March 2023 Building Electrification Supplement, pp. 1-2.
[282] CARB, 2022 State Strategy for the State Implementation Plan, pp. 101–103. Available at *https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf*.
[283] Letter dated February 22, 2023, from Steven S. Cliff, Executive Director, CARB, to Martha Guzman, Regional Administrator, EPA Region IX, with enclosures. The EPA has not yet taken action on the 2022 State SIP Strategy.
[284] CARB, 2022 Scoping Plan, pp. 211–215 and Appendix F.

building heating appliances starting in 2030, pending rule development and CARB Board approval in 2025.[285]

Third, the State discusses the technical and economic feasibility challenges of implementing a zero-emission standard for space and water heaters in the San Joaquin Valley. The State summarizes its position in the March 2023 Building Electrification Supplement and refers to technical and economic feasibility considerations outlined in Appendix F of the 2022 Scoping Plan, which CARB included as an attachment to the March 2023 Building Electrification Supplement.

With regard to technical feasibility, CARB acknowledges that electric alternatives to gas-fueled appliances are currently available for deployment in some applications but cites various challenges related to manufacturing capacity, retrofit complications (e.g., physical space constraints), consumer awareness/perception, and decreased performance of some units in colder climates.[286] The State asserts that consumer preference for appliance types that they are already familiar with is a major barrier to building electrification and discusses the need for increased consumer awareness and adoption, which would allow manufacturers to take advantage of economies of scale and increase production capacity.[287]

With regard to economic feasibility, CARB provides some qualitative comparisons between capital and energy costs for electric and natural gas-powered appliances, which vary depending on equipment and installation needs, climate zones, and energy rate structures.[288] Costs associated with retrofitting an existing building are expected to be higher than those for new construction due to the potential for additional installation costs, which may include electrical panel and circuit upgrades, rewiring, ductwork modifications, and space reconfigurations.[289] Energy costs are expected to vary depending on the characteristics of the

[285] 2022 State SIP Strategy, Table 3.
[286] 2022 Scoping Plan, pp. 5–10.
[287] Id. at Appendix F, p. 22.
[288] Id. at 11–13.
[289] Id. at 16–18.

appliances and buildings, climate variation, consumer use patterns, and utility rate structures.[290] CARB notes that higher energy bills after electrification have the potential to especially burden low-income residents of the State and discusses the importance of coordinating statewide actions to ensure energy rates are structured to support electrification.[291]

Additionally, the State posits that low-income customers may be less likely to adopt electric appliances early on due to capital costs and could end up paying a larger share of systemwide fossil gas system costs as other households move away from natural gas use.[292] With regard to the San Joaquin Valley specifically, the District notes that the per capita income of District residents is only 40.5 percent of the average per capita income of areas in California that have adopted building electrification ordinances to date, creating additional challenges for implementation in the Valley.[293] Furthermore, the State notes that care must be taken to ensure that vulnerable communities are not adversely affected. For example, some rural and tribal areas in California rely on propane or wood burning for heating because they are not connected to the State's electric grid or natural gas infrastructure.[294] CARB emphasizes the need for robust community engagement to ensure equitable consideration of low-income and environmental justice communities in the Valley and identifies a need for increased incentive funding to support a successful transition to building decarbonization.[295]

Lastly, the State discusses the anticipated implementation timelines for zero-NO_X building electrification standards in the context of the San Joaquin Valley Plan for the 1997 annual $PM_{2.5}$ NAAQS. CARB asserts that the public process to develop a rulemaking would take at least two years and that more time would be needed for implementation.[296] As discussed earlier, CARB's adoption and implementation timeline for a statewide zero-NO_X measure

---

[290] Id. at 12.
[291] Id. at 13–14.
[292] Id. at 15.
[293] March 2023 Building Electrification Supplement, pp. 2–3. The average per capita income of San Joaquin Valley residents is $24,708 while the average per capita income in cities with building electrification ordinances is $60,969.
[294] Id.
[295] Id. at Section 4.
[296] March 2023 Building Electrification Supplement, p. 4.

involves taking a measure to the CARB Board in 2025 and beginning implementation in 2030. This timeline was established to allow adequate time for CARB to collaborate with the U.S. Department of Energy; California Energy Commission; and California Building Standards Commission, Department of Housing and Community Development; and to provide time for robust public engagement with community-based organizations and other key stakeholders. The State asserts that emission reductions from building decarbonization are not feasible in the timeframe of the SJV $PM_{2.5}$ Plan, given the 2023 attainment date for the 1997 annual $PM_{2.5}$ NAAQS. The District has committed in the 2022 Plan for the 2015 8-Hour Ozone Standard to evaluate current and upcoming work by CARB and other agencies and to evaluate the feasibility of implementing zero-emission NO_X requirements for building heating sources in the Valley as part of their ongoing work to attain the 2015 ozone NAAQS.[297]

Mobile Sources

For mobile sources, CARB identifies the sources of direct $PM_{2.5}$ and NO_X in the San Joaquin Valley that are subject to the State's emissions control measures and provides its evaluation of these regulations for compliance with BACM requirements in Appendix D of the 15 μg/m^3 SIP Revision. Appendix D describes CARB's process for determining BACM, including identification of the sources of direct $PM_{2.5}$ and NO_X in the San Joaquin Valley, identification of potential control measures for such sources, assessment of the stringency and feasibility of the potential control measures, and adoption and implementation of feasible control measures.[298]

Mobile source categories for which CARB has primary responsibility for reducing emissions in California include most new and existing on- and non-road engines and vehicles and motor vehicle fuels. The SJV $PM_{2.5}$ Plan's BACM demonstration provides a general description of CARB's key mobile source programs and regulations and a comprehensive table

[297] 2022 Plan for the 2015 8-Hour Ozone Standard, Section 3.3.4.2.1. Available at *https://ww2.valleyair.org/rules-and-planning/air-quality-plans/ozone-plans/2022-ozone-plan-for-the-san-joaquin-valley/*.
[298] 15 μg/m^3 SIP Revision, Appendix D, Chapter II.

listing on-road and non-road mobile source regulatory actions taken by CARB since 1985.[299]

Appendix D of the 15 μg/m^3 SIP Revision also describes the current efforts of the eight local jurisdiction metropolitan planning organizations (MPOs) to implement cost-effective transportation control measures (TCMs) in the San Joaquin Valley.[300] TCMs are projects that reduce air pollutants from transportation sources by reducing vehicle use, traffic congestion, or vehicle miles traveled. TCMs are currently being implemented in the San Joaquin Valley as part of the Congestion Mitigation and Air Quality cost effectiveness policy adopted by the eight local jurisdiction MPOs and in the development of each Regional Transportation Plan (RTP). The Congestion Mitigation and Air Quality policy, which is included in a number of the District's prior attainment plan submissions for the ozone and $PM_{2.5}$ NAAQS, provides a standardized process for distributing 20 percent of the Congestion Mitigation and Air Quality funds to projects that meet a minimum cost effectiveness threshold beginning in fiscal year 2011. The MPOs revisited the minimum cost effectiveness standard during the development of their 2018 RTPs and 2019 Federal Transportation Improvement Program and concluded that they were implementing all reasonable transportation control measures.[301] Appendix D of the District's "2016 Ozone Plan for 2008 8-Hour Ozone Standard," adopted June 16, 2016, contains a listing of adopted TCMs for the San Joaquin Valley.[302]

ii. The EPA's Review of the State's Submission

We have reviewed the State's and District's analysis and determination in the SJV $PM_{2.5}$ Plan that their baseline mobile, stationary, and area source control measures meet the requirements for BACM for sources of direct $PM_{2.5}$ and applicable $PM_{2.5}$ plan precursors (i.e., NO_X) for purposes of the 1997 annual $PM_{2.5}$ NAAQS. In our review, we considered our evaluation of the State's and District's rules and supporting information included in the SJV

[299] Id. at Table 17.
[300] Id. at D-127 and D-128.
[301] Id. at D-127.
[302] Id. and SJVUAPCD, "2016 Ozone Plan for 2008 8-Hour Ozone Standard" (adopted June 16, 2016), Appendix D, Attachment D, tables D-10 to D-17.

$PM_{2.5}$ Plan in connection with our approval of the demonstrations for BACM (including BACT) and MSM for the 2006 24-hour $PM_{2.5}$ NAAQS,[303] our approval of the demonstration for BACM for the 1997 24-hour $PM_{2.5}$ NAAQS,[304] and our proposed disapproval of the demonstration for BACM for the 2012 annual $PM_{2.5}$ NAAQS.[305] We are proposing to find that the evaluation processes followed by CARB and the District in the SJV $PM_{2.5}$ Plan to identify potential BACM are generally consistent with the requirements of the $PM_{2.5}$ SIP Requirements Rule, the State's and District's evaluation of potential measures is appropriate, and the State and District have provided reasoned justifications for their rejection of potential measures based on technological or economic infeasibility. We also agree with the District's conclusion that all reasonable TCMs are being implemented in the San Joaquin Valley and that additional TCMs are being considered by the metropolitan transportation agencies as part of the Congestion Mitigation and Air Quality cost effectiveness policy, with strategies adopted to meet their SB375 greenhouse gas reduction targets. Therefore, we propose to find that these TCMs implement BACM for transportation sources.

With regard to building heating appliances, based on the EPA's review of the additional information provided in the March 2023 Building Electrification Supplement, and for the reasons discussed below, we are proposing to approve the State's BACM demonstration for NO_X and direct $PM_{2.5}$ emissions from building heating appliances for purposes of meeting the CAA requirements for the 1997 annual $PM_{2.5}$ NAAQS.

Consistent with the EPA's prior approvals of the State's BACM demonstration for building heating emission sources with respect to the 2006 24-hour and 1997 24-hour $PM_{2.5}$ NAAQS, we are proposing to find that the State provided a thorough review of measures for building heating sources that were being implemented in other nonattainment areas at the time the 2018 $PM_{2.5}$ Plan was developed, in accordance with 40 CFR 51.1010(a)(2)(i). The State has

[303] 85 FR 44192.
[304] 87 FR 4503 (January 28, 2022).
[305] 86 FR 74310.

since updated the analysis to reflect the current facts and circumstances for controlling emissions from such sources in 2023 by providing a feasibility analysis and an updated evaluation of current measures and ongoing efforts by the State and local air districts to develop more stringent requirements in the future.

In accordance with 40 CFR 51.1010(a)(3)(iii), the State has provided a detailed justification, based on technical and economic feasibility constraints, for why a zero-emission standard for building heating appliances is not feasible in the timeframe of the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS (i.e., before the projected attainment date). The State summarized various challenges that must be overcome, ranging from increased manufacturing to coordination with other State agencies to ensure energy rates are structured to support electrification. The State emphasized the need for careful consideration of potential adverse effects on low-income and environmental justice communities and a robust public process. The EPA acknowledges the work that is already underway by CARB to develop a statewide zero-emission NO_X measure for this source category and the recent commitment by the District in its plan for the 2015 ozone NAAQS to continue to study the feasibility of such standard for the San Joaquin Valley specifically.

With regard to efforts currently underway by the Bay Area AQMD, we note that on March 15, 2023, Bay Area AQMD adopted amendments to Rule 9-4 ("Nitrogen Oxides from Fan Type Residential Central Furnaces") and Rule 9-6 ("Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters").[306] These rules govern point of sale emission standards for small, typically residential and commercial, water and space heating systems. The amendments to Rule 9-4 lower the current NO_X emission limit for applicable furnaces from 40 ng/J by to 14 ng/J (which matches the limit in SJVUAPCD Rule 4905) with a compliance date of

[306] BAAQMD Board Resolution No. 2023-03, A Resolution of the Board of Directors of the Bay Area Air Quality Management District Amending Regulation 9, Rule 4 (Nitrogen Oxides from Fan-Type Residential Furnaces) and Amending Regulation 9, Rule 6 (Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters); and Certifying a California Environmental Quality Act Environmental Impact Report, March 15, 2023.

January 1, 2024; followed by a zero-NO_X emission requirement with a compliance date of January 1, 2029.[307] The amendments to Rule 9-6 introduce a zero-NO_X emission standard for residential and commercial water heaters and boilers to be implemented by January 1, 2027 and January 1, 2031 depending on equipment heat rate (i.e., the size of the boiler or water heater).[308]

The fifth step in identifying and selecting controls needed to meet BACM/BACT requirements in the $PM_{2.5}$ SIP Requirements Rule involves determining the earliest date by which a control measure or technology can be implemented in whole or in part. Accordingly, while Bay Area AQMD recently adopted zero-emission requirements for building heating sources, its timeframes for implementing those standards (i.e., 2027–2031) do not conflict with the State's conclusion that a zero-emission standard is not feasible in the timeframe of the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS (i.e., by the December 31, 2023 attainment date).[309] Based on measures currently being implemented by the Bay Area AQMD, South Coast AQMD, and other California air districts as discussed in the SJV $PM_{2.5}$ Plan and herein, we agree with the State's conclusion that the District's current rules include the most stringent requirements that are currently being implemented in the nation for this source category.

We note that the District is currently working to develop a new Serious area attainment plan for purposes of the 2012 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. Such plan must demonstrate attainment of those NAAQS as expeditiously as practicable but no later than December 31, 2025, or by the most expeditious alternative date practicable and no later than December 31, 2030, in accordance with the requirements of CAA sections 189(b) and 188(e). Under CAA section 189(b)(1)(B), the Serious area plan for the 2012 annual $PM_{2.5}$ NAAQS must include, among other things, provisions to assure that the plan provides for implementation of

---

[307] Final Staff Report, Proposed Amendments to Building Appliance Rules – Regulation 9, Rule 4: Nitrogen Oxides from Fan Type Residential Central Furnaces and Rule 6: Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters, p. 8.

[308] Id. at 9.

[309] Furthermore, in light of CARB's work towards state-wide zero-emission requirements for building heating sources, and a recent 9th Circuit opinion on a City of Berkeley ordinance (see *California Restaurant Association v. City of Berkeley,* No. 21-16278 (9th Cir. 2023)), we note that there is uncertainty as to the exact timeline on which such requirements may be implemented.

BACM/BACT and additional feasible measures for the control of direct $PM_{2.5}$ and $PM_{2.5}$ precursors. Given the longer time horizon of the 2012 annual $PM_{2.5}$ NAAQS, affording additional time for potential control measures to achieve emission reductions that may assist in attainment of those NAAQS, we note that nothing in this proposal should be interpreted as speaking to whether new measures for building heating appliances could be implemented in whole or in part within the timeframe of the attainment plan for those NAAQS.

