SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft South Coast Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

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EXECUTIVE SUMMARY

Purpose

Over the past two decades, air quality has significantly improved in the South Coast Air Basin (Basin) due to stringent regulation of emission sources. As a result, the levels of fine particulate matter (PM2.5) and coarse particulate matter (PM10) measured in the Basin now meet several National Ambient Air Quality Standards (NAAQS or standards). When an area meets the NAAQS, the United States Environmental Protection Agency (U.S. EPA) can issue a Clean Data Determination (CDD) to suspend certain federal Clean Air Act (CAA) planning requirements. While U.S. EPA has issued clean data determinations for the 1997 24-hour and annual PM2.5 standards in the Basin, the Basin remains designated formally as nonattainment of those standards. To be redesignated to attainment, South Coast AQMD must submit redesignation requests and maintenance plans to U.S. EPA to ensure that the region will continue to meet the standards.

This State Implementation Plan (SIP) revision contains two redesignation requests and three maintenance plans for PM2.5 and PM10 NAAQS in the Basin. The standards, along with the Basin's attainment status and objective of this SIP revision, are summarized in Table ES-1 and the following sections provide a brief overview for each standard.

TABLE ES-1

STANDARDS ADDRESSED BY THIS SIP REVISION FOR THE SOUTH COAST AIR BASIN

Air Quality Standard	Concentration Limit	Attainment Status	Redesignation Request Included?	Maintenance Plan Included?
1987 24-hour PM10	150 µg/m^3	Attainment	No	Yes, 2nd maintenance plan
1997 24-hour PM2.5	65 µg/m^3	"Moderate" nonattainment	Yes	Yes, 1st maintenance plan
1997 Annual PM2.5	15.0 µg/m^3	"Moderate" nonattainment	Yes	Yes, 1st maintenance plan

1997 PM2.5 Standards

The Basin was originally designated as a nonattainment area for the 1997 PM2.5 standards in 2005.[1] Since then, air quality has steadily improved, largely driven by regulations adopted by South Coast AQMD and CARB. In 2016, U.S. EPA determined that the Basin met the 1997 24-hour and annual PM2.5 standards based on 2011-2013 monitoring data.[2] This SIP revision demonstrates that the 1997 PM2.5 standards will continue to be met through 2039, ensuring a full 10-year maintenance period following U.S. EPA approval of the redesignation requests.

1987 24-hour PM10 Standard

In April 2010, South Coast AQMD via CARB submitted a request to U.S. EPA to redesignate the Basin from "serious" nonattainment to attainment for the 1987 24-hour PM10 standard. The request was accompanied by a maintenance plan showing continued attainment of the PM10 standard through 2030. Effective July 26, 2013, U.S. EPA approved the redesignation request and maintenance plan.[3]

CAA Section 175A(b) requires the submission of a second maintenance plan eight years after redesignation to attainment. To comply with this requirement, South Coast AQMD developed and submitted to U.S. EPA via CARB the Final 2021 PM10 Maintenance Plan for the South Coast Air Basin (2021 PM10 Maintenance Plan),[4] which ensured continued attainment of the standard through 2035. However, U.S. EPA deferred action on the 2021 PM10 Maintenance Plan due to high PM10 measured in 2018 at Long Beach – Hudson, which was directly impacted by nearby construction activities. A continuous PM10 Beta Attenuation Monitor has been collecting data since January 2022 at both the Long Beach–Hudson and Long Beach–Signal Hill monitoring sites. A monitor at the Long Beach – Hudson was previously decommissioned due to the termination of the lease by the landlord. Following the resumption of the measurements, the first valid design value for these sites is 2024, covering the 2022–2024 period. During this time, both sites confirmed no exceedances of the 24-hour PM10 standard. The 2024 design values at all other monitoring sites in the Basin are in attainment of the PM10 standard except for Mira Loma. Two windblown dust events contributed to PM10 exceedances in 2024 at Mira Loma and exceptional event demonstrations

[1] U.S. EPA, Air Quality Designations and Classifications for the Fine Particles (PM2.5) National Ambient Air Quality Standards, 70 Fed. Reg. 944, January 5, 2005. https://www.federalregister.gov/documents/2005/01/05/05-1/air-quality-designations-and-classifications-for-the-fine-particles-pm25-national-ambient-air

[2] U.S. EPA, Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 Fed. Reg. 48350, July 25, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

[3] U.S. EPA, Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; California; South Coast Air Basin; Approval of PM10 Maintenance Plan and Redesignation to Attainment for the PM10 Standard, 78 Fed. Reg. 38223, June 26, 2013. https://www.federalregister.gov/documents/2013/06/26/2013-15145/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning-purposes

[4] Available at https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2021-pm10-maintenance-plan-for-the-south-coast-air-basin.pdf

were developed to exclude these days from the design value.[5] This SIP revision seeks to update the 2021 PM10 Maintenance Plan with the latest information and demonstrate maintenance through 2033, which will be 20 years after the Basin was redesignated to attainment.

Requirements for Redesignation

South Coast AQMD is requesting redesignation to attainment for the 1997 24-hour and annual PM2.5 standards. The CAA establishes the requirements for redesignation of a nonattainment area to attainment. Specifically, CAA Section 107(d)(3)(E) allows for redesignation provided that:

1. U.S. EPA determines that the area has attained the applicable NAAQS;

2. U.S. EPA has fully approved the applicable implementation plan for the area under Section 110(k);

3. U.S. EPA determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable SIP, applicable federal air pollution control regulations, and other permanent and enforceable reductions;

4. U.S. EPA has fully approved a maintenance plan for the area meeting the requirements of CAA Section 175A; and

5. The State containing such area has met all requirements applicable to the area under Section 110 and Part D of the CAA.

This SIP revision demonstrates how the above requirements are met for the 1997 PM2.5 standards.

Maintenance Plan Requirements

CAA Section 175A requires areas requesting redesignation to submit an initial maintenance plan ensuring continued attainment for at least 10 years after redesignation. Additionally, the plan must include a commitment to submit a second maintenance plan eight years after redesignation. The second maintenance plan must ensure continued maintenance for another 10 years following the initial maintenance period (i.e., 20 years in total after redesignation).

In this SIP revision, South Coast AQMD is submitting initial maintenance plans for the PM2.5 standards and a second maintenance plan for PM10 (see Table ES-1). Maintenance plans are required to include an emissions inventory, a maintenance demonstration, motor vehicle emissions budgets, monitoring network requirements, verification of continued attainment, and contingency provision elements. This SIP revision

[5] Exceptional Event Demonstration report will be forthcoming.

seeks to satisfy all requirements applicable to maintenance plans and ensures continued attainment of the PM10 and PM2.5 standards in the Basin through 2033 and 2039, respectively.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 1: INTRODUCTION

Purpose

The South Coast Air Basin (Basin) is currently designated as a nonattainment area for multiple National Ambient Air Quality Standards (NAAQS or standards) for particulate matter (PM). PM is defined by its diameter for air quality regulatory purposes.[6] In terms of criteria pollutants, PM is segregated into those with a diameter of 10 micrometers or smaller (PM10) and those that are 2.5 micrometers or smaller (PM2.5). PM2.5 and PM10 levels in the Basin have improved significantly over the past two decades resulting in levels that meet several standards. Once a nonattainment area meets the NAAQS, the Clean Air Act (CAA) allows areas to develop and submit a request to redesignate the area to attainment. Among other requirements, the CAA stipulates that redesignation requests must be accompanied by a maintenance plan showing that the area will continue to meet the standard.

This State Implementation Plan (SIP) revision contains two redesignation requests and three maintenance plans for PM2.5 and PM10 NAAQS in the Basin. The standards, along with the Basin's attainment status and objective of this SIP revision, are summarized in Table 1-1. This chapter provides background on PM2.5 and PM10 SIPs and discusses each of the standards addressed by this SIP revision.

TABLE 1-1
STANDARDS ADDRESSED BY THIS SIP REVISION FOR THE SOUTH COAST AIR BASIN

Air Quality Standard	Concentration Limit	Attainment Status	Redesignation Request Included?	Maintenance Plan Included?
1987 24-hour PM10	150 µg/m^3	Attainment	No	Yes, 2nd maintenance plan
1997 24-hour PM2.5	65 µg/m^3	"Moderate" nonattainment	Yes	Yes, 1st maintenance plan
1997 Annual PM2.5	15.0 µg/m^3	"Moderate" nonattainment	Yes	Yes, 1st maintenance plan

[6] CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10) webpage. https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health#:~:text=Fine%20particulate%20matter%20is%20defined,comprises%20a%20portion%20of%20PM10

PM10 and PM2.5 in the Atmosphere

Airborne PM is not a homogeneous pollutant, but is a mixture of many chemical species. Particles vary widely in size, shape, and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, and crustal materials.

PM2.5 and PM10 Formation

PM2.5 and PM10 originate from both natural and anthropogenic sources and consist of a mix of solid particles and liquid droplets suspended in the air. PM2.5 and PM10 can be emitted directly (primary PM) or formed in the atmosphere through chemical reactions (secondary PM). Key sources of primary PM10 in the Basin are construction and demolition activities, dust from paved and unpaved roads, residential fuel combustion and commercial cooking. Key sources of primary PM2.5 include road dust, commercial cooking, residential fuel combustion, and industrial activities such as wood processing and paper manufacturing. Wildfires and windblown dust are significant sources of PM2.5 and PM10 emissions as well. Secondary PM formation occurs through reactions of precursors such as oxides of sulfur (SOx), oxides of nitrogen (NOx), volatile organic compounds (VOC), and ammonia (NH3), leading to the formation of species with lower volatility that condense into the particle-phase. While both primary and secondary PM2.5 contribute to ambient PM2.5 concentrations, about two thirds of PM2.5 in the Basin is secondary.

Health Impacts

Both PM10 and PM2.5 have significant health effects, but PM2.5 poses a greater risk due to its ability to penetrate deeper into the respiratory system and bloodstream, causing respiratory and cardiovascular disease. Long-term exposure to PM2.5 is strongly linked to premature death, particularly among individuals with chronic heart and lung diseases. PM2.5 contributes to reduced lung development in children and increases risk of chronic respiratory illnesses such as bronchitis and chronic obstructive pulmonary disease (COPD). Studies show that PM2.5 exposure is associated with an increased risk of stroke, lung cancer, diabetes, and adverse pregnancy outcomes (e.g., low birth weight and preterm birth).[7,8]

Although PM10 includes PM2.5, epidemiologists typically describe the health impacts of PM10 by focusing on particles between 2.5 and 10 micrometers in diameter (PM10-2.5). These larger particles tend to deposit on the surfaces of the upper region of the lung where they do not cause health effects as severe as those caused by PM2.5. Short-term exposure to PM10-2.5 can irritate airways, cause coughing and throat discomfort, and worsen asthma and COPD, leading to hospitalization and emergency department

[7] Brook, R.D., et al. (2010). "Particulate Matter Air Pollution and Cardiovascular Disease: An Update to the Scientific Statement from the American Heart Association." Circulation, 121(21), 2331–2378. https://doi.org/10.1161/CIR.0b013e3181dbece1

[8] Pope, C.A., et al. (2019). "Fine Particulate Air Pollution and Human Mortality: 25+ Years of Cohort Studies." Environmental Research, 183, 108924. https://doi.org/10.1016/j.envres.2019.108924

visits. Long-term exposure to PM10-2.5 may contribute to reduced lung function and may be associated with increased risk of respiratory disease, although the effects are less clear than with PM2.5.

1987 24-Hour PM10 Standard

The 24-hour PM10 NAAQS of 150 µg/m^3 was promulgated on July 1, 1987. The United States Environmental Protection Agency (U.S. EPA) subsequently categorized areas into three groups based on the likelihood that the existing SIP would need to be revised to meet the PM10 NAAQS. The Basin was categorized as a Group I area, indicating a strong likelihood that the SIP would require revision.[9]

In 1990, amendments were introduced in the CAA which changed procedures and requirements for implementation of the NAAQS. Under Section 107(d)(4)(B) of the amended CAA, the Basin was designated as a "moderate" nonattainment area for the PM10 NAAQS by operation of law on November 15, 1990. Subsequently, U.S. EPA established a deadline of November 15, 1991 for the submission of "moderate" area PM10 SIPs with a corresponding attainment date of December 31, 1994.[10] In response, South Coast AQMD submitted a PM10 SIP as part of the 1991 Air Quality Management Plan (AQMP) to U.S. EPA via CARB. The 1991 AQMP included a control strategy based on Reasonably Available Control Measures (RACM) for fugitive dust sources and a request for reclassification to "serious" nonattainment, as air quality modeling indicated that the Basin would not meet the December 31, 1994 attainment deadline.

On January 8, 1993, U.S. EPA reclassified the Basin as a "serious" PM10 nonattainment area under CAA Section 188(b)(1) with an attainment date of December 31, 2001.[11] CAA section 189(b)(2) requires the submission of 1) a Best Available Control Measures (BACM) demonstration within 18 months of reclassification and 2) an attainment demonstration within 4 years of reclassification. The BACM demonstration was adopted by South Coast AQMD as part of the 1994 AQMP on September 9, 1994 and submitted to U.S. EPA via CARB on November 15, 1994. To comply with the requirement for an attainment demonstration, South Coast AQMD adopted the 1997 AQMP on November 15, 1996 and submitted it to U.S. EPA via CARB on February 5, 1997. The 1997 AQMP included an emissions inventory, a control strategy, an updated BACM demonstration, a Reasonable Further Progress (RFP) demonstration, contingency measures, an attainment demonstration, and Motor Vehicle Emissions Budgets (MVEBs). Additionally, it requested a five-year attainment date extension to December 31, 2006, as allowed under CAA Section 188(e). To qualify for the extension, the 1997 AQMP demonstrated that it included the Most Stringent Measures (MSM) that were implemented or achieved in practice in any state and could be feasibly implemented in the Basin.

[9] U.S. EPA, PM10 Group I and Group II Areas, 52 Fed. Reg. 29383, August 7, 1987. https://archives.federalregister.gov/issue_slice/1987/8/7/29375-29385.pdf#page=9

[10] U.S. EPA, Designations and Classifications for Initial PM10 Nonattainment Areas, 56 Fed. Reg. 11101, March 15, 1991. https://archives.federalregister.gov/issue_slice/1991/3/15/11100-11105.pdf#page=2

[11] U.S. EPA, Reclassification of Moderate PM-10 Nonattainment Areas to Serious Areas, 58 Fed. Reg. 3334, January 8, 1993. https://archives.federalregister.gov/issue_slice/1993/1/8/3328-3342.pdf#page=7

In 2002, South Coast AQMD submitted a PM10 SIP update for the South Coast Air Basin and requested U.S. EPA to expedite its approval of the five-year extension of the attainment date. As part of this update, South Coast AQMD committed to develop a new attainment demonstration using the latest emissions inventory and planning assumptions. On April 18, 2003, U.S. EPA approved the five-year attainment date extension and multiple SIP elements contained in the 1994 and 1997 AQMPs.[12] South Coast AQMD subsequently adopted the 2003 AQMP and submitted it to U.S. EPA via CARB on January 9, 2004. The 2003 AQMP fulfilled South Coast AQMD's commitment to update the PM10 attainment demonstration with the latest planning assumptions and emissions inventory. On November 14, 2005, U.S. EPA approved the PM10 SIP elements in the 2003 AQMP.[13]

In January 2010, South Coast AQMD adopted a PM10 redesignation request and maintenance plan and submitted it to U.S. EPA via CARB on April 28, 2010.[14] The action was prompted by monitoring data collected from 2004–2008 that demonstrated attainment of the 24-hour PM10 standard in the Basin after exclusion of exceptional events. Effective July 26, 2013, U.S. EPA redesignated the Basin to attainment for the 24-hour PM10 standard and approved the maintenance plan.[15]

Under CAA Section 175A(b), a second maintenance plan is required eight years after redesignation to ensure continued attainment for another decade after the initial 10-year period following redesignation. To comply with this requirement, South Coast AQMD adopted the Final 2021 PM10 Maintenance Plan for the South Coast Air Basin (2021 PM10 Maintenance Plan)[16] in June 2021 and submitted the plan to U.S. EPA via CARB in July 2021. The 2021 PM10 Maintenance Plan ensured continued attainment of the standard through 2035. However, U.S. EPA deferred action on the plan due to an unusually high PM10 concentration (587 $\mu g/m^3$) measured in 2018 at the Long Beach–Hudson monitoring site, which was directly impacted by nearby construction activities. A continuous PM10 Beta Attenuation Monitor has been collecting data since January 2022 at both the Long Beach–Hudson and Long Beach–Signal Hill monitoring sites. The first valid design value for these sites is 2024, covering the 2022–2024 period. During

[12] U.S. EPA, Approval and Promulgation of State Implementation Plans; California—South Coast, 68 Fed. Reg. 19316, April 18, 2003. https://www.federalregister.gov/documents/2003/04/18/03-9478/approval-and-promulgation-of-state-implementation-plans-california-south-coast

[13] U.S. EPA, Approval and Promulgation of State Implementation Plans for Air Quality Planning Purposes; California-South Coast and Coachella, 70 Fed. Reg. 69081, November 14, 2005. https://www.federalregister.gov/documents/2005/11/14/05-22463/approval-and-promulgation-of-state-implementation-plans-for-air-quality-planning-purposes

[14] South Coast AQMD, Final PM10 Redesignation Request and Maintenance Plan for the South Coast Air Basin, December 2009. https://downloads.regulations.gov/EPA-R09-OAR-2013-0007-0008/attachment_27.pdf

[15] U.S. EPA, Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; California; South Coast Air Basin; Approval of PM10 Maintenance Plan and Redesignation to Attainment for the PM10 Standard, 78 Fed. Reg. 38223, June 26, 2013. https://www.federalregister.gov/documents/2013/06/26/2013-15145/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning

[16] South Coast AQMD, Final 2021 PM10 Maintenance Plan for the South Coast Air Basin, June 2021. https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2021-pm10-maintenance-plan-for-the-south-coast-air-basin.pdf

this time, both sites confirmed no exceedances of the 24-hour PM10 standard. A request has been submitted to U.S. EPA to formally close the Hudson site and continue monitoring at the Signal Hill site to provide ongoing representation of PM10 air quality in the Long Beach area.

The 2024 design values at monitoring sites in the Basin are in attainment of the PM10 standard except for Mira Loma. Several windblown dust events have contributed to PM10 exceedances in the 2024 design value period at Mira Loma. South Coast AQMD has prepared two exceptional event demonstrations to exclude two events in 2024 from the design value; removal of these dates results in a design value that meets the standard.

South Coast AQMD has developed a new PM10 maintenance plan with updated information that extends the demonstration of continued attainment through 2033, 20 years after the Basin was redesignated to attainment. The new PM10 maintenance plan is intended to replace the 2021 PM10 Maintenance Plan that is pending action by U.S. EPA.

1997 PM2.5 Standards

Effective April 5, 2005, U.S. EPA designated the South Coast Air Basin as nonattainment under Subpart 1 of the CAA for the 1997 24-hour and annual PM2.5 NAAQS with an attainment date of April 5, 2010.[17] South Coast AQMD adopted and submitted the 2007 AQMP, which contained all necessary SIP elements for the 1997 PM2.5 standards, to U.S. EPA via CARB on November 28, 2007.[18] Air quality modeling in the 2007 AQMP demonstrated that the Basin could not meet the April 2010 deadline and therefore the 2007 AQMP included a request for a five-year extension of the attainment date until April 5, 2015, as allowed under Section 172(a)(2)(A) of the CAA.

On July 21, 2011, CARB adopted revisions to the MVEBs in the 2007 AQMP and subsequently submitted them to U.S. EPA.[19] On November 9, 2011, U.S. EPA approved multiple PM2.5 SIP elements including the emissions inventory, RACM/Reasonably Available Control Technology (RACT) demonstration, RFP and attainment demonstrations, and transportation conformity MVEBs.[20] However, U.S. EPA disapproved the

[17] U.S. EPA, Air Quality Designations and Classifications for the Fine Particles (PM2.5) National Ambient Air Quality Standards, 70 Fed. Reg. 944, January 5, 2005. https://www.federalregister.gov/documents/2005/01/05/05-1/air-quality-designations-and-classifications-for-the-fine-particles-pm25-national-ambient-air

[18] South Coast AQMD, 2007 Air Quality Management Plan, June 2007. https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan/2007-air-quality-management-plan

[19] CARB, Proposed 8-Hour Ozone State Implementation Plan Revisions and Technical Revisions to the PM2.5 State Implementation Plan Transportation Conformity Budgets for the South Coast and San Joaquin Valley Air Basins, June 2011. https://ww2.arb.ca.gov/sites/default/files/classic/planning/sip/2007sip/2011_ozone_sip_staff_report_with_appendices.pdf

[20] U.S. EPA, Approval of Air Quality Implementation Plans; California; South Coast; Attainment Plan for 1997 PM2.5 Standards, 76 Fed. Reg. 69928, November 9, 2011.

contingency measures SIP element because the measures did not achieve sufficient emission reductions, nor did they address the 2012 RFP milestone year. In October 2011, South Coast AQMD adopted a SIP revision to address U.S. EPA's disapproval of the contingency measure elements in the 2007 AQMP.[21] The SIP revision quantified excess emission reductions that were not included in the 2007 AQMP and demonstrated that actual emission levels in the Basin in 2012 were below the corresponding RFP targets. On October 29, 2013, U.S. EPA approved the SIP revision as satisfying contingency measure requirements for the 1997 PM2.5 standards.[22]

In January 2013, the U.S. Court of Appeals, D.C. Circuit ruled that U.S. EPA erred in implementing the 1997 PM2.5 NAAQS pursuant solely to the general implementation provisions of Subpart 1 of the CAA, without considering the particulate matter specific provisions of Subpart 4.[23] Although Subpart 4 relates to PM10, the Court reasoned that the plain meaning of the CAA requires implementation of the PM2.5 standards under Subpart 4 because PM2.5 falls within the statutory definition of PM10 and is thus subject to the same statutory requirements as PM10. Subpart 4 is more specific about what states must do to bring areas into attainment through the establishment of a two-tier classification system for nonattainment areas ("moderate" or "serious"). Subpart 4 also has specific provisions regarding the regulation of emissions of PM precursors that are not present in Subpart 1.

On June 2, 2014, U.S. EPA reclassified the Basin as a "moderate" nonattainment area for the 1997 PM2.5 standards to implement the more stringent provisions of Subpart 4.[24] However, the reclassification carried no immediate consequence for the Basin as monitoring data demonstrated attainment of the 1997 PM2.5 standards. Effective August 24, 2016, U.S. EPA formally determined that the Basin attained the 1997 PM2.5 NAAQS based on 2011–2013 monitoring data.[25] More recent data demonstrate that the Basin has

https://www.federalregister.gov/documents/2011/11/09/2011-27620/approval-of-air-quality-implementation-plans-california-south-coast-attainment-plan-for-1997-pm25

[21] South Coast AQMD, Adopt Revisions to 2007 PM2.5 State Implementation Plan for South Coast Air Basin, October 7, 2011. https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2011/2011-oct7-036.pdf

[22] U.S. EPA, Approval and Promulgation of Implementation Plans; California; South Coast; Contingency Measures for 1997 PM2.5 Standards, 78 Fed. Reg. 64402, October 29, 2013. https://www.federalregister.gov/documents/2013/10/29/2013-25182/approval-and-promulgation-of-implementation-plans-california-south-coast-contingency-measures-for-1997

[23] Natural Resources Defense Council v. E.P.A. (D.C. Cir. 2013) 706 F.3d 428; see also U.S. EPA, Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan (SIP) Provisions for the 1997 Fine Particle (PM2.5) National Ambient Air Quality Standard (NAAQS) and 2006 PM2.5 NAAQS, 79 Fed. Reg. 31566, June 2, 2014. https://www.federalregister.gov/documents/2014/06/02/2014-10395/identification-of-nonattainment-classification-and-deadlines-for-submission-of-state-implementation

[24] U.S. EPA, Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan (SIP) Provisions for the 1997 Fine Particle (PM2.5) National Ambient Air Quality Standard (NAAQS) and 2006 PM2.5 NAAQS, 79 Fed. Reg. 31566, June 2, 2014. https://www.govinfo.gov/content/pkg/FR-2014-06-02/pdf/2014-10395.pdf

[25] U.S. EPA, Clean Data Determination for 1997 PM2.5 Standards; California-South Coast; Applicability of Clean Air Act Requirements, 81 Fed. Reg. 48350, July 25, 2016.

continued to attain the 1997 PM2.5 standards. Therefore, this SIP revision includes redesignation requests and maintenance plans for both annual and 24-hour standards.

Requirements for Redesignation to Attainment

South Coast AQMD is requesting redesignation to attainment for the 1997 annual and 24-hour PM2.5 standards. Section 107(d)(3)(E) of the CAA allows for redesignation provided that:

1. U.S. EPA determines that the area has attained the applicable NAAQS;
2. U.S. EPA has fully approved the applicable implementation plan for the area under Section 110(k);
3. U.S. EPA determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable SIP, applicable federal air pollution control regulations, and other permanent and enforceable reductions;
4. U.S. EPA has a fully-approvable maintenance plan for the area meeting the requirements of CAA Section 175A; and
5. The State containing such area has met all requirements applicable to the area under Section 110 and Part D of the CAA.

This SIP revision demonstrates how the above requirements are met for the 1997 PM2.5 annual and 24-hour standards.