For the foregoing reasons, we propose to find that the SJV $PM_{2.5}$ Plan provides for the implementation of BACM/BACT for sources of direct $PM_{2.5}$ and NO_X as expeditiously as practicable in accordance with the requirements of CAA section 189(b)(1)(B), and in satisfaction of both the Serious area and section 189(d) plan requirements.

c. Section 189(d) Five Percent Requirement

The SJV $PM_{2.5}$ Plan's demonstration of annual five percent reductions in NO_X emissions is in Chapter 5 ("Demonstration of Federal Requirements for 1997 $PM_{2.5}$ Standard"), Section 5.2 ("5% Plan Demonstration") of the 15 $\mu g/m^3$ SIP Revision. As shown in Table 6, the demonstration uses the 2013 base year inventory as the starting point from which the five percent per year emissions reductions are calculated and uses 2017 as the year from which the reductions start. The target required reduction in 2017 is five percent of the base year (2013) inventory, which is a reduction of approximately 15.9 tpd of NO_X, and the targets for subsequent years are additional reductions of five percent per year until the 2023 attainment year. The projected emissions inventories reflect NO_X emissions reductions achieved by baseline (i.e., already adopted) control measures only and the demonstration shows that these NO_X emissions reductions are greater than the required five percent per year.

Table 6 – 2017–2023 Annual Five Percent Emissions Reductions Demonstration for the San Joaquin Valley

Year	% Reduction from 2013 Base Year	5% Target (tpd NO_X)	CEPAM Inventory v1.05 (tpd NO_X)	Meets 5%?
2013 (base year)	-	-	317.3	-

2017	5%	301.3	233.4	Yes
2018	10%	285.5	221.5	Yes
2019	15%	269.6	214.5	Yes
2020	20%	253.8	203.3	Yes
2021	25%	238.0	191.0	Yes
2022	30%	222.1	179.8	Yes
2023	35%	206.3	153.6	Yes

Source: 15 μg/m^3 SIP Revision, Table 5-2.

The EPA proposes to find that the State's use of 2017 as the starting point from which the five percent per year emissions reductions should begin is reasonable and consistent with the CAA. As discussed in Section IV.C.1 of this document, the EPA interprets the language under CAA section 189(d) to require a state to submit a new attainment plan to achieve annual reductions "from the date of such submission until attainment." The 15 μg/m^3 SIP Revision was submitted by the State on November 8, 2021, and the 2018 $PM_{2.5}$ Plan on which it was based was submitted by the State on May 10, 2019. However, the Serious area attainment deadline for the San Joaquin Valley nonattainment area for the 1997 $PM_{2.5}$ NAAQS was December 31, 2015.[310] Accordingly, a plan submittal to meet the requirements under section 189(d) was due by December 31, 2016, and reductions were required to occur as of that date. The decline in emissions starting in 2017 shows that reductions did, in fact, occur within the required timeframe. Furthermore, the State's demonstration shows that NO_X emissions reductions from 2017 to 2023 are greater than the required minimum five percent per year. Thus, the EPA proposes to find that the SJV $PM_{2.5}$ Plan meets the CAA 189(d) requirement to provide for an annual reduction in $PM_{2.5}$ or $PM_{2.5}$ precursor emissions of not less than five percent per year of the amount of such emissions reported in the most recent inventory prepared for the area.

D. Attainment Demonstration and Modeling

1. Statutory and Regulatory Requirements

Section 189(b)(1)(A) of the CAA requires that each Serious area plan include a demonstration (including air quality modeling) that the plan provides for attainment of the $PM_{2.5}$

[310] 80 FR 18528.

NAAQS by the applicable attainment date. As discussed at the beginning of Section IV of this proposal, given that the outermost statutory Serious area attainment date for the San Joaquin Valley area (i.e., December 31, 2015) has passed and that the EPA has already found that the San Joaquin Valley area failed to attain by that date, the EPA must evaluate the State's plan for attainment by a later attainment date. Given that the finding of failure to attain triggered the State's obligation to submit a new plan meeting the requirements of section 189(d), the EPA is evaluating the SJV $PM_{2.5}$ Plan in light of the outermost attainment date required in section 189(d). That section, in conjunction with section 172(a)(2), requires that the attainment date be as expeditious as practicable, but not later than five years following the EPA's finding that the area failed to attain the NAAQS by the applicable Serious area attainment date, except that the EPA may extend the attainment date to a date no later than 10 years from the date of this determination (i.e., to November 23, 2026), "considering the severity of nonattainment and the availability and feasibility of pollution control measures." In this case, in the 15 $\mu g/m^3$ SIP Revision, the State projected such attainment by December 31, 2023.

In the $PM_{2.5}$ SIP Requirements Rule, the EPA explained that the same general requirements that apply to Moderate and Serious area plans under CAA sections 189(a) and 189(b) should apply to plans developed pursuant to CAA section 189(d)—i.e., the plan must include a demonstration (including air quality modeling) that the control strategy provides for attainment of the $PM_{2.5}$ NAAQS as expeditiously as practicable.[311] For purposes of determining the attainment date that is as expeditious as practicable, the state must conduct future year modeling that takes into account emissions growth, known controls (including any controls that were previously determined to be RACM/RACT or BACM/BACT), the five percent per year emissions reductions required by CAA section 189(d), and any other emissions controls that are needed for expeditious attainment of the NAAQS.

[311] 40 CFR 51.1011(b)(1); 81 FR 58010, 58102.

The EPA's $PM_{2.5}$ modeling guidance[312] ("Modeling Guidance") recommends that states use a photochemical model, such as the Comprehensive Air Quality Model with Extensions (CAMx) or Community Multiscale Air Quality Model (CMAQ), to simulate a base case, with meteorological and emissions inputs reflecting a base case year, to replicate concentrations monitored in that year. The Modeling Guidance recommends the following procedures for states to use in attainment demonstrations. The model should undergo a performance evaluation to ensure that it satisfactorily reproduces the concentrations monitored in the base case year. The model may then be used to simulate emissions occurring in other years required for an attainment plan, namely the base year (which may differ from the base case year) and future year.[313] The Modeling Guidance recommends that the modeled response to the emissions changes between the base and future years be used to calculate relative response factors (RRFs). The modeled RRFs are applied to a monitored base design value (computed from monitored concentrations in the base year and neighboring years) to estimate the projected design value in the future year, which can be compared against the NAAQS. In the recommended procedure, the RRFs are calculated for each chemical species component of $PM_{2.5}$, and for each quarter of the year, to reflect their differing responses to seasonal meteorological conditions and emissions. These quarterly RRFs are applied to base period $PM_{2.5}$ concentrations that have been split into species components, using available chemical species measurements. The Modeling Guidance provides additional detail on the recommended approach.[314]

2. Summary of the State's Submission

The 15 $\mu g/m^3$ SIP Revision includes a modeled demonstration projecting that the San Joaquin Valley will attain the 1997 annual $PM_{2.5}$ NAAQS by December 31, 2023, based on

---

[312] Memorandum dated November 29, 2018, from Richard Wayland, Air Quality Assessment Division, Office of Air Quality Planning and Standards, EPA, to Regional Air Division Directors, EPA, Subject: "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze," ("Modeling Guidance").
[313] In this section, we use the terms "base case," "base year" or "baseline," and "future year" as described in Section 2.3 of the EPA's Modeling Guidance. CARB refers to the base year as the "reference year."
[314] Modeling Guidance, Section 4.4, "What is the Modeled Attainment Tests [sic] for the Annual Average $PM_{2.5}$ NAAQS."

ongoing emissions reductions from baseline control measures, reductions from regulatory measures adopted by CARB and the District following development of the 2018 $PM_{2.5}$ Plan, and a commitment by CARB to adopt and implement an additional regulatory measure to meet an enforceable commitment. CARB's updated attainment demonstration for the 15 $\mu g/m^3$ SIP Revision built upon modeling performed for the 2018 $PM_{2.5}$ Plan, applying a scaling procedure described below. CARB conducted photochemical modeling with the CMAQ model using inputs developed from routinely available meteorological and air quality data, as well as more detailed and extensive data from the DISCOVER-AQ field study conducted in January and February of 2013.[315] The Plan's primary discussion of the photochemical modeling appears in Appendix K ("Modeling Attainment Demonstration") of the 15 $\mu g/m^3$ SIP Revision. The State briefly summarizes the area's air quality problem in Chapter 2 ("Air Quality Challenges and Trends") of the 2018 $PM_{2.5}$ Plan and the modeling results in Chapter 5 ("Demonstration of Federal Requirements for 1997 $PM_{2.5}$ Standard"), Section 5.3 ("Attainment Demonstration and Modeling") of the 15 $\mu g/m^3$ SIP Revision. The State provides a conceptual model of $PM_{2.5}$ formation in the San Joaquin Valley as part of the modeling protocol in Appendix L ("Modeling Protocol") of the 2018 $PM_{2.5}$ Plan. Appendix J ("Modeling Emission Inventory") of the 2018 $PM_{2.5}$ Plan describes emissions input preparation procedures. The modeling and its documentation are mainly identical to those submitted in the 2018 $PM_{2.5}$ Plan, except that Chapter 5 and Appendix K were updated to document procedures and results specific to the 2023 attainment demonstration, including the scaling of some model results. The following briefly summarizes the submitted modeling; additional details appear in the EPA's "Technical Support Document, EPA Evaluation of Air Quality Modeling, San Joaquin Valley $PM_{2.5}$ Plan for the 2006 $PM_{2.5}$ NAAQS," February 2020 ("EPA's February 2020 Modeling TSD") accompanying the EPA's action on the 2018 $PM_{2.5}$ Plan for the 2006 $PM_{2.5}$ NAAQS.

[315] NASA, "Deriving Information on Surface conditions from COlumn and VERtically Resolved Observations Relevant to Air Quality," available at *https://www.nasa.gov/mission_pages/discover-aq/index.html*.

CARB developed a photochemical air quality model application for simulating $PM_{2.5}$ in the San Joaquin Valley. CARB started with a conceptual model of $PM_{2.5}$ formation in the area and a modeling protocol describing the following modeling procedures. The procedures and their outcomes are also documented in Appendix K. CARB selected the episode (i.e., base year) to model, the modeling domain, and the modeling platform (CMAQ version 5.0.2); developed initial and boundary conditions, and base and future year emissions inventories for input into the model; and carried out performance evaluations for both the meteorological and photochemical modeling. Finally, CARB used the modeled $PM_{2.5}$ concentration outputs in the numerical NAAQS attainment test and in an unmonitored area analysis. These procedures are generally consistent with the EPA's recommendations in the Modeling Guidance.

For the 1997 annual $PM_{2.5}$ NAAQS attainment demonstration in the 15 $\mu g/m^3$ SIP Revision, the State relied on existing model simulations available from previous work for the 2018 $PM_{2.5}$ Plan but applied them differently to reflect more recent conditions and a revised 2023 attainment date. To estimate the 2023 design value, the State used existing simulations to calculate RRFs, scaled the RRFs to reflect 2018–2023 emissions changes, and then applied the RRFs to a 2018 base design value.

The State relied on three CMAQ simulations: (1) a 2013 base case simulation to demonstrate that the model can reasonably reproduce monitored $PM_{2.5}$ concentrations; (2) a 2020 baseline year or "reference" simulation; and (3) a 2024 future year simulation. The 2020 and 2024 simulations used projected emissions growth and reductions due to controls reflecting those respective years. The State carried out these simulations for the 2018 $PM_{2.5}$ Plan for 2020 and 2024 attainment demonstrations for various $PM_{2.5}$ NAAQS.

While the State continued to rely on these same model simulations for the 15 $\mu g/m^3$ SIP Revision, it applied them differently than in the 2018 $PM_{2.5}$ Plan. For the 15 $\mu g/m^3$ SIP Revision, the State calculated a five-year weighted average of monitored concentrations, centered on 2018, as the base design value, and applied RRFs to the 2018 weighted average to predict the 2023

design value, as in the procedure recommended in the Modeling Guidance. The standard RRF would be the ratio of modeled 2023 concentrations to modeled 2018 concentrations, so the RRF would represent the modeled $PM_{2.5}$ change resulting from emissions changes between 2018 and 2023. Since modeling for the years 2018 and 2023 was not available, the State first calculated RRFs from the available 2020 and 2024 simulations, and then scaled them to account for the emissions changes that occur between 2018 and 2023, as shown in the equations in Appendix K.[316] This scaling of the RRFs can also be understood in terms of model sensitivity to emissions, since the RRF represents the relative change in $PM_{2.5}$ design value that results from a modeled emissions change, i.e., a sensitivity. Essentially, the 2020 and 2024 model results were used to update the estimate of the sensitivity of $PM_{2.5}$ concentration to emissions. That sensitivity was applied to the expected 2018–2023 emissions change, yielding an estimate of the 2018–2023 ambient $PM_{2.5}$ change. The net result was that the State used emissions to scale the 2020–2024 RRF in order to estimate a 2018–2023 RRF, and then applied the 2018–2023 RRF to the 2018 base design value to estimate the 2023 design value. For conservatism, if a scaled RRF was lower than the original, the State used the higher original one so that the projected $PM_{2.5}$ concentration would be higher.

The State applied the RRFs to a five-year weighted average base design value, consistent with Modeling Guidance recommendations, to minimize the influence of year-to-year variability. The base design value used monitored concentrations from 2016–2020, centered on 2018. This updates the attainment demonstration relative to that in the 2018 $PM_{2.5}$ Plan, which used a base design value centered on 2012. For Bakersfield-Planz, the site with the highest base design value, the base design value concentration was 16.3 $\mu g/m^3$. This calculation procedure incorporated the 2020 design value despite its "adverse meteorological conditions and increased impacts from wildfires" that contributed to the San Joaquin Valley not attaining the 1997 annual

[316] 15 $\mu g/m^3$ SIP Revision, Appendix K, p. 64 and Table 31.

NAAQS in 2020.[317] CARB notes that because 2020 was unusual due to the COVID-19 pandemic, it also conducted alternative base design value calculations, in which it substituted the average of 2018 and 2019 for 2020, or simply excluded it, yielding Bakersfield base design values of 16.2 and 16.4 µg/m^3, respectively.

Table 7 shows the 2018 base design values and 2023 projected future year annual $PM_{2.5}$ design values at monitoring sites in the San Joaquin Valley. The highest 2023 projected design value is 14.7 µg/m^3 at the Bakersfield–California monitoring site, which is below the 15.0 µg/m^3 level of the 1997 annual $PM_{2.5}$ NAAQS.[318]

Table 7 – Projected Future Annual $PM_{2.5}$ Design Values at Monitoring Sites in the San Joaquin Valley (µg/m^3)

Monitoring Site	2018 Base Design Value	2023 Projected Design Value
Bakersfield - Planz	16.3	14.7
Visalia	15.2	14.0
Bakersfield - Golden State	15.1	13.6
Hanford	14.8	12.8
Bakersfield - California Ave.	14.6	13.2
Corcoran	14.3	13.3
Fresno - Hamilton & Winery	13.9	13.0
Fresno - Garland	13.3	12.4
Clovis	12.2	11.4
Turlock	12.2	11.3
Stockton	11.7	11.1
Merced - S Coffee	11.5	10.6
Madera	11.3	10.2
Merced - Main Street	11.3	10.8
Modesto	10.6	9.9
Manteca	9.9	9.4
Tranquility	7.5	6.8

Source: 15 µg/m^3 SIP Revision, Table 5-6; and Appendix K, Table 33.

3. The EPA's Review of the State's Submission

The EPA previously evaluated the modeling relied upon in the 15 µg/m^3 SIP Revision in the context of the attainment demonstrations in the 2018 $PM_{2.5}$ Plan for the 1997 24-hour $PM_{2.5}$ NAAQS, the 2006 24-hour $PM_{2.5}$ NAAQS, and the Moderate area plan for the 2012 $PM_{2.5}$

[317] Id. at 60.
[318] Id. at 61.

NAAQS. For more details, see the EPA's February 2020 Modeling TSD. Most aspects of the 2018 $PM_{2.5}$ Plan modeling and the EPA's evaluation of it are the same for the 24-hour and the annual averaging times, and the EPA has found them adequate. These include the modeling protocol, choice of model, meteorological modeling, modeling emissions inventory, choice of model, modeling domain, and procedures for model performance evaluation. However, since the evaluation in the February 2020 Modeling TSD reached conclusions for 24-hour average $PM_{2.5}$, here we discuss aspects of the modeling relevant for the annual average, including for the 1997 annual $PM_{2.5}$ NAAQS.

One aspect that differs between the 24-hour and annual averaging times is the specific calculation procedure for estimating a future design value. In the procedure recommended in the Modeling Guidance for both averaging times, the model is used to calculate RRFs, the ratio of modeled future concentrations to base year concentrations, and the RRF is applied to monitored base year period concentrations; this is done for each monitor, $PM_{2.5}$ species, and calendar quarter. But for the 24-hour averaging time, the recommended procedure is to use the highest individual concentration days in each quarter, whereas for the annual average, the recommended procedure is to use the average of all days in each quarter. For the current action on the 15 $\mu g/m^3$ SIP Revision, the EPA finds that the State's procedures[319] for estimating 2020 and 2024 design values for annual average $PM_{2.5}$ generally followed the EPA's recommendations and are adequate.

As discussed above, to predict 2023 design values, the State relied on model results from 2020 and 2024, using emissions differences to calculate scaled RRFs to reflect the modeled effect of emissions changes between 2018 and 2023, and then applied these to a 2018 base design value. This amounted to scaling model results by applying modeled $PM_{2.5}$ sensitivity (concentration change per emissions change) to an updated emissions change. The EPA discussed this approach with the State prior to development of the 15 $\mu g/m^3$ SIP Revision. The

[319] Id. at 19.

EPA has approved comparable scaling in other plans, such as the San Joaquin Valley "2008 $PM_{2.5}$ Plan" for the 1997 $PM_{2.5}$ NAAQS,[320] to account for revised emissions estimates for trucks and diesel off-road equipment.[321] The EPA proposed to approve similar scaling for the "2015 Plan for the 1997 $PM_{2.5}$ Standard"[322] to account for emissions inventory changes relative to the 2008 plan.[323] In comparison with scaling approaches used previously, the RRF scaling approach in the 15 $\mu g/m^3$ SIP Revision has some advantages. The RRFs are calculated on a seasonal basis and account for chemical interactions between the separate components of $PM_{2.5}$ since they incorporate modeled changes in all the components simultaneously. The approach thus accounts for seasonal variation in model responses and for possible nonlinear and nonadditive responses to emissions changes. A simpler scaling approach might use only the total $PM_{2.5}$ as opposed to individual $PM_{2.5}$ components, only annual averages instead of quarterly averages, or it may assume that sensitivity to individual species emissions changes can be directly added. While these are not necessarily incorrect, especially for small emissions changes, the approach in the 15 $\mu g/m^3$ SIP Revision of scaling RRFs avoids potential inaccuracies resulting from the underlying assumptions of simpler approaches.

The EPA notes that scaling is not the standard approach for an attainment demonstration recommended in the EPA's Modeling Guidance. Typically, RRFs are calculated directly from a model prediction for a base year, which has undergone a performance evaluation against observations, and for a future year; the RRFs are then applied to a base design value that reflects monitored data representative of the base year. In the 15 $\mu g/m^3$ SIP Revision, the State started from the standard RRFs, but adjusted them to reflect the emissions changes between two future years; 2018 and 2023 are both future with respect to the original 2013 model base case year. The State applied the RRFs to recent (2018-centered) monitor data, rather than to data reflective of

[320] CARB submitted the "2008 $PM_{2.5}$ Plan" to the EPA on June 30, 2008.
[321] 76 FR 69896, November 9, 2011.
[322] CARB submitted the "2015 Plan for the 1997 $PM_{2.5}$ Standard" to the EPA on June 25, 2015.
[323] 81 FR 6936, February 9, 2016.

the 2013 base case year. This scaling approach is self-consistent and takes advantage of existing modeling as well as of more recent emissions and monitoring data. Given that the 15 $\mu g/m^3$ SIP Revision is an amendment to the 2018 $PM_{2.5}$ Plan to demonstrate attainment within the same statutory timeframe required under section 189(d) of the CAA (as discussed in Section I.B of this proposal), and that the scaling approach is used for estimating future design values for years close to those for which modeling is available, the EPA proposes to find the scaling approach used in the 15 $\mu g/m^3$ SIP Revision to be acceptable.

As mentioned above, the State calculated alternative base design values to exclude the unusual year of 2020. The State did not discuss the 2023 design values derived from those calculations. Since the alternative base design values are within 0.1 $\mu g/m^3$ of the 16.3 $\mu g/m^3$ value that was used, and the projected 14.7 $\mu g/m^3$ 2023 design value is well below the NAAQS level of 15.0 $\mu g/m^3$, those alternative design value calculations would not change the conclusion of projected attainment in 2023.

Another modeling aspect that can differ between 24-hour and annual average is the focus of the model performance evaluation on the respective averaging times. For the 24-hour average, it is especially important that modeled concentrations on the highest days are comparable to those on the highest monitored days because calculation of the design value for the 24-hour $PM_{2.5}$ NAAQS uses the 98th percentile concentrations. For the annual average, peak concentrations continue to be important, but lower concentration days are also important because all days are included in the average. Under- and over-predictions on non-peak days may average out and have little overall effect on the modeled annual concentration, but systematic underprediction on non-peak days could lead to model underprediction of the annual average concentration. This problem of model bias is mitigated by the use of the model in a relative sense as recommended in the Modeling Guidance. In the RRF, model bias "cancels out" to a degree since it would be present in both its numerator (future year) and its denominator (base year). Applying the RRF to monitored base year concentration in this way anchors the final model

prediction to real-world concentrations. Further, the Modeling Guidance recommends that RRFs be calculated on a quarterly basis to better account for emissions sources and atmospheric chemistry that differ between the seasons.

The 2018 $PM_{2.5}$ Plan did not include a separate model performance evaluation for the 24-hour and annual $PM_{2.5}$ averaging times; the State used statistical and graphical analyses applicable to both. The EPA evaluated the modeling for the 1997 annual $PM_{2.5}$ NAAQS using that same information, much of which has already been discussed in the EPA's February 2020 Modeling TSD. For the most part, in the TSD, the EPA did not distinguish between the two averaging times either but drew conclusions for the 24-hour averaging time rather than the annual averaging time. We did note a relatively large negative normalized bias (underprediction) in the ammonium and nitrate performance statistics[324] for the 2nd quarter for monitoring sites in Bakersfield, Fresno, and Visalia; and we add here that the 3rd quarter has similar negative bias. Underprediction of total $PM_{2.5}$ in the 2nd and 3rd quarters is also evident in time series plots for most monitoring sites, though by only a small amount for several monitoring sites.[325] The RRF procedure removes much of this bias, such that the underprediction in the model performance evaluation does not translate into an underpredicted future design value. The EPA's February 2020 Modeling TSD noted that because the 2nd and 3rd quarters have projected concentrations that are less than half of the concentrations in the 1st and 4th quarters, this may have a small influence on annual average concentrations. (It has even less influence on the 24-hour average because peak 24-hour concentrations typically occur in winter, i.e., in the 1st and 4th quarters). For example, the worst quarterly underprediction for nitrate was for the 3rd quarter and occurred when the quarterly total $PM_{2.5}$ concentration was 9.4 $\mu g/m^3$. By contrast, for the 1st quarter, there was a small overprediction in nitrate when the quarterly total $PM_{2.5}$ concentration was 21.1 $\mu g/m^3$. That is, nitrate predictions are more biased during the quarters with low $PM_{2.5}$

[324] 15 $\mu g/m^3$ SIP Revision, Appendix K, tables 20–23.
[325] Id. at figures S.41–S.52.

concentrations. This is apparent from the Plan's "bugle" plot for the four monitors with speciated data.[326] Large (negative) biases in nitrate predictions occur for the lowest quarterly nitrate concentrations. For the higher concentrations that have the largest effect on the annual average, the nitrate fractional bias is sometimes positive and sometimes negative. For total $PM_{2.5}$, the fractional bias has a similar seasonal pattern to that of nitrate, with underprediction during the 2nd and 3rd quarters when quarterly $PM_{2.5}$ concentration values are in the 5–10 $\mu g/m^3$ range, and a small bias when quarterly concentrations are in the 20–30 $\mu g/m^3$ range. For the overall annual average, performance is good relative to that seen in other modeling studies with lower values of bias and error for multiple performance statistics for nitrate, as well as for the other $PM_{2.5}$ species and total $PM_{2.5}$.[327]

The high $PM_{2.5}$ concentration days are generally captured by the model even though some are underpredicted in December at certain monitoring sites such as Fresno. Overall, the modeled site maxima are comparable to the measurements. Also, the frequency of high and low days generally matches observations so the annual, as well as the daily, model performance is acceptable.

The EPA must make several findings in order to approve the modeled attainment demonstration in an attainment plan SIP submission. First, we must find that the attainment demonstration's technical bases, including the emissions inventories and air quality modeling, are adequate. As discussed in Section IV.A of this preamble, we have previously approved the emissions inventories on which the SJV $PM_{2.5}$ Plan's attainment demonstration and related provisions are based. Furthermore, the EPA has evaluated the State's choice of model and the extensive discussion in the Modeling Protocol and Appendix K about modeling procedures, tests, and performance evaluations. We find that the analyses are consistent with the EPA's guidance on modeling for $PM_{2.5}$ attainment planning purposes. Based on these reviews, we find that the

[326] Id. at Figure 13.
[327] Id. at Figure 14.

modeling in the Plan is adequate for the purposes of supporting the RFP demonstration and demonstration of attainment by December 31, 2023, and are proposing to approve the air quality modeling. For further detail, see the EPA's February 2020 Modeling TSD.

Second, we must find that the SIP submittal provides for expeditious attainment through the timely implementation of the control strategy, including RACM, BACM, and any other emissions controls that are needed for expeditious attainment. As discussed in Section IV.C of this preamble, we are proposing to approve the control strategy in the SJV $PM_{2.5}$ Plan, including the BACM/BACT demonstration and the five percent emissions reduction requirement under CAA sections 189(b)(1)(B) and 189(d), respectively.

Third, the EPA must find that the emissions reductions that are relied on for attainment in the SIP submission are creditable. As discussed in Section IV.C.2.a of this document, the SJV $PM_{2.5}$ Plan relies principally on rules that have already been adopted and implemented by the State, and approved by the EPA, to achieve the emissions reductions needed to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley by December 31, 2023. We present our evaluation of the rules in Section IV.C.2.a of this document and in Sections III and IV of the EPA's 1997 Annual $PM_{2.5}$ TSD. We find that all but two of these rules are SIP-creditable and that the total emissions reductions attributed to the two measures that are not SIP-creditable have de minimis impacts on the attainment demonstration in the Plan. The balance of the reductions that the State has modeled to achieve attainment by this date is currently represented by an enforceable commitment that accounts for 1.8 percent of the NO_X and 0.9 percent of the direct $PM_{2.5}$ emissions reductions needed for attainment.

The EPA may accept enforceable commitments in lieu of adopted control measures in attainment demonstrations when the circumstances warrant it and the commitments meet the three criteria the EPA has established for this purpose. The EPA is proposing to find that circumstances here warrant the consideration of enforceable commitments and that the three criteria are met: (1) The commitment constitutes a limited portion of the required emissions

reductions; (2) the State has demonstrated its capability to meet their commitments; and (3) the commitment is for an appropriate timeframe. We therefore propose to approve the State's reliance on the enforceable commitments in its attainment demonstration.

Based on these evaluations, we propose to determine that the SJV $PM_{2.5}$ Plan provides for attainment of the 1997 annual $PM_{2.5}$ NAAQS by the most expeditious date practicable, consistent with the requirements of CAA section 189(d). We present the basis for this proposed determination in Section IV.C.2.a of this proposal. Furthermore, because the December 31, 2015 Serious area attainment date has passed, and the EPA found that the area failed to attain by the Serious area attainment date, we are evaluating the State's compliance with the Serious area plan requirements in light of the attainment date required under CAA section 189(d).[328] For the reasons described in this section, in addition to our review of the SJV $PM_{2.5}$ Plan's control measure evaluations, the EPA is proposing to approve the attainment date of December 31, 2023 in the SJV $PM_{2.5}$ Plan under section 172(a)(2), given the severity of nonattainment in the San Joaquin Valley nonattainment area and the feasibility of control measures. We are also proposing to determine that the Plan meets the Serious area attainment plan requirements under CAA section 189(b)(1)(A).