Maintenance Plan Requirements

CAA Section 175A requires areas requesting redesignation to submit an initial maintenance plan ensuring continued attainment for at least 10 years after redesignation. Further, areas must develop and submit a second maintenance plan eight years after redesignation. The second maintenance plan must ensure continued maintenance for another 10 years following the initial maintenance period and 20 years in total from the original redesignation date. However, the requirement to submit a second maintenance plan for the 1997 annual PM2.5 standard is no longer in effect as the standard is revoked in areas redesignated to attainment.[26]

In this SIP revision, South Coast AQMD is submitting two initial maintenance plans and one second

https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

[26] U.S. EPA, Fine Particulate Matter National Ambient Air Quality Standards; State Implementation Plan Requirements, 81 Fed. Reg. 58010, August 24, 2016. https://www.federalregister.gov/documents/2016/08/24/2016-18768/fine-particulate-matter-national-ambient-air-quality-standards-state-implementation-plan

maintenance plan (see Table 1-1). The maintenance plans ensure continued attainment until the maintenance horizon years of 2033 and 2039 for PM10 and PM2.5, respectively. For the PM2.5 standards, the maintenance horizon year must be at least 10 years after U.S. EPA approves the redesignation request. Although U.S. EPA's timeline is uncertain, under CAA section 107(d)(3)(D), U.S. EPA is required to act on redesignation requests within 18 months of submittal. Therefore, staff assumes that U.S. EPA will act on the SIP revision by 2029 and therefore 2039 would serve as an appropriate maintenance horizon year. Given the length of time between now and 2039, the PM2.5 maintenance plans also include 2033 as an interim milestone year to provide assurance that the standards will not be exceeded during the maintenance period.

In addition to a maintenance demonstration, maintenance plans are required to include an emissions inventory, MVEBs, monitoring network requirements, verification of continued attainment, and contingency provision elements. The requirement for maintenance areas to adopt contingency provisions is separate from nonattainment area requirements for contingency measures under CAA Sections 172(c)(9) and 182(c)(9). Unlike nonattainment area contingency measures, maintenance areas are not required to have adopted measures that take effect automatically. Instead, contingency provisions must include a list of actions and specify a schedule and procedure for implementation of the actions once triggered. This SIP revision seeks to satisfy all requirements applicable to maintenance plans.

Format of This Document

This document is organized into nine chapters, each addressing a specific topic. Each of the chapters is summarized below.

Chapter 1, "Introduction," provides background on the PM2.5 and PM10 standards in the Basin and discusses requirements related to redesignation requests and maintenance plans.

Chapter 2, "Monitoring Network," discusses the network of ambient air quality monitors located within the Basin.

Chapter 3, "Emissions Inventory," summarizes the attainment year and future milestone year emissions inventories.

Chapter 4, "1997 24-Hour PM2.5 Standard Redesignation Request and Maintenance Plan," discusses requirements related to the redesignation request and maintenance plan for the 1997 24-hour PM2.5 standard.

Chapter 5, "1997 Annual PM2.5 Standard Redesignation Request and Maintenance Plan," discusses requirements related to the redesignation request and maintenance plan for the 1997 annual PM2.5 standard.

Chapter 6, "1987 24-Hour PM10 Standard Second Maintenance Plan," discusses requirements related to

the second maintenance plan for the 1987 24-hour PM10 standard.

Chapter 7, “Transportation Conformity,” discusses the motor vehicle emissions budget for the South Coast Air Basin Maintenance Plans for PM2.5 and PM10 NAAQS.

Chapter 8, “Public Process,” discusses the role of public participation in developing the South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10.

Chapter 9, “California Environmental Quality Act and Socioeconomic Impacts,” discusses legal requirements related to CEQA and socioeconomic impact assessments.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 2: MONITORING NETWORK

Current Monitoring Network

South Coast AQMD monitors PM2.5 and PM10 with a comprehensive monitoring network. The PM2.5 and PM10 monitors and their locations are shown in this section. For information about the types of monitors, sampling schedule, monitoring purpose, and spatial scale of each monitor in the PM2.5 and PM10 monitoring networks, see the South Coast AQMD Monitoring Network Plan.[27] The PM2.5 and PM10 monitoring networks meet the minimum monitoring requirements specified in 40 CFR Part 58.

PM2.5 Monitoring Network

South Coast AQMD monitors PM2.5 at the locations shown in Figure 2-1 and listed in Table 2-1. The figure shows currently operating monitors and monitors that have operated between 2009 – 2024 but have now been relocated. Based on site availability, some monitoring locations may move over time. Two types of monitors are shown: federal reference method (FRM) gravimetric monitors and hourly Beta Attenuation monitors (BAM).

Only some of the BAMs meet the requirements for comparability with FRM; other BAMs that do not meet the requirements are not used for comparison with the NAAQS. For calculation of design value, we use data that is labeled with air quality system (AQS) parameter code 88101, which is the code for PM2.5 data that is comparable with the NAAQS.

[27] South Coast AQMD. 2020. South Coast AQMD FINAL 2024 Annual Air Quality Monitoring Network Plan. Available at: http://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan#

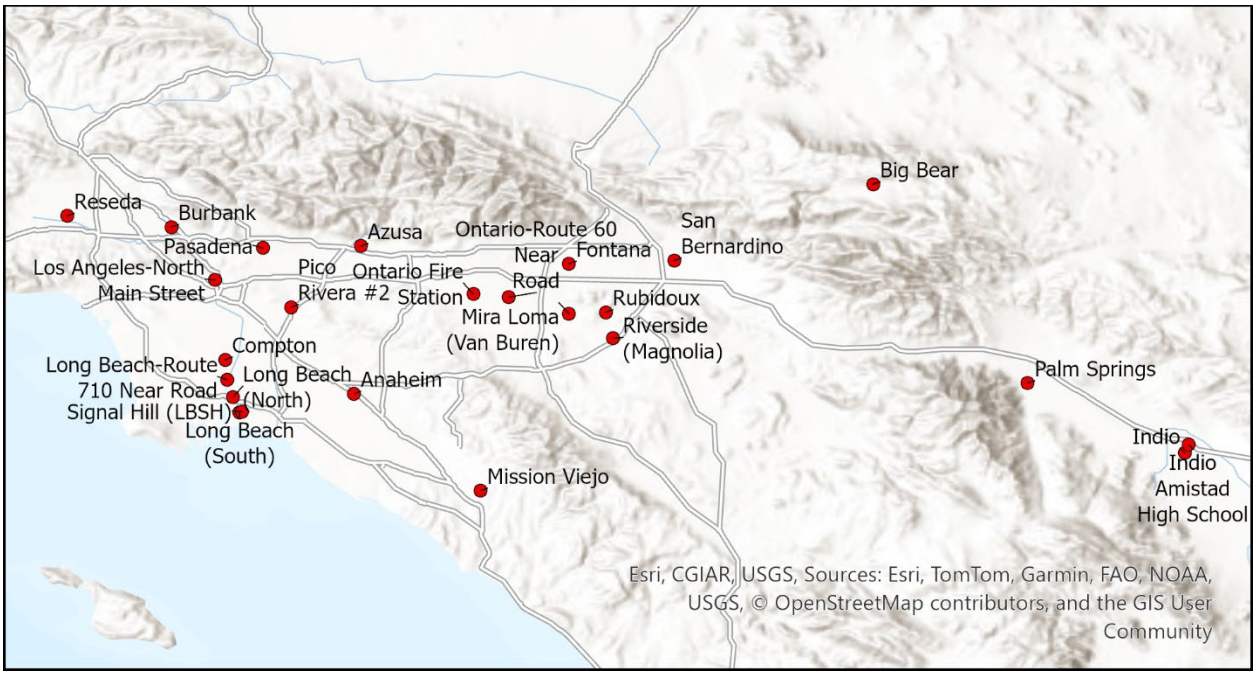


FIGURE 2-1

LOCATIONS OF PM2.5 MONITORS THAT ARE CURRENTLY OPERATING OR OPERATED BETWEEN 2009-2024 BUT HAVE BEEN RELOCATED.

TABLE 2-1

LIST OF PM2.5 MONITORS IN THE SOUTH COAST AIR BASIN THAT ARE CURRENTLY OPERATING OR OPERATED BETWEEN 2009 – 2024 BUT HAVE BEEN RELOCATED.

State Code	County Code	Site Num	POC	Local Site Name	Open Date	Close Date	Last Method Type
06	037	0002	1	Azusa	1999-01-01	2022-09-29	Gravimetric
06	037	0002	21	Azusa	2018-01-02	2022-01-20	Gravimetric
06	037	1002	3	Burbank	2008-01-01	2009-12-31	Beta Attenuation
06	037	1002	1	Burbank	1999-01-01	2014-06-30	Gravimetric
06	037	1103	3	Los Angeles-North Main Street	2008-01-01		Beta Attenuation
06	037	1103	1	Los Angeles-North Main Street	1999-01-01		Gravimetric
06	037	1103	9	Los Angeles-North Main Street	2011-10-01	2011-10-01	Beta Attenuation
06	037	1103	2	Los Angeles-North Main Street	1999-01-01		Gravimetric
06	037	1201	1	Reseda	1999-01-01		Gravimetric
06	037	1302	3	Compton	2024-01-01		Beta Attenuation
06	037	1302	1	Compton	2008-11-02		Gravimetric
06	037	1602	1	Pico Rivera #2	2005-10-01		Gravimetric
06	037	1602	21	Pico Rivera #2	2017-02-01	2022-01-20	Gravimetric
06	037	1602	2	Pico Rivera #2	2017-05-01	2022-01-17	Gravimetric
06	037	2005	1	Pasadena	1999-01-01		Gravimetric
06	037	2005	2	Pasadena	1999-01-01	2020-02-04	Gravimetric
06	037	4002	1	Long Beach (North)	1999-01-01	2022-06-30	Gravimetric
06	037	4002	3	Long Beach (North)	2009-01-06	2009-12-31	Beta Attenuation
06	037	4004	1	Long Beach (South)	2003-08-07	2022-04-30	Gravimetric
06	037	4004	3	Long Beach (South)	2012-01-01	2022-04-30	Beta Attenuation
06	037	4008	3	Long Beach-Route 710 Near Road	2016-01-01		Beta Attenuation
06	037	4008	1	Long Beach-Route 710 Near Road	2015-01-01		Gravimetric
06	037	4009	1	Signal Hill (LBSH)	2022-04-21		Gravimetric
06	037	4009	3	Signal Hill (LBSH)	2022-04-01		Beta Attenuation
06	059	0007	3	Anaheim	2008-01-01		Beta Attenuation
06	059	0007	1	Anaheim	2001-09-01		Gravimetric
06	059	0007	2	Anaheim	2017-05-01	2018-08-07	Gravimetric
06	059	2022	1	Mission Viejo	1999-06-15	2021-12-31	Gravimetric
06	059	2022	3	Mission Viejo	2020-01-01	2022-04-21	Beta Attenuation
06	065	1003	1	Riverside (Magnolia)	1999-01-01	2014-12-31	Gravimetric
06	065	8001	9	Rubidoux	2011-08-01	2021-12-31	Beta Attenuation
06	065	8001	3	Rubidoux	2008-01-01		Beta Attenuation
06	065	8001	1	Rubidoux	1999-01-01		Gravimetric
06	065	8001	2	Rubidoux	1999-01-01		Gravimetric
06	065	8005	3	Mira Loma (Van Buren)	2008-01-01		Beta Attenuation
06	065	8005	1	Mira Loma (Van Buren)	2005-10-25		Gravimetric
06	065	8005	2	Mira Loma (Van Buren)	2012-04-03		Gravimetric
06	071	0025	1	Ontario Fire Station	1999-01-01	2014-06-30	Gravimetric
06	071	0025	2	Ontario Fire Station	1999-01-01	2011-04-06	-
06	071	0027	1	Ontario-Route 60 Near Road	2015-01-01		Gravimetric
06	071	0027	3	Ontario-Route 60 Near Road	2015-08-01		Beta Attenuation
06	071	2002	21	Fontana	2016-04-30	2018-11-29	Gravimetric
06	071	2002	1	Fontana	1999-01-01		Gravimetric
06	071	8001	3	Big Bear	2022-01-01		Beta Attenuation
06	071	8001	1	Big Bear	1999-02-08		Gravimetric
06	071	9004	1	San Bernardino	1999-01-01		Gravimetric

PM10 Monitoring Network

South Coast AQMD monitors PM10 at the locations shown in Figure 2-2 and listed in Table 2-2. The figure shows currently operating monitors and monitors that have operated between 2009 – 2024 but have now been relocated. Based on site availability, some monitoring locations may move over time. Three types of monitors are shown: federal reference method (FRM) gravimetric monitors, hourly Beta Attenuation monitors (BAM), and hourly Tapered Element Oscillating Microbalance (TEOM) monitors.

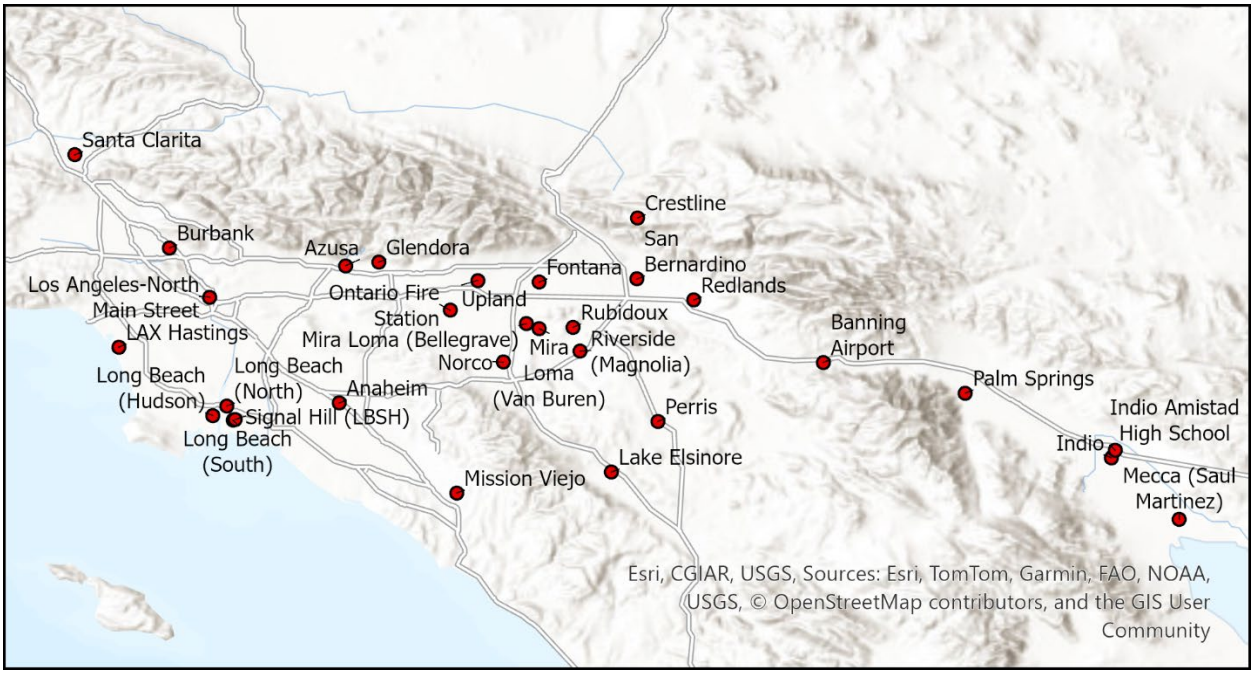


FIGURE 2-2

LOCATIONS OF PM10 MONITORS THAT ARE CURRENTLY OPERATING OR OPERATED BETWEEN 2009-2024 BUT HAVE BEEN RELOCATED.

TABLE 2-2

LIST OF PM10 MONITORS IN THE SOUTH COAST AIR BASIN THAT ARE CURRENTLY OPERATING OR OPERATED BETWEEN 2009 – 2024 BUT HAVE BEEN RELOCATED.

State Code	County Code	Site Num	POC	Local Site Name	Open Date	Close Date	Last Method Type
06	037	0002	2	Azusa	1985-01-01	2022-09-29	Gravimetric
06	037	0016	3	Glendora	2008-01-01		Beta Attenuation
06	037	1002	3	Burbank	2008-01-01	2014-06-30	TEOM
06	037	1002	2	Burbank	1985-01-01	2014-06-30	Gravimetric
06	037	1103	2	Los Angeles-North Main Street	1985-02-01		Gravimetric
06	037	1103	4	Los Angeles-North Main Street	2023-08-23		Gravimetric
06	037	1103	9	Los Angeles-North Main Street	2011-10-01	2011-12-31	-
06	037	1103	3	Los Angeles-North Main Street	2008-01-01		Beta Attenuation
06	037	4002	5	Long Beach (North)	1993-01-01	2013-09-30	Beta Attenuation
06	037	4002	2	Long Beach (North)	1985-01-01	2013-10-10	Gravimetric
06	037	4004	1	Long Beach (South)	2003-08-07	2009-12-31	-
06	037	4004	2	Long Beach (South)	2003-08-07	2022-04-30	Gravimetric
06	037	4006	1	Long Beach (Hudson)	2013-07-01	2020-07-01	Gravimetric
06	037	4006	3	Long Beach (Hudson)	2022-01-01		Beta Attenuation
06	037	4009	3	Signal Hill (LBSH)	2022-01-01		Beta Attenuation
06	037	5005	1	LAX Hastings	2004-04-12	2021-09-14	Gravimetric
06	037	6012	1	Santa Clarita	2001-04-25		Gravimetric
06	059	0007	1	Anaheim	2001-09-01		Gravimetric
06	059	0007	5	Anaheim	2010-01-01	2010-02-28	TEOM
06	059	0007	3	Anaheim	2008-01-01		Beta Attenuation
06	059	2022	1	Mission Viejo	1999-06-15	2022-07-31	Gravimetric
06	065	0003	1	Norco	1993-01-01	2021-12-31	Gravimetric
06	065	0004	3	Mira Loma (Bellegrave)	2008-01-01	2011-05-12	TEOM
06	065	0004	1	Mira Loma (Bellegrave)	2006-01-05	2011-06-03	Gravimetric
06	065	0012	1	Banning Airport	1998-02-01		Gravimetric
06	065	1003	5	Riverside (Magnolia)	2010-08-04	2014-12-31	Beta Attenuation
06	065	6001	1	Perris	1985-01-01	2021-12-01	Gravimetric
06	065	8001	5	Rubidoux	1993-01-01	2011-07-31	TEOM
06	065	8001	9	Rubidoux	1993-01-01	2011-12-31	Beta Attenuation
06	065	8001	3	Rubidoux	1988-01-01		Beta Attenuation
06	065	8001	2	Rubidoux	1985-01-01		Gravimetric
06	065	8001	4	Rubidoux	2009-01-01	2023-08-23	Gravimetric
06	065	8005	1	Mira Loma (Van Buren)	2006-01-01	2023-10-04	Gravimetric
06	065	8005	2	Mira Loma (Van Buren)	2015-04-06	2023-10-04	Gravimetric
06	065	8005	3	Mira Loma (Van Buren)	2010-03-08		Beta Attenuation
06	065	8005	4	Mira Loma (Van Buren)	2015-04-03	2023-10-04	Gravimetric
06	065	9001	3	Lake Elsinore	2008-01-01		Beta Attenuation
06	071	0005	1	Crestline	1980-01-17		Gravimetric
06	071	0025	1	Ontario Fire Station	1998-12-11	2014-06-30	Gravimetric
06	071	0025	2	Ontario Fire Station	2009-01-01	2014-06-30	Gravimetric
06	071	1004	3	Upland	2008-01-01	2023-04-01	Beta Attenuation
06	071	2002	3	Fontana	2024-09-11		Beta Attenuation
06	071	2002	2	Fontana	1985-10-01		Gravimetric
06	071	4003	1	Redlands	1993-01-01		Gravimetric
06	071	9004	3	San Bernardino	2008-01-01		Beta Attenuation
06	071	9004	2	San Bernardino	1988-01-01	2021-12-31	Gravimetric

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 3: EMISSIONS INVENTORY

Introduction

This chapter represents annual average day emissions by major source category for the South Coast Air Basin. Reported pollutants are directly emitted PM2.5 and PM10, and their precursors: volatile organic compounds (VOCs), nitrogen oxides (NOx), sulfur oxides (SOx), and ammonia (NH3). Emissions inventory for the base (2023) and future milestone years (2033 and 2039) are included. Pursuant to the U.S. Environmental Protection Agency (EPA) PM2.5 National Ambient Air Quality Standard (NAAQS) implementation rule,[28] the filterable and condensable portion of PM2.5 emissions are provided in Appendix III. Filterable PM2.5 refers to the fine particles that already exist in solid form as they leave a source (such as a smokestack or engine) and can be collected directly from the exhaust using a filter. Condensable PM2.5, in contrast, consists of gases in the hot exhaust that cannot be captured by a filter at the source but form fine particles once the exhaust cools in the atmosphere.

Inventory Description

The emissions inventory for this Plan builds upon previous inventories developed for the 2022 Air Quality Management Plan (AQMP)[29] and the South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard (hereinafter referred to as the 2024 PM2.5 Plan).[30] The 2022 AQMP inventory was developed with actual commercial and industrial activity data, socioeconomic data, and vehicle activity representing 2018. Future year emissions were projected from the base year using socioeconomic growth forecast included in the Southern California Association of Governments' (SCAG) 2020 Regional Transportation Plan (RTP). The 2024 PM2.5 Plan emissions inventory is largely consistent with that of the 2022 AQMP, with the primary difference being the on-road mobile source emissions. The 2024 PM2.5 Plan utilizes EMFAC 2021—the most recent U.S. EPA-approved model for on-road mobile sources at the time—whereas the 2022 AQMP was based on EMFAC 2017. Since the 2024 PM2.5 Plan, SCAG has adopted the 2024 RTP, which supersedes the 2020 RTP and provides updated travel activities and land use planning.

The emissions inventory in this Plan introduces updates to large point and on-road mobile sources while it is largely based on the 2022 AQMP. Reported emissions from facilities subject to Annual Emission Reporting requirements replaced the point source emissions projected to 2023. On-road mobile source emissions were estimated using travel activity data from the 2024 RTP and EMFAC 2021. Appendix III includes a brief analysis comparing the travel activity data used in the 2022 AQMP and this Plan, along with detailed discussions on emissions inventory methodology.

[28] 40 CFR 51.1008(a)(1)(iv).
[29] 2022 Air Quality Management Plan, available at https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf
[30] South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard, available at https://www.aqmd.gov/docs/default-source/clean-air-plans/pm2.5-plans/final-pm2.5-plan/2012-annual-pm2-5-plan.pdf

Attainment Inventory and Future Emissions

U.S. EPA guidance recommends that areas develop an attainment inventory that represents "emissions during the time period associated with the monitoring data showing attainment."[31] The most recent year design value (DV) demonstrating attainment of the PM10 and PM2.5 standards and available during the development of this Plan is 2024 DV, representing the 2022-2024 monitoring period. Since 2023 falls within this period and aligns with other planning efforts, this Plan defines 2023 as attainment inventory year. The corresponding 2023 inventory is presented in Table 3-1.

This Plan presents projected emissions for the maintenance horizon years 2033 and 2039, as summarized in Tables 3-2 and 3-3, respectively. The baseline emissions, so-called business-as-usual scenario, reflect rules and regulations already adopted during the development of the 2022 AQMP and the 2024 PM2.5 Plan.

Recent actions by CARB, U.S. EPA, U.S. Congress, and related litigation affecting California's authority to regulate mobile sources may impact emission reductions from certain regulations included in the baseline emissions inventory. Under the Clean Air Act (CAA), California may request U.S. EPA waivers or authorizations to implement its own on-road and off-road emissions standards. CARB has submitted its regulations to U.S. EPA for its review and approval, where applicable, and in the past, the U.S. EPA approved such submissions. Advanced Clean Transit (ACT) and Low NOx Omnibus regulations are among those for which waivers were previously granted. In addition, CARB adopted the Heavy-Duty Inspection and Maintenance (HD I/M) regulation, also known as "Clean Truck Check", on December 9, 2021. This regulation requires periodic emissions inspections, On-Board Diagnostics (OBD) monitoring, and compliance fees for heavy-duty vehicles beginning in January 2023. All these regulations were originally included in the baseline emissions.

However, in June 2025, the waivers for ACT and Low NOx Omnibus as well as Advanced Clean Cars II were rescinded under the Congressional Review Act (CRA). While California and ten other states filed suit, challenging the rescissions as unlawful under the CRA and contrary to long-standing precedent, the SIP creditability of the emission reductions from these rules is uncertain. In addition, in February 2026, U.S. EPA disapproved the HD I/M regulation as it applies to out-of-state trucks.[32] To reflect these developments, CARB released adjustment factors to remove the associated reductions from the baseline inventory.[33] The baseline emissions presented in this Plan incorporate those adjustment factors (i.e., reductions from ACT, Low NOx Omnibus and the out-of-state portion of the HD I/M regulation have been

[31] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. Memorandum from John Calcagni to USEPA Regional Directors. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

[32] US EPA, Air Plan Revisions; California; Heavy-Duty Vehicle Inspection and Maintenance Program, 91 Fed. Reg. 5325, February 6, 2026.

[33] Adjustment Emissions Benefits of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Warranty Phase 1, and Heavy-Duty Omnibus Regulations. Available at https://www.epa.gov/system/files/documents/2025-12/attachment-a-description-of-emfac2021-adjustment-factors.pdf

removed).

Figure 3-1 shows overall emission trends for PM2.5, PM10 and precursors. NOx emissions are projected to decline significantly through 2039. In contrast, SOx emissions are expected to grow slightly, driven by increased activity from ocean-going vessels and aircraft. PM2.5 and PM10 emissions are also projected to increase, largely due to growing vehicle activity that contributes to road dust, along with increases in construction and commercial cooking associated with continued population growth. Overall VOC emissions are expected to decline, despite continuous increase in VOC emissions from consumer products driven by population growth. NH3 emissions are also expected to increase, driven by both population growth and emissions from on-road vehicles.

TABLE 3-1
2023 ANNUAL AVERAGE EMISSIONS BY MAJOR SOURCE CATEGORY IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

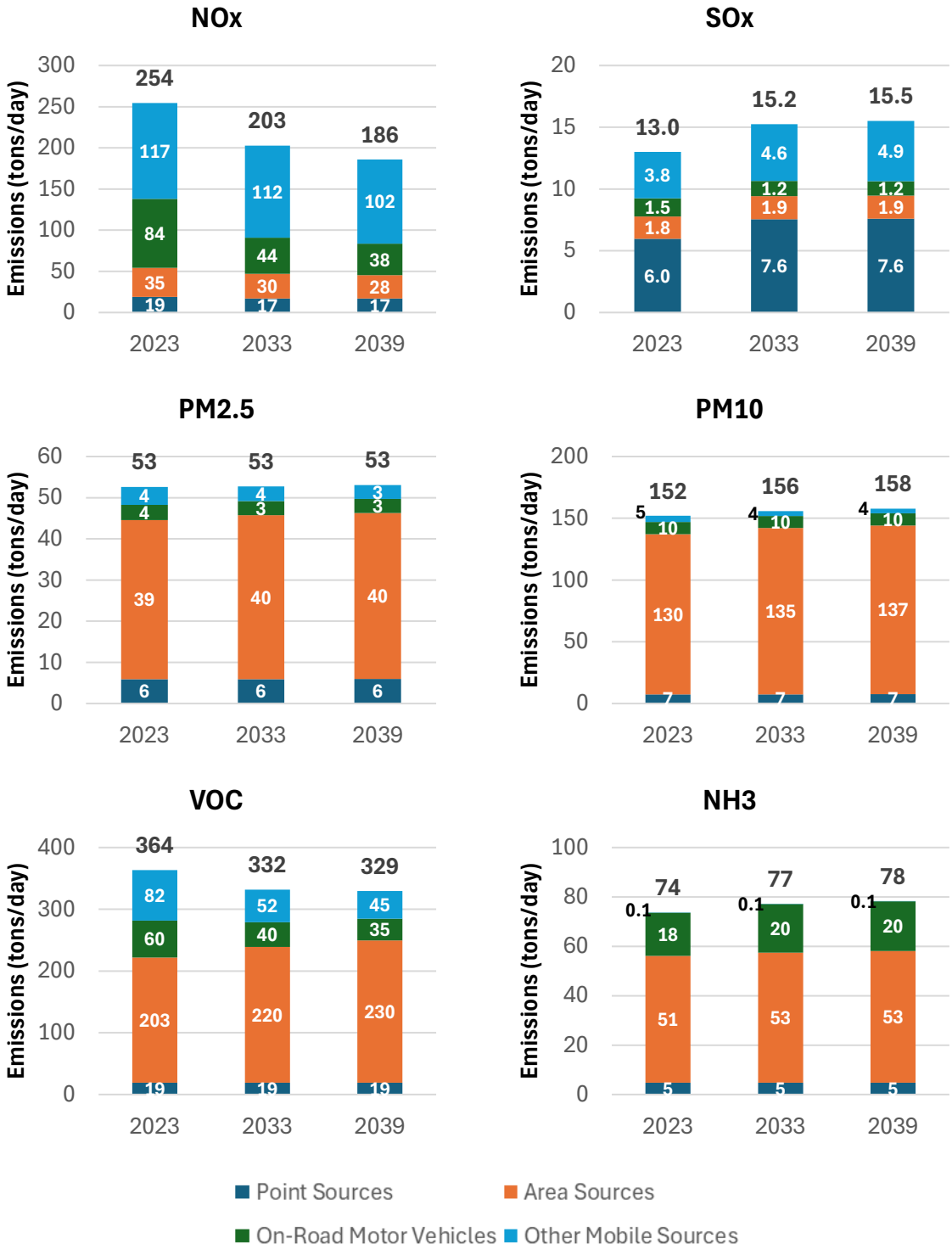
	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.10	21.57	2.01	4.88	4.84	6.96
Waste Disposal	15.08	1.04	0.55	0.29	0.29	5.76
Cleaning and Surface Coatings	35.72	0.03	0.00	1.52	1.46	0.12
Petroleum Production and Marketing	18.28	0.19	0.28	1.01	0.70	0.05
Industrial Processes	10.74	0.21	0.07	10.08	5.00	9.11
Solvent Evaporation	125.36	0.00	0.00	0.03	0.02	1.20
Residential Fuel Combustion	8.97	18.99	0.34	6.96	6.78	0.11
Farming Operations	1.06	0.00	0.00	0.68	0.14	5.87
Construction And Demolition	0.00	0.00	0.00	23.59	2.36	0.00
Paved Road Dust	0.00	0.00	0.00	57.21	8.56	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.74	1.67	0.00
Commercial Cooking	1.12	0.00	0.00	11.79	11.79	0.00
Residential Ammonia						26.90
Other Miscellaneous Sources	0.50	0.16	0.03	2.32	0.91	0.03
RECLAIM		11.97	4.49			
Total Stationary and Area Sources	**221.93**	**54.16**	**7.78**	**137.12**	**44.52**	**56.11**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	55.94	39.35	1.17	6.80	2.46	12.22
Heavy-Duty Vehicles	3.54	41.63	0.28	2.85	1.19	4.43
Buses and Motorhomes	0.43	2.75	0.02	0.21	0.09	0.87
Total On-Road Sources	**59.91**	**83.73**	**1.47**	**9.86**	**3.73**	**17.52**
Other Mobile Sources						
Aircraft	3.35	17.77	1.54	0.73	0.65	0.00
Trains	0.69	16.13	0.02	0.37	0.34	0.01
Ocean-Going Vessels and Harbor Craft	9.80	36.90	2.08	0.95	0.88	0.03
Off-Road Equipment	49.41	42.88	0.10	2.22	1.94	0.08
Other Off-Road Sources	18.55	2.87	0.00	0.73	0.55	0.01
Total Other Mobile Sources	**81.81**	**116.55**	**3.76**	**5.00**	**4.36**	**0.12**
Total Anthropogenic Sources	**363.65**	**254.44**	**13.00**	**151.98**	**52.63**	**73.75**

TABLE 3-2
2033 ANNUAL AVERAGE EMISSIONS BY MAJOR SOURCE CATEGORY IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.05	29.46	2.03	4.62	4.58	6.31
Waste Disposal	15.87	1.25	0.57	0.31	0.30	6.22
Cleaning and Surface Coatings	37.14	0.08	0.00	1.58	1.52	0.12
Petroleum Production and Marketing	17.72	0.52	0.31	1.01	0.70	0.05
Industrial Processes	10.95	1.21	0.08	10.68	5.35	9.11
Solvent Evaporation	140.80	0.00	0.00	0.03	0.03	1.16
Residential Fuel Combustion	8.86	14.29	0.32	6.77	6.58	0.11
Farming Operations	1.00	0.00	0.00	0.65	0.13	5.79
Construction And Demolition	0.00	0.00	0.00	25.43	2.54	0.00
Paved Road Dust	0.00	0.00	0.00	59.50	8.90	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.73	1.67	0.00
Commercial Cooking	1.18	0.00	0.00	12.50	12.50	0.00
Residential Ammonia						28.49
Other Miscellaneous Sources	0.50	0.16	0.03	2.24	0.90	0.03
RECLAIM			6.08			
Total Stationary and Area Sources	**239.06**	**46.98**	**9.42**	**142.05**	**45.70**	**57.39**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	37.67	19.73	0.95	6.50	2.19	13.63
Heavy-Duty Vehicles	2.22	23.02	0.26	3.02	1.17	5.43
Buses and Motorhomes	0.28	1.27	0.01	0.18	0.07	0.63
Total On-Road Sources	**40.17**	**44.02**	**1.23**	**9.69**	**3.42**	**19.69**
Other Mobile Sources						
Aircraft	3.89	26.24	2.03	0.81	0.72	0.00
Trains	0.69	17.41	0.03	0.36	0.33	0.01
Ocean-Going Vessels and Harbor Craft	10.13	39.22	2.43	1.04	0.96	0.03
Off-Road Equipment	24.30	26.26	0.10	1.37	1.19	0.08
Other Off-Road Sources	13.40	2.68	0.01	0.51	0.39	0.01
Total Other Mobile Sources	**52.41**	**111.80**	**4.59**	**4.09**	**3.59**	**0.13**
Total Anthropogenic Sources	**331.64**	**202.79**	**15.24**	**155.84**	**52.73**	**77.21**

TABLE 3-3
2039 ANNUAL AVERAGE EMISSIONS BY MAJOR SOURCE CATEGORY IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.06	29.10	2.05	4.56	4.51	6.11
Waste Disposal	16.20	1.27	0.58	0.32	0.31	6.38
Cleaning and Surface Coatings	37.17	0.07	0.00	1.58	1.52	0.12
Petroleum Production and Marketing	18.00	0.51	0.33	1.01	0.70	0.05
Industrial Processes	10.96	1.20	0.08	10.72	5.37	9.11
Solvent Evaporation	150.61	0.00	0.00	0.03	0.03	1.14
Residential Fuel Combustion	8.85	12.99	0.32	6.76	6.57	0.11
Farming Operations	0.97	0.00	0.00	0.64	0.12	5.72
Construction And Demolition	0.00	0.00	0.00	26.47	2.65	0.00
Paved Road Dust	0.00	0.00	0.00	60.30	9.02	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.73	1.67	0.00
Commercial Cooking	1.22	0.00	0.00	12.91	12.91	0.00
Residential Ammonia						29.33
Other Miscellaneous Sources	0.50	0.16	0.03	2.20	0.89	0.03
RECLAIM			6.08			
Total Stationary and Area Sources	**249.55**	**45.31**	**9.47**	**144.22**	**46.27**	**58.10**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	32.95	16.44	0.90	6.37	2.09	13.79
Heavy-Duty Vehicles	2.07	20.96	0.26	3.20	1.23	5.87
Buses and Motorhomes	0.22	0.85	0.01	0.17	0.06	0.43
Total On-Road Sources	**35.23**	**38.25**	**1.17**	**9.75**	**3.38**	**20.09**
Other Mobile Sources						
Aircraft	3.91	27.85	2.09	0.82	0.73	0.00
Trains	0.57	14.51	0.03	0.28	0.26	0.02
Ocean-Going Vessels and Harbor Craft	10.34	34.34	2.64	1.10	1.02	0.03
Off-Road Equipment	18.11	22.84	0.10	1.21	1.03	0.06
Other Off-Road Sources	11.71	2.63	0.01	0.44	0.33	0.01
Total Other Mobile Sources	**44.65**	**102.16**	**4.86**	**3.84**	**3.37**	**0.12**
Total Anthropogenic Sources	**329.43**	**185.72**	**15.50**	**157.81**	**53.05**	**78.31**



(Numbers may not add up due to rounding)

FIGURE 3-1
TRENDS IN EMISSIONS BY MAJOR SOURCE CATEGORIES

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 4: 1997 24-HOUR STANDARD REDESIGNATION REQUEST AND MAINTENANCE PLAN

1.0 Introduction

The South Coast Air Basin (Basin) is a "moderate" nonattainment area for the 1997 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS or standard). In July 2016, U.S. EPA determined that the Basin attained the 1997 24-hour PM2.5 NAAQS based on 2011 – 2013 monitoring data.[34] The complete SIP history of the 1997 24-hour standard for the Basin is discussed in Chapter 1.

This chapter presents South Coast AQMD's request to redesignate the Basin to attainment for the 1997 24-hour PM2.5 standard. This request complies with the requirements of CAA Section 107(d)(3)(E): the standard has been met, emission reductions are permanent and enforceable, the SIP is approved under CAA Section 110(k), and all applicable Clean Air Act requirements have been satisfied.

In addition, this chapter includes a maintenance plan (Plan) as required under CAA Section 175A. The Plan demonstrates continued attainment through 2039, commits to maintaining the PM2.5 monitoring network, outlines methods to verify continued attainment, and includes contingency provisions in case violations occur.

2.0 Redesignation Request

2.1 Attainment of the Standard

The 1997 24-hour PM2.5 NAAQS is attained if the design value is less than or equal to 65 µg m^{-3}. The design value is calculated by determining the 98th percentile of the 24-hour PM2.5 concentrations in a year and then averaging the 98th percentile values over three years. The calculation is performed at each monitoring site and the highest design value in the Basin is used to determine attainment. Details on the monitoring network can be found in Chapter 2.

Design values during 2001 – 2024 were calculated to demonstrate attainment and analyze trends to provide evidence that the improvement in PM2.5 air quality is due to permanent and enforceable emission reductions. To evaluate trends in design values, measurements that are not regulatory significant but generally meet the definition of an exceptional event were removed. These events are defined as "suspected exceptional events" as they do not have a supporting exceptional event demonstration because removal or inclusion of the exceedance does not have regulatory significance. Exceptional events are those data points where the concentration was caused by a natural event or activity that is unlikely to recur and that is not reasonably controllable or preventable. For this analysis, only July 4th and 5th are considered suspected exceptional events since Independence Day fireworks often cause exceedances of

[34] U.S. EPA, Clean Data Determination for 1997 PM2.5 Standards; California-South Coast; Applicability of Clean Air Act Requirements, 81 Fed. Reg. 48350, July 25, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

the PM2.5 24-hour NAAQS and according to Title 40 in the Code of Federal Regulations, fireworks that are significantly integral to traditional national, ethnic, or other cultural events are considered exceptional events.[35] Wildfires may also be considered PM2.5 exceptional events, but these were not removed from the trends analysis.

Figure 4-1 shows the trend of the 24-hour PM2.5 design values from 2001-2024. The figure demonstrates that design values have not exceeded the 1997 24-hour PM2.5 NAAQS of 65 µg m^{-3} since 2005. Therefore, the Basin meets the 1997 24-hour PM2.5 NAAQS. Furthermore, maximum PM2.5 design values in the Basin have decreased by 54% since 2001. This provides evidence that concentration reductions are due to permanent and enforceable emission reductions rather than favorable meteorology, since design values show a generally decreasing trend. They have been below the NAAQS for two decades.

Appendix I provides an analysis of meteorology in the 2022 – 2024 time period. The analysis provides additional evidence that meteorology was not favorable to lower concentrations during 2022 – 2024, and that precipitation was especially low during November and December 2024, contributing to higher than usual PM2.5 levels. This shows that concentration reductions are due to reductions in emissions rather than due to favorable meteorology.

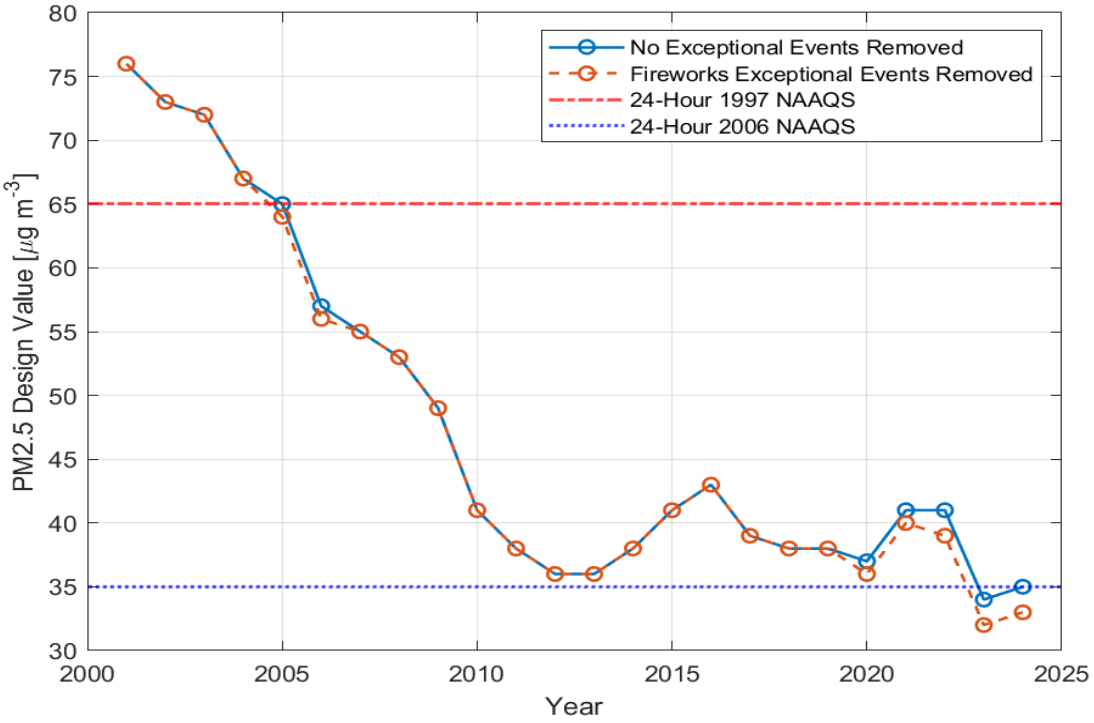


FIGURE 4-1
24-HOUR PM2.5 DESIGN VALUES FOR SOUTH COAST AIR BASIN

[35] Title 40 Code of Federal Regulations, Part 50.14 (b)(2) (40 CFR § 50.14(b)(2)) https://www.ecfr.gov/current/title-40/part-50/section-50.14#p-50.14(b)(2)

Table 4-1 shows design values calculated for the 2022 – 2024 three-year period. Before removing any events, the highest 24-hour average PM2.5 design value in the Basin is 35 µg m^{-3} at Fontana, and after removing the fireworks events, the highest design value is 33 µg m^{-3} at Mira Loma (Van Buren). If the design value is equal to or less than the NAAQS, the area is considered to meet the standard. The design value is well below the 1997 24-hour average PM2.5 NAAQS (65 µg m^{-3}); thus, the Basin met the 1997 24-hour average PM2.5 NAAQS during 2022 – 2024. In 2016, U.S. EPA finalized a determination that the Basin attained the 1997 24-hour PM2.5 NAAQS.[36] This determination was based on 2011 – 2013 data and the design value calculations in this plan demonstrate that the Basin continues to attain the 1997 24-hour PM2.5 NAAQS.

TABLE 4-1
DESIGN VALUES FOR 1997 24-HOUR AVERAGE PM2.5 NAAQS IN THE SOUTH COAST AIR BASIN DURING 2022-2024

State Code	County Code	Site Number	Site Name	No Exceptional Events Removed (ug/m3)	Suspected Fireworks Events Removed (ug/m3)
06	037	1103	Los Angeles-North Main Street	27	26
06	037	1201	Reseda	26	22
06	037	1302	Compton	32	29
06	037	1602	Pico Rivera #2	30	27
06	037	2005	Pasadena	26	21
06	037	4008	Long Beach-Route 710 Near Road	26	26
06	059	0007	Anaheim	25	24
06	065	8001	Rubidoux	28	27
06	065	8005	Mira Loma (Van Buren)	34	33
06	071	0027	Ontario-Route 60 Near Road	31	30
06	071	2002	Fontana	35	30
06	071	8001	Big Bear	29	29
06	071	9004	San Bernardino	30	29

Since 2018, the design site—the site with the highest design value—has shifted over time in the Basin. To demonstrate the reduction in concentrations at these design stations over the past decade, we plotted their design value trends in Figure 4-2. There is a decreasing trend at Mira Loma (Van Buren), Fontana, and Pico Rivera #2 since 2008. Design values have also decreased at Ontario-Route 60 Near Road and Compton

[36] U.S. EPA, Clean Data Determination for 1997 PM2.5 Standards; California-South Coast; Applicability of Clean Air Act Requirements, 81 Fed. Reg. 48350, July 25, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25

since 2017. The gap from 2014 to 2016 at several sites is due to invalid measurements resulting in invalid design values during those years.

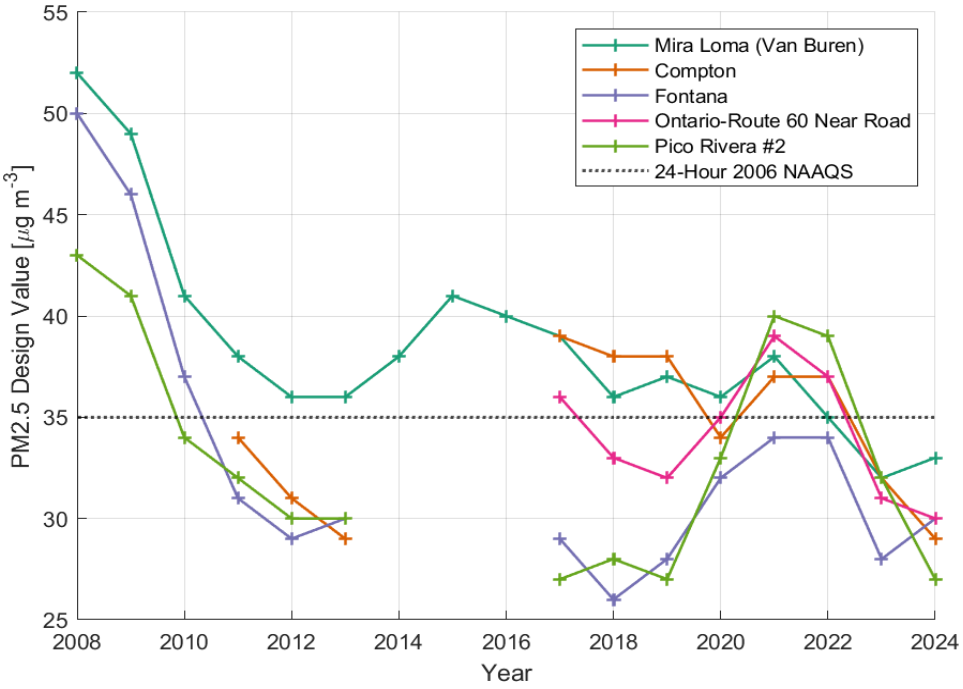


FIGURE 4-2
TREND OF 24-HOUR PM2.5 DESIGN VALUES AT SEVERAL STATIONS AFTER REMOVING SUSPECTED EXCEPTIONAL EVENTS CAUSED BY FIREWORKS

2.2 Permanent and Enforceable Emission Reductions

The improvement in PM2.5 must be attributable to permanent and enforceable emission reductions for U.S. EPA to redesignate an area to attainment. Attainment based on temporary emission reductions or unusually favorable meteorology does not satisfy the criteria for redesignation to attainment. A comprehensive discussion of recent meteorology can be found in Appendix II.

U.S. EPA guidance recommends quantifying the percentage reduction of emissions from the year used to designate an area as nonattainment as part of a redesignation request.[37] The Basin was designated as nonattainment for the 1997 24-hour PM2.5 standard based on the 2003 design value, which reflects measurements taken during 2001 – 2003. The 2007 Air Quality Management Plan (AQMP), which addressed the 1997 24-hour PM2.5 NAAQS for the Basin, used 2002 as the base year for emissions inventory development. Considering these two factors, the emissions inventory for 2002 was included

[37] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment, 1992. Memorandum from John Calcagni to USEPA Regional Directors. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

in this analysis to quantify progress in reducing emissions.

As shown in Table 4-2, all pollutant emissions have decreased substantially. In particular, PM2.5, NOx, VOC, and SOx emissions have been reduced by 27%, 73%, 53%, and 83%, respectively, since 2002. The percentage reductions are calculated based on 2023 emissions, derived from the attainment inventory presented in Chapter 3.

TABLE 4-2
REDUCTION OF ANNUAL AVERAGE BASIN TOTAL EMISSIONS OF PM2.5 AND ITS PRECURSORS FROM 2002 TO 2023*

	2002 (tons per day)	2023 (tons per day)	Reductions from 2002 to 2023 (%)
PM2.5	71.98	52.63	26.9
NOx	948.49	254.44	73.2
VOC	772.95	363.65	53.0
SOx	76.45	13.00	83.0
NH3	95.19	73.75	22.5

*Emissions for 2002 are derived from CEPAM2022 PM2.5 SIP Version 1.00

The emission reductions are due to permanent and enforceable stationary and mobile source regulations adopted by South Coast AQMD and the California Air Resources Board (CARB). Summaries of selected South Coast AQMD rules and CARB regulations that have reduced emissions of PM2.5 and PM2.5 precursors over the past decade are provided below. A complete list of rules approved into the SIP is available on U.S. EPA's website.[38]

[38] U.S. EPA, EPA-Approved South Coast Air District Regulations in the California SIP. https://www.epa.gov/air-quality-implementation-plans/epa-approved-south-coast-air-district-regulations-california-sip#iv

2.2.1 Summary of Key South Coast AQMD Rules

Rule 444

Rule 444 – Open Burning was adopted in 1976 and last amended in 2013 to regulate open burning practices to minimize emissions and smoke impacts. It applies to activities such as agricultural burning, disposal of tumbleweeds, prescribed burns, and fire prevention training. Rule 444 mandates obtaining prior authorization for burns and burning only on designated days that meet meteorological and air quality criteria. The rule prohibits the burning of non-vegetative materials such as trash and construction debris. For large projects or prescribed burns that produce more than one ton of PM emissions, a Smoke Management Plan (SMP) is required to minimize public smoke exposure. Entities must notify South Coast AQMD before and after burning and maintain records of the activity. Certain exemptions apply, including recreational fires and ceremonial burns.

Rule 445

Rule 445 – Wood-Burning Devices reduces emissions from wood-burning devices such as fireplaces or wood stoves. It was originally adopted in 2008 to implement control measure BCM-03 – Emission Reductions from Wood Burning Fireplaces and Wood Stoves in the 2007 AQMP. The rule contains requirements regarding the sale and installation of wood-burning devices, prohibits the burning or sale of unseasoned wood, and includes curtailment of wood-burning on "No-Burn" days when the ambient concentration of PM2.5 is forecast to exceed the curtailment threshold.

In June 2020, Rule 445 was amended to include PM2.5 contingency measures and to switch the Source-Receptor-area specific curtailment to a Basin-wide curtailment approach. In October 2020, it was again amended to include ozone contingency measures. The rule was subsequently approved by U.S. EPA, excluding paragraph (g) (Ozone Contingency Measures) and paragraph (k) (Penalties).[39] Rule 445 contains four PM2.5 contingency measures, each of which impose lower curtailment thresholds upon any of U.S. EPA's findings of failure to comply or attain as specified in 40 CFR §51.1014(a). In 2020, the first PM2.5 contingency measure was triggered upon U.S. EPA's finding of failure to attain the 2006 24-hour PM2.5 standard by the December 31, 2019 attainment deadline.[40] As a result, the wood burning curtailment threshold was lowered from 30 µg/m^3 to 29 µg/m^3 during November-February.