E. Reasonable Further Progress and Quantitative Milestones

1. Statutory and Regulatory Requirements

Section 172(c)(2) of the CAA provides that all nonattainment area plans shall require reasonable further progress (RFP) toward attainment. In addition, CAA section 189(c) requires that all $PM_{2.5}$ nonattainment area plans include quantitative milestones to be achieved every three years until the area is redesignated to attainment and that demonstrate RFP. Section 171(l) of the Act defines RFP as "such annual incremental reductions in emissions of the relevant air pollutant as are required by [Part D] or may reasonably be required by the Administrator for the purpose

[328] See CAA section 172(a)(2) and 179(d); 40 CFR 51.1004(a)(3).

of ensuring attainment of the applicable [NAAQS] by the applicable date." Neither subpart 1 nor subpart 4 of part D, title I of the Act requires that states achieve a set percentage of emissions reductions in any given year for purposes of satisfying the RFP requirement. For purposes of the $PM_{2.5}$ NAAQS, the EPA has interpreted the RFP requirement to require that the nonattainment area plans show annual incremental emissions reductions sufficient to maintain "generally linear progress" toward attainment by the applicable deadline.[329]

Attainment plans for PM nonattainment areas should include detailed schedules for compliance with emissions control measures in the area and provide corresponding annual emissions reductions to be achieved by each milestone in the schedule.[330] In reviewing an attainment plan under subpart 4, the EPA considers whether the annual incremental emissions reductions to be achieved are reasonable in light of the statutory objective of timely attainment. Although early implementation of the most cost-effective control measures is often appropriate, states should consider both cost-effectiveness and pollution reduction effectiveness when developing implementation schedules for control measures and may implement measures that are more effective at reducing $PM_{2.5}$ earlier to provide greater public health benefits.[331]

In addition to the EPA's longstanding guidance on the RFP requirements for PM, the Agency has established specific regulatory requirements for the $PM_{2.5}$ NAAQS in the $PM_{2.5}$ SIP Requirements Rule for purposes of satisfying the Act's RFP requirements and provides related guidance in the preamble to the rule. Specifically, under the $PM_{2.5}$ SIP Requirements Rule, each $PM_{2.5}$ attainment plan must contain an RFP analysis that includes, at minimum, the following four components: (1) an implementation schedule for control measures; (2) RFP projected emissions for direct $PM_{2.5}$ and all $PM_{2.5}$ plan precursors for each applicable milestone year, based on the anticipated control measure implementation schedule; (3) a demonstration that the control strategy and implementation schedule will achieve reasonable progress toward attainment

[329] General Preamble Addendum, 42015.
[330] Id. at 42016.
[331] Id.

between the base year and the attainment year; and (4) a demonstration that by the end of the calendar year for each triennial milestone date for the area, pollutant emissions will be at levels that reflect either generally linear progress or stepwise progress in reducing emissions on an annual basis between the base year and the attainment year.[332] Additionally, states should estimate the RFP projected emissions for each quantitative milestone year by sector on a pollutant-by-pollutant basis.[333]

Section 189(c) of the Act requires that $PM_{2.5}$ attainment plans include quantitative milestones that demonstrate RFP. The purpose of the quantitative milestones is to allow periodic evaluation of the area's progress towards attainment of the $PM_{2.5}$ NAAQS consistent with RFP requirements. Because RFP is an annual emission reduction requirement and the quantitative milestones are to be achieved every three years, when a state demonstrates compliance with the quantitative milestone requirement, it should also demonstrate that RFP has been achieved during each of the relevant three years. Quantitative milestones should provide an objective means to evaluate progress toward attainment meaningfully, e.g., through imposition of emissions controls in the attainment plan and the requirement to quantify those required emissions reductions. The CAA also requires a state to submit, within 90 days after each three-year quantitative milestone date, a milestone report that includes technical support sufficient to document completion statistics for appropriate milestones, e.g., of the calculations and any assumptions made concerning the emission reductions to date.[334]

The CAA does not specify the starting point for counting the three-year periods for quantitative milestones under CAA section 189(c). In the General Preamble and General Preamble Addendum, the EPA interpreted the CAA to require that the starting point for the first three-year period be the due date for the Moderate area plan submission.[335] In keeping with this

---

[332] 40 CFR 51.1012(a).
[333] 81 FR 58010, 58056.
[334] CAA section 189(c)(2) and 40 CFR 51.1013(b). See also, $PM_{2.5}$ SIP Requirements Rule, 58065 and General Preamble Addendum, 42016–42017.
[335] General Preamble, 13539, and General Preamble Addendum, 42016.

historical approach, the EPA established December 31, 2014, the deadline that the EPA established for a state's submission of any additional attainment-related SIP elements necessary to satisfy the subpart 4 Moderate area requirements for the 1997 $PM_{2.5}$ NAAQS, as the starting point for the first three-year period under CAA section 189(c) for the 1997 $PM_{2.5}$ NAAQS in the San Joaquin Valley.[336]

Under the $PM_{2.5}$ SIP Requirements Rule, each attainment plan submission for an area designated nonattainment for the 1997 $PM_{2.5}$ NAAQS before January 15, 2015, must contain quantitative milestones to be achieved no later than three years after December 31, 2014, and every three years thereafter until the milestone date that falls within three years after the applicable attainment date.[337] If the area fails to attain, this post-attainment date milestone provides the EPA with the tools necessary to monitor the area's continued progress toward attainment while the state develops a new attainment plan.[338] Quantitative milestones must provide for objective evaluation of RFP toward timely attainment of the $PM_{2.5}$ NAAQS in the area and include, at minimum, a metric for tracking progress achieved in implementing SIP control measures, including BACM and BACT, by each milestone date.[339]

Because the EPA designated the San Joaquin Valley area as nonattainment for the 1997 annual $PM_{2.5}$ NAAQS effective April 5, 2005,[340] the plan for this area must contain quantitative milestones to be achieved no later than three years after December 31, 2014 (i.e., by December 31, 2017), and every three years thereafter until the milestone date that falls within three years after the applicable attainment date.[341] For a Serious area attainment plan with a statutory attainment date of December 31, 2015, the relevant quantitative milestone year is December 31,

---

[336] 79 FR 31566 (final rule establishing subpart 4 Moderate area classifications and deadline for related SIP submissions). Although this final rule did not affect any action that the EPA had previously taken under CAA section 110(k) on a SIP for a $PM_{2.5}$ nonattainment area, the EPA noted that states may need to submit additional SIP elements to fully comply with the applicable requirements of subpart 4, even for areas with previously approved $PM_{2.5}$ attainment plans, and that the deadline for any such additional plan submissions was December 31, 2014. Id. at 31569.
[337] 40 CFR 51.1013(a)(4).
[338] 81 FR 58010, 58064.
[339] Id. at 58064 and 58092.
[340] 70 FR 944.
[341] 40 CFR 51.1013(a)(4).

2017. However, as discussed in Section III of this proposal, the area did not attain by the statutory Serious area attainment date and evaluating reasonable further progress toward that date does not make sense. We are therefore evaluating the Serious area obligations based on the attainment date the State must meet in a plan required under CAA section 189(d).[342] To meet CAA section 189(d), the SJV $PM_{2.5}$ Plan includes a demonstration that the area will attain by December 31, 2023. Therefore, in accordance with 40 CFR 51.1013(a)(4), the attainment plan for this area must contain quantitative milestones to be achieved no later than December 31, 2017, December 31, 2020, December 31, 2023, and December 31, 2026.

2. Summary of the State's Submission

Appendix H ("RFP, Quantitative Milestones, and Contingency") of the 15 μg/m^3 SIP Revision contains the State's RFP demonstration and quantitative milestones for the 1997 annual $PM_{2.5}$ NAAQS, and the Valley State SIP Strategy contains the control measure commitments that CARB has identified as mobile source quantitative milestones.[343] Given the State's conclusions that ammonia, SO_X, and VOC emissions do not contribute significantly to $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley, as discussed in Section IV.B of this proposed rule, the RFP demonstration provided by the State addresses emissions of direct $PM_{2.5}$ and NO_X.[344] Similarly, the State developed quantitative milestones based on the Plan's control strategy measures that achieve reductions in emissions of direct $PM_{2.5}$ and NO_X.[345] Appendix H of the 15 μg/m^3 SIP Revision identifies the milestone dates of December 31, 2017, December 31, 2020, December 31, 2023, and December 31, 2026, for the 1997 annual $PM_{2.5}$ NAAQS.[346] The RFP analysis in the Plan shows generally linear progress toward attainment of

[342] See CAA section 179(d); 40 CFR 51.1004(a)(3).
[343] Valley State SIP Strategy, Table 7 (identifying State measures scheduled for action between 2017 and 2023, inter alia) and CARB Resolution 18-49, "San Joaquin Valley Supplement to the 2016 State Strategy for the State Implementation Plan" (October 25, 2018), p. 5 (adopting State commitment to begin public processes and propose for Board consideration the list of proposed SIP measures outlined in the Valley State SIP Strategy and included in Attachment A, according to the schedule set forth therein).
[344] 15 μg/m^3 SIP Revision, Appendix H, p. H-1.
[345] Id. at H-18 and H-19 (District milestones) and H-21 and H-22 (State milestones).
[346] Id. at Table H-11.

the 1997 annual $PM_{2.5}$ NAAQS.

We describe the RFP analysis and quantitative milestones in the SJV $PM_{2.5}$ Plan in greater detail below.

Reasonable Further Progress

The State addresses the RFP and quantitative milestone requirements in Appendix H of the 15 μg/m^3 SIP Revision. The State estimates that emissions of direct $PM_{2.5}$ and NO_X will generally decline from the 2013 base year to the projected 2023 attainment year, and beyond to the 2026 post-attainment quantitative milestone year. The Plan's emissions inventory shows that direct $PM_{2.5}$ and NO_X are emitted by a large number and range of sources in the San Joaquin Valley. Table H-2 in Appendix H contains an anticipated implementation schedule for District regulatory control measures and Table 4-8 in Chapter 4 of the 15 μg/m^3 SIP Revision contains an anticipated implementation schedule for CARB control measures in the San Joaquin Valley. Table H-5 in Appendix H contains projected emissions for each quantitative milestone year. These emissions levels reflect both baseline emissions projections and commitments to achieve additional emission reductions through implementation of new control measures by 2023.[347]

The SJV $PM_{2.5}$ Plan identifies emissions reductions needed for attainment of the 1997 annual $PM_{2.5}$ NAAQS by 2023,[348] and identifies San Joaquin Valley's progress toward attainment in each milestone year.[349] The State and District set RFP targets for each of the quantitative milestone years as shown in Table H-8 of Appendix H of the 15 μg/m^3 SIP Revision.

According to the Plan, reductions in both direct $PM_{2.5}$ and NO_X emissions from 2013 base year levels result in emissions levels consistent with attainment in the 2023 attainment year. Based on these analyses, CARB and the District assert that the adopted control strategy and

---

[347] Id. at tables H-3 (emissions projections based on baseline measures), H-4 (reductions from control measure commitments), and H-5 (emissions projections accounting for controls). The 15 μg/m^3 SIP Revision includes commitments for reductions from new control measures by 2023.
[348] Id. at Table H-6.
[349] Id. at Table H-7.

additional commitment for reductions from Heavy-Duty I/M by 2023 are adequate to meet the RFP requirement for the 1997 annual $PM_{2.5}$ NAAQS.

The State and District's control strategy for attaining the 1997 annual $PM_{2.5}$ NAAQS relies on ongoing emissions reductions from baseline measures, emissions reductions from three measures adopted following the development of the 2018 $PM_{2.5}$ Plan and prior to adoption of the 15 μg/m^3 SIP Revision, and an aggregate tonnage commitment for the remaining reductions needed for attainment. The majority of the NO_X and $PM_{2.5}$ reductions needed for attainment result from CARB's current mobile source control program. The attainment control strategy in the Plan is projected to achieve total emission reductions of 156 tpd NO_X and 4.54 tpd direct $PM_{2.5}$, of which 98 percent (153 tpd) and 99 percent (4.5 tpd), respectively, are attributed to CARB's baseline mobile source program.[350] These on-going controls will thus result in additional reductions in NO_X and direct $PM_{2.5}$ emissions between the 2013 base year and 2023 attainment year.[351]

CARB's mobile source control program provides significant ongoing reductions in emissions of direct $PM_{2.5}$ and NO_X from on-road and non-road mobile sources, such as light duty vehicles, heavy-duty trucks and buses, non-road equipment, and fuels. For on-road and non-road mobile sources, which represent the largest sources of NO_X emissions in the San Joaquin Valley, Appendix H of the 15 μg/m^3 SIP Revision identifies five mobile source regulations and control programs that limit emissions of direct $PM_{2.5}$ and NO_X: The On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation ("Truck and Bus Regulation"), the In-Use Off-Road Diesel-Fueled Fleets Regulation ("Off-Road Regulation"), the California Low-NO_X Engine Standard for new on-road heavy-duty engines used in medium and heavy-duty trucks purchased in California, Heavy-Duty I/M, and the second phase of the Advanced Clean Cars Program ("ACC 2").[352]

---

[350] 15 μg/m^3 SIP Revision, Chapter 4, Table 4-7.
[351] 15 μg/m^3 SIP Revision, Appendix H, Table H-4.
[352] Id. at H-20 and H-21. Because the ACC 2 measure is not scheduled for implementation until 2026 (see 15 μg/m^3 SIP Revision, Table 4-8), which is after the January 1, 2023 implementation deadline under 40 CFR 51.1011(b)(5) for control measures necessary for attainment by December 31, 2023, we are not reviewing this program as part of the control strategy in the SJV $PM_{2.5}$ Plan.

CARB's mobile source BACM analysis in Appendix D of the 15 µg/m^3 SIP Revision provides a more comprehensive overview of each of these programs and regulations, among many others.[353] CARB's emission projections for mobile sources are presented in the Plan's emissions inventory.[354]

The District has also adopted numerous stationary and area source rules for direct $PM_{2.5}$ and NO_X emission sources that are projected to contribute to RFP and attainment of the $PM_{2.5}$ standards. These include control measures for stationary internal combustion engines, residential fireplaces, glass manufacturing facilities, agricultural burning sources, and various sizes of boilers, steam generators, and process heaters used in industrial operations. Appendix H of the 15 µg/m^3 SIP Revision identifies stationary source regulatory control measures implemented by the District that achieve ongoing $PM_{2.5}$ and/or NO_X reductions through the Plan's RFP milestone years and the attainment year.[355] These measures include rule amendments that the District adopted in 2019 through 2022, as summarized in Table 2 of the EPA's 1997 Annual $PM_{2.5}$ TSD. The District's stationary and area source BACM analysis in Appendix C of the 2018 $PM_{2.5}$ Plan provide a more comprehensive overview of each of these programs and regulations, among many others.[356]

Quantitative Milestones

Appendix H of the 15 µg/m^3 SIP Revision identifies December 31 milestone dates for the 2017 and 2020 RFP milestone years, the 2023 attainment year, and a post-attainment milestone year of 2026.[357] Appendix H also identifies target emissions levels to meet the RFP requirement for direct $PM_{2.5}$ and NO_X emissions for each of these milestone years[358] and control measures that CARB and the District plan to implement by each of these years, in accordance with the

[353] 15 µg/m^3 SIP Revision, Appendix D, Chapter IV.
[354] 2018 $PM_{2.5}$ Plan, Appendix B.
[355] 15 µg/m^3 SIP Revision, Appendix H, Table H-2.
[356] 15 µg/m^3 SIP Revision, Appendix D, Chapter IV, and Appendix C.
[357] 15 µg/m^3 SIP Revision, Appendix H, Table H-11.
[358] Id. at Table H-5.

control strategy in the Plan.[359] The identified regulatory measures include State measures for light-duty vehicles and non-road vehicles and several District measures for stationary and area sources.[360]

Specifically, for the 2017 milestone year, Appendix H of the 15 μg/m^3 SIP Revision describes the District's quantitative milestone as a report on the implementation of several District rules, and CARB's quantitative milestones as a report on three measure-specific milestones: (1) actions taken between 2012 and 2017 to implement the Truck and Bus Regulation that required particulate filters and cleaner engine standards on existing heavy-duty diesel trucks and buses in California; (2) implementation of the "Advanced Clean Cars Program" ("ACC Program") between 2014 and 2017; and (3) implementation of the "In-Use Off-Road Diesel-Fueled Fleets Regulation" ("Off-Road Regulation") between 2014 and 2017.[361]

CARB submitted its 2017 Quantitative Milestone Report for the San Joaquin Valley to the EPA on December 20, 2018.[362] The report includes a certification that CARB and the District met the 2017 quantitative milestones identified in the 2018 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ NAAQS and discusses the State's and District's progress on implementing the three CARB measures and six District measures identified in Appendix H as quantitative milestones for the 2017 milestone year. On February 15, 2021, the EPA determined that the 2017 Quantitative Milestone Report was adequate.[363] In our evaluation of the 2017 Quantitative Milestone Report, we found that the control measures in the Plan are in effect, consistent with the RFP demonstration in the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS, but we noted that the determination of adequacy did not constitute approval of any component of the SJV $PM_{2.5}$

[359] Id. at H-20 and H-21 (for CARB milestones) and H-17 and H-18 (for District milestones).
[360] Id. at H-18 and H-19 (District milestones), and H-21 and H-22 (State milestones).
[361] Id. at H-21 to H-22.
[362] Letter dated December 20, 2018, from Richard W. Corey, Executive Officer, CARB, to Michael Stoker, Regional Administrator, EPA Region IX, with attachment "2017 Quantitative Milestone Report for the 1997 and 2006 NAAQS."
[363] Letter dated February 15, 2021, from Deborah Jordan, Acting Regional Administrator, EPA Region IX, to Richard W. Corey, Executive Officer, CARB, with enclosure titled "EPA Evaluation of 2017 Quantitative Milestone Report."