On September 5, 2025, Rule 445 was amended to implement the South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard (2024 PM2.5 Plan) control measure BCM-18 – Further Emission

[39] U.S. EPA, Air Plan Approval; California; Los Angeles-South Coast Air Basin, 87 Fed. Reg. 12866, March 8, 2022. https://www.federalregister.gov/documents/2022/03/08/2022-04761/air-plan-approval-california-los-angeles-south-coast-air-basin#page-12869

[40] U.S. EPA, Finding of Failure To Attain the 2006 24-Hour Fine Particulate Matter Standards; California; Los Angeles-South Coast Air Basin, 85 Fed. Reg. 57733, September 16, 2020. https://www.federalregister.gov/documents/2020/09/16/2020-19588/finding-of-failure-to-attain-the-2006-24-hour-fine-particulate-matter-standards-california-los

Reductions from Wood-Burning Fireplaces and Wood Stoves.[41] The amendment lowered the wood burning curtailment threshold from 29 µg/m^3 to 25 µg/m^3 and removed the low-income exemption from the curtailment program. The PM2.5 contingency provisions were amended as well to include two contingency measures, which each reduce the curtailment threshold by 2 µg/m^3.

Rule 1111

Originally adopted in 1978, Rule 1111 reduces NOx emissions from natural-gas-fired, fan-type central furnaces with a heat input capacity below 175,000 BTU per hour, or, for combination heating and cooling units, a cooling capacity under 65,000 BTU per hour. In 2009, South Coast AQMD amended Rule 1111 to lower the NOx emission limit from 40 to 14 nanograms per joule (ng/J), setting a compliance deadline of October 1, 2016, for most new residential space heating furnaces. Since then, the rule has been revised multiple times to provide additional flexibility and address implementation challenges.

A significant amendment was introduced in 2014 to allow a mitigation fee alternative compliance option. This allowed manufacturers to continue selling non-compliant furnaces for up to 36 months beyond the applicable compliance date by paying a fee. In 2018, further amendments increased the mitigation fee, prohibited the use of propane furnaces capable of operating on natural gas without proper certification, and added labeling requirements for clarity and enforcement.

In 2019, a temporary exemption from the 14 ng/J emission limit was granted for condensing and non-condensing furnaces installed at elevations of 4,200 feet or higher, recognizing the unique challenges of high-altitude installations. The 2020 amendment extended both this exemption and the mitigation fee option for weatherized furnaces through September 30, 2021. In 2021, the compliance deadline for mobile home furnaces using the mitigation fee option was also extended, this time to September 30, 2023.

The most recent amendment, adopted in January 2026, designated mobile home furnaces as the final category eligible for the mitigation fee option until September 30, 2030. The mitigation fee compliance option is needed due to the unique challenges for mobile homes, such as space constraints and limited electrical capacity.

Rule 1147

Rule 1147 – NOx Reductions from Miscellaneous Sources reduces emissions from combustion equipment such as ovens, dryers, dehydrators, heaters, kilns, calciners, furnaces, and incinerators. Initially adopted in 2008, the rule has been amended three times to extend implementation dates, provide compliance flexibility for small and large sources, and introduce more stringent limits.

The most recent amendment in 2022 updated the NOx limits to reflect Best Available Retrofit Control Technology (BARCT). Under Rule 1147, micro-turbines must meet a stringent NOx emission limit of 9 parts

[41] South Coast AQMD, South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard, June 7, 2024. https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan

per million (ppm). All other equipment types that require a South Coast AQMD permit, but are not regulated by other NOx rules, must comply with emission limits ranging from 20 to 60 ppm, based on the equipment type and process temperature. Compliance deadlines are determined by equipment age and manufacturing date. Units already meeting the earlier Rule 1147 limits must comply with updated BARCT limits by July 1 of the year after the unit burner becomes 32 years old. Units not previously in compliance must submit applications to meet the revised emission limits by July 1, 2023, or July 1 of the year after the unit burner becomes 12 years old, whichever is later.

RECLAIM

South Coast AQMD's Regulation XX – Regional Clean Air Incentives Market (RECLAIM) has resulted in significant reductions of NOx and SOx emissions from facilities belonging to the RECLAIM program. Established in 1993, RECLAIM is a market-based, cap-and-trade program for facilities that emit greater than or equal to 4 tons per year of NOx or SOx, as defined in Rule 2001. RECLAIM includes 15 rules that outline the applicability, definitions, allocations, trading and operational requirements, as well as monitoring, reporting, and recordkeeping obligations.

Under this program, facilities are issued NOx and SOx allocations, known as RECLAIM Trading Credits (RTCs) or facility emission caps, which decline annually to drive emission reductions. To meet the declining annual facility caps, RECLAIM facilities have the option to install pollution control equipment, modify operations, or purchase RTCs from the RECLAIM market. RECLAIM further promoted additional reductions by re-assessing RTCs based on periodic assessments of BARCT for a wide range of equipment such as boilers, heaters, furnaces, ovens, kilns, coke calciners, fluid catalytic cracking units, internal combustion engines, and turbines. RECLAIM intended to provide BARCT-equivalent or greater emission reductions in the aggregate for the facilities in the program.

In 1994, the initial RTC allocations were set at 110 tons per day (tpd) of NOx and 25 tpd of SOx. On January 7, 2005, South Coast AQMD adopted amendments to reduce the NOx RTC allocation—effectively a "shave" or reduction in the cap of allowable emissions. The 2005 NOx shave resulted in a NOx RTC reduction of 7.7 tpd, a reduction of approximately 22.5 percent of the total 2003 RTC holdings, which was implemented in 5 phases: 4 tpd by 2007 and an additional 0.925 tpd in each of the following 4 years (2008-2011). On November 5, 2010, South Coast AQMD adopted additional amendments to the RECLAIM program that resulted in cumulative SOx reductions of 5.7 tpd, a more than 51 percent reduction based on 2004 allocations, from all RECLAIM facilities by 2019. In December 2015, RECLAIM was amended again to implement a second NOx shave that reduced NOx RTC allocations by 12 tpd from 2016 to 2022. The remaining RECLAIM RTC allocation was set to 14.5 tpd.[42]

The RECLAIM program has been evaluated for its transition to a command-and-control regulatory structure as a result of implementation of control measure CMB-05: Further NOx Reductions from RECLAIM Assessment from the 2016 AQMP. In addition, CMB-05 sought to achieve an additional 5 tpd of NOx reductions by implementing source- and industry-specific BARCT-level controls to address the

[42] Annual RECLAIM Audit Report for 2022 Compliance Year, South Coast AQMD, March 1, 2024. http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-mar1-021.pdf

concerns that the cap-and-trade structure was not reducing emissions as effectively or rapidly as a traditional regulatory approach. To facilitate this transition and implement BARCT level controls, South Coast AQMD adopted a series of RECLAIM landing rules between 2018 and 2024 that establish source-specific and industry-specific BARCT requirements under a command-and-control regulatory structure. The landing rules include Rules 1109.1, 1110.2, 1118.1, 1134, 1135, 1146 series, 1147 series, 1153.1, and 1159.1. Implementation of some of these rules has already resulted in emission reductions, contributing to continued attainment of the 1997 PM2.5 standards.

2.2.2 Summary of Key CARB Regulations

Key Mobile Source Regulations and Programs Providing Emission Reductions

Given the severity of California's air quality challenges and the need for ongoing emission reductions, the California Air Resources Board (CARB) has implemented the most comprehensive mobile source emissions control program in the nation. CARB's comprehensive program relies on four fundamental approaches:

- Stringent emissions standards that minimize emissions from new vehicles and equipment;
- In-use programs that target the existing fleet and require the use of the cleanest vehicles and emissions control technologies;
- Cleaner fuels that minimize emissions during combustion; and,
- Incentive programs that remove older, dirtier vehicles and equipment and replace those vehicles with the cleanest technologies.

This multi-faceted approach has spurred the development of increasingly cleaner technologies and fuels and achieved significant emission reductions across all mobile source sectors that go far beyond federal programs or programs in other states.

Regulations

CARB's mobile source regulatory programs extend back to the 1960s, and predate the federal Clean Air Act Amendments (Act) of 1970, which established the basic national framework for controlling air pollution. In recognition of the pioneering nature of CARB's efforts, the Act preserves California's inherent authority to set emission standards for new motor vehicles that are at least as stringent, in the aggregate, as the federal government via a federal waiver of preemption under Section 209(b) of the Act. The Act under section 209(e) also allows California to seek federal authorization to set emission standards for off-road engines and vehicles. Since the 1970s, CARB has sought and obtained more than 100 waivers and authorizations for its new motor vehicle and engine regulations. CARB's history of progressively strengthening standards as technology advances, coupled with the waiver process requirements, has ensured that California's regulations remain the most stringent in the nation.

Incentive Programs

CARB and District staff work closely on identifying and distributing incentive funds to accelerate cleanup of vehicles and engines, which work in tandem with regulations to accelerate deployment of cleaner technology. Incentive programs encourage both the early retirement of dirty, older cars and the purchase of newer, lower-emitting vehicle engines and technologies. Several State and local incentive funding pools have been used historically and remain available to fund the accelerated turnover of vehicles and equipment. To date, CARB incentive programs have been allocated approximately $9 billion, resulting in over 700,000 vehicles and equipment being replaced or deployed.

In recognition of the key role that incentives play in complementing State and local air quality regulations to reduce emissions, the scope and scale of California's air quality incentive programs has since greatly expanded. Each of CARB's incentive programs has its own statutory requirements, goals, and categories of eligible projects that collectively provide for a diverse and complex incentives portfolio. CARB uses this portfolio approach to incentives to accelerate development and early commercial deployment of the cleanest mobile source technologies and to improve access to clean transportation.

A. Light-Duty Vehicles

Cars are 99 percent cleaner than they were in 1975 due to CARB's longstanding light-duty mobile source program. Since setting the nation's first motor vehicle exhaust emission standards in 1966 that led to the first pollution controls, California has dramatically tightened emission standards for light-duty vehicles. As a result of these efforts, light-duty vehicle emissions in the South Coast Air Basin (South Coast) have been reduced significantly since 1990 and will continue to go down through 2039. Key light-duty programs include Advanced Clean Cars (ACC), On-Board Diagnostics, Reformulated Gasoline, Incentive Programs, and the Enhanced Smog Check Program.

1. Advanced Clean Cars

CARB's ACC Program, adopted in 2012, was a pioneering package of regulations that - although separate in construction - are related and were developed to address both ambient air quality needs and climate change. The ACC program combines the control of smog, soot causing pollutants and greenhouse gas (GHG) emissions into a single coordinated package of requirements for model years beginning in 2015. The ACC Program included amendments affecting the ZEV requirements through the 2017 model year in order to enable manufacturers to successfully meet 2018 and subsequent model year requirements. These ZEV amendments were intended to achieve commercialization through simplifying the regulation and pushing technology to higher volume production in order to achieve cost reductions. The ACC Program will continue to achieve benefits into the future as new cleaner cars enter the fleet and displace older and dirtier vehicles.

2. California Enhanced Smog Check Program

The Bureau of Automotive Repair (BAR) is the State agency charged with administration and implementation of the Smog Check Program. The Smog Check Program is designed to reduce air pollution from California registered vehicles by requiring periodic inspections for emission-control system problems, and by requiring repairs for any problems found. The Enhanced Smog Check program began in 1998 and subsequent amendments occurred in 2009 and 2013.

3. Reformulated Gasoline (CaRFG)

Since 1992, CARB has been regulating the formulation of gasoline through the California Reformulated Gasoline program (CaRFG). The CaRFG program has been implemented in three phases, and has resulted in California gasoline being the cleanest in the world. California's cleaner-burning gasoline regulation is one of the cornerstones of the State's efforts to reduce air pollution and cancer risk. The results from cleaning up fuel can have an immediate impact as soon as it is sold in the State. Vehicle manufacturers design low-emission emission vehicles to take full advantage of cleaner-burning gasoline properties.

B. Medium- and Heavy-Duty On-Road Vehicles

Due to the benefits of CARB's longstanding heavy-duty mobile source program, heavy-duty on-road vehicle emissions throughout California and in the South Coast have been reduced significantly since 1990 and will continue to decrease through 2039. Key programs contributing to those reductions include new heavy-duty engine standards, cleaner diesel fuel requirements, California's Truck and Bus Regulation, and incentive programs.

1. Engine Standards

Since 1990, heavy-duty engine NOx emission standards have become dramatically more stringent, dropping from 6 grams per brake horsepower-hour (g/bhp-hr) in 1990 down to the current 0.2 g/bhp-hr standard, which took effect in 2010. In addition to mandatory NOx standards, there have been several generations of optional lower NOx standards put in place over the past 15 years. Starting in 2015, engine manufacturers were allowed to certify to three optional NOx emission standards of 0.1 g/bhp-hr, 0.05 g/bhp-hr, and 0.02 g/bhp-hr (i.e., 50 percent, 75 percent, and 90 percent lower than the mandatory standard of 0.2 g/bhp-hr). The optional standards allow local air districts and CARB to preferentially provide incentive funding to buyers of cleaner trucks, and to encourage the development of cleaner engines.

2. Cleaner In-Use Heavy-Duty Trucks (Truck and Bus Regulation)

California's Regulation to Reduce Emissions from In-Use On-Road Diesel Fueled Vehicles (Truck and Bus Regulation) was first adopted in December 2008. This rule represents a multi-year effort to turn over the legacy fleet of heavy-duty on-road engines and replace them with the cleanest technology available. In December 2010, CARB revised specific provisions of the Truck and Bus Regulation, in recognition of the deep economic effects of the recession on businesses and the corresponding decline in emissions.

Starting in 2012, the Truck and Bus Regulation phased in requirements applicable to an increasingly larger percentage of California's truck and bus fleet over time, so that by 2023 nearly all older vehicles were upgraded to have exhaust emissions meeting 2010 model year engine emissions levels. The regulation applies to nearly all diesel-fueled trucks and buses with a gross vehicle weight rating greater than 14,000 pounds that are privately or federally owned, including on-road and off-road agricultural yard goat trucks, and privately and publicly owned school buses.

3. Heavy-Duty Inspection and Maintenance Regulation

To ensure heavy-duty trucks remain clean in-use, CARB adopted in 2021 the Heavy-Duty Inspection and Maintenance Regulation (Clean Truck Check), which requires periodic demonstrations that vehicles' emissions control systems are properly functioning in order to legally operate within the State. This regulation is designed to achieve criteria emissions reductions by ensuring that malfunctioning emissions control systems are repaired in a timely fashion.

In January 2026, U.S. EPA partially approved CARB's Clean Truck Check submittal as a revision to the California SIP. While this partial approval does not impact CARB's ability to protect public health by fully enforcing and implementing Clean Truck Check in California, it does impact the State's ability to credit emissions reductions from the program in the SIP. Though CARB questions the propriety of not granting full approval, the emissions inventory in this plan reflects emissions reduction benefits from only the portion of the regulation that U.S. EPA approved into the SIP.

4. Clean Diesel Fuel

Since 1993, CARB has limited the aromatic hydrocarbon content and sulfur content of diesel fuel. Diesel powered vehicles account for a disproportionate amount of diesel particulate matter, which is considered a toxic air contaminant in California. In 2006, CARB required low-sulfur diesel fuel to be used not only by on-road diesel vehicles but also for off-road engines. The diesel fuel regulation allows alternative diesel formulations as long as emission reductions are equivalent to the CARB formulation.

5. Advanced Clean Fleet Regulation (ACF)

Adopted in 2023, the Advanced Clean Fleet (ACF) regulation established requirements for fleets to phase in zero-emission medium- and heavy-duty vehicles to improve air quality and public health. After the lack of action by the previous federal administration on its Clean Air Act waiver request for ACF, CARB amended the regulation in September 2025 to repeal parts of the ACF regulation applying to federal or private fleets, including requirements for drayage trucks, to reduce confusion for federal and private fleet operators and resolve pending litigation. The amendments also provide new flexibility in meeting the regulation's requirements for state and local government fleets, and streamlined the processes for applying for exemptions.

C. Off-Road Sources

Off-road sources encompass equipment powered by an engine that does not operate on the road. Sources vary and include locomotives, aircraft, tractors, harbor craft, off-road recreational vehicles, construction equipment, forklifts, and cargo handling equipment. As a result of these emission control efforts, off-road mobile source emissions in the South Coast have been reduced significantly since 1990 and will continue to decrease through 2039. Key programs in this sector include Off-Road Engine Standards, Clean Diesel Fuel, Cleaner In-Use Off-Road Regulation, and the In-Use Large Spark Ignition (LSI) Fleet Regulation.

1. Off-Road Engine Standards

Off-road diesel engines were first subject to engine standards and durability requirements in 1996, with the most recent Tier 4 Final emission standards being phased in starting in 2013. Tier 4 emission standards are based on the use of advanced after-treatment technologies such as diesel particulate filters and selective catalytic reduction. Manufacturers of forklift engines are subject to new engine standards for both diesel and Large Spark Ignition (LSI) engines. LSI engines have been subject to new engine standards that include both criteria pollutant and durability requirements since 2001 with the cleanest requirements phased-in starting in 2010.

CARB first approved regulations to control exhaust emissions from small off-road engines (SORE) such as lawn and garden equipment in December 1990. The 1990 - 2016 regulations were implemented through three tiers of progressively more stringent exhaust emission standards that were phased in between 1995 and 2008. The most recent suite of amendments (December 2021) requires most newly manufactured SORE engines to be zero-emission starting in 2024.

To control emissions from Transport Refrigeration Units (TRUs), CARB adopted in 2004 the Airborne Toxic Control Measure (ATCM) for In-Use Diesel-Fueled TRUs, TRU Generator Sets, and Facilities where TRUs Operate, which set increasingly stringent engine standards to reduce diesel particulate matter emissions from TRUs and TRU generator sets. The ATCM for TRUs was subsequently amended in 2010 and 2011, and most recently in February 2022, as the first phase of new requirements to transition diesel-powered TRUs to zero-emission technology. CARB plans to develop a subsequent Part 2 regulation to require zero-emission trailer TRUs, domestic shipping container TRUs, railcar TRUs, and TRU generator sets, for future CARB Board consideration. In January 2025, U.S. EPA partially granted CARB's request for authorization for the February 2022 Amendments.

2. In-Use Off-Road Diesel Fueled Fleets (Off-Road Regulation)

The Off-Road Regulation was first approved in 2007 and applies to equipment used in construction, manufacturing, the rental industry, road maintenance, airport ground support and landscaping. The Off-Road Regulation significantly reduces emissions of diesel PM and NOx from the over 150,000 in-use off-road diesel vehicles that operate in California. The regulation requires owners to modernize their fleets

by replacing older engines or vehicles with newer, cleaner models, retiring older vehicles or using them less often, or by applying retrofit exhaust controls.

Fleets are subject to increasingly stringent restrictions on adding older vehicles. The regulation also sets performance requirements. While the regulation has many specific provisions, in general by each compliance deadline, a fleet must demonstrate that it has either met the fleet average target for that year, or has completed the Best Available Control Technology requirements.

3. Large Spark-Ignition (LSI) Engine Fleet Requirements

Large spark-ignition engines, which are defined as spark-ignition (i.e., Otto-cycle) engines greater than 25 horsepower, are used in a variety of equipment, including, but not limited to, forklifts, airport ground support equipment (GSE), sweeper/scrubbers, industrial tow tractors, generator sets, and irrigation pumps. LSI equipment is found throughout the state operating at warehouses and distribution centers, seaports, airports, railyards, manufacturing plants, and many other commercial and industrial facilities. Forklift fleets are subject to in-use fleet requirements either under the LSI fleet regulation, if fueled by gasoline or propane, or under the off-road diesel fleet regulation, if fueled by diesel. Both regulations require fleets to retire, repower, or replace higher-emitting equipment in order to maintain fleet average standards.

The LSI Fleet Regulation was adopted in 2006 and amended in 2010 and 2016. It requires fleet operators with four or more LSI forklifts to meet fleet average emission standards. The 2006 LSI rulemaking and 2010 amendments required specific hydrocarbon + NOx fleet average emission level standards that became increasingly more stringent over time. The focus of the 2016 amendments was to collect data from fleet operators in order to inform the development of requirements that would support the broad-scale deployment of zero-emission equipment in LSI applications. The 2016 amendments also required fleet operators to report key compliance information to CARB and extended to 2023 requirements from the prior LSI Fleet Regulation that were otherwise due to sunset in 2016.

4. Cargo Handling Equipment (CHE)

Cargo handling equipment (CHE) include yard trucks (hostlers), rubber-tired gantry cranes, container handlers, forklifts, and dozers. The Cargo Handling Equipment (CHE) Regulation established requirements for in-use and newly purchased diesel-powered equipment at ports and intermodal rail yards. CARB adopted the CHE Regulation in 2005, which established best available control technology for new and in-use CHE that operate at California's ports and intermodal rail yards through accelerated turnover of older equipment through retrofits and/or replacement to cleaner engines. Since 2006, the CHE Regulation has resulted in reductions of diesel PM and NOx at ports and intermodal rail yards throughout California.

5. Clean Diesel Fuel

Since 1993, CARB has limited the aromatic hydrocarbon content and sulfur content of diesel fuel. In 2006, CARB required low-sulfur diesel fuel to also be used for off-road engines. The diesel fuel regulation allows alternative diesel formulations as long as emission reductions are equivalent to the CARB formulation.

6. Marine Sources and Ocean-Going Vessels (OGVs)

To reduce emissions from Ocean Going Vessels (OGV), CARB has in place the Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline (Ocean-Going Vessel Fuel Regulation, 2008) and the Ocean-Going Vessels At Berth Regulation (2007). The At Berth Regulation requires container ships, passenger ships, and refrigerated-cargo ships at six California ports to meet compliance requirements for auxiliary engines while they are docked, including emission or power reduction requirements.

In 2007, CARB adopted the Commercial Harbor Craft Regulation (CHC Regulation), which reduces toxic and criteria emissions. Commercial harbor craft include ferries, excursion vessels, tugboats (including ocean-going tugboats), barges, and commercial and commercial passenger fishing boats. This regulation was subsequently amended in 2010, and again in March 2022, to establish expanded and more stringent in-use requirements to cover more vessel categories and mandate accelerated deployment of zero-emission and advanced technologies in vessel categories where technology feasibility has been demonstrated. In January 2025, U.S. EPA partially granted CARB's request for authorization for Amendments to the CHC Regulation.

Conclusion

In conclusion, CARB has implemented the most comprehensive mobile source emissions control program in the nation. CARB's mobile source control program is robust and targets all sources of emissions through a four-pronged approach. First, increasingly stringent emissions standards drive the use of the cleanest available engines and equipment, and minimize emissions from new vehicles and equipment. Second, to speed the turnover of older, dirtier engines and equipment to cleaner new equipment, in-use programs target emissions from the existing fleet by requiring vehicle and fleet owners to transition legacy fleets and vehicles to the cleanest vehicles and emissions control technologies. Third, cleaner fuels minimize emissions from all combustion engines being used across the State. Finally, incentive programs help accelerate the turnover to cleaner technologies, while also facilitating the development of the next generation of clean technologies that are needed to meet future air quality targets.

This multi-faceted approach has spurred the development and use of increasingly cleaner technologies and fuels, and has also provided significant emission reductions across all mobile source sectors that go far beyond other programs across the country.

2.3 SIP and Compliance with CAA

To be eligible for redesignation, an area must have an approved SIP and be in compliance with all applicable requirements under Section 110 and Part D of the CAA. As the SIP history of the 1997 24-hour PM2.5 standard is discussed in Chapter 1, the 1997 24-hour PM2.5 NAAQS was addressed in the 2007 AQMP and the 2011 SIP revision and subsequently approved by U.S. EPA. Table 4-3 summarizes the SIP revisions addressing the 1997 24-hour PM2.5 standard and U.S. EPA's actions on each item.

TABLE 4-3
SOUTH COAST AIR BASIN STATE IMPLEMENTATION PLAN REVISIONS FOR THE 1997 24-HOUR PM2.5 STANDARD

SIP Revision	Submittal Date	U.S. EPA Action	Approval Date
2007 AQMP	11/28/2007	Approved all elements except contingency measures (76 FR 69928)[43]	11/09/2011
2011 SIP revision for the 2007 AQMP	11/14/2011 and supplemented on 4/24/2013	Approved contingency measures (78 FR 64402)[44]	10/29/2013

Although PM2.5 attainment plans have been approved, U.S. EPA has long held that requirements associated with attainment are not applicable for purposes of evaluating whether an area that has attained the standard qualifies for redesignation.[45] This interpretation is rooted in the General Preamble and the Calcagni memorandum[46] which states: "The requirements for reasonable further progress … and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard." As the Basin already attains the 1997 24-hour PM2.5 standard, the

[43] U.S. EPA, Approval of Air Quality Implementation Plans; California; South Coast; Attainment Plan for 1997 PM2.5 Standards, 76 Fed. Reg. 69928, November 9, 2011. https://www.federalregister.gov/documents/2011/11/09/2011-27620/approval-of-air-quality-implementation-plans-california-south-coast-attainment-plan-for-1997-pm25

[44] U.S. EPA, Approval and Promulgation of Implementation Plans; California; South Coast; Contingency Measures for 1997 PM2.5 Standards, 78 Fed. Reg. 64402, October 29, 2013. https://www.federalregister.gov/documents/2013/10/29/2013-25182/approval-and-promulgation-of-implementation-plans-california-south-coast-contingency-measures-for?utm_

[45] U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 13498, April 16, 1992. https://archives.federalregister.gov/issue_slice/1992/4/16/13412-13570.pdf#page=87

[46] U.S. EPA. Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

remaining applicable CAA requirements include:

1. An emission inventory under section 172(c)(3);
2. A permit program for the construction and operation of new and modified major stationary sources of $PM_{2.5}$ under sections 172(c)(5) and 189(a)(1)(A);
3. Control requirements for major stationary sources of $PM_{2.5}$ precursors under section 189(e), except where the Administrator determines that such sources do not contribute significantly to $PM_{2.5}$ levels that exceed the standard in the area;
4. Requirements under section 172(c)(7) that meet the applicable provisions of section 110(a)(2); and
5. Provisions to ensure that federally supported or funded projects conform to the air quality planning goals in the applicable SIP under section 176(c).