Plan.[364]

For the 2020 milestone year, Appendix H of the 15 μg/m^3 SIP Revision describes the District's quantitative milestone as a report on "[t]he status of SIP measures adopted between 2017 and 2020 as per the schedule included in the adopted Plan.[365] The schedule for development of new or revised SIP measures in the 15 μg/m^3 SIP Revision identifies "action dates" between 2017 and 2020 for eight District measures listed in tables 4-4 and 4-5 of Chapter 4, including, for example, "Rule 4311, Flares," "Rule 4702, Internal Combustion Engines," and "Rule 4901, Wood Burning Fireplaces and Wood Burning Heaters."[366] Appendix H describes CARB's quantitative milestone as a report on two measure-specific milestones: (1) actions taken between 2017 and 2020 to implement the Truck and Bus Regulation, and (2) the "status of SIP measures adopted between 2017 and 2020, including *Advanced Clean Cars 2* and the *Heavy-Duty Vehicle Inspection and Maintenance Program*." The schedule for development of new or revised CARB measures in the 15 μg/m^3 SIP Revision identifies "action" dates between 2017 and 2020 for 16 CARB measures listed in Table 4-8 of Chapter 4, including, for example, the "Heavy-Duty Vehicle Inspection and Maintenance Program" and "Small Off-Road Engines."[367]

For the 2023 milestone year, the District's quantitative milestone is to report on the status of SIP measures adopted between 2020 and 2023.[368] The schedule for development of new or revised SIP measures in the 15 μg/m^3 SIP Revision identifies "action dates" in 2021 and 2022

---

[364] Id.

[365] 15 μg/m^3 SIP Revision, Appendix H, p. H-18.

[366] 15 μg/m^3 SIP Revision, Chapter 4, tables 4-4 and 4-5. See also email dated November 12, 2019, from Jon Klassen, SJVUAPCD to Wienke Tax, EPA Region IX, "RE: follow up on aggregate commitments in SJV $PM_{2.5}$ plan" (attaching "District Progress In Implementing Commitments with 2018 $PM_{2.5}$ Plan," stating the District's intent to take action on the listed rules and measures by beginning the public process on each measure and then proposing the rule or measure to the SJVUAPCD Governing Board).

[367] Id. at Table 4-8. See also email dated November 12, 2019, from Sylvia Vanderspek, CARB to Anita Lee, EPA Region IX, "RE: SJV $PM_{2.5}$ information" (attaching "Valley State SIP Strategy Progress") and December 2018 Staff Report, pp. 14-15 (stating CARB's intent to "bring to the Board or take action on the list of proposed State measures for the Valley" by the action dates specified in Table 2).

[368] We note that the District's identified quantitative milestone for 2023 on page H-18 of Appendix H contains a typographical error, as it includes a District report on "[t]he status of SIP measures adopted between 2017 and 2020 as per the schedule included in the adopted Plan." SJVUAPCD confirmed via an email that the District intended to refer here to the status of SIP measures adopted between 2020 and 2023, consistent with the schedule in the 15 μg/m^3 SIP Revision. See email dated January 26, 2022, from Jon Klassen, SJVUAPCD, to Ashley Graham, EPA Region IX, "Subject: FW: 2023 QM Report commitment in Attainment Plan Revision."

for "Rule 4354, Glass Melting Furnaces," "Rule 4352, Solid Fuel-Fired Boilers, Steam Generators And Process Heaters," and "Rule 4550, Conservation Management Practices."[369] Appendix H describes CARB's quantitative milestone as a report on actions taken between 2020 and 2023 to implement (1) the Truck and Bus Regulation, and (2) the "California *Low-NO_X Engine Standard* for new on-road heavy-duty engines used in medium- and heavy-duty trucks purchased in California."[370]

Finally, for the 2026 milestone year, Appendix H of the 15 µg/m^3 SIP Revision describes the District's quantitative milestone as a report on (1) "[i]mplementation of amendments to [the] *Residential Wood Burning Strategy*, including any regulatory amendments to the District Burn Cleaner incentive program"; (2) "[i]mplementation of amendments to [the] *Commercial Under-Fired Strategy*, including any regulatory amendments and implementation of [the] related incentive-based strategy; and (3) "[t]he status of SIP measures adopted between 2023 and 2026 as per the schedule included in the adopted Plan.[371] The schedule for development of new or revised SIP measures in the 15 µg/m^3 SIP Revision identifies "implementation begins" dates of 2023 and 2024 for seven District measures listed in Table 4-4 of Chapter 4, and "ongoing" implementation for three incentive-based measures in Table 4-5. Appendix H describes CARB's quantitative milestone as a report on (1) the number of pieces of agricultural equipment upgraded to Tier 4 through 2026 due to the "Accelerated Turnover of Agricultural Tractors Measure," and (2) the number of trucks and buses upgraded to a low-NO_X engine or cleaner through 2026 due to the "Accelerated Turnover of Trucks and Buses Measure."[372]

3. The EPA's Review of the State's Submission

Reasonable Further Progress

The EPA has evaluated the RFP demonstration in Appendix H of the 15 µg/m^3 SIP

[369] 15 µg/m^3 SIP Revision, Chapter 4, Table 4-4.
[370] 15 µg/m^3 SIP Revision, Appendix H, p. H-22.
[371] Id. at H-19.
[372] Id. at H-22.

Revision and, for the following reasons, proposes to find that it satisfies the statutory and regulatory requirements for RFP.

First, the Plan contains an anticipated implementation schedule for the attainment control strategy, including all BACM and BACT control measures and CARB's aggregate tonnage commitment, as required by 40 CFR 51.1012(a)(1). The implementation schedule is found in tables 4-4, 4-5, and 4-8 of the 15 $\mu g/m^3$ SIP Revision and in Table H-2 of Appendix H. The 15 $\mu g/m^3$ SIP Revision documents the State's, District's, and MPOs' conclusions that they are implementing all BACM/BACT and additional feasible measures for direct $PM_{2.5}$ and NO_X emissions in the San Joaquin Valley as expeditiously as practicable.[373]

Second, the RFP demonstration presents projected emissions levels for direct $PM_{2.5}$ and NO_X to be achieved by each applicable milestone year as required by 40 CFR 51.1012(a)(2). These projections are based on the continued implementation of existing control measures in the area (i.e., baseline measures) and the commitment by CARB to achieve additional emissions reductions by 2023, and reflect full implementation of the State's, District's, and MPOs' attainment control strategy for these pollutants.

Third, the projected emissions levels based on the implementation schedule in the Plan demonstrate that the control strategy will achieve direct $PM_{2.5}$ and NO_X emissions reductions at rates representing generally linear progress towards attainment between the 2013 baseline year and the 2023 attainment year as required by 40 CFR 51.1012(a)(3). The projected emissions levels for 2017, 2020, 2023, and 2026 are approximately at or below the target RFP emission levels for each year, and the decreases in emissions levels lead to the achievement of the reductions required for attainment in 2023. The target emissions levels and associated control requirements provide for objective evaluation of the area's progress towards attainment of the 1997 annual $PM_{2.5}$ NAAQS.

---

[373] The BACM/BACT control strategy that provides the basis for these emissions projections is described in Chapter 4, Appendix C, and Appendix D of the 15 $\mu g/m^3$ SIP Revision.

For these reasons, we propose to determine that the SJV $PM_{2.5}$ Plan satisfies the requirements for RFP in CAA section 172(c)(2) and 40 CFR 51.1012 for the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

Quantitative Milestones

Appendix H of the 15 μg/m^3 SIP Revision identifies milestone dates (i.e., December 31 of 2017, 2020, 2023, and 2026) that are consistent with the requirements of 40 CFR 51.1013(a)(4). The Plan also identifies target emissions levels for direct $PM_{2.5}$ and NO_X to be achieved by these milestone dates through implementation of the control strategy. These target emissions levels and associated control requirements provide for objective evaluation of the area's progress towards attainment of the 1997 annual $PM_{2.5}$ NAAQS.

CARB and District's quantitative milestones in Appendix H are to implement specific measures identified in the Plan. These milestones provide an objective means for tracking CARB and the District's progress in implementing their respective control strategies and thus, provide for objective evaluation of the San Joaquin Valley's progress toward timely attainment. For these reasons, we propose to determine that the SJV $PM_{2.5}$ Plan satisfies the requirements for quantitative milestones in CAA section 189(c) and 40 CFR 51.1013 for the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley for purposes of both the Serious area and CAA section 189(d) attainment plans.

We note that on April 1, 2021, CARB submitted the San Joaquin Valley "2020 Quantitative Milestone Report for the 1997 and 2006 NAAQS" ("2020 QM Report") to the EPA.[374] The EPA is currently reviewing the 2020 QM Report and will determine, as part of its determination on the submitted report, whether the State and District have met their identified quantitative milestones for 2020.

[374] Letter dated March 30, 2021, from Richard W. Corey, Executive Officer, CARB, to Deborah Jordan, Acting Regional Administrator, EPA Region 9, with enclosure.

F. Motor Vehicle Emission Budgets

1. Statutory and Regulatory Requirements

Section 176(c) of the CAA requires federal actions in nonattainment and maintenance areas to conform to the goals of the state's SIP to eliminate or reduce the severity and number of violations of the NAAQS and achieve timely attainment of the NAAQS. Conformity to the SIP's goals means that such actions will not: (1) cause or contribute to violations of a NAAQS; (2) increase the frequency or severity of an existing violation; or (3) delay timely attainment of any NAAQS or any interim milestone.

Actions involving Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) funding or approval are subject to the EPA's transportation conformity rule, codified at 40 CFR part 93, subpart A ("Transportation Conformity Rule"). Under this rule, metropolitan planning organizations (MPOs) in nonattainment and maintenance areas coordinate with state and local air quality and transportation agencies, the EPA, FHWA, and FTA to demonstrate that an area's regional transportation plans (RTPs) and transportation improvement programs conform to the applicable SIP. This demonstration is typically done by showing that estimated emissions from existing and planned highway and transit systems are less than or equal to the motor vehicle emission budgets ("budgets") contained in all control strategy plans applicable to the area. An attainment plan for the $PM_{2.5}$ NAAQS must include budgets for each RFP milestone year and the attainment year, as appropriate, for direct $PM_{2.5}$ and $PM_{2.5}$ precursors subject to transportation conformity analyses. Budgets are generally established for specific years and specific pollutants or precursors and must reflect all motor vehicle control measures contained in the attainment and RFP demonstrations.[375]

Under the $PM_{2.5}$ SIP Requirements Rule, Serious area $PM_{2.5}$ attainment plans must include appropriate quantitative milestones and projected RFP emissions levels for direct $PM_{2.5}$

[375] 40 CFR 93.118(e)(4)(v).

and all $PM_{2.5}$ plan precursors in each milestone year.[376] For an area designated nonattainment for the 1997 $PM_{2.5}$ NAAQS before January 15, 2015, the attainment plan must contain quantitative milestones to be achieved no later than three years after December 31, 2014, and every three years thereafter until the milestone date that falls within three years after the applicable attainment date.[377] As the EPA explained in the preamble to the $PM_{2.5}$ SIP Requirements Rule, it is important to include a post-attainment year quantitative milestone to ensure that, if the area fails to attain by the attainment date, the EPA can continue to monitor the area's progress toward attainment while the state develops a new attainment plan.[378] Although the post-attainment year quantitative milestone is a required element of a Serious area plan, it is not necessary to demonstrate transportation conformity for the post-attainment year or to use the post-attainment year budgets in transportation conformity determinations until such time as the area fails to attain the 1997 annual $PM_{2.5}$ NAAQS.

$PM_{2.5}$ plans should identify budgets for direct $PM_{2.5}$, NO_X, and all other $PM_{2.5}$ precursors for which on-road emissions are determined to significantly contribute to $PM_{2.5}$ levels in the area for each RFP milestone year and the attainment year, if the plan demonstrates attainment. All direct $PM_{2.5}$ SIP budgets should include direct $PM_{2.5}$ from tailpipe, brake wear, and tire wear motor vehicle emissions. With respect to emissions of VOC, SO_2, and/or ammonia, the transportation conformity provisions of 40 CFR part 93, subpart A, apply only if the EPA Regional Administrator or the director of the state air agency has made a finding that transportation-related emissions of these precursors within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and Department of Transportation (DOT), or if the applicable implementation plan (or implementation plan submission) includes any of these precursors in the approved (or adequate) budget as part of the

[376] 40 CFR 51.1012(a), 51.1013(a)(2).
[377] 40 CFR 51.1013(a)(4) and 81 FR 58010, 58058 and 58063–58064. Because the area has failed to attain the 1997 annual $PM_{2.5}$ NAAQS by the Serious area attainment date, the applicable attainment date for the purposes of our evaluation is the section 189(d) projected attainment date of December 31, 2023.
[378] 81 FR 58010, 58063–58064.