The following sections discuss South Coast AQMD's fulfillment of these requirements.

2.3.1 Emissions Inventory

Chapter 3 and Appendix III present a comprehensive, accurate, current inventory of PM2.5 and its precursors for 2023 and future milestone years. Thus, this plan satisfies the requirement for an emissions inventory.

2.3.2 Permit Program for New or Modified Stationary Sources

CAA Section 172(c) requires permits for the construction and operation of new or modified major stationary sources. New Source Review (NSR) for major and in some cases minor sources of PM2.5 and its precursors is presently addressed through South Coast AQMD's NSR and RECLAIM programs (Regulations XIII and XX, respectively). Both programs are applicable to sources located in the South Coast AQMD jurisdiction, including the South Coast Air Basin and the Coachella Valley. Regulation XIII establishes the federal and State mandated pre-construction review program for new, modified, or relocated sources. The NSR program ensures that all new and modified sources install BACT and their emission increases are fully offset with creditable emission reductions.

The components of South Coast AQMD's NSR program are contained within Regulation XIII. Rule 1325 was first adopted on June 3, 2011 to incorporate U.S. EPA's requirements for PM2.5 and its precursors into Regulation XIII. The rule mirrors federal requirements which include the definition of major source, significant emissions rate, offset ratios, and the applicability requirements of Lowest Achievable Emission Rate (LAER), facility compliance, offsets, and control of PM2.5 precursors. In 2021, U.S. EPA approved Rule 1325 as meeting all applicable NSR requirements.[47]

[47] Air Plan Approval; California; South Coast Air Quality Management District; Stationary Source Permits, 86 Fed. Reg. 58592 (Oct. 22, 2021) https://www.federalregister.gov/documents/2021/10/22/2021-22884/air-plan-approval-california-south-coast-air-quality-management-district-stationary-source-permits

RECLAIM facilities are currently not subject to emission offsets for NOx and SOx under Regulation XIII; however, these facilities are instead subject to NOx and SOx emission offsets under Regulation XX. In 2017, U.S. EPA approved the emission offset requirements for RECLAIM facilities.[48] The RECLAIM transition to a command-and-control regulatory structure will require former RECLAIM sources to become subject to traditional NSR for NOx and SOx under Regulation XIII, as applicable.

VOC and ammonia emissions are also subject to BACT under existing NSR. VOC emissions are required to be offset when a new or modified source has the potential to emit 4 tons per year or more of VOC. Ammonia emission sources have not historically been subject to NSR offset requirements. However, for permitted ammonia sources, Rule 1303 (NSR Requirements) requires denial of "the Permit to Construct for any relocation, or for any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is employed for the new or relocated source or for the actual modification to an existing source." BACT shall be at least as stringent as LAER as defined in CAA Section 171(3); therefore, South Coast AQMD's current regulations requiring BACT comply with the federal LAER requirements.

2.3.3 PM Precursor Requirement in Nonattainment NSR

CAA Section 189(e) states that control requirements applicable to plans in effect for major stationary PM sources shall also apply to major stationary sources of PM precursors, except where such sources do not contribute significantly to PM levels which exceed the standard in the area. Rule 1325 defines a major stationary source as a facility that has the potential to emit 70 or more tons per year of PM2.5 or PM2.5 precursors, including NOx, VOC, ammonia, and SOx. In 2021, U.S. EPA approved Rule 1325 as meeting all applicable NSR requirements.[49]

[48] U.S. EPA, Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area Classifications Approach, 82 Fed. Reg. 43176, September 14, 2017. https://www.federalregister.gov/documents/2017/09/14/2017-19454/approval-of-california-air-plan-revisions-south-coast-air-quality-management-district

[49] U.S. EPA, Air Plan Approval; California; South Coast Air Quality Management District; Stationary Source Permits, 86 Fed. Reg. 58592 (October 22, 2021)

2.3.4 Compliance with CAA Section 110(a)(2)

CAA Section 110(a)(2) contains general SIP requirements, including those related to enforceable emission limitations; monitoring, compiling and analyzing ambient air quality data; preconstruction review of new or modified stationary sources; the availability of funding, staff, and resources necessary to implement the SIP; and assurances that the State maintains responsibility for ensuring adequate implementation of the SIP. South Coast AQMD and CARB have submitted and U.S. EPA has approved SIP revisions addressing the general CAA Section 110 provisions for the 1997 24-hour PM2.5 standard in the Basin (see Table 4-2). There are no outstanding or disapproved SIP elements that prevent redesignation to attainment.

2.3.5 General and Transportation Conformity

Under CAA Section 176(c), states are required to establish criteria and procedures to ensure that federally supported or funded projects conform to the air quality planning goals in the applicable SIP. Section 176(c) further provides that state conformity provisions must be consistent with federal conformity regulations that the CAA requires U.S. EPA to promulgate. U.S. EPA's conformity regulations are codified at 40 CFR part 93, subparts A (referred to herein as “transportation conformity”) and B (referred to herein as “general conformity”). Pursuant to 40 CFR part 93 and CAA Section 107(d), transportation conformity budgets are provided in Chapter 7. Transportation conformity budgets are established for each NAAQS for which an area has been designated as nonattainment or maintenance. Thus, new transportation plans are required to meet the budgets set for any NAAQS including those established in this maintenance plan, once U.S. EPA approves them.

2.3.7 Summary

The Basin has a fully approved SIP for the 1997 24-hour PM2.5 standard and South Coast AQMD has complied with all applicable CAA requirements.

3.0 Maintenance Plan

To comply with CAA Sections 107(d)(3)(E) and 175A, South Coast AQMD has developed a maintenance plan to ensure continued attainment of the 1997 24-hour PM2.5 standard for at least 10 years following redesignation. U.S. EPA must approve the maintenance plan in order to redesignate the Basin to attainment. A maintenance plan must contain an emissions inventory, a maintenance demonstration, motor vehicle emissions budgets, monitoring network requirements, verification of continued attainment, and contingency provisions. In addition, a commitment must be made to submit a second maintenance plan 8 years after redesignation. This section demonstrates how all requirements are fulfilled.

3.1 Attainment Inventory

U.S. EPA guidance recommends that areas develop an attainment inventory that represents emissions during the time period associated with the monitoring data showing attainment.[50] The most recent year with an attaining design value for the 1997 24-hour PM2.5 standard is 2024, representing 2022-2024 monitoring data. Therefore, 2023 provides an appropriate foundation for the attainment inventory. The 2023 attainment inventory is presented in Chapter 3 and Appendix III.

3.2 Maintenance Demonstration

Section 175A(a) of the CAA requires a demonstration of maintenance of the NAAQS for at least 10 years after redesignation. The maintenance horizon year in this plan is 2039, which will cover a period of more than 10 years after U.S. EPA approves the redesignation request. Generally, areas can demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future anticipated mix of sources and emission rates will not cause a violation of the NAAQS. In addition, South Coast AQMD consulted with U.S. EPA for the most appropriate approach to demonstrate maintenance. Considering all these factors, this maintenance demonstration utilizes a proportional rollback method, where the 2024 design value is scaled to reflect changes in the emissions corresponding to PM2.5 chemical species between 2023 and 2039. The detailed methodology describing how the future values are calculated is presented in Appendix IV.

The maintenance demonstration for the 1997 24-hour PM2.5 NAAQS uses 2023 as the base year emissions inventory and includes 2033 (interim milestone year) and 2039 (maintenance horizon year). Chapter 3, Figure 3-1, shows how emissions of PM2.5 and its precursors change from 2023 to 2033 and 2039. Future emissions of NOx and VOCs will decline after 2023, while direct PM2.5, NH3, and SOx emissions will marginally increase or remain almost unchanged. However, the large reduction in NOx emissions will ensure maintenance of the PM2.5 standards. Further, the inventory does not project sudden increases in emissions during any year between 2023 and 2039, providing assurance that the standard will not be exceeded during interim years.

The 24-hour PM2.5 projected design values for 2039 are shown in Table 4-4. To demonstrate maintenance of the 1997 24-hour PM2.5 standard, future design values must be less than or equal to 65 µg/m³. By 2039, Fontana is expected to have the highest 24-hour PM2.5 design value among all monitoring sites at 34 µg/m³, which is far below the standard, ensuring continued attainment of the 1997 PM2.5 NAAQS until 2039 and very likely beyond. Furthermore, this wide margin below the NAAQS means that even an unforeseen loss in emission reductions would be unlikely to jeopardize the maintenance demonstration. Future design values exhibit little to no change because the decrease in

[50] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment, September 4, 1992. https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

ammonium nitrate is offset by increases in other chemical species. Refer to Appendix IV for details on the speciation.

TABLE 4-4
PROJECTED 24-HOUR PM2.5 DESIGN VALUES IN THE BASIN FOR 2033 AND 2039

Station	2024 DV (ug/m3)	2033 DV (ug/m3)	2039 DV (ug/m3)
Anaheim	25	25	25
Big Bear	29	28	28
Compton	32	31	31
Fontana	35	34	34
Long Beach near-road	26	26	25
Los Angeles	26	26	25
Mira Loma	34	33	33
Ontario near-road	31	30	30
Pasadena	26	26	25
Pico Rivera	30	29	29
Reseda	26	26	25
Riverside	28	27	27
San Bernardino	30	29	29
Long Beach	22	22	21

3.3 Transportation Conformity

Details on transportation conformity can be found in Chapter 7.

3.4 Verification of Continued Attainment

U.S. EPA guidance requires that air districts indicate how they will track the progress of their maintenance plans over time to ensure continued attainment.[51] Two options suggested by the guidance include: 1) periodic updates to the emissions inventory, and 2) periodic review of the inputs and assumptions used for the emission inventory and subsequent updates to the inventory if those inputs or assumptions have significantly changed. South Coast AQMD is committing to the latter option to verify continued attainment.

The underlying data for the Basin's emissions inventory is updated regularly. For example, South Coast

[51] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

AQMD maintains reported emissions data from major facilities through the Annual Emissions Reporting program and submits the data to CARB every year.[52] Traffic activity data, which is an essential input to estimate on-road mobile emissions, is updated every four years when Southern California Association of Governments (SCAG) develops a new regional transportation plan. The on-road motor vehicle emissions model, EMFAC, is updated approximately every three to five years. South Coast AQMD tracks emission reductions resulting from regulations and programs impacting stationary and mobile sources. In collaboration with CARB and SCAG, the methodologies, input data, and assumptions used to develop the emissions inventory are reviewed and updated as new data and/or methods become available. These reviews and updates are conducted regularly. If South Coast AQMD finds that the inputs to the emissions inventory have changed significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventories presented in this maintenance plan, and evaluate the potential impacts.

In addition, South Coast AQMD will analyze the PM2.5 ambient air quality data collected from its monitoring network to verify continued attainment of the standard. Specifically, as part of the contingency provisions described in the next section, the 24-hour PM2.5 concentrations will be compared with the 1997 24-hour PM2.5 NAAQS on an annual basis. South Coast AQMD commits to continue operation of a robust monitoring network, in accordance with 40 CFR part 58 and in consultation with U.S. EPA. A thorough discussion of the monitoring network is provided in Chapter 2.

3.5 Contingency Provisions

CAA Section 175A(d) requires maintenance plans to identify contingency provisions to promptly correct any violation of the standard which occurs after the redesignation of the area as attainment. Contingency provisions should, at minimum, identify control measures to be adopted and/or implemented as a contingency in the event of emission increases, a schedule and procedure for adoption and implementation, and a time limit for action by South Coast AQMD. The contingency provisions should also identify the indicators or triggers that will determine when contingency provision actions need to be implemented.

3.5.1 Definitions

Exceptional event (EE): Measurements that are removed from the calculation of design values. South Coast AQMD must submit an exceptional event demonstration that is concurred upon by U.S. EPA.

Contingency provision trigger value: A calculated statistic that is used to determine if the contingency provisions have been triggered. It is analogous to the design value except that "contingency provision exceptional events," defined below, are removed from the calculation. Further details are presented in Appendix V.

[52] South Coast AQMD, Annual Emissions Reporting webpage. https://www.aqmd.gov/home/rules-compliance/compliance/annual-emission-reporting

Contingency provision exceptional event: Measurements that are removed from the calculation of the contingency provision trigger value. South Coast AQMD will develop a contingency provision exceptional event demonstration (CEED) and submit the CEED to CARB and U.S. EPA for review. Upon submittal, South Coast AQMD will await further guidance from CARB and/or U.S. EPA staff. Contingency provision exceptional events could have occurred at any time in the latest 3-year period, not necessarily in the last year that is the subject of the most recent contingency provision trigger value calculation. CEEDs, submitted to CARB and U.S. EPA, can be disapproved by either agency. Further details are presented in Appendix V.

Contingency provision triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS, or a written notice by U.S. EPA to disagree with a submitted CEED.

Contingency provision actions triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. This determination will trigger the contingency provision actions.

3.5.2 Schedule for Implementation

The schedule for implementation of the contingency provisions is illustrated in Figure 4-3. By April 30 each year, South Coast AQMD will calculate the design value using quality assured monitoring data for the previous year. This timeline allows for the analysis of 24-hour integrated sample data, which requires laboratory analysis and is not available in real-time. If the design value exceeds the NAAQS, South Coast AQMD will evaluate potential contingency provision exceptional events that occurred in the latest three-year period and determine if they meet the criteria for a CEED. If a CEED is warranted, it will be prepared and submitted to U.S. EPA and CARB for concurrent review by May 31st. While this timeline requires an expedited analysis of the potential contingency provision exceptional events, it is consistent with the data certification timeline, which typically occurs in May. During the preparation of the CEED, South Coast AQMD will consult U.S. EPA and CARB to develop an approvable demonstration.

If neither a CEED nor an EE demonstration is submitted and South Coast AQMD determines that the contingency provision trigger value exceeds the NAAQS, then the contingency provision actions will be triggered. South Coast AQMD will start implementing the contingency provision actions as soon as the determination is made, which will be no later than June 1st of each year. South Coast AQMD will complete the implementation of contingency provision actions within 24 months from this determination.

If either CARB or U.S. EPA disagrees with a CEED, it may be necessary for South Coast AQMD to submit a comprehensive EE demonstration. If South Coast AQMD has submitted a comprehensive EE demonstration to U.S. EPA, South Coast AQMD will begin the implementation of the contingency provisions while awaiting U.S. EPA's decision on the submitted EE demonstration, even if U.S. EPA's concurrence on the EE demonstration would avoid triggering the contingency provision actions. During this period, South Coast AQMD will focus on identifying possible causes of the violation, opportunities

to reduce emissions, available funding if an incentive-based approach is needed, key stakeholders to solicit contingency provision actions, and other elements necessary to fully implement contingency provision actions upon U.S. EPA's rejection of the submitted EE demonstration. If U.S. EPA rejects the EE demonstration, it will trigger the full implementation of all contingency provision actions as necessary. South Coast AQMD will implement contingency provision actions, as needed, to avoid future exceedances of the standard. In this case, it may take longer than 24 months to complete implementation of the contingency provision actions. This timeline allows for up to 6 months for the South Coast AQMD to develop an EE demonstration including time for CARB review, up to an additional 12 months for U.S. EPA to concur or reject the EE demonstration after formal submission,[53] and up to 12 months for the South Coast AQMD to complete the implementation of necessary contingency provision actions. If U.S. EPA concurs on the EE demonstration, South Coast AQMD will stop the implementation of the contingency provisions and will not initiate contingency provision actions. Further details on contingency provision exceptional events and procedures are provided in Appendix V.

[53] U.S. EPA Exceptional Event Rule. The final rule and supporting documentation is available at https://www.epa.gov/air-quality-analysis/final-2016-exceptional-events-rule-supporting-guidance-documents-updated-faqs.

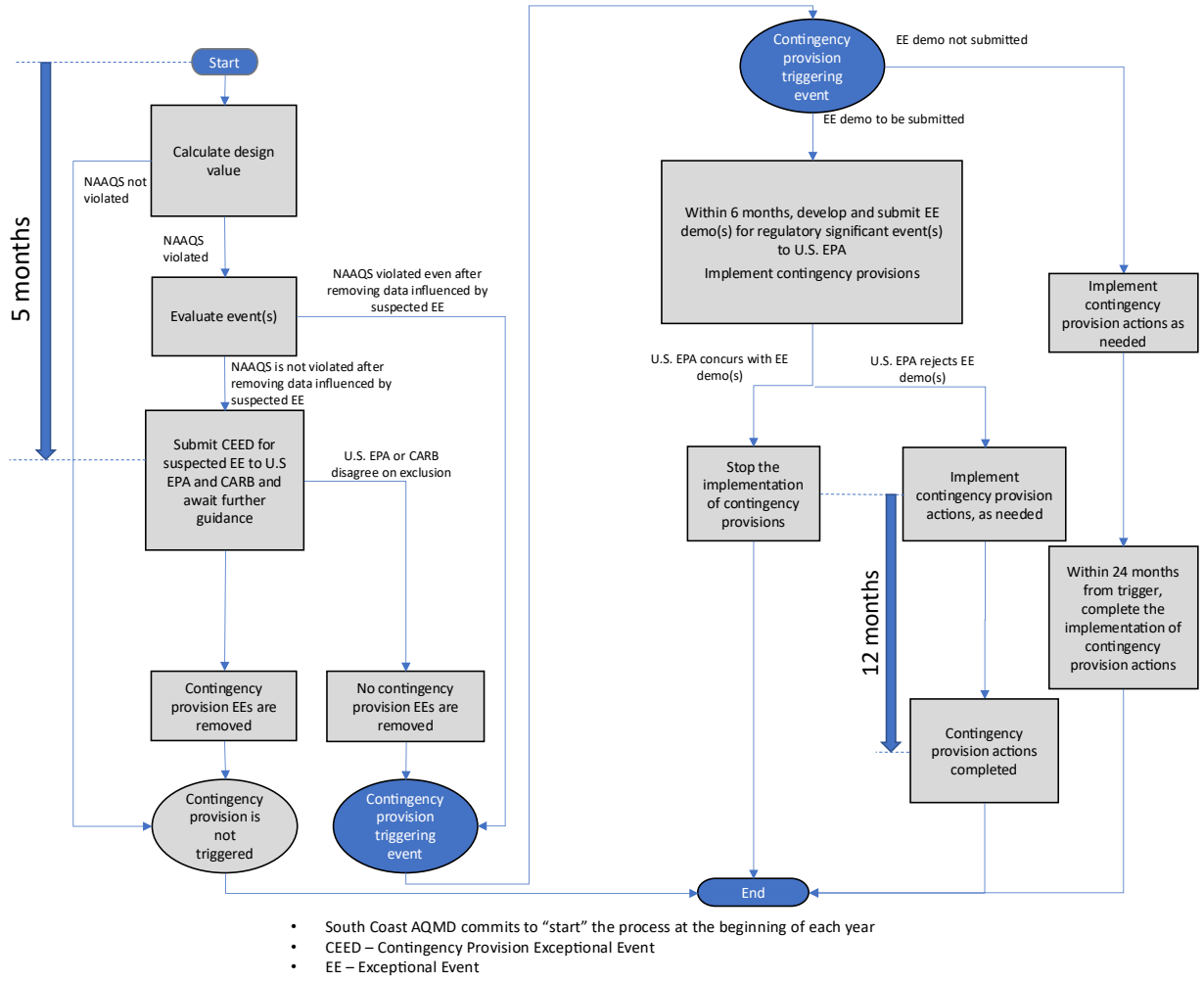


FIGURE 4-3
CONTINGENCY PROVISION TRIGGER AND SCHEDULE FOR IMPLEMENTATION

3.5.3 Contingency Provision Actions

The contingency provision actions begin implementation when the contingency provision trigger value exceeds 65 µg/m3, the level of the NAAQS, or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. South Coast AQMD will review available data to identify the emission sources that contributed to the exceedance. This review may involve an analysis of speciation data, source attribution studies, meteorological data, etc. Causes of the trigger event may include local and regional primary PM2.5 emission sources and secondary particulate matter formation. If the causes of the trigger event can be determined, South Coast AQMD will use this information when evaluating potential actions to target emission reductions for the emission sources that contributed to the exceedance. If the causes of the trigger event cannot be determined, South Coast AQMD will use a

granular-level emissions inventory, available advanced sensor-based monitoring data, or other large datasets to inform the contingency provision actions.

The contingency provision actions, specified below, will be evaluated and implemented as needed to address the cause of the exceedance and correct the exceedance as expeditiously as possible:

1. Consult with key stakeholders of the relevant emission sources to determine if voluntary or incentive-based control measures could reduce emissions, if feasible.
2. Evaluate whether changes to enforcement of existing rules could reduce emissions.
3. Evaluate amending Rule 445 - Wood-Burning Devices to further strengthen prohibitions on particulate emissions and to promote best management practices on biomass burning. An overview of this rule is provided in Section 2.2 of this chapter.
4. Propose new rules or modify other existing rules to reduce particulate emissions, if needed.

3.6 Commitment to Submit a Second Maintenance Plan

South Coast AQMD commits to adopt and submit a second maintenance plan eight years after U.S. EPA redesignates the Basin to attainment for the 1997 24-hour PM2.5 standard, in accordance with CAA Section 175A(b). The second maintenance plan will include a horizon year that is 20 years from the date of redesignation.

4.0 Summary Checklist

Table 4-5 summarizes the elements that need to be satisfied in order to meet CAA requirements, as well as conform to U.S. EPA's guidance. Sections 2.1 – 2.3 address the requirements associated with redesignation while Sections 3.1 – 3.6 contain the maintenance plan. Section 3.2 demonstrates maintenance of the 1997 24-hour PM2.5 NAAQS through 2039. Section 3.4 commits South Coast AQMD to maintain a future PM2.5 monitoring network and to verify continued attainment of the 1997 24-hour PM2.5 NAAQS by reviewing inputs and assumptions used for the emission inventory when new information becomes available. If South Coast AQMD finds that these inputs have changed significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventory presented in this maintenance plan, and evaluate the potential impacts. Section 3.5 establishes contingency provisions that are triggered by a measured violation of the 1997 24-hour PM2.5 NAAQS.

TABLE 4-5
SUMMARY CHECKLIST OF DOCUMENT REFERENCES

Element	CAA/U.S. EPA Requirement	Document Reference
Redesignation Request	Attainment of the standard	Section 2.1
Redesignation Request	Improvement due to permanent and enforceable reductions	Section 2.2
Redesignation Request	SIP approved under CAA Section 110(k)	Section 2.3
Redesignation Request	Satisfied applicable requirements under CAA Section 110 and Part D	Section 2.3
Maintenance Plan	Attainment inventory	Section 3.1; Chapter 3; Appendix III
Maintenance Plan	Maintenance demonstration	Section 3.2
Maintenance Plan	Transportation conformity	Section 3.3 Chapter 7
Maintenance Plan	Monitoring network	Section 3.4; Chapter 2
Maintenance Plan	Verification of continued attainment	Section 3.4
Maintenance Plan	Contingency provisions	Section 3.5
Maintenance Plan	Commitment to adopt second maintenance plan	Section 3.6

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 5: 1997 ANNUAL PM2.5 STANDARD REDESIGNATION REQUEST AND MAINTENANCE PLAN

1.0 Introduction

The South Coast Air Basin (Basin) is currently a "moderate" nonattainment area for the 1997 annual PM2.5 National Ambient Air Quality Standard (NAAQS or standard). In 2016, U.S. EPA determined that the Basin met the standard, thereby suspending certain Clean Air Act (CAA) planning requirements related to attainment.[54] The complete SIP history of the 1997 annual PM2.5 standard for the Basin is discussed in Chapter 1.

This chapter presents South Coast AQMD's request to redesignate the Basin to attainment for the 1997 annual PM2.5 standard. This request complies with the requirements of CAA Section 107(d)(3)(E): the standard has been met, emission reductions are permanent and enforceable, the SIP is approved under CAA Section 110(k), and all applicable Clean Air Act requirements have been satisfied.

In addition, this chapter includes a maintenance plan (Plan) as required under CAA Section 175A. The Plan demonstrates continued attainment through 2039, commits to maintaining the PM2.5 monitoring network, outlines methods for verifying continued attainment, and includes contingency provisions should violations occur.

2.0 Redesignation Request

2.1 Attainment of the Standard

The 1997 annual PM2.5 NAAQS is attained if the design value is less than or equal to 15.0 µg/m3. The Basin's design value is determined based on the monitoring site with the highest 3-year average of annual mean PM2.5 concentrations. Details on the monitoring network can be found in Chapter 2.

Design values during 2001 – 2024 were calculated to demonstrate attainment and analyze trends to provide evidence that the improvement in PM2.5 air quality is due to permanent and enforceable emission reductions. To evaluate trends in design values, measurements that are not regulatory significant but generally meet the definition of an exceptional event were removed. These events are defined as "suspected exceptional events" as they do not have a supporting exceptional event demonstration because removal or inclusion of the exceedance does not have regulatory significance. Exceptional events are those data points where the concentration was caused by a natural event or activity that is unlikely to recur and that is not reasonably controllable or preventable. For this analysis, only July 4th and 5th are considered suspected exceptional events. According to Title 40 in the Code of Federal Regulations, fireworks that are significantly integral to traditional national, ethnic, or other cultural events are

[54] U.S. EPA, Clean Data Determination for 1997 PM2.5 Standards; California-South Coast; Applicability of Clean Air Act Requirements, 81 Fed. Reg. 48350, July 26, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

considered exceptional events.[55] Wildfires may also be considered PM2.5 exceptional events but these were not removed from the trends analysis.

In 2016, U.S. EPA finalized a determination that the Basin attained the 1997 annual PM2.5 NAAQS with a design value of 14.8 µg m^{-3} at Mira Loma based on 2011 – 2013 monitoring data.[56] The design values presented in this Plan demonstrate that the Basin continues to meet the 1997 annual PM2.5 NAAQS as shown in Figure 5-1. In addition, there has been an overall downward trend in the Basin's design value despite regional growth and periodic drought, which is conducive to elevated PM2.5 concentrations. Appendix II includes an analysis of meteorology in the 2022 – 2024 time period, providing additional evidence that meteorology was not favorable for lower concentrations during 2022–2024.

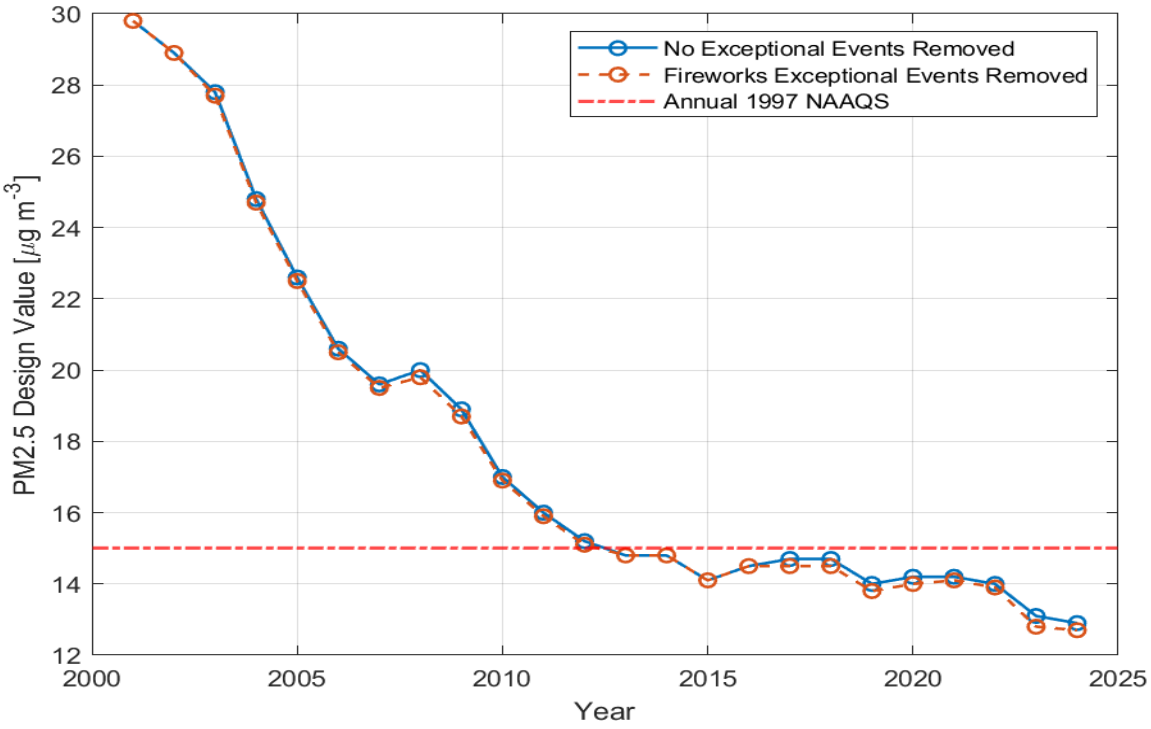


FIGURE 5-1
ANNUAL PM2.5 DESIGN VALUES FOR THE SOUTH COAST AIR BASIN FROM 2001 TO 2024

Table 5-1 shows design values calculated for the 2022 – 2024 three year period before and after removing July 4th and 5th, suspected exceptional events due to fireworks. Before removing any events, the highest annual PM2.5 design value in the Basin is 12.9 µg m-3 at Ontario-Route 60 Near Road, and after removing

[55] Title 40 Code of Federal Regulations, Part 50.14 (b)(2) (40 CFR § 50.14(b)(2)) https://www.ecfr.gov/current/title-40/part-50/section-50.14#p-50.14(b)(2)

[56] U.S. EPA, Clean Data Determination for 1997 PM2.5 Standards; California-South Coast; Applicability of Clean Air Act Requirements, 81 Fed. Reg. 48350, July 25, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

the fireworks days the highest design value is 12.7 µg m-3. Thus, the Basin met the 1997 annual PM2.5 NAAQS during 2022 – 2024 because the design value is less than the NAAQS. The design station–the station with the highest design value in the basin–has been Ontario-Route 60 Near Road since 2017. This persistent decrease of design value over time matches the general downward trends of direct PM2.5 and its precursor emissions, providing evidence that concentration reductions are due to emission reductions rather than favorable meteorology.

TABLE 5-1
DESIGN VALUES FOR THE 1997 ANNUAL PM2.5 NAAQS IN THE SOUTH COAST AIR BASIN DURING 2022-2024 WITH AND WITHOUT REMOVING FIREWORK DAYS, SUSPECTED EXCEPTIONAL EVENTS

State Code	County Code	Site Number	Site Name	No Exceptional Events Removed	Suspected Exceptional Events Removed
06	037	1103	Los Angeles-North Main Street	11.1	11
06	037	1201	Reseda	9.2	9.1
06	037	1302	Compton	11.9	11.8
06	037	1602	Pico Rivera #2	11.5	11
06	037	2005	Pasadena	10	9.6
06	037	4008	Long Beach-Route 710 Near Road	11.5	11.5
06	059	0007	Anaheim	9.8	9.7
06	065	8001	Rubidoux	11.3	11.2
06	065	8005	Mira Loma (Van Buren)	12.4	12.3
06	071	0027	Ontario-Route 60 Near Road	12.9	12.7
06	071	2002	Fontana	11.9	11.5
06	071	8001	Big Bear	7.4	7.4
06	071	9004	San Bernardino	11.7	11.5

To demonstrate the reduction in concentrations at stations throughout the Basin over the past decade, we plotted design value trends of the stations with the highest design values in Figure 5-2. There is a decreasing trend at all of these stations since their measurements began.

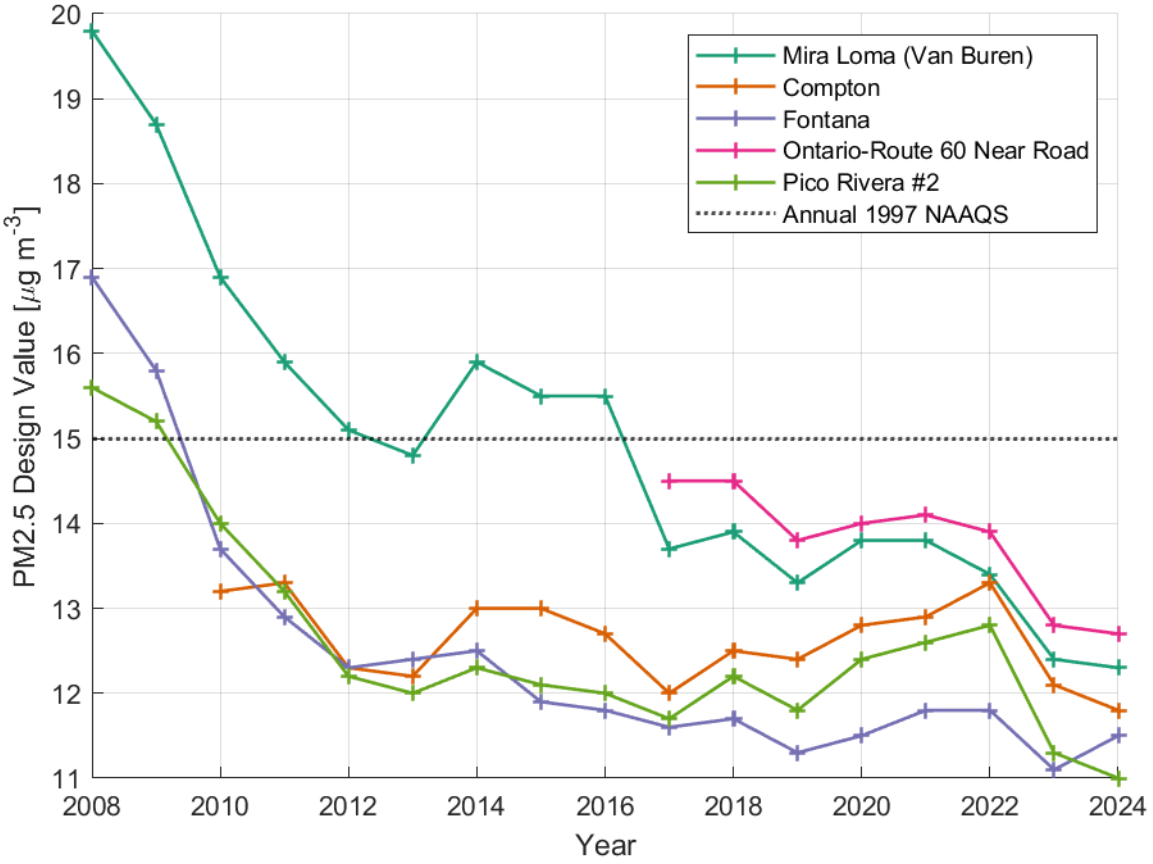


FIGURE 5-2
TREND OF ANNUAL PM2.5 DESIGN VALUES AT SEVERAL STATIONS WITHOUT FIREWORK DAYS, SUSPECTED EXCEPTIONAL EVENTS

2.2 Permanent and Enforceable Emission Reductions

The improvement in PM2.5 must be attributable to permanent and enforceable emission reductions for U.S. EPA to redesignate an area to attainment. Attainment based on temporary emission reductions or unusually favorable meteorology does not satisfy the criteria for redesignation to attainment. As shown in Figure 5-1, the Basin has not exceeded the 1997 annual PM2.5 NAAQS over the last decade. The improvement observed in PM2.5 concentrations is therefore not due to temporary reductions or unusually favorable meteorology. Appendix II presents a detailed evaluation of recent meteorology to further support this claim.

U.S. EPA guidance recommends quantifying the percentage reduction of emissions from the year used

to designate an area as nonattainment as part of a redesignation request.[57] The Basin was originally designated as nonattainment for the 1997 annual PM2.5 standard based on the 2003 design value, which reflected measurements taken from 2001 to 2003. The 2007 Air Quality Management Plan (AQMP), which was the first AQMP to address the 1997 PM2.5 NAAQS, used 2002 as the base year for emissions inventory development. Considering these two factors, the emissions inventory for 2002 was selected for comparison. California Emissions Projection Analysis Model (CEPAM) 2022 PM2.5 SIP v1.00 was used to estimate 2002 emissions and the 2023 emissions are from the attainment inventory provided in Chapter 3.

As shown in Table 5-2, all pollutant emissions have decreased substantially, especially PM2.5, VOC, NOx, and SOx emissions, which have been reduced by 27%, 73%, 53%, and 83%, respectively, since 2002. These reductions are attributable to regulations and programs that reduce emissions from stationary and mobile sources. For discussion of the key regulations and programs contributing to the reductions, refer to Chapter 4, Section 2.2. The regulations that contributed to attainment of the 1997 24-hour PM2.5 NAQQS also contributed to improvements in annual PM2.5 levels in the Basin. The extensive history of air quality regulation in the Basin provides strong evidence that the improvement in air quality is due to permanent and enforceable emission reductions.

TABLE 5-2
REDUCTION OF ANNUAL AVERAGE BASIN TOTAL EMISSIONS OF PM2.5 AND ITS PRECURSORS FROM 2002 TO 2023*

	2002 (tons per day)	2023 (tons per day)	Reductions from 2002 to 2023 (%)
PM2.5	71.98	52.63	26.9
NOx	948.49	254.44	73.2
VOC	772.95	363.65	53.0
SOx	76.45	13.00	83.0
NH3	95.19	73.75	22.5

*Emissions for 2002 are derived from CEPAM2022 PM2.5 SIP Version 1.00

2.3 SIP and Compliance with CAA

To be eligible for redesignation, an area must have an approved SIP and be in compliance with all applicable requirements under Section 110 and Part D of the CAA. Chapter 1 discusses the history of the

[57] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment, 1992. Memorandum from John Calcagni to USEPA Regional Directors. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

1997 annual PM2.5 standard in the Basin, including U.S. EPA's approval of attainment plans. In summary, multiple PM2.5 SIP elements in the 2007 AQMP were approved by U.S. EPA in 2011 except for the contingency measures element which was disapproved.[58] However, U.S. EPA later approved the contingency measures element following the submission of a SIP revision.[59] Therefore, the Basin has an approved SIP for the 1997 annual PM2.5 standard.

Although PM2.5 attainment plans have been approved, U.S. EPA has long held that requirements associated with attainment are not applicable for purposes of evaluating whether an area that has attained the standard qualifies for redesignation.[60] This interpretation is rooted in the General Preamble and the Calcagni memorandum[61] which states: "The requirements for reasonable further progress … and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard." As the Basin already attains the 1997 annual PM2.5 standard, the remaining applicable CAA requirements for a "moderate" nonattainment area include:

1. An emission inventory under section 172(c)(3);
2. A permit program for the construction and operation of new and modified major stationary sources of $PM_{2.5}$ under sections 172(c)(5) and 189(a)(1)(A);
3. Control requirements for major stationary sources of $PM_{2.5}$ precursors under section 189(e), except where the Administrator determines that such sources do not contribute significantly to $PM_{2.5}$ levels that exceed the standard in the area;
4. Requirements under section 172(c)(7) that meet the applicable provisions of section 110(a)(2); and
5. Provisions to ensure that federally supported or funded projects conform to the air quality planning goals in the applicable SIP under section 176(c).

The following sections discuss South Coast AQMD's fulfillment of these requirements.

[58] U.S. EPA, Approval of Air Quality Implementation Plans; California; South Coast; Attainment Plan for 1997 PM2.5 Standards, 76 Fed. Reg. 69928, November 9, 2011. https://www.federalregister.gov/documents/2011/11/09/2011-27620/approval-of-air-quality-implementation-plans-california-south-coast-attainment-plan-for-1997-pm25

[59] U.S. EPA, Approval and Promulgation of Implementation Plans; California; South Coast; Contingency Measures for 1997 PM2.5 Standards, 78 Fed. Reg. 64402, October 29, 2013. https://www.federalregister.gov/documents/2013/10/29/2013-25182/approval-and-promulgation-of-implementation-plans-california-south-coast-contingency-measures-for?utm_

[60] U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 13498, April 16, 1992. https://archives.federalregister.gov/issue_slice/1992/4/16/13412-13570.pdf#page=87

[61] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

2.3.1 Emissions Inventory

Chapter 3 and Appendix III present a comprehensive, accurate, current inventory of PM2.5 and its precursors for 2023 and future milestone years. Thus, this plan satisfies the requirement for an emissions inventory.

2.3.2 Permit Program for New or Modified Stationary Sources

CAA Section 172(c) requires permits for the construction and operation of new or modified major stationary sources. New Source Review (NSR) for major and in some cases minor sources of PM2.5 and its precursors is presently addressed through South Coast AQMD's NSR and RECLAIM programs (Regulations XIII and XX, respectively). Both programs are applicable to sources located in the South Coast AQMD jurisdiction, including the South Coast Air Basin and the Coachella Valley. Regulation XIII establishes the federal and State mandated pre-construction review program for new, modified, or relocated sources. The NSR program ensures that all new and modified sources install BACT and their emission increases are fully offset with creditable emission reductions.

The components of South Coast AQMD's NSR program are contained within Regulation XIII. Rule 1325 was first adopted on June 3, 2011 to incorporate U.S. EPA's requirements for PM2.5 and its precursors into Regulation XIII. The rule mirrors federal requirements which include the definition of major source, significant emissions rate, offset ratios, and the applicability requirements of Lowest Achievable Emission Rate (LAER), facility compliance, offsets, and control of PM2.5 precursors. In 2021, U.S. EPA approved Rule 1325 as meeting all applicable NSR requirements.[62]

RECLAIM facilities are currently not subject to emission offsets for NOx and SOx under Regulation XIII; however, these facilities are instead subject to NOx and SOx emission offsets under Regulation XX. In 2017, U.S. EPA approved the emission offset requirements for RECLAIM facilities.[63] The RECLAIM transition to a command-and-control regulatory structure will require former RECLAIM sources to become subject to traditional NSR for NOx and SOx under Regulation XIII, as applicable.

VOC and ammonia emissions are also subject to BACT under existing NSR. VOC emissions are required to be offset when a new or modified source has the potential to emit 4 tons per year or more of VOC. Ammonia emission sources have not historically been subject to NSR offset requirements. However, for permitted ammonia sources, Rule 1303 (NSR Requirements) requires denial of "the Permit to Construct for any relocation, or for any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is employed for the new or relocated source or for the actual modification to an existing source." BACT shall be at

[62] U.S. EPA, Air Plan Approval; California; South Coast Air Quality Management District; Stationary Source Permits, 86 Fed. Reg. 58592, October 22, 2021. https://www.federalregister.gov/documents/2021/10/22/2021-22884/air-plan-approval-california-south-coast-air-quality-management-district-stationary-source-permits

[63] U.S. EPA, Approval of California Air Plan Revisions, South Coast Air Quality Management District, 82 Fed. Reg. 43176, September 14, 2017. https://www.federalregister.gov/documents/2017/09/14/2017-19454/approval-of-california-air-plan-revisions-south-coast-air-quality-management-district

least as stringent as LAER as defined in CAA Section 171(3); therefore, South Coast AQMD's current regulations requiring BACT comply with the federal LAER requirements.

2.3.3 PM Precursor Requirement in Nonattainment NSR

CAA Section 189(e) states that control requirements applicable to plans in effect for major stationary PM sources shall also apply to major stationary sources of PM precursors, except where such sources do not contribute significantly to PM levels which exceed the standard in the area. Rule 1325 defines a major stationary source as a facility that has the potential to emit 70 or more tons per year of PM2.5 or PM2.5 precursors, including NOx, VOC, ammonia, and SOx. In 2021, U.S. EPA approved Rule 1325 as meeting all applicable NSR requirements.[64]

2.3.4 Compliance with CAA Section 110(a)(2)

CAA Section 110(a)(2) contains general SIP requirements, including those related to enforceable emission limitations; monitoring, compiling and analyzing of ambient air quality data; preconstruction review of new or modified stationary sources; the availability of funding, staff, and resources necessary to implement the SIP; and assurances that the State maintains responsibility for ensuring adequate implementation of the SIP. South Coast AQMD and CARB have submitted and U.S. EPA has approved SIP revisions addressing the general CAA Section 110 provisions for the 1997 annual PM2.5 standard in the Basin.[65] There are no outstanding or disapproved SIP elements that prevent redesignation for the 1997 annual PM2.5 standard.

[64] U.S. EPA, Air Plan Approval; California; South Coast Air Quality Management District; Stationary Source Permits, 86 Fed. Reg. 58592, October 22, 2021. https://www.federalregister.gov/documents/2021/10/22/2021-22884/air-plan-approval-california-south-coast-air-quality-management-district-stationary-source-permits

[65] U.S. EPA, EPA-Approved South Coast Air District Regulations in the California SIP. https://www.epa.gov/air-quality-implementation-plans/epa-approved-south-coast-air-district-regulations-california-sip

2.3.5 General and Transportation Conformity

Under CAA Section 176(c), states are required to establish criteria and procedures to ensure that federally supported or funded projects conform to the air quality planning goals in the applicable SIP. Section 176(c) further provides that state conformity provisions must be consistent with federal conformity regulations that the CAA requires U.S. EPA to promulgate. U.S. EPA's conformity regulations are codified at 40 CFR part 93, subparts A (referred to herein as "transportation conformity") and B (referred to herein as "general conformity"). Pursuant to 40 CFR part 93 and CAA section 107(d), transportation conformity budgets are provided in Chapter 7. However, conformity determinations for the 1997 annual PM2.5 standard will no longer be required once the Basin has been redesignated to attainment for the standard. This is because transportation conformity budgets are not required for a revoked standard.[66]

2.3.6 Summary

The Basin has a fully approved SIP for the 1997 annual PM2.5 standard and South Coast AQMD has complied with all applicable CAA requirements.

3.0 Maintenance Plan

To comply with CAA Sections 107(d)(3)(E) and 175A, South Coast AQMD has developed a maintenance plan to ensure continued attainment of the 1997 annual PM2.5 standard for at least 10 years following redesignation. The maintenance plan addresses requirements applicable to the 1997 annual PM2.5 standard which include an emissions inventory, a maintenance demonstration, monitoring network requirements, verification of continued attainment, and contingency provisions. Because the 1997 annual PM2.5 standard is revoked in areas redesignated to attainment, submission of a second 10-year maintenance plan will not be required for the Basin.[67] Therefore, the maintenance plan does not include a commitment to submit a second maintenance plan 8 years after redesignation.

3.1 Attainment Inventory

U.S. EPA guidance recommends that areas develop an attainment inventory that represents emissions during the time period associated with the monitoring data showing attainment.[68] The most recent year with an attaining design value for the 1997 annual PM2.5 standard is 2024, based on 2022-2024 data.

[66] U.S. EPA, Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 Fed. Reg. 48350, July 25, 2016. https://www.federalregister.gov/documents/2016/07/25/2016-17410/clean-data-determination-for-1997-pm25-standards-california-south-coast-applicability-of-clean-air

[67] U.S. EPA, Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, 81 Fed. Reg. 58010, August 24, 2016. https://www.federalregister.gov/documents/2016/08/24/2016-18768/fine-particulate-matter-national-ambient-air-quality-standards-state-implementation-plan

[68] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

Therefore, 2023 provides an appropriate foundation for the attainment inventory. The 2023 attainment inventory is presented in Chapter 3 and Appendix III.

3.2 Maintenance Demonstration

Section 175A(a) of the CAA requires a demonstration of maintenance of the NAAQS for at least 10 years after redesignation. The maintenance horizon year in this plan is 2039, which will cover a period of more than 10 years after U.S. EPA approves the redesignation request. Generally, areas can demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future anticipated mix of sources and emission rates will not cause a violation of the NAAQS. In addition, South Coast AQMD consulted with U.S. EPA for the most appropriate approach to demonstrate maintenance. Considering all these factors, this maintenance demonstration utilizes a proportional rollback method, where the 2024 design value is scaled to reflect changes in the emissions corresponding to PM2.5 chemical species between 2023 and 2039. The detailed methodology describing how the future values are calculated is presented in Appendix IV.

The maintenance demonstration for the 1997 annual PM2.5 NAAQS uses 2023 as the base year (attainment year) emissions inventory and includes 2033 (interim milestone year) and 2039 (maintenance horizon year). Chapter 3, Figure 3-1, shows how emissions of PM2.5 and its precursors change from 2023 to 2033 and 2039. Future emissions of NOx and VOCs will decline after 2023, while direct PM2.5, NH3, and SOx emissions will marginally increase or remain almost unchanged. However, the large reduction in NOx emissions will ensure maintenance of the 1997 annual PM2.5 standard. Further, the inventory does not project sudden increases in emissions during any year between 2023 and 2039, providing assurance that the standard will not be exceeded during interim years.

The annual PM2.5 projected design values for 2039 are shown in Table 5-3. To demonstrate maintenance of the 1997 annual PM2.5 standard, future design values must be less than or equal to 15.0 µg/m³. By 2039, Ontario is expected to have the highest annual PM2.5 design value among all monitoring sites, at 12.7 µg/m³, which is well below the 1997 annual PM2.5 NAAQS. Furthermore, this wide margin below the NAAQS means that an unforeseen loss in emission reductions would be unlikely to jeopardize the maintenance demonstration. Future design values exhibit little to no change because the decrease in ammonium nitrate is offset by increases in other chemical species. Refer to Appendix IV for details on the speciation.

TABLE 5-3

PROJECTED ANNUAL PM2.5 DESIGN VALUES (μg/m^3) FOR 2033 AND 2039

Monitoring Site	2024 DV (μg/m^3)	2033 DV (μg/m^3)	2039 DV (μg/m^3)
Anaheim	9.8	9.8	9.8
Big Bear	7.4	7.3	7.3
Compton	11.9	11.8	11.8
Fontana	11.9	11.7	11.7
Long Beach-Route 710 Near Road	11.5	11.4	11.4
Los Angeles-North Main Street	11.2	11.1	11.1
Mira Loma (Van Buren)	12.4	12.2	12.2
Ontario-Route 60 Near Road	12.9	12.7	12.7
Pasadena	10.0	9.9	9.9
Pico Rivera #2	11.5	11.4	11.4
Reseda	9.2	9.1	9.1
Rubidoux	11.3	11.2	11.1
San Bernardino	11.7	11.5	11.5
Signal Hill (LBSH)	9.2	9.1	9.1

3.3 Transportation Conformity

Details on transportation conformity can be found in Chapter 7.

3.4 Verification of Continued Attainment

U.S. EPA guidance requires that air districts indicate how they will track the progress of their maintenance plans over time to ensure continued attainment.[69] Two options suggested by the guidance include: 1) periodic updates to the emissions inventory, and 2) periodic review of the inputs and assumptions used for the emission inventory and subsequent updates to the inventory if those inputs or assumptions have significantly changed. South Coast AQMD is committing to the latter option to verify continued attainment.