RFP, attainment, or maintenance strategy.[379] With respect to $PM_{2.5}$ from re-entrained road dust, the transportation conformity provisions of 40 CFR part 93, subpart A apply if the EPA Regional Administrator or the director of the state air agency has made a finding that re-entrained road dust emissions within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT, or if the applicable implementation plan (or implementation plan submission) includes re-entrained road dust in the approved (or adequate) budget as part of the reasonable further progress, attainment, or maintenance strategy.[380] Similarly, for $PM_{2.5}$ from construction emissions, the transportation conformity provisions of 40 CFR part 93, subpart A apply if the area's implementation plan identifies construction-related fugitive $PM_{2.5}$ as a significant contributor to the nonattainment problem.[381]

In addition, transportation conformity requirements apply with respect to emissions of NO_X in $PM_{2.5}$ areas unless both the EPA Regional Administrator and the director of the state air agency have made a finding that transportation-related emissions of NO_X within the nonattainment area are not a significant contributor to the $PM_{2.5}$ nonattainment problem and have so notified the MPO and DOT, or the applicable implementation plan (or implementation plan submission) does not establish an approved (or adequate) budget for such emissions as part of the RFP, attainment, or maintenance strategy.[382]

It is not always necessary for states to establish motor vehicle emissions budgets for all $PM_{2.5}$ precursors. The $PM_{2.5}$ SIP Requirements Rule allows a state to demonstrate that emissions of certain precursors do not contribute significantly to $PM_{2.5}$ levels that exceed the NAAQS in a nonattainment area, in which case the state may exclude such precursor(s) from its control evaluations for the specific NAAQS at issue. If a state successfully demonstrates that the emissions of one or more of the $PM_{2.5}$ precursors from all sources do not contribute significantly

---

[379] 40 CFR 93.102(b)(2)(v); see also Conformity Rule preambles at 69 FR 40004, 40031-40034 (July 1, 2004) and 70 FR 24280, 24283–24285 (May 6, 2005).
[380] 40 CFR 93.102(b)(3).
[381] 40 CFR 93.122(f); see also Conformity Rule preambles at 69 FR 40004, 40035-40036 (July 1, 2004).
[382] 40 CFR 93.102(b)(2)(iv).

to $PM_{2.5}$ levels in the subject area, then it is not necessary to establish motor vehicle emissions budgets for such precursor(s) consistent with the applicability requirements of the transportation conformity regulations (40 CFR 93.102(b)(2)(v)).[383]

Additionally, the transportation conformity regulations contain criteria for determining whether emissions of one or more $PM_{2.5}$ precursors are insignificant for transportation conformity purposes.[384] For a pollutant or precursor to be considered an insignificant contributor based on the transportation conformity rule's criteria, the control strategy SIP must demonstrate that it would be unreasonable to expect that such an area would experience enough motor vehicle emissions growth in that pollutant and/or precursor for a NAAQS violation to occur. Insignificance determinations are based on factors such as air quality, SIP-approved motor vehicle control measures, trends and projections of motor vehicle emissions, and the percentage of the total attainment plan emissions inventory for the NAAQS at issue that is comprised of motor vehicle emissions. The EPA's explanation for providing for insignificance determinations is described in the July 1, 2004, revision to the Transportation Conformity Rule.[385]

Transportation conformity trading mechanisms are allowed under 40 CFR 93.124 where a state establishes appropriate mechanisms for such trades. The basis for the trading mechanism is the SIP attainment modeling that establishes the relative contribution of each $PM_{2.5}$ precursor pollutant. The applicability of emissions trading between conformity budgets for conformity purposes is described in 40 CFR 93.124(b).

The EPA's process for determining the adequacy of a budget consists of three basic steps: (1) notifying the public of a SIP submittal; (2) providing the public the opportunity to comment on the budgets during a public comment period; and (3) making a finding of adequacy or inadequacy.[386] The EPA can notify the public by either posting an announcement that the EPA

[383] 81 FR 58010, 58055, 58058, and 58090.
[384] 40 CFR 93.109(f).
[385] 69 FR 40004.
[386] 40 CFR 93.118(f).

has received SIP budgets on the EPA's adequacy website,[387] or through a *Federal Register* notice of proposed rulemaking when the EPA reviews the adequacy of an implementation plan's budgets simultaneously with its review and action on the SIP itself.[388]

2. Summary of the State's Submission

The 15 μg/m^3 SIP Revision includes budgets for direct $PM_{2.5}$ and NO_X emissions, calculated using annual average daily emissions, for 2017 (RFP milestone year), 2020 (RFP milestone year), 2023 (attainment year), and 2026 (post-attainment quantitative milestone year).[389] The Plan establishes separate direct $PM_{2.5}$ and NO_X subarea budgets for each county, and partial county (for Kern County), in the San Joaquin Valley.[390] CARB calculated the budgets using EMFAC2014.[391] At the time that the emissions inventories and other underlying technical information in the 2018 $PM_{2.5}$ Plan was developed, EMFAC2014 was CARB's latest version of the EMFAC model for estimating emissions from on-road vehicles operating in California that was approved by the EPA. CARB calculated the latest modeled vehicle miles traveled and speed distributions from the most recently amended 2017 Federal Statewide Transportation Improvement Program (FSTIP) for each MPO as of January 2018. The budgets reflect annual average emissions consistent with the annual averaging period for the 1997 annual $PM_{2.5}$ NAAQS and the SJV $PM_{2.5}$ Plan's RFP and 5 percent demonstrations.

The direct $PM_{2.5}$ budgets include tailpipe, brake wear, and tire wear emissions but do not include paved road dust, unpaved road dust, and road construction dust emissions.[392] The State is not required to include re-entrained road dust in the budgets under section 93.103(b)(3) and 93.122(f) unless the EPA or the State has made a finding that these emissions are significant.

---

[387] 40 CFR 93.118(f)(1).
[388] 40 CFR 93.118(f)(2).
[389] 15 μg/m^3 SIP Revision, Appendix D, Table 18.
[390] 40 CFR 93.124(c) and (d).
[391] EMFAC is short for *EM*ission *FAC*tor. The EPA announced the availability of the EMFAC2014 model for use in state implementation plan development and transportation conformity in California on December 14, 2015. The EPA's approval of the EMFAC2014 emissions model for SIP and conformity purposes was effective on the date of publication of the notice in the *Federal Register*.
[392] 15 μg/m^3 SIP Revision, Appendix D, pp. D-122 and D-123.

Neither the State nor the EPA has made such a finding, but the Plan does include a discussion of the significance/insignificance factors for re-entrained road dust.[393] The budgets included in the SJV $PM_{2.5}$ Plan for purposes of the 1997 annual $PM_{2.5}$ NAAQS are shown in Table 8.

Table 8 – Motor Vehicle Emission Budgets for the San Joaquin Valley for the 1997 annual $PM_{2.5}$ NAAQS (annual average, tpd)

County	2017 (RFP Year)		2020 (RFP Year)		2023 (Attainment Year)		2026 (Post-Attainment Year)	
	$PM_{2.5}$	NO_X	$PM_{2.5}$	NO_X	$PM_{2.5}$	NO_X	$PM_{2.5}$	NO_X
Fresno	0.9	28.5	0.9	25.3	0.8	15.1	0.8	14.0
Kern	0.8	28.0	0.8	23.3	0.7	13.3	0.8	12.5
Kings	0.2	5.8	0.2	4.8	0.2	2.8	0.2	2.6
Madera	0.2	5.3	0.2	4.2	0.2	2.5	0.2	2.2
Merced	0.3	10.7	0.3	8.9	0.3	5.3	0.3	4.8
San Joaquin	0.7	14.9	0.6	11.9	0.6	7.6	0.6	6.7
Stanislaus	0.4	11.9	0.4	9.6	0.4	6.1	0.4	5.4
Tulare	0.4	10.8	0.4	8.5	0.4	5.2	0.4	4.5

Source: 15 μg/m^3 SIP Revision, Appendix D, Table 18. Budgets are rounded up to the nearest tenth of a ton.

The State did not include budgets for VOC, SO_2, or ammonia. As discussed in Section IV.B of this proposed rule, the State submitted a $PM_{2.5}$ precursor demonstration documenting its conclusion that control of these precursors would not significantly contribute to attainment of the 1997 annual $PM_{2.5}$ NAAQS, and the EPA is proposing to approve the precursor demonstration. Therefore, if the EPA approves the demonstration, consistent with the transportation conformity regulation (40 CFR 93.102(b)(2)(v)), the State would not be required to submit budgets for these precursors. The State included a discussion of the significance/insignificance factors for ammonia, SO_2, and VOC to demonstrate a finding of insignificance under the transportation conformity rule.[394]

Conformity Trading Mechanism

The 15 μg/m^3 SIP Revision also includes a proposed trading mechanism for transportation conformity analyses that would allow the MPOs in the area to use future decreases

[393] Id. at D-121 and D-122.
[394] Id.

in NO_X emissions from on-road mobile sources to offset any on-road increases in direct $PM_{2.5}$ emissions. In the SJV $PM_{2.5}$ Plan, the approximate weighting ratios of the precursor emissions for annual average $PM_{2.5}$ formation in equivalent tons per day of NO_X are 6.5 to 1 (i.e., reducing 6.5 tons of NO_X is equivalent to reducing one ton of $PM_{2.5}$). Therefore, if an MPO found, while preparing a conformity determination that on-road emissions of direct $PM_{2.5}$ were exceeding the direct $PM_{2.5}$ motor vehicle emissions budget, it could use any excess NOx reductions to offset the excess direct $PM_{2.5}$ emissions by applying the trading ratio of 6.5 tons of NOx emissions to 1 ton of direct $PM_{2.5}$ emissions. This ratio was derived by performing a sensitivity analysis based on a 30 percent reduction of NO_X or $PM_{2.5}$ emissions and calculating the corresponding effect on design values at sites in Bakersfield and Fresno (i.e., an updated analysis relative to the 2008 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ NAAQS). For comparison, in approving the budgets for the 2008 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ NAAQS, the EPA approved a trading mechanism for transportation conformity analyses that allowed for such one-way trades (i.e., only excess NO_X can be used to offset $PM_{2.5}$, not vice versa) at a 9 to 1 NO_X to $PM_{2.5}$ ratio.[395]

To ensure that the trading mechanism does not affect the ability of the San Joaquin Valley to meet the NO_X budget, the NO_X emission reductions available to supplement the $PM_{2.5}$ budget would only be those remaining after the NO_X budget has been met.[396] The Plan also provides that the San Joaquin Valley MPOs shall clearly document the calculations used in the trading, along with any additional reductions of NO_X and $PM_{2.5}$ emissions in the conformity analysis.

3. The EPA's Review of the State's Submission

Generally, the EPA first conducts a preliminary review of budgets submitted with an attainment plan for $PM_{2.5}$ for adequacy, prior to taking action on the plan itself, and did so in this case with respect to the $PM_{2.5}$ budgets in the SJV $PM_{2.5}$ Plan. On November 15, 2021, the EPA

[395] 76 FR 69896, 69923 (November 9, 2011).
[396] 15 µg/m^3 SIP Revision, Appendix D, pp. D-126 and D-127.

announced the availability of the 15 μg/m^3 SIP Revision with budgets and a 30-day public comment period. This announcement was posted on the EPA's Adequacy Web site at: *https://www.epa.gov/state-and-local-transportation/state-implementation-plans-sip-submissions-currently-under-epa*. The comment period for this notification ended on December 15, 2021. We did not receive any comments during this comment period.

The EPA determined that the budgets in the 15 μg/m^3 SIP Revision are adequate for use for transportation conformity purposes. In a letter dated February 1, 2022, the EPA notified CARB and other agencies involved in the interagency consultation process in the San Joaquin Valley that we had reviewed the 2020 RFP and 2023 attainment year budgets in the 15 μg/m^3 SIP Revision and found that they are adequate for transportation conformity purposes.[397] The EPA announced the availability of the budgets and notified the public of the adequacy finding via a *Federal Register* notice on February 10, 2022.[398] This adequacy finding became effective on February 25, 2022 and the budgets have been used in transportation conformity determinations in the San Joaquin Valley area since that date. In this action, we are reviewing the budgets for approval into the California SIP.

Based on our proposal to approve the State's demonstration that emissions of ammonia, SO_2, and VOCs do not contribute significantly to $PM_{2.5}$ levels that exceed the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley, as discussed in Section IV.B of this proposal, and the information about ammonia, SO_2, and VOC emissions in the Plan, the EPA proposes to find that it is not necessary to establish motor vehicle emissions budgets for transportation-related emissions of ammonia, SO_2, and VOC to attain the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley. Based on the information about re-entrained road dust in the Plan,[399] and in accordance with 40 CFR 93.102(b)(3) and 93.122(f), the EPA proposes to find that it is not

[397] Letter dated February 1, 2022, from Matthew Lakin, Acting Director, Air and Radiation Division, EPA Region IX, to Richard Corey, Executive Officer, CARB.
[398] 87 FR 7834 (February 10, 2022).
[399] 15 μg/m^3 SIP Revision, Appendix D, pp. D-121 to D-123.

necessary to include re-entrained road dust emissions in the budgets for 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley.

For the reasons discussed in Sections IV.D and IV.E of this proposed rule, the EPA is proposing to approve the attainment, RFP, and 5 percent demonstrations, respectively, in the SJV $PM_{2.5}$ Plan. The 2020 RFP and 2023 attainment year budgets, as shown in Table 8 of this proposed rule, are consistent with these demonstrations, are clearly identified and precisely quantified, and meet all other applicable statutory and regulatory requirements including the adequacy criteria in 40 CFR 93.118(e)(4) and (5). For these reasons, the EPA proposes to approve the 2020 and 2023 budgets listed in Table 8. We provide a more detailed discussion in Section VI of the EPA's 1997 Annual $PM_{2.5}$ TSD. We are not proposing to approve the 2017 budgets[400] or the post-attainment year 2026 budgets at this time. The budgets that the EPA is proposing to approve relate only to the 1997 annual $PM_{2.5}$ NAAQS, and our proposed approval does not affect the status of the previously-approved budgets for the 1997 24-hour $PM_{2.5}$ NAAQS, the 2006 $PM_{2.5}$ NAAQS, or the 2012 $PM_{2.5}$ NAAQS and related trading mechanisms that remain in effect for those $PM_{2.5}$ NAAQS.

Although the post-attainment year quantitative milestone is a required element of the Serious area plan, it is not necessary to demonstrate transportation conformity for 2026 or to use the 2026 budgets in transportation conformity determinations until such time as the area fails to attain the 1997 annual $PM_{2.5}$ NAAQS. Therefore, the EPA is not taking action on the submitted budgets for 2026 in the SJV $PM_{2.5}$ Plan at this time. Additionally, the EPA has not yet started the adequacy process for the 2026 budgets.

If the EPA were either to find adequate or to approve the post-attainment milestone year budgets now, those budgets would have to be used in transportation conformity determinations that are made after the effective date of the adequacy finding or approval even if the San Joaquin

[400] We are not proposing to approve the 2017 budgets because such budgets would not be used in any future transportation conformity determination because the Plan includes budgets for 2020.

Valley ultimately attains the $PM_{2.5}$ NAAQS by the attainment date. This would mean that the San Joaquin Valley MPOs would be required to demonstrate conformity for the post-attainment date milestone year and all later years addressed in the conformity determination (e.g., the last year of the metropolitan transportation plan) to the post-attainment date RFP budgets rather than the budgets associated with the attainment year for the area (i.e., the budgets for 2023). The EPA does not believe that it is necessary to demonstrate conformity using these post-attainment year budgets in areas that either the EPA anticipates will attain by the attainment date or in areas that attain by the attainment date.

If the EPA determines that the San Joaquin Valley has failed to attain the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date, the EPA would begin the budget adequacy and approval processes under 40 CFR 93.118 for the 2026 post-attainment year budgets concurrent with such determination that the area failed to attain. If the EPA finds the 2026 budgets adequate or approves them, those budgets must then be used in subsequent transportation conformity determinations.[401] The EPA believes that initiating the process to act on the submitted post-attainment year budgets concurrent with a determination that the area has failed to attain by the applicable attainment date ensures that transportation activities will not cause or contribute to new violations, increase the frequency or severity of any existing violations, or delay timely attainment or any required interim emissions reductions or milestones in the San Joaquin Valley $PM_{2.5}$ nonattainment area, consistent with the requirements of CAA section 176(c)(1)(B).