The underlying data for the Basin's emissions inventory is updated regularly. South Coast AQMD maintains reported emissions data from major facilities through the Annual Emissions Reporting program and submits the data to CARB every year.[70] Traffic activity data, which is an essential input to

[69] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

[70] South Coast AQMD, Annual Emissions Reporting. https://www.aqmd.gov/home/rules-compliance/compliance/annual-emission-reporting

estimate on-road mobile emissions, is updated every four years when Southern California Association of Governments (SCAG) develops a new regional transportation plan. The on-road motor vehicle emissions model, EMFAC, is updated approximately every three to four years. South Coast AQMD tracks emission reductions resulting from regulations and programs impacting stationary and mobile sources. In collaboration with CARB and SCAG, the methodologies, input data, and assumptions used to develop the emissions inventory are reviewed and updated as new data and/or methods become available. These reviews and updates are conducted regularly. If South Coast AQMD finds that the inputs to the emissions inventory have changed significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventories presented in this maintenance plan, and evaluate the potential impacts.

In addition, South Coast AQMD will analyze the PM2.5 ambient air quality data collected from its monitoring network to verify continued attainment of the standard. Each year, as part of the contingency provisions described in the next section, the annual average PM2.5 concentrations from monitoring stations will be compared with the 1997 annual average PM2.5 NAAQS. South Coast AQMD commits to continue operation of a robust monitoring network, in accordance with 40 CFR part 58 and in consultation with U.S. EPA and CARB. A thorough discussion of the monitoring network is provided in Chapter 2.

3.5 Contingency Provisions

CAA Section 175A(d) requires maintenance plans to identify contingency provisions to promptly correct any violation of the standard which occurs after the redesignation of the area as attainment. Contingency provisions should, at minimum, identify control measures to be adopted and/or implemented as a contingency in the event of emission increases, a schedule and procedure for adoption and implementation, and a time limit for action by South Coast AQMD. The contingency provisions should also identify the indicators or triggers that will determine when contingency provision actions need to be implemented.

3.5.1 Definitions

Exceptional event (EE): Measurements that are removed from the calculation of design values. South Coast AQMD must submit an exceptional event demonstration that is concurred upon by U.S. EPA.

Contingency provision trigger value: A calculated statistic that is used to determine if the contingency provisions have been triggered. It is analogous to the design value except that "contingency provision exceptional events," defined below, are removed from the calculation. Further details are presented in Appendix V.

Contingency provision exceptional event: Measurements that are removed from the calculation of the contingency provision trigger value. South Coast AQMD will develop a contingency provision exceptional event demonstration (CEED) and submit the CEED to CARB and U.S. EPA for review. Upon submittal, South

Coast AQMD will await further guidance from CARB and/or U.S. EPA staff. Contingency provision exceptional events could have occurred at any time in the latest 3-year period, not necessarily in the last year that is the subject of the most recent contingency provision trigger value calculation. CEEDs, submitted to CARB and U.S. EPA, can be disapproved by either agency. Further details are presented in Appendix V.

Contingency provision triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS, or a written notice by U.S. EPA to disagree with a submitted CEED.

Contingency provision actions triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. This determination will trigger the contingency provision actions.

3.5.2 Schedule for Implementation

The schedule for implementation of the contingency provisions is illustrated in Figure 5-3. By April 30 each year, South Coast AQMD will calculate the design value using quality assured monitoring data for the previous year. This timeline allows for the analysis of 24-hour integrated sample data, which requires laboratory analysis and is not available in real-time. If the design value exceeds the NAAQS, South Coast AQMD will evaluate potential contingency provision exceptional events that occurred in the latest three-year period and determine if they meet the criteria for a CEED. If a CEED is warranted, it will be prepared and submitted to U.S. EPA and CARB for concurrent review by May 31st. While this timeline requires an expedited analysis of the potential contingency provision exceptional events, it is consistent with the data certification timeline, which typically occurs in May. During the preparation of the CEED, South Coast AQMD will consult U.S. EPA and CARB to develop an approvable demonstration.

If neither a CEED nor an EE demonstration is submitted and South Coast AQMD determines that the contingency provision trigger value exceeds the NAAQS, then the contingency provision actions will be triggered. South Coast AQMD will start implementing the contingency provision actions as soon as the determination is made, which will be no later than June 1st of each year. South Coast AQMD will complete the implementation of contingency provision actions within 24 months from this determination.

If either CARB or U.S. EPA disagrees with a CEED, it may be necessary for South Coast AQMD to submit a comprehensive EE demonstration. If South Coast AQMD has submitted a comprehensive EE demonstration to U.S. EPA, South Coast AQMD will begin the implementation of the contingency provisions while awaiting U.S. EPA's decision on the submitted EE demonstration, even if U.S. EPA's concurrence on the EE demonstration would avoid triggering the contingency provision actions. During this period, South Coast AQMD will focus on identifying possible causes of the violation, opportunities to reduce emissions, available funding if an incentive-based approach is needed, key stakeholders to solicit contingency provision actions, and other elements necessary to fully implement contingency

provision actions upon U.S. EPA's rejection of the submitted EE demonstration. If U.S. EPA rejects the EE demonstration, it will trigger the full implementation of all contingency provision actions as necessary. South Coast AQMD will implement contingency provision actions, as needed, to avoid future exceedances of the standard. In this case, it may take longer than 24 months to complete implementation of the contingency provision actions. This timeline allows for up to 6 months for the South Coast AQMD to develop an EE demonstration including time for CARB review, up to an additional 12 months for U.S. EPA to concur or reject the EE demonstration after formal submission,[71] and up to 12 months for the South Coast AQMD to complete the implementation of necessary contingency provision actions. If U.S. EPA concurs on the EE demonstration, South Coast AQMD will stop the implementation of the contingency provisions and will not initiate contingency provision actions. Further details on contingency provision exceptional events and procedures are provided in Appendix V.

[71] U.S. EPA Exceptional Event Rule. The final rule and supporting documentation is available at https://www.epa.gov/air-quality-analysis/final-2016-exceptional-events-rule-supporting-guidance-documents-updated-faqs.

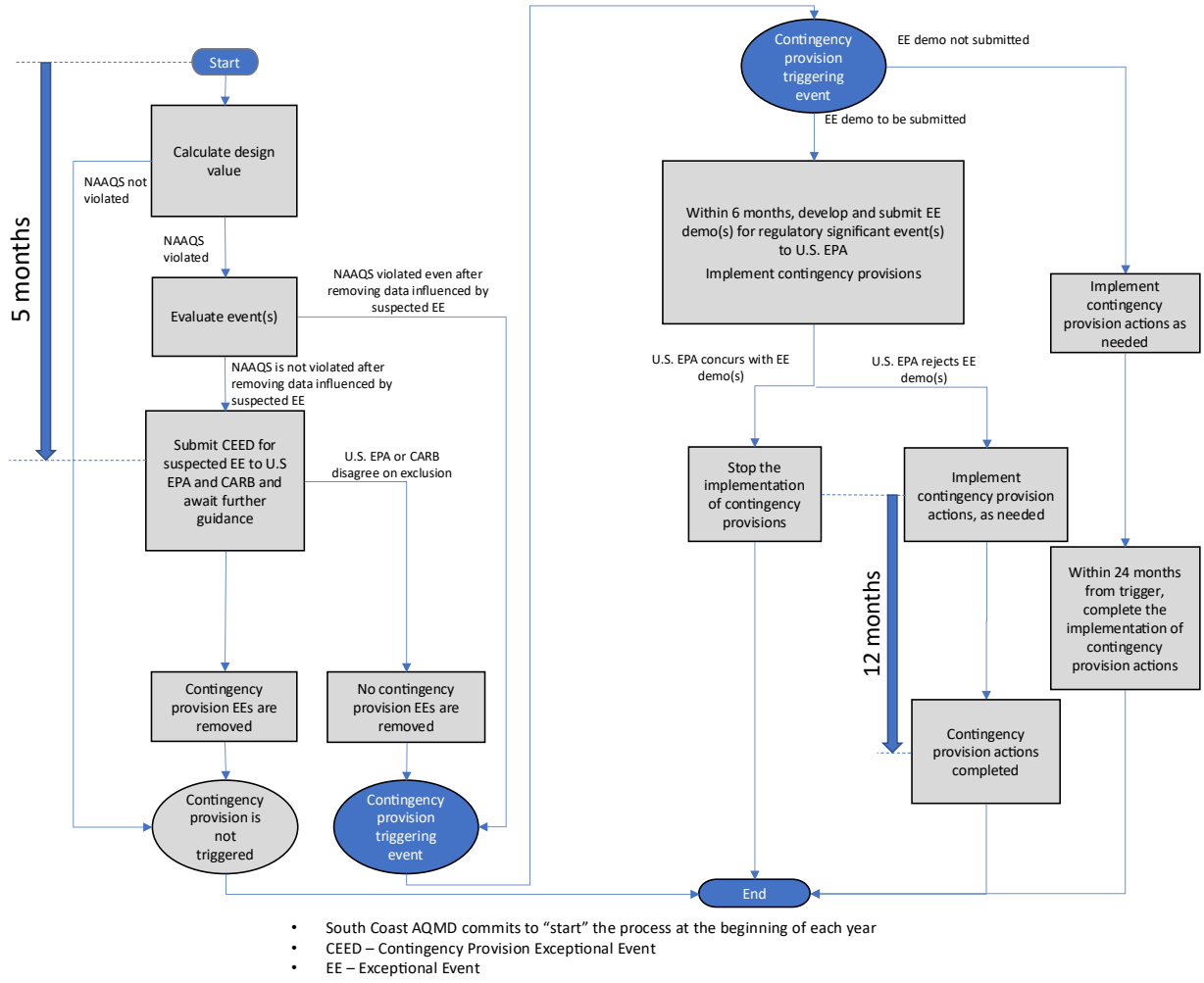


FIGURE 5-3
CONTINGENCY PROVISION TRIGGER AND SCHEDULE FOR IMPLEMENTATION

3.5.3 Contingency Provision Actions

The contingency provision actions begin implementation when the contingency provision trigger value exceeds 15.0 µg/m3, the level of the NAAQS, or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. South Coast AQMD will review available data to identify the emission sources that contributed to the exceedance. This review may involve an analysis of speciation data, source attribution studies, meteorological data, etc. Causes of the trigger event may include local and regional primary PM2.5 emission sources and secondary particulate matter formation. If the causes of the trigger event can be determined, South Coast AQMD will use this information when evaluating potential actions to target emission reductions for the emission sources that contributed to the exceedance. If the causes of the trigger event cannot be determined, South Coast AQMD will use a

granular-level emissions inventory, available advanced sensor-based monitoring data, or other large datasets to inform the contingency provision actions.

The contingency provision actions, specified below, will be evaluated and implemented as needed to address the cause of the exceedance and correct the exceedance as expeditiously as possible:

1. Consult with key stakeholders of the relevant emission sources to determine if voluntary or incentive-based control measures could reduce emissions, if feasible.
2. Evaluate whether changes to enforcement of existing rules could reduce emissions.
3. Evaluate amending Rule 445 - Wood-Burning Devices to further strengthen prohibitions on particulate emissions and to promote best management practices on biomass burning. An overview of this rule is provided in Section 2.2 of this chapter.
4. Propose new rules or modify other existing rules to reduce particulate emissions, if needed.

4.0 Summary Checklist

Table 5-4 summarizes the elements that need to be satisfied in order to meet CAA requirements as well as conform to U.S. EPA's guidance. Sections 2.1 – 2.3 address the requirements associated with redesignation while Sections 3.1 – 3.5 contain the maintenance plan. Section 3.2 demonstrates maintenance of attainment of the 1997 annual PM2.5 NAAQS through 2039. Section 3.4 commits South Coast AQMD to maintain a future PM2.5 monitoring network and to verify continued attainment by reviewing inputs and assumptions used for the emission inventory when new information becomes available. If South Coast AQMD finds that these inputs have changed significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventory presented in this maintenance plan, and evaluate the potential impacts. Section 3.5 establishes contingency provisions that are triggered by a measured violation of the 1997 annual PM2.5 NAAQS.

TABLE 5-4
SUMMARY CHECKLIST OF DOCUMENT REFERENCES

Element	CAA/U.S. EPA Requirement	Document Reference
Redesignation Request	Attainment of the standard	Section 2.1
Redesignation Request	Improvement due to permanent and enforceable reductions	Section 2.2
Redesignation Request	SIP approved under CAA Section 110(k)	Section 2.3
Redesignation Request	Satisfied applicable requirements under CAA Section 110 and Part D	Section 2.3
Maintenance Plan	Attainment inventory	Section 3.1; Chapter 3; Appendix III
Maintenance Plan	Maintenance demonstration	Section 3.2
Maintenance Plan	Transportation conformity	Section 3.3; Chapter 7
Maintenance Plan	Monitoring network	Section 3.4; Chapter 2
Maintenance Plan	Verification of continued attainment	Section 3.4
Maintenance Plan	Contingency provisions	Section 3.5

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 6: 1987 24-HOUR PM10 STANDARD SECOND MAINTENANCE PLAN

1.0 Introduction

Although the South Coast Air Basin (Basin) was previously classified as a "serious" nonattainment area for the 1987 24-hour PM10 NAAQS, PM10 levels improved significantly beginning in 2004. In April 2010, South Coast AQMD submitted a redesignation request and maintenance plan to U.S. EPA in accordance with CAA Sections 107(d)(3)(E) and 175A. Effective July 26, 2013, U.S. EPA redesignated the Basin to attainment for the 24-hour PM10 standard and approved the maintenance plan.[72] CAA Section 175A(b) requires the submission of a second maintenance plan eight years after an area has been redesignated to attainment. Accordingly, South Coast AQMD submitted the second PM10 maintenance plan to U.S. EPA in 2021. However, as discussed in detail in Chapter 1, U.S. EPA expressed concerns regarding a high PM10 measurement in 2018 that was invalidated by South Coast AQMD staff due to direct impact from nearby construction activities. Therefore, U.S. EPA did not act on the 2021 maintenance plan. To address the concern raised by U.S. EPA, a revised maintenance plan was developed.

The revised maintenance plan for the 1987 24-hour PM10 standard (PM10 Maintenance Plan) covers 2023 through 2033. It is designed to comply with CAA Section 175A and U.S. EPA guidance and includes monitoring data showing continued attainment, a maintenance demonstration, verification of continued attainment, transportation conformity, and contingency provisions.[73]

2.0 Monitoring Data Showing Continued Attainment

This section includes a description of the South Coast AQMD monitoring network for PM10 in the Basin, an analysis of PM10 trends, an analysis of trends of meteorological factors that influence PM10 concentrations, and a discussion of exceedances of the NAAQS for the 2010 - 2020 period. In addition, this section provides a list of exceedances of the PM10 NAAQS during the first maintenance period and PM10 exceptional events for which South Coast AQMD is preparing exceptional event demonstrations for submission to U.S. EPA to request exclusion of the events from comparison with the NAAQS. This analysis demonstrates that the Basin has continued to attain the PM10 standard during the first maintenance plan period and that meteorological factors during the first maintenance period were not unusually favorable

[72] U.S. EPA, Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; California; South Coast Air Basin; Approval of PM10 Maintenance Plan and Redesignation to Attainment for the PM10 Standard, 78 Fed. Reg. 38223, June 26, 2013. https://www.federalregister.gov/documents/2013/06/26/2013-15145/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning

[73] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment. Memorandum from John Calcagni to U.S. EPA Regional Directors. September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

to lower pollutant levels. This section also discusses the major sources of PM10 and South Coast AQMD rules that regulate emissions of particulate matter in the Basin.

2.1 PM10 Trends and Influence of Meteorological Factors Over the First Maintenance Period

Attainment of the 24-hour PM10 NAAQS is based on the design value, which represents the average number of exceedances of the standard in a three-year period. This form is not useful for analyzing trends of concentrations over time. We therefore use a different but related form, referred to as the concentration-based design value in this document, and the annual average PM10 concentration to analyze PM10 trends.

For this analysis, the concentration-based design value is defined as the fourth highest concentration at a monitor in a three-year period, after simulating days without measurements. To simulate days without measurements, each measurement is repeated n times in each year, where $n = round\left(\frac{dyear}{d}\right)$, where $dyear$ is the number of days in the year (365 or 366), d is the number of measurements at the monitor, and $round()$ rounds to the nearest integer. The concentration-based design value can be complete or incomplete. The value is complete if all quarters in the three-year period are at least 75% complete or the concentration-based design value is 155 µg m^{-3} or larger. Completeness is calculated by dividing the number of valid samples by the number of scheduled samples. This methodology produces similar conclusions as the official exceedance-based design values, but also provides additional context when tracking trends in measured concentrations over time. In general, concentration-based design values of 155 µg m^{-3} or larger would also have exceedance-based design values that do not attain the standard.

Figure 6-1 shows the design values with all valid data, removing exceedance exceptional events, and after removing all potential exceptional events (see Appendix I for definition of exceptional events). The South Coast Air Basin PM10 design value, which represents the maximum design value of all monitors, without removing exceptional events, increased over the 2011 - 2024 period (Figure 6-1). This is because there have been more wind-blown dust and wildfire driven exceedances of the NAAQS in the later years of the 2011 - 2024 period. After removing exceedance exceptional events that meet screening criteria listed in Table I-1 (Appendix I), there were nine exceedances of the 24-hour PM10 NAAQS over the first maintenance period (Table 6-1). On July 31, 2023, four monitoring locations recorded PM10 levels exceeding the standard. However, the three-year 24-hour PM10 design value did not exceed one, indicating successful maintenance of the standard during the 2011 - 2024 period.

TABLE 6-1
EXCEEDANCES OF THE 24-HOUR PM10 NAAQS AFTER REMOVAL OF SUSPECTED EXCEPTIONAL EVENTS

Date	Stations
11/12/2013	Mira Loma (Van Buren)
7/9/2018	Upland
10/26/2020	Glendora
10/7/2022	San Bernardino
7/31/2023	Rubidoux, Mira Loma (Van Buren), Lake Elsinore, San Bernardino
9/8/2024	Mira Loma (Van Buren)

The maximum concentration-based design value after removing exceedance exceptional events in the South Coast Air Basin increased from 110 to 150 (36%) over this period, with most of the increase occurring before 2015. From 2015 to 2024, the trend of the concentration-based design value after removing exceedance or all potential exceptional events is relatively flat.

PM10 concentrations are influenced by precipitation because the water droplets remove particulate matter from the air and less fugitive dust is emitted from moist outdoor surfaces than similar dry surfaces. In addition, the atmospheric instability that commonly occurs with rainstorms facilities ventilation of the Basin and vertical mixing. Appendix II analyzes trends in meteorological data including precipitation and includes a discussion on the impact on particulate matter concentrations. Briefly, precipitation conditions during 2010 – 2024 were not conducive to lower PM10 concentrations since precipitation tended to be lower than average in prior years during this period. Additionally, a more than 10-year period is likely a long enough time frame to represent most of the variation in other meteorological factors that influence mixing, transport, and dispersion of pollution and can influence PM10 concentrations. Since the trends in PM10 concentration-based design value after removing exceedance or all potential exceptional events are relatively flat, this provides evidence that meteorology was not unusually favorable to lower PM10 concentrations over the first maintenance period (2010-2024). Rather, PM10 concentrations after removing exceptional events have continued to attain the PM10 NAAQS due to implementation of control measures and enforcement of rules for emission controls.

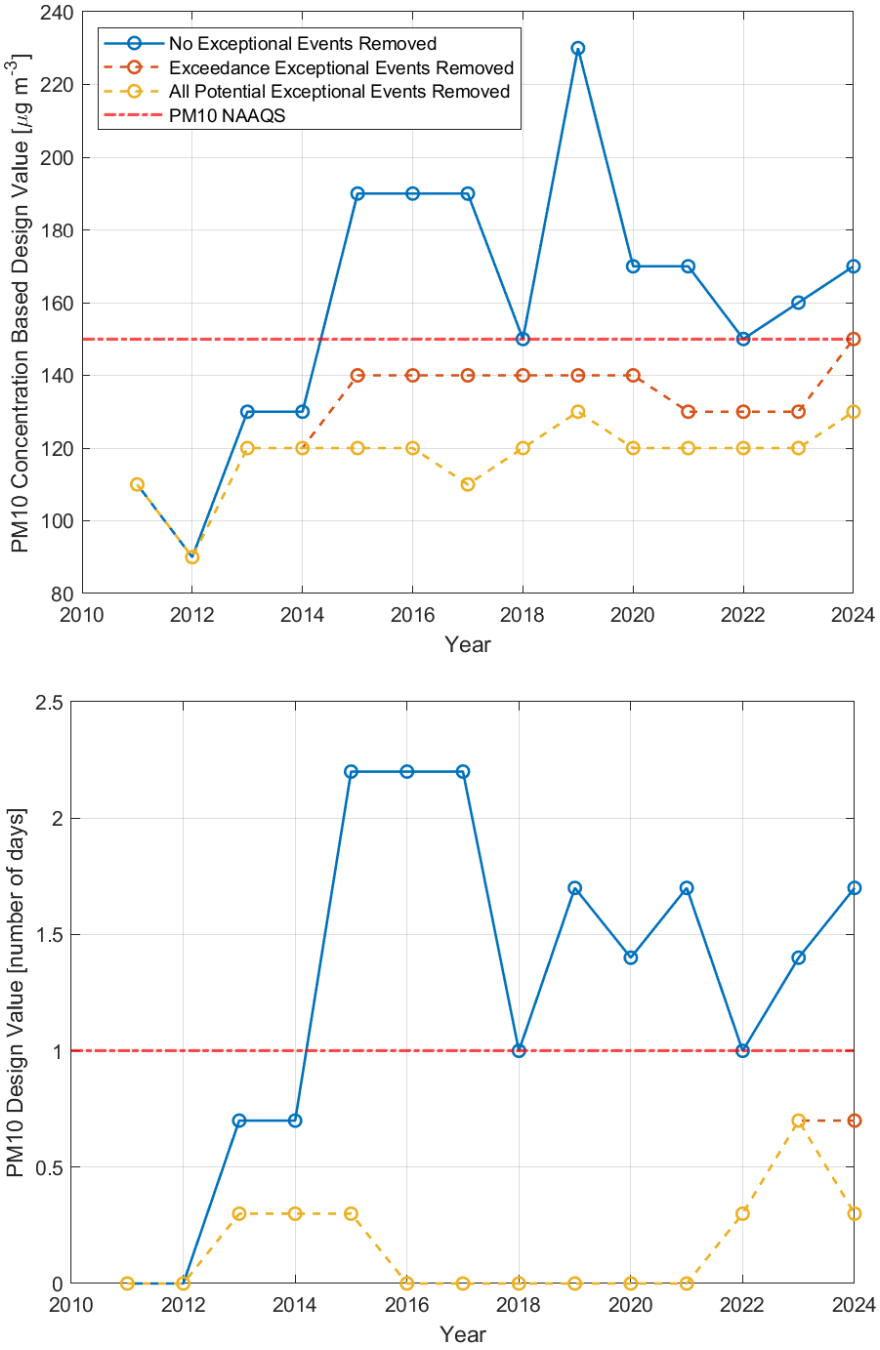


FIGURE 6-1

TREND OF PM10 CONCENTRATION-BASED DESIGN VALUES (TOP) AND DESIGN VALUE (BOTTOM). THE VALUE SHOWN IS THE MAXIMUM OF ALL PM10 MONITORS IN THE SOUTH COAST AIR BASIN.[74]

[74] One high PM10 concentration (587 µg/m³) measured on July 19, 2018 at the Long Beach–Hudson monitoring site was not included in the design value calculations because the data was considered to be invalid due to impacts from construction adjacent to and underneath the monitoring site, and the data was flagged with a null qualifier code in U.S. EPA's air quality system (AQS).

2.2 Contingency Provision Trigger in the First Maintenance Period

The first maintenance plan established a contingency provision trigger that involved first determining if a violation of the PM10 NAAQS has occurred, and second determining if the violation was due to an exceptional event.[75] Only violations of the PM10 NAAQS after removing exceptional events would trigger the contingency provisions. Staff used the analysis of PM10 design values in the first maintenance period to determine if the contingency provisions were triggered during 2013 - 2024.

Figure 6-1 shows that design values in the South Coast Air Basin have been less than 1 after removing exceedance exceptional events since 2011. Thus, the Basin has continued to attain the 1987 24-Hour PM10 NAAQS after removing exceptional events since the start of the first maintenance period, July 26, 2013, the effective date of the redesignation to attainment for the 1987 PM10 standard. Based on this, staff conclude that the contingency provisions were not triggered since the beginning of the first maintenance period to December 31, 2024. The complete measurement data for 2025 was unavailable during the development of this maintenance plan, therefore 2025 was not included in this report. However, preliminary data indicates continued maintenance of the standard in 2025, excluding potential exceptional events.

One exceedance measured at Long Beach-Hudson monitoring site on July 19, 2018 was excluded in the design value calculations because the data was considered to be invalid due to construction activities adjacent to and underneath the station, and the data was flagged with a null qualifier code in U.S. EPA's air quality system (AQS). Because the measurement was considered invalid, the contingency provisions were not triggered. A continuous PM10 Beta Attenuation Monitor has been collecting data since January 2022 at both the Long Beach–Hudson and Long Beach–Signal Hill monitoring sites. The first valid design value for these sites since the Long Beach—Hudson site closure is 2024, covering the 2022–2024 period. During this time, both sites confirmed no exceedances of the 24-hour PM10 standard.

3.0 Second Maintenance Period

3.1 Maintenance Demonstration

An area can demonstrate continued compliance with the NAAQS in one of two ways: by showing that future emissions of a pollutant or its precursors will remain below the levels in the attainment inventory, or by using modeling to demonstrate that the expected mix of future emission sources will not cause a violation of the standard. South Coast AQMD's first PM10 maintenance plan for the Basin, adopted in January 2010, used photochemical transport modeling to demonstrate continued compliance. Since then, the Basin has consistently met the PM10 standard, after exclusion of exceptional events, and 2023

[75] See letter from Elaine Chang to Deborah Jordan, dated March 19, 2023, in docket EPA-R09-OAR-2013-0007 at www.regulations.gov

emissions are significantly lower than those in the 2009 attainment inventory approved by the U.S. EPA.[76] In addition, South Coast AQMD consulted with U.S. EPA for the most appropriate approach to demonstrate maintenance. Considering all these factors, this maintenance demonstration utilizes a proportional rollback method, where the 2024 PM10 concentrations are scaled to reflect changes in the emissions corresponding to PM10 chemical species between 2023 and 2033. The detailed methodology describing how the future PM10 concentrations are calculated is presented in Appendix IV.