As noted above, the State included a trading mechanism to be used in transportation conformity analyses that would be used in conjunction with the budgets in the SJV $PM_{2.5}$ Plan, as allowed for under 40 CFR 93.124(b). This trading mechanism would allow MPOs to use future decreases in NO_X emissions from on-road mobile sources to offset any on-road increases in $PM_{2.5}$ emissions using a 6.5 to 1 NO_X to $PM_{2.5}$ ratio in transportation conformity determinations for the 1997 annual $PM_{2.5}$ NAAQS. To ensure that the trading mechanism does

[401] See 40 CFR 93.109(c).

not affect the ability to meet the NO_X budget, the Plan provides that the NO_X emissions reductions available to supplement the $PM_{2.5}$ budget would only be those remaining after the NO_X budget has been met. The San Joaquin Valley MPOs will have to document clearly the calculations used in the trading when demonstrating conformity, along with any additional reductions of NO_X and $PM_{2.5}$ emissions in the conformity analysis. The trading calculations must be performed prior to the final rounding to demonstrate conformity with the budgets.

The EPA has reviewed the trading mechanism as described on pages D-125 to D-127 in Appendix D of the 15 $\mu g/m^3$ SIP Revision and finds it is appropriate for transportation conformity purposes in the San Joaquin Valley for the 1997 annual $PM_{2.5}$ NAAQS. The methodology for estimating the trading ratio for conformity purposes is essentially an update (based on newer modeling) of the approach that the EPA previously approved for the 2008 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ NAAQS[402] and the 2012 $PM_{2.5}$ Plan for the 2006 24-hour $PM_{2.5}$ NAAQS.[403] The State's approach in the previous plans was to model the ambient $PM_{2.5}$ effect of areawide NO_X emissions reductions and of areawide direct $PM_{2.5}$ emissions reductions, and to express the ratio of these modeled sensitivities as an inter-pollutant trading ratio.

In the updated analysis for the SJV $PM_{2.5}$ Plan, the State completed separate sensitivity analyses for the annual and 24-hour NAAQS and modeled only transportation related sources in the nonattainment area. The ratio the State is proposing to use for transportation conformity purposes is derived from air quality modeling that evaluated the effect of reductions in transportation-related NO_X and $PM_{2.5}$ emissions in the San Joaquin Valley on ambient concentrations at the Bakersfield-California Avenue, Bakersfield-Planz, Fresno-Garland, and Fresno-Hamilton & Winery monitoring sites. The modeling that the State performed to evaluate the effectiveness of NO_X and $PM_{2.5}$ reductions on ambient annual concentrations showed NO_X to $PM_{2.5}$ ratios that range from a high of 7.1 at the Bakersfield-Planz monitor to a low of 6.0 at the

[402] 80 FR 1816, 1841 (January 13, 2015) (noting the EPA's prior approval of budgets for the 1997 annual and 24-hour $PM_{2.5}$ standards in the 2008 $PM_{2.5}$ Plan at 76 FR 69896).
[403] 81 FR 59876 (August 31, 2016).

two Fresno monitors.[404] In a recent action on the 2018 $PM_{2.5}$ Plan for the 2012 annual $PM_{2.5}$ NAAQS, we found that the State's approach is a reasonable method to use to develop ratios for transportation conformity purposes and approved the 6.5 to 1 NO_X to $PM_{2.5}$ trading mechanism as an enforceable component of the transportation conformity program for the San Joaquin Valley for the 2012 $PM_{2.5}$ NAAQS.[405] Here, we similarly find that the State's approach is reasonable and propose to approve the 6.5 to 1 NO_X for $PM_{2.5}$ trading mechanism as enforceable components of the transportation conformity program for the San Joaquin Valley for the 1997 annual $PM_{2.5}$ NAAQS. If approved, this trading ratio will replace the 9 to 1 NO_X to $PM_{2.5}$ trading ratio approved for the San Joaquin Valley for analysis years after 2014 for the 1997 annual $PM_{2.5}$ NAAQS.[406]

G. Nonattainment New Source Review Requirements Under CAA Section 189(e)

Section 189(e) of the CAA specifically requires that the control requirements applicable to major stationary sources of direct $PM_{2.5}$ also apply to major stationary sources of $PM_{2.5}$ precursors, except where the Administrator determines that such sources do not contribute significantly to $PM_{2.5}$ levels that exceed the NAAQS in the area.[407] The control requirements applicable to major stationary sources of direct $PM_{2.5}$ in a Serious $PM_{2.5}$ nonattainment area include, at minimum, the requirements of a nonattainment NSR permit program meeting the requirements of CAA sections 172(c)(5) and 189(b)(3). As part of our April 7, 2015 final action to reclassify the San Joaquin Valley area as Serious nonattainment for the 1997 $PM_{2.5}$ standards, we established a May 7, 2016 deadline for the State to submit nonattainment NSR SIP revisions addressing the requirements of CAA sections 189(b)(3) and 189(e) of the Act for the 1997 $PM_{2.5}$ NAAQS.[408]

---

[404] 15 µg/m^3 SIP Revision, Appendix D, p. D-126.
[405] See 86 FR 49100, 49128 (September 1, 2021) (proposed rule) and 86 FR 67343, 67346 (November 26, 2021) (final rule).
[406] 76 FR 69896.
[407] General Preamble, 13539 and 13541–13542.
[408] 80 FR 18528, 18533.

California submitted nonattainment NSR SIP revisions to address the subpart 4 requirements for the San Joaquin Valley Serious $PM_{2.5}$ nonattainment area on November 20, 2019.[409] On June 28, 2023, the EPA finalized a limited approval and limited disapproval of the nonattainment NSR SIP revisions.[410] We are not taking any further action on the submission at this time.

V. Environmental Justice Considerations

Executive Order 12898 requires that federal agencies, to the greatest extent practicable and permitted by law, identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.[411] Additionally, Executive Order 13985 directs federal government agencies to assess whether, and to what extent, their programs and policies perpetuate systemic barriers to opportunities and benefits for people of color and other underserved groups,[412] and Executive Order 14008 directs federal agencies to develop programs, policies, and activities to address the disproportionate health, environmental, economic, and climate impacts on disadvantaged communities.[413]

To identify environmental burdens and susceptible populations in underserved communities in the San Joaquin Valley nonattainment area and to better understand the context of our proposed action on these communities, we rely on the EPA's August 2022 screening-level analysis for $PM_{2.5}$ in the San Joaquin Valley using the EPA's environmental justice (EJ)

---

[409] Letter dated November 15, 2019, from Richard W. Corey, Executive Officer, CARB, to Michael Stoker, Regional Administrator, EPA Region IX.
[410] EPA Region IX, "Air Plan Revisions; California; San Joaquin Valley Air Pollution Control District; Stationary Source Permits," final rule signed June 28, 2023.
[411] 59 FR 7629 (February 16, 1994).
[412] 86 FR 7009 (January 25, 2021).
[413] 86 FR 7619 (February 1, 2021).

screening and mapping tool ("EJSCREEN").[414,415] Maps showing census block level data for the San Joaquin Valley from EJSCREEN are included in the EPA's 1997 Annual $PM_{2.5}$ TSD. The results of this analysis are being provided for informational and transparency purposes.

Our screening-level analysis indicates that the "Demographic Index" for each of the eight counties in the San Joaquin Valley is above the national average, ranging from 48 percent in Stanislaus County to 61 percent in Tulare County, compared to 36 percent nationally. The Demographic Index is the average of an area's percent minority and percent low income populations, i.e., the two populations explicitly named in Executive Order 12898.[416] All eight counties are above the national average for demographic indices of "Linguistically Isolated Population" and "Population with Less than High School Education."

With respect to pollution, all eight counties are at or above the 97th percentile nationally for the $PM_{2.5}$ index and seven of the eight counties in the San Joaquin Valley are at or above the 90th percentile nationally for the $PM_{2.5}$ EJ index, which is a combination of the Demographic Index and the $PM_{2.5}$ index. Most counties are also above the 80th percentile for each of 11 additional EJ indices included in the EPA's EJSCREEN analysis. In addition, several counties are above the 90th percentile for certain EJ indices, including, for example, the Ozone EJ Index (Fresno, Kern, Madera, Merced, and Tulare counties), the National Air Toxics Assessment (NATA) Respiratory Hazard EJ Index (Madera and Tulare counties), and the Wastewater

---

[414] EJSCREEN provides a nationally consistent dataset and approach for combining environmental and demographic indicators. EJSCREEN is available at *https://www.epa.gov/ejscreen/what-ejscreen.* The EPA used EJSCREEN to obtain environmental and demographic indicators representing each of the eight counties in the San Joaquin Valley. We note that the indicators for Kern County are for the entire county. While the indicators might have slightly different numbers for the San Joaquin Valley portion of the county, most of the county's population is in the San Joaquin Valley portion, and thus the differences would be small. These indicators are included in EJSCREEN reports that are available in the rulemaking docket for this action.

[415] EPA Region IX, "EJSCREEN Analysis for the Eight Counties of the San Joaquin Valley Nonattainment Area," August 2022.

[416] EJSCREEN reports environmental indicators (e.g., air toxics cancer risk, Pb paint exposure, and traffic proximity and volume) and demographic indicators (e.g., people of color, low income, and linguistically isolated populations). The value for a particular indicator measures how the community of interest compares with the state, the EPA region, or the national average. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the U.S. population has a higher value than the average person in the location being analyzed. EJSCREEN also reports EJ indexes, which are combinations of a single environmental indicator with the EJSCREEN Demographic Index. For additional information about environmental and demographic indicators and EJ indexes reported by EJSCREEN, see EPA, "EJSCREEN Environmental Justice Mapping and Screening Tool – EJSCREEN Technical Documentation," Section 2 (September 2019).

Discharge Indicator EJ Index (Merced, San Joaquin, Stanislaus, and Tulare counties).[417]

This proposed action would approve the State's plan for attaining the 1997 annual $PM_{2.5}$ NAAQS. Information on the 1997 annual $PM_{2.5}$ NAAQS and its relationship to negative health impacts can be found at 62 FR 38652 (July 18, 1997). We expect that this action and resulting emissions reductions will generally be neutral or contribute to reduced environmental and health impacts on all populations in the San Joaquin Valley, including people of color and low-income populations. At a minimum, this action would not worsen existing air quality and is expected to ensure the area is meeting requirements to attain and/or maintain air quality standards. Further, there is no information in the record indicating that this action is expected to have disproportionately high or adverse human health or environmental effects on a particular group of people.

VI. CAA Section 110(a)(2)(E)(i) "Necessary Assurances" and Title VI of the Civil Rights Act of 1964

As discussed in Section III of this proposal, a Serious area plan must meet the general requirements applicable to all SIP submissions under section 110 of the CAA, including the requirement to provide necessary assurances that the implementing agencies have adequate personnel, funding, and authority under section 110(a)(2)(E). Section 110(a)(2)(E) of the CAA, in relevant part and with emphasis added, reads as follows:

> (2) Each implementation plan submitted by a State under this chapter shall be adopted by the State after reasonable notice and public hearing. Each such plan shall— …
>
> (E) provide (i) *necessary assurances* that the State (or, except where the Administrator deems inappropriate, the general purpose local government or governments, or a regional agency designated by the State or general purpose local governments for such purpose) will have adequate personnel, funding, and authority under State (and, as appropriate, local) law to carry out such implementation plan *(and is not prohibited by any provision of Federal or State law from carrying out such implementation plan or portion thereof)*, (ii) requirements that the State comply with the requirements respecting State

[417] Notably, Tulare County is above the 90th percentile for 6 of the 12 EJ indices in the EPA's EJSCREEN analysis, including the $PM_{2.5}$ EJ Index, which is the highest value among all San Joaquin Valley counties.

> boards under section 7428 of this title, and (iii) necessary assurances that, where the State has relied on a local or regional government, agency, or instrumentality for the implementation of any plan provision, the State has responsibility for ensuring adequate implementation of such plan provision.[418]

The EPA has previously addressed considerations regarding CAA section 110(a)(2)(E)(i) specifically as it regards Title VI of the Civil Rights Act of 1964 (Title VI) in prior SIP actions. In 2012, the EPA explained the following in a SIP action, in response to a comment regarding this provision:

> El Comité asserts that California failed to provide a "demonstration" that its proposed revisions are not prohibited by Title VI of the Civil Rights Act. Section 110(a)(2)(E), however, does not require a state to "demonstrate" it is not prohibited by Federal or State law from implementing its proposed SIP revision. Rather, this section requires a state to provide "necessary assurances" of this. Courts have given EPA ample discretion in deciding what assurances are "necessary" and have held that a general assurance or certification is sufficient. ("EPA is entitled to rely on a state's certification unless it is clear that the SIP violates state law and proof thereof...is presented to EPA." BCCA Appeal Group v. EPA, 355 F.3d 817, 830 fn 11 (5th Cir. 2003)).[419]

The EPA's position on CAA section 110(a)(2)(E)(i) was ultimately upheld by the Ninth Circuit Court of Appeals in a challenge to an EPA SIP action.[420] In that decision, *El Comité*, the Ninth Circuit stated,

> El Comité's argument fails because it misconstrues the EPA's burden regarding the "necessary assurances" requirement. The EPA has a duty to provide a reasoned judgment as to whether the state has provided "necessary assurances," but what assurances are "necessary" is left to the EPA's discretion. *NRDC, Project on Clean Air v. EPA,* 478 F.2d 875, 890-91 (1st Cir.1973); *see also Motor Vehicle Mfrs. Ass'n,* 463 U.S. at 43, 103 S.Ct. 2856 (providing that an agency's decision is not arbitrary and capricious if it considered the relevant data and gave a satisfactory explanation for its action).[421]

What is appropriate for purposes of necessary assurances can vary depending upon the nature of the issues in a particular situation. Thus, the EPA evaluates a state's compliance with CAA 110(a)(2)(E)(i) on a case-by-case basis.

For purposes of background context, Title VI prohibits recipients of federal financial

---

[418] 42 U.S.C. 7410(a)(2)(E) (emphasis added).
[419] 77 FR 65294, 65302 (October 26, 2012) (footnotes omitted).
[420] *El Comité Para El Bienstar de Earlimart et al. (El Comité) v. EPA,* 786 F.3d 688 (9th Cir. 2015).
[421] Id. at 700.

assistance from discriminating on the basis of race, color, or national origin. Under the EPA's nondiscrimination regulations, which implement Title VI and other federal civil rights laws,[422] recipients of EPA financial assistance are prohibited from taking actions in their programs or activities that are intentionally discriminatory and/or have an unjustified disparate impact.[423] This includes policies, criteria, or methods of administering programs that are neutral on their face but have the effect of discriminating.[424] Under the EPA's regulation, recipients of EPA financial assistance are also required to have in place certain procedural safeguards, including grievance procedures that assure the prompt and fair resolution of external discrimination complaints.[425]

The EPA carries out its mandate to ensure that recipients of EPA financial assistance comply with their nondiscrimination obligations by investigating administrative complaints filed with the EPA alleging discrimination prohibited by Title VI and the other federal civil rights laws;[426] initiating affirmative compliance reviews;[427] and providing technical assistance to recipients to assist them in meeting their Title VI obligations. The EPA notes that at the time of this proposal, no Title VI complaint has been filed against CARB or the District regarding the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS. Also, the EPA (through the Office of External Civil Rights Compliance (OECRC)) has not initiated and is not currently conducting a compliance review of either CARB or SJVUAPCD.

In a recent supplemental proposal on the San Joaquin Valley attainment plan for the 2012 annual $PM_{2.5}$ NAAQS, the EPA acknowledged that it had not issued national guidance or regulations concerning implementation of section 110(a)(2)(E) as it pertains to consideration of Title VI in the context of the SIP program.[428] While the EPA's work on this SIP-specific guidance is ongoing as of the time of this proposed action, there are resources of general

[422] 40 CFR. part 7 and part 5.
[423] 40 CFR 7.30 and 7.35.
[424] 40 CFR 7.35(b).
[425] 40 CFR 7.90.
[426] 40 CFR 7.120.
[427] 40 CFR 7.115.
[428] 87 FR 60494, 60528-30 (October 5, 2022).

applicability concerning Title VI obligations for recipients of federal financial assistance.[429]

State Submission

On June 15, 2023, CARB submitted to the EPA supplemental information from CARB and the District ("Title VI Supplement") in which the State outlines its consideration of Title VI in the context of SIP development in order to provide necessary assurances for purposes of CAA section 110(a)(2)(E)(i).[430]

The State's Title VI Supplement discusses actions being taken locally and statewide by CARB and the California legislature. For example, the State's Title VI Supplement discusses California State Assembly Bill 617 ("AB 617"), a State law which requires community-focused and community-driven action to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants in California. CARB implements AB 617 through its Community Air Protection Program, which began implementation in 2018. As of February 2023, 19 communities have been selected to receive additional support and opportunities for outreach in developing and implementing actions for cleaner air in their communities, including four communities in the San Joaquin Valley.[431] In addition, the Title VI Supplement points to development of community air monitoring networks to learn about local exposures and the development of a racial equity assessment lens to consider benefits and burdens of CARB programmatic work in the planning stages. The EPA

---

[429] See ECRCO's Toolkit Chapter I at: *https://www.epa.gov/sites/default/files/2017-01/documents/toolkit-chapter1-transmittal_letter-faqs.pdf*, January 18, 2017, and Department of Justice "Title VI Legal Manual (Updated)" at: *https://www.justice.gov/crt/fcs/T6Manual6*. See also, e.g., EPA, "Guidance on Considering Environmental Justice During the Development of Regulatory Actions," (May 2015); EPA, "Technical Guidance for Assessing Environmental Justice in Regulatory Analysis," (June 2016); *El Comite Para el Bienestar de Earlimart v. EPA*, 786 F.3d 688 (9th Cir. 2015); and *S. Camden Citizens in Action v. New Jersey Dept. of Envtl. Prot*., 145 F. Supp. 2d 446, 501 (D.N.J. 2001), opinion modified and supplemented, 145 F. Supp. 2d 505 (D.N.J. 2001), rev'd, 274 F.3d 771 (3d Cir. 2001) (agency, as recipient of federal funding, had obligation under Title VI to consider racially disparate adverse impacts when determining whether to issue permit, in addition to applicant's compliance with applicable air quality standards).

[430] Letter dated June 15, 2023, from Steven S. Cliff, Executive Officer, CARB, to Martha Guzman, Regional Administrator, EPA Region IX, with enclosures titled "Title VI of the Civil Rights Act of 1964: CARB Supplemental Information for EPA in Support of 15 $\mu g/m^3$ Annual $PM_{2.5}$ Standard" ("CARB Title VI Supplement") and "San Joaquin Valley Air Pollution Control District Write-Up on Title VI of the Civil Rights Act of 1964: Supplemental Information for EPA in Support of 15 $\mu g/m^3$ Annual $PM_{2.5}$ Standard" ("District Title VI Supplement").

[431] Id. at 5. The four San Joaquin Valley communities that have been selected into the Community Air Protection Program are South Central Fresno, Shafter, Stockton, and Arvin/Lamont.

acknowledges CARB's and the District's explanation that these types of actions result in engagement with the public in the communities affected by this SIP revision, which helps to provide necessary assurances as contemplated by section 110(a)(2)(E)(i).

Specific to the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS, the submission further describes the early and enhanced public engagement processes that CARB and the District undertook during the development and approval of the 2016 State SIP Strategy, Valley State SIP Strategy, 2018 $PM_{2.5}$ Plan, and 15 $\mu g/m^3$ SIP Revision, all of which formed the basis for the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS. CARB notes that the State prioritized public participation and describes the numerous public meetings and workshops held in Sacramento, Fresno, and Bakersfield for community-based organizations and other stakeholders during the preparation of the SJV $PM_{2.5}$ Plan and related control measures, including the Heavy-Duty I/M measure.[432] CARB and the District also note that Plan documents were made available for public review 30 days prior to board consideration, and that board hearings and workshops offered simultaneous Spanish translation services and that interpretation in other languages was made available on request.[433]

In addition to discussing the State's processes for public engagement during the development of the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS, the State's Title VI Supplement also describes CARB's recent and ongoing efforts to develop and implement the 2022 State SIP Strategy.[434] These efforts include soliciting public input on potential control measures through meetings with individual community-based organizations, workshops, and webinars, and publishing a list of the suggested measures from the public to seek additional input. Several of the measures suggested by the public were ultimately adopted in the 2022 State SIP Strategy,[435] and CARB notes that public processes will continue as each measure is

[432] CARB Title VI Supplement, pp. 3–4.
[433] CARB Title VI Supplement, p. 3, and District Title VI Supplement.
[434] CARB Title VI Supplement, pp. 4–6.
[435] These measures include a regulation developed in collaboration with the California Department of Pesticide Regulation to reduce VOC emissions from pesticides, and a measure to provide small trucking companies with access to zero-emission truck incentive funding.

developed, adopted, and implemented by the State.

Finally, the State describes its written Civil Rights Policy and Discrimination Complaint process.[436] CARB's Civil Rights Policy states in part:

> It is the California Air Resources Board (CARB) policy to provide fair and equal access to the benefits of a program or activity administered by CARB. CARB will not tolerate discrimination against any person(s) seeking to participate in, or receive the benefits of, any program or activity offered or conducted by CARB.

The state explains that through its Civil Rights Officer, CARB coordinates compliance efforts, receives inquiries concerning non-discrimination requirements, and ensures the agency is complying with State and federal reporting and record retention requirements, including those required by CARB's Civil Rights Policy, Title VI, and 40 CFR 7.10 *et seq*. CARB's Civil Rights Policy includes a process for filing a complaint of discrimination against CARB if an individual believes they were unlawfully denied full and equal access during the administration of the agency's programs and services offered to the public. A complaint must be filed within one year of the alleged discrimination with the potential for an extension of 90 days if the complainant first obtained knowledge of the facts of the alleged violation after the expiration of the one-year time limit.

In this action, the EPA is proposing to find that the State has provided adequate necessary assurances for purposes of CAA section 110(a)(2)(E)(i) for the SJV $PM_{2.5}$ Plan for the 1997 annual $PM_{2.5}$ NAAQS. The EPA's proposed SIP approval does not constitute a formal finding of compliance with Title VI or 40 CFR part 7. The EPA did not conduct a full Title VI investigation or compliance review.[437] Approval of this SIP submission for purposes of CAA 110(a)(2)(E)(i) does not affect the EPA's discretion to enforce Title VI and/or the EPA's civil rights regulations. The EPA retains full authority to process complaints which may result in conducting a Title VI

---

[436] Id. at 6–8.

[437] As discussed in Section V of this proposal, the EPA conducted an analysis of environmental burdens and susceptible populations in underserved communities as part of this action. The EPA summarized the results of the EJSCREEN analysis in the EPA's 1997 Annual $PM_{2.5}$ TSD and in a worksheet included in the docket for this action (EPA Region IX, "EJSCREEN Analysis for the Eight Counties of the San Joaquin Valley Nonattainment Area," August 2022).

investigation or compliance review with respect to CARB and/or this SIP action. Nothing in this proposed action is intended to limit or impact the EPA's discretion regarding necessary assurances determinations in other SIP actions.

VII. Summary of Proposed Action and Request for Public Comment

For the reasons discussed in this proposed rule, under CAA section 110(k)(3), the EPA is proposing to approve portions of the SJV $PM_{2.5}$ Plan submitted by California that pertain to the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley nonattainment area as follows:

(1) We are proposing to find that the 2013 base year emissions inventories continue to satisfy the requirements of CAA section 172(c)(3) and 40 CFR 51.1008 for purposes of both the Serious area and the CAA section 189(d) attainment plans, and to find that the forecasted inventories for the years 2017, 2018, 2019, 2020, 2023, and 2026 provide an adequate basis for the BACM, RFP, five percent, and modeled attainment demonstration analyses;

(2) We are proposing to approve the following elements as meeting the Serious nonattainment area planning requirements:

   a) the BACM/BACT demonstration as meeting the requirements of CAA section 189(b)(1)(B) and 40 CFR 51.1010(a);

   b) the demonstration (including air quality modeling) that the Plan provides for attainment as expeditiously as practicable as meeting the requirements of CAA sections 179(d) and 189(b) and 40 CFR 51.1011(b);

   c) the RFP demonstration as meeting the requirements of CAA sections 172(c)(2) and 171(1) and 40 CFR 51.1012; and

   d) the quantitative milestone demonstration as meeting the requirements of CAA section 189(c) and 40 CFR 51.1013;

(3) We are proposing to approve the following elements as meeting the CAA section 189(d) planning requirements:

   a) the BACM/BACT demonstration as meeting the requirements of CAA sections

189(a)(1)(C)[438] and 189(b)(1)(B) and 40 CFR 51.1010(c);

b) the demonstration that the Plan will, at a minimum, achieve an annual five percent reduction in emissions of NO_X as meeting the requirements of CAA section 189(d) and 40 CFR 51.1010(c);

c) the demonstration (including air quality modeling) that the Plan provides for attainment as expeditiously as practicable as meeting the requirements of CAA sections 179(d) and 189(d) and 40 CFR 51.1011(b);

d) the RFP demonstration as meeting the requirements of CAA sections 172(c)(2) and 171(1) and 40 CFR 51.1012; and

e) the quantitative milestone demonstration as meeting the requirements of CAA section 189(c) and 40 CFR 51.1013;

(4) We are proposing to approve the motor vehicle emission budgets for 2020 and 2023 as shown in Table 8 of this proposed rule because they are derived from approvable RFP and attainment demonstrations and meet the requirements of CAA section 176(c) and 40 CFR part 93, subpart A; and

(5) We are proposing to approve the trading mechanism provided for use in transportation conformity analyses for the 1997 annual $PM_{2.5}$ NAAQS, in accordance with 40 CFR 93.124(b).

As discussed in Section I.B of this document, on November 26, 2021, the EPA partially approved and partially disapproved portions of the 2018 $PM_{2.5}$ Plan that addressed attainment of the 1997 annual $PM_{2.5}$ NAAQS in the San Joaquin Valley nonattainment area. The elements that the EPA disapproved include the attainment demonstration, comprehensive precursor demonstration, five percent annual emissions reductions demonstration, BACM demonstration,

[438] As discussed in Section III.B of this document, a section 189(d) plan must address any outstanding Moderate or Serious area requirements that have not previously been approved. Because we have not previously approved a subpart 4 RACM demonstration for the San Joaquin Valley nonattainment area, we are also proposing to approve the BACM/BACT demonstration in the SJV $PM_{2.5}$ Plan as meeting the subpart 4 RACM/RACT requirement for the area.

RFP demonstration, quantitative milestones, motor vehicle emission budgets, and contingency measures. This disapproval was effective on December 27, 2021. Also effective December 27, 2021, the EPA disapproved the contingency measure element of the 2018 $PM_{2.5}$ Plan as it relates to the requirements for the Serious area plan 2006 24-hour $PM_{2.5}$ NAAQS and the Moderate area plan for the 2012 annual $PM_{2.5}$ NAAQS.[439] In our November 26, 2021 final disapprovals, we noted that offset and highway sanctions under CAA sections 179(b)(2) and 179(b)(1), respectively, would not apply if California submits, and we approve, a SIP submission that corrects all of the deficiencies identified in our final actions prior to the imposition of sanctions.[440] This proposed approval, if finalized, would remedy several but not all of the deficiencies because this action does not address the prior disapprovals of the contingency measure requirements for the 1997 annual $PM_{2.5}$ NAAQS, 2006 24-hour $PM_{2.5}$ NAAQS, and 2012 annual $PM_{2.5}$ NAAQS. Therefore, the sanctions will apply in the San Joaquin Valley as outlined in the November 26, 2021 final disapprovals unless or until California submits, and we approve, a SIP submission or submissions meeting the outstanding contingency measure requirements for these NAAQS.

The EPA is soliciting public comments on the issues discussed in this proposed rule. We will accept comments from the public on this proposal for the next 30 days.

VIII. Statutory and Executive Order Reviews

Under the CAA, the Administrator is required to approve a SIP submission that complies with the provisions of the CAA and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, the EPA's role is to approve state choices, provided that they meet the criteria of the CAA. Accordingly, this action merely approves state law as meeting Federal requirements and does not impose additional requirements beyond those imposed by state law. For that reason, this action:

---

[439] 86 FR 67343.
[440] 86 FR 67329.

- Is not a significant regulatory action subject to review by the Office of Management and Budget under Executive Orders 12866 (58 FR 51735, October 4, 1993) and 13563 (76 FR 3821, January 21, 2011);
- Does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- Is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.);
- Does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- Does not have federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- Is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- Is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001); and
- Is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA;

In addition, the SIP is not approved to apply on any Indian reservation land or in any other area where the EPA or an Indian tribe has demonstrated that a tribe has jurisdiction. In those areas of Indian country, the rule does not have tribal implications and will not impose substantial direct costs on tribal governments or preempt tribal law as specified by Executive Order 13175 (65 FR 67249, November 9, 2000).

Executive Order 12898 (Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, Feb. 16, 1994) directs Federal agencies

to identify and address "disproportionately high and adverse human health or environmental effects" of their actions on minority populations and low-income populations to the greatest extent practicable and permitted by law. The EPA defines environmental justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies."

The SJVUAPCD did not evaluate environmental justice considerations as part of its SIP submittal; the CAA and applicable implementing regulations neither prohibit nor require such an evaluation. The EPA performed an environmental justice analysis, as is described above in the section titled, "Environmental Justice Considerations." The analysis was done for the purpose of providing additional context and information about this rulemaking to the public, not as a basis of the action. Due to the nature of the action being taken here, this action is expected to have a neutral to positive impact on the air quality of the affected area. In addition, there is no information in the record upon which this decision is based inconsistent with the stated goal of EO 12898 of achieving environmental justice for people of color, low-income populations, and Indigenous peoples.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Ammonia, Incorporation by reference, Intergovernmental relations, Nitrogen dioxide, Particulate matter, Reporting and recordkeeping requirements, Sulfur dioxide, Volatile organic compounds.

Authority: 42 U.S.C. 7401 *et seq.*

Dated: July 5, 2023.

Martha Guzman Aceves,
Regional Administrator,
Region IX.

[FR Doc. 2023-14687 Filed: 7/13/2023 8:45 am; Publication Date: 7/14/2023]