The maintenance demonstration for the 1987 24-hour PM2.5 NAAQS uses 2023 as the base year emissions inventory and 2033 as the maintenance horizon year. Chapter 3, Figure 3-1, shows how emissions of PM10 and its precursors change from 2023 to 2033. As discussed in Chapter 3, future emissions of NOx and VOCs will decline after 2023, while direct PM2.5, NH3, and SOx emissions will marginally increase or remain almost unchanged. However, the large reduction in NOx emissions will ensure maintenance of the PM10 standard. No sudden increases in emissions are projected between 2023 and 2033, providing assurance that the standard will not be exceeded during interim years.

The 24-hour PM10 design value represents the number of days per year when PM10 concentrations are greater than or equal to 155 µg/m³, averaged over a three-year period. An area meets the standard if the design value is one or less. However, because this value reflects exceedance frequency rather than actual concentrations, it is not well-suited for demonstrating maintenance. Instead, this maintenance demonstration uses the concentration-based design value described in Section 2.1.

The 24-hour PM10 fourth-highest concentrations from 2022 to 2024 as well as projected concentrations for 2033 are shown in Table 6-2. Both monitored concentrations from 2022 to 2024 and projected concentrations for 2033 are well below 155 µg/m^3, demonstrating that the 24-hour PM10 standard will continue to be met through 2033. Furthermore, this wide margin below the NAAQS means that an unforeseen loss in emission reductions would be unlikely to jeopardize the maintenance demonstration.

[76] U.S. EPA, Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; State of California; PM10; Redesignation of the South Coast Air Basin to Attainment; Approval of PM10 Redesignation Request and Maintenance Plan for the South Coast Air Basin, 78 Fed. Reg. 20868, April 8, 2013. https://www.federalregister.gov/documents/2013/04/08/2013-08117/approval-and-promulgation-of-implementation-plans-designation-of-areas-for-air-quality-planning

TABLE 6-2
2033 PROJECTED 24-HOUR PM10 CONCENTRATIONS (mg/m^3)

Station	2022–2024 4th Highest Concentration (µg/m^3)	2033 Concentration (µg/m^3)
Anaheim	100	101
Fontana	130	132
Los Angeles	70	71
Mira Loma	130	132
Riverside	120	122
San Bernardino	130	132
Long Beach	70	71
Mission Viejo	30	30
Banning Airport	100	101
Crestline	50	51
Redlands	70	71
Santa Clarita	70	71
Glendora	80	81

3.2 Verification of Continued Attainment

U.S. EPA guidance requires that air districts indicate how they will track the progress of their maintenance plans over time to ensure continued attainment.[77] Two options suggested by the guidance include: 1) periodic updates to the emissions inventory, and 2) periodic review of the inputs and assumptions used for the emission inventory and subsequent updates to the inventory if those inputs or assumptions have significantly changed. South Coast AQMD is committing to the latter option to verify continued attainment.

The underlying data for the Basin's emissions inventory is updated regularly. South Coast AQMD maintains reported emissions data from major facilities through the Annual Emissions Reporting program and submits the data to CARB every year.[78] Traffic activity data, which is an essential input to estimate on-road mobile emissions, is updated every four years when Southern California Association of Governments (SCAG) develops a new regional transportation plan. The on-road motor vehicle emissions model, EMFAC, is updated approximately every three to four years. South Coast AQMD tracks emission reductions resulting from regulations and programs impacting stationary and mobile sources. In collaboration with CARB and SCAG, the methodologies, input data, and assumptions used to develop the emissions inventory are reviewed and updated as new data and/or methods become available. These reviews and updates are conducted regularly. If South Coast AQMD finds that the inputs to the emissions inventory have changed

[77] U.S. EPA, Procedures for Processing Requests to Redesignate Areas to Attainment, September 4, 1992. Available at: https://www.epa.gov/sites/default/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

[78] South Coast AQMD, Annual Emissions Reporting. https://www.aqmd.gov/home/rules-compliance/compliance/annual-emission-reporting

significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventories presented in this maintenance plan, and evaluate the potential impacts.

In addition, South Coast AQMD will analyze the PM10 ambient air quality data collected from its monitoring network to verify continued attainment of the standard. Specifically, as part of the contingency provisions described in the next section, the PM10 concentrations from monitoring stations will be compared with the 1987 24-hour PM10 NAAQS on a quarterly basis. South Coast AQMD commits to continue operation of a robust monitoring network, in accordance with 40 CFR part 58 and in consultation with U.S. EPA and CARB. A thorough discussion of the monitoring network is provided in Chapter 2.

3.3 Transportation Conformity

Details on transportation conformity can be found in Chapter 7.

3.4 Contingency Provisions

CAA Section 175A(d) requires maintenance plans to identify contingency provisions to promptly correct any violation of the standard which occurs after the redesignation of the area as attainment. Contingency provisions should, at minimum, identify control measures to be adopted and/or implemented as a contingency in the event of emission increases, a schedule and procedure for adoption and implementation, and a time limit for action by South Coast AQMD. The contingency provisions should also identify the indicators or triggers that will determine when contingency provision actions need to be implemented.

3.4.1 Definitions

Exceptional event (EE): Measurements that are removed from the calculation of design values. South Coast AQMD must submit an exceptional event demonstration that is concurred upon by U.S. EPA.

Contingency provision trigger value: A calculated statistic that is used to determine if the contingency provisions have been triggered. It is analogous to the design value except that "contingency provision exceptional events," defined below, are removed from the calculation. Further details are presented in Appendix V.

Contingency provision exceptional event: Measurements that are removed from the calculation of the contingency provision trigger value. South Coast AQMD will develop a contingency provision exceptional event demonstration (CEED) and submit the CEED to CARB and U.S. EPA for review. Upon submittal, South Coast AQMD will await further guidance from CARB and/or U.S. EPA staff. Contingency provision exceptional events could have occurred at any time in the latest 3-year period, not necessarily in the last year that is the subject of the most recent contingency provision trigger value calculation. CEEDs, submitted to CARB and U.S. EPA, can be disapproved by either agency. Further details are presented in Appendix V.

Contingency provision triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS, or a written notice by U.S. EPA to disagree with a submitted CEED.

Contingency provision actions triggering event: A determination by South Coast AQMD that the contingency provision trigger value exceeds the NAAQS or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. This determination will trigger the contingency provision actions.

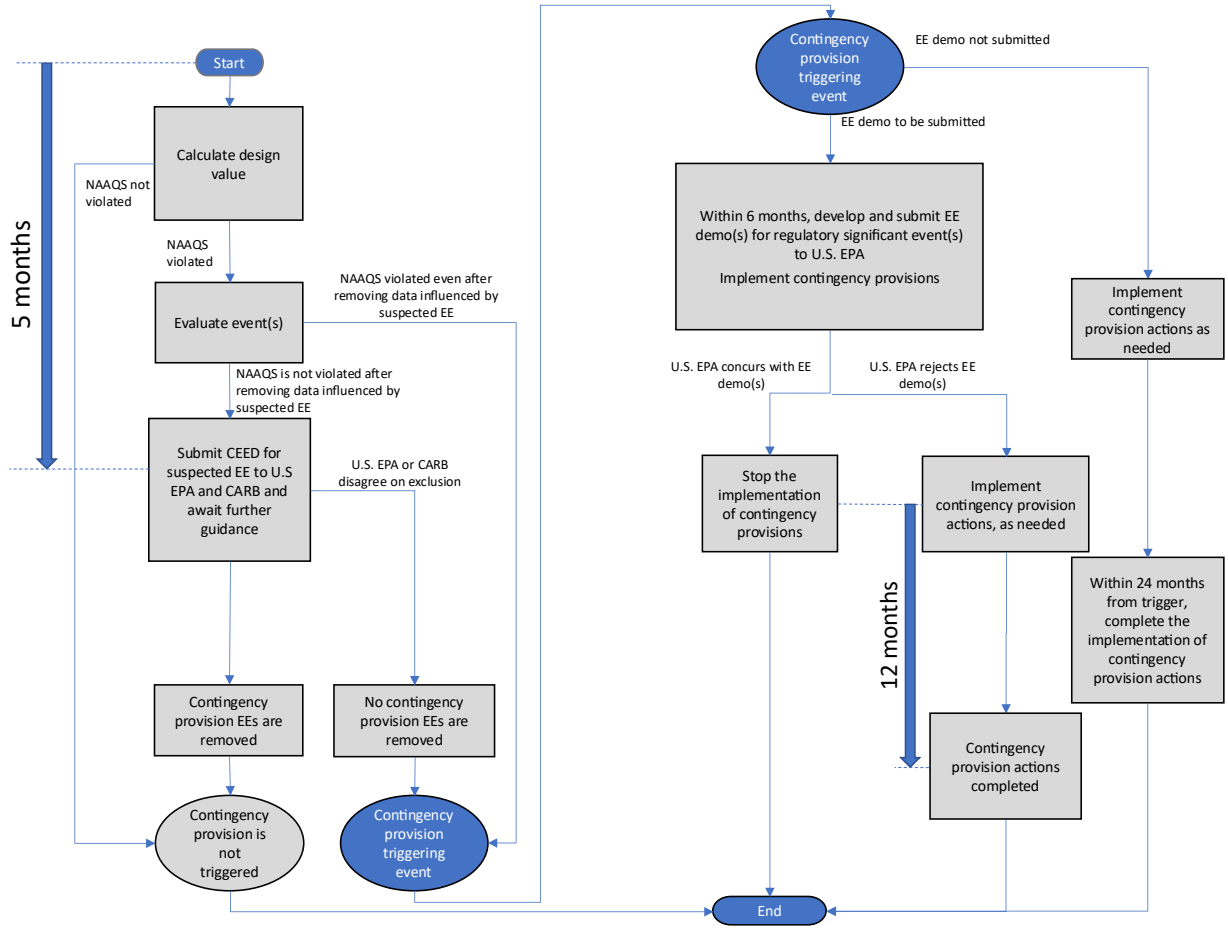
3.4.2 Schedule for Implementation

The schedule for implementation of the contingency provisions is illustrated in Figure 6-2. Within four months after the end of each quarter (i.e., by April 30, July 31, October 31, and January 31), South Coast AQMD will calculate the design value using quality assured monitoring data for the previous quarter. This timeline allows for the analysis of 24-hour integrated sample data, which requires laboratory analysis and is not available in real-time. If the design value exceeds the NAAQS, South Coast AQMD will evaluate potential contingency provision exceptional events that occurred in the latest three-year period and determine if they meet the criteria for a CEED. If a CEED is warranted, it will be prepared and submitted to U.S. EPA and CARB for concurrent review within five months after the end of each quarter (i.e., by May 31, August 31, November 30, and February 28 or 29). While this timeline requires an expedited analysis of the potential contingency provision exceptional events, it is consistent with the data certification timeline, which typically occurs four months after the end of each quarter. During the preparation of the CEED, South Coast AQMD will consult U.S. EPA and CARB to develop an approvable demonstration.

If neither a CEED nor an EE demonstration is submitted and South Coast AQMD determines that the contingency provision trigger value exceeds the NAAQS, then the contingency provision actions will be triggered. South Coast AQMD will start implementing the contingency provision actions as soon as the determination is made, which will be no later than five months after the end of each quarter. South Coast AQMD will complete the implementation of contingency provision actions within 24 months from this determination.

If either CARB or U.S. EPA disagrees with a CEED, it may be necessary for South Coast AQMD to submit a comprehensive EE demonstration. If South Coast AQMD has submitted a comprehensive EE demonstration to U.S. EPA, South Coast AQMD will begin the implementation of the contingency provisions while awaiting U.S. EPA's decision on the submitted EE demonstration, even if U.S. EPA's concurrence on the EE demonstration would avoid triggering the contingency provision actions. During this period, South Coast AQMD will focus on identifying possible causes of the violation, opportunities to reduce emissions, available funding if an incentive-based approach is needed, key stakeholders to solicit contingency provision actions, and other elements necessary to fully implement contingency provision actions upon U.S. EPA's rejection of the submitted EE demonstration. If U.S. EPA rejects the EE demonstration, it will trigger the full implementation of all contingency provision actions as necessary. South Coast AQMD will implement contingency provision actions, as needed, to avoid future

exceedances of the standard. In this case, it may take longer than 24 months to complete implementation of the contingency provision actions. This timeline allows for up to 6 months for the South Coast AQMD to develop an EE demonstration including time for CARB review, up to an additional 12 months for U.S. EPA to concur or reject the EE demonstration after formal submission,[79] and up to 12 months for the South Coast AQMD to complete the implementation of necessary contingency provision actions. If U.S. EPA concurs on the EE demonstration, South Coast AQMD will stop the implementation of the contingency provisions and will not initiate contingency provision actions. Further details on contingency provision exceptional events and procedures are provided in Appendix V.



- South Coast AQMD commits to "start" the process at the beginning of each quarter
- CEED – Contingency Provision Exceptional Event
- EE – Exceptional Event

FIGURE 6-2
CONTINGENCY PROVISION TRIGGER AND SCHEDULE FOR IMPLEMENTATION

[79] U.S. EPA Exceptional Event Rule. The final rule and supporting documentation is available at https://www.epa.gov/air-quality-analysis/final-2016-exceptional-events-rule-supporting-guidance-documents-updated-faqs.

3.4.3 Contingency Provision Actions

The contingency provision actions begin implementation when the contingency provision trigger value is greater than 1 exceedance, the level of the PM10 NAAQS, or, if an EE demonstration is submitted to U.S. EPA, a decision by U.S. EPA to reject the EE demonstration. South Coast AQMD will review available data to identify the emission sources that contributed to the exceedance. This review may involve an analysis of speciation data, source attribution studies, meteorological data, etc. Causes of the trigger event may include local and regional PM10 emission sources. If the causes of the trigger event can be determined, South Coast AQMD will use this information when evaluating potential actions to target emission reductions for the emission sources that contributed to the exceedance. If the causes of the trigger event cannot be determined, South Coast AQMD will use a granular-level emissions inventory, available advanced sensor-based monitoring data, or other large datasets to inform the contingency provision actions.

The contingency provision actions, specified below, will be evaluated and implemented as needed to address the cause of the exceedance and correct the exceedance as expeditiously as possible:

- Consult with stakeholders to determine if voluntary or incentive-based control measures could reduce emissions, if feasible.
- Assess whether improved education and training on fugitive dust mitigation could help lower emissions.[80]
- Evaluate whether changes to enforcement of existing rules could reduce emissions.
- Consider amending Rules 403, 403.2, 444, 445, 1105.1, 1112.1, 1137, 1156, 1157, 1158, and 1186 to further strengthen prohibitions on particulate emissions. These rules are described in Section 3.4.4.
- Develop and propose new rules to reduce particulate emissions, if necessary.

3.4.4 South Coast AQMD's PM10 Rules

The largest sources of primary PM10 in the Basin are road dust and construction and demolition. However, the dominant sources vary throughout the Basin, and some source categories may cause localized areas with elevated PM10 concentrations relative to the surrounding area or other parts of the Basin. Rules for regulating emissions from sources of primary PM10 in the Basin are listed in Table 6-3 along with the emission source categories that are covered by those rules. These rules are described in this section. Some of these rules may be considered for amendment to further reduce particulate emissions as part of the contingency provision actions described in Section 3.4.2.

[80] Training to mitigate fugitive dust emissions is implemented as part of South Coast AQMD Rule 403. Information about this training is available at: https://www.aqmd.gov/home/programs/business/training-403-403-1-403-2-fugitive-dust

TABLE 6-3
SOUTH COAST AQMD RULES THAT REGULATE MAJOR SOURCES OF PM10

Emission Sources	South Coast AQMD Rule Number
Fugitive Dust and Construction	403
Fugitive Dust from Large Roadway Projects	403.2
Open Burning	444
Wood-Burning Devices	445
Fluid Catalytic Cracking Units (FCCUs)	1105.1
Cement Kilns	1112.1
Woodworking Operations	1137
Cement Manufacturing Facilities	1156
Aggregate and Related Operations	1157
Storage, Handling, and Transport of Coke, Coal, and Sulfur	1158
Paved and Unpaved Roads and Livestock Operations	1186

Rule 403 – Fugitive Dust

Rule 403, first adopted in 1976 and amended six times since, reduces particulate matter entrained in the ambient air as a result of anthropogenic fugitive dust sources. The rule requires implementation of control measures to prevent, reduce, or mitigate fugitive dust emissions and includes a performance standard that prohibits visible emissions from crossing any property line. Projects greater than 50 acres and/or those that move more than 5,000 cubic yards of earth are required to notify South Coast AQMD of the project location, implement specific control measures, and maintain recordkeeping. While Rule 403 applies to a wide range of fugitive dust source categories, source-specific rules that control PM10 emissions may also apply.

To assist with dust control planning, South Coast AQMD and Coachella Valley local governments have developed guidance handbooks.[81,82] Additionally, South Coast AQMD offers a three-hour training class, *Dust Control in the South Coast Air Basin*,[83] available in person and virtually. This class provides a comprehensive overview of dust control requirements and strategies for minimizing airborne particulate matter from earth-moving activities.

Rule 403.2 – Fugitive Dust from Large Roadway Projects

[81] South Coast AQMD, Rule 403 Fugitive Dust Implementation Handbook. https://www.aqmd.gov/docs/default-source/compliance/rule-403-dust-control-forms/rule-403-fugitive-dust-implementation-handbook-0120km-arc.pdf

[82] South Coast AQMD, Rule 403.1 Coachella Valley Dust Class Volume 1: https://www.aqmd.gov/docs/default-source/compliance/rule-403-dust-control-forms/coachella-valley-dustclass-volume-i-0120km-arc.pdf, and Volume II: https://www.aqmd.gov/docs/default-source/compliance/rule-403-dust-control-forms/coachella-valley-dustclass-volume-ii-0120km-arc.pdf

[83] South Coast AQMD, Dust Control in the South Coast Air Basin (Rule 403). https://www.aqmd.gov/home/programs/business/training-403-403-1-403-2-fugitive-dust

Rule 403.2, adopted on June 3, 2022, aims to reduce fugitive dust emissions from large roadway projects and minimize air quality impacts. It applies to construction and demolition activities near large roadways classified as interstates or expressways. The rule requires dust control measures such as water misting systems, material pile covers, vehicle speed restrictions, and designated dust control supervisors. It also mandates project signage, recordkeeping, and public notifications for projects near sensitive receptors. The rule supplements existing dust control regulations (e.g., Rules 403 and 403.1[84]) to ensure compliance with air quality standards.

Rule 444 – Open Burning

Rule 444 – Open Burning was adopted in 1976 and last amended in 2013 to regulate open burning practices to minimize emissions and smoke impacts. It applies to activities such as agricultural burning, disposal of tumbleweeds, prescribed burns, beach burning, and fire prevention training. Rule 444 mandates obtaining prior authorization for burns and burning only on designated days that meet meteorological and air quality criteria. The rule prohibits the burning of non-vegetative materials such as trash and construction debris. For large projects or prescribed burns that produce more than one ton of PM emissions, a Smoke Management Plan (SMP) is required to minimize public smoke exposure. Entities must notify South Coast AQMD before and after burning and maintain records of the activity.

Rule 445 – Wood-Burning Devices

Rule 445 reduces emissions from wood-burning devices such as fireplaces or wood stoves. It was originally adopted in 2008 and contains requirements regarding the sale and installation of wood-burning devices, prohibits the burning or sale of unseasoned wood, and includes curtailment of wood-burning on "No-Burn" days when the ambient concentration of PM2.5 is forecast to exceed the curtailment threshold.

In June 2020, Rule 445 was amended to include PM2.5 contingency measures and to switch the source-receptor area-specific curtailment to a Basin-wide curtailment approach. In October 2020, it was amended again to include ozone contingency measures. The rule was subsequently approved by U.S. EPA, excluding paragraph (g) (Ozone Contingency Measures) and paragraph (k) (Penalties).[85] Rule 445 contains four PM2.5 contingency measures, each of which impose lower curtailment thresholds upon any of U.S. EPA's findings of failure to comply or attain as specified in 40 CFR §51.1014(a). In 2020, the first PM2.5 contingency measure was triggered upon U.S. EPA's finding of failure to attain the 2006 24-hour PM2.5 standard by the December 31, 2019 attainment deadline.[86] As a result, the wood burning curtailment threshold was lowered from 30 µg/m^3 to 29 µg/m^3 during November–February.

[84] Rule 403.1 applies to fugitive dust sources in Coachella Valley.

[85] U.S. EPA, Air Plan Approval; California; Los Angeles-South Coast Air Basin, 87 Fed. Reg. 12866, March 8, 2022. https://www.federalregister.gov/documents/2022/03/08/2022-04761/air-plan-approval-california-los-angeles-south-coast-air-basin#page-12869

[86] U.S. EPA, Finding of Failure To Attain the 2006 24-Hour Fine Particulate Matter Standards; California; Los

On September 5, 2025, Rule 445 was amended to implement the South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard (2024 PM2.5 Plan)[87] control measure BCM-18 – Further Emission Reductions from Wood-Burning Fireplaces and Wood Stoves. The amendment lowered the wood burning curtailment threshold from 29 µg/m^3 to 25 µg/m^3 and removed the low-income exemption from the curtailment program. The PM2.5 contingency provisions were amended as well to include two contingency measures, which each reduce the curtailment threshold by 2 µg/m3.

Rule 1105.1 – Reduction of PM10 and Ammonia Emissions from Fluid Catalytic Cracking Units

Adopted in 2003, Rule 1105.1 focuses on reducing PM10 emissions from FCCUs at petroleum refineries. The rule establishes strict emission limits for filterable PM10, requiring effective control technologies, regular testing, and continuous monitoring to minimize PM10 pollution. Filterable PM10 emissions are limited to 3.6 pounds per hour, 0.005 grains per dry standard cubic foot (gr/dscf) of flue gas corrected to 3 percent O2 dry, or 2.8 pounds per thousand barrels of fresh feed.

Rule 1112.1 – Emissions of Particulate Matter and Carbon Monoxide from Cement Kilns

Adopted in 1986 and amended in 2009, Rule 1112.1 sets PM emission limits for cement kilns and clinker coolers, requiring accurate monitoring, compliance testing, and reporting to control air pollution from cement manufacturing operations. Combined PM emissions from cement kilns and clinker coolers shall not exceed 0.40 pounds per ton of kiln feed if the kiln feed rates are less than 75 tons per hour and shall be limited to 30 pounds per hour if the kiln feed rates are 75 tons per hour or greater.

Rule 1137 – PM10 Emission Reductions from Woodworking Operations

Adopted in 2002, Rule 1137 mandates strict PM10 control measures for woodworking facilities, requiring effective capture and filtration of sawdust emissions, and proper waste handling to minimize airborne particulate pollution. In particular, sawdust emissions are required to be vented to an emission control device such that no visible emissions exit from external ductwork or the control device, except for 15 minutes after start-up or 15 minutes before shutdown.

Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities

Adopted in 2005 and amended once in 2015, Rule 1156 reduces PM emissions and minimizes hexavalent chromium emissions from cement manufacturing facilities by regulating operations, material handling, and transport. The rule mandates the use of baghouse systems, dust suppressants, and enclosures for storage piles, conveyors, and transfer points to prevent fugitive dust emissions. Facilities must comply with

Angeles-South Coast Air Basin, 85 Fed. Reg. 57733, September 16, 2020. https://www.federalregister.gov/documents/2020/09/16/2020-19588/finding-of-failure-to-attain-the-2006-24-hour-fine-particulate-matter-standards-california-los

[87] South Coast AQMD, South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard, June 7, 2024. https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan

opacity limits, conduct continuous emissions monitoring, and follow strict PM10 monitoring requirements if violations occur. After facility closure, former cement plants must continue monitoring hexavalent chromium and implement dust control measures to prevent emissions from contaminated sites.

Rule 1157 – PM10 Emission Reductions from Aggregate and Related Operations

Rule 1157 was adopted in 2005 and amended in 2006. It further reduces PM10 emissions from aggregate and related operations and implements the 2003 AQMP Control Measure BCM-08 – Further Emission Reductions from Aggregate and Cement Manufacturing Operations. At the time of the 2006 rule amendment, Rule 1157 affected approximately 29 aggregate facilities. These facilities generate PM10 emissions during their mining, processing, and handling (i.e., transporting, loading/unloading, conveying, crushing, screening, mixing, and storing) of the aggregates. Unpaved roads and track-out from these facilities are two other significant sources of PM10 emissions.

Rule 1158 – Storage, Handling, and Transport of Coke, Coal and Sulfur

Rule 1158 was adopted in 1983 and was last amended in 2008. Rule 1158 requires coke, coal, and sulfur piles to be enclosed, covered, or treated with water sprays or dust suppressants to prevent airborne PM emissions. Furthermore, the rule sets a visible dust standard. The road surfaces and vehicle movement areas where material has accumulated have to be paved to allow effective cleaning. Trucks and trailers transporting materials have to be covered, be leak resistant, and be cleaned before leaving the facility.

Rule 1186 – PM10 Emissions from Paved and Unpaved Roads and Livestock Operations

Adopted in 1997 and amended multiple times, Rule 1186 reduces PM10 emissions from vehicular travel on paved and unpaved public roads, as well as at livestock operations, and implements the 1994 AQMP control measure BCM-01 – Control of Emissions from Paved and Unpaved Roads. Rule 1186 applies to the entire South Coast AQMD jurisdiction, except for unpaved road requirements, which are limited to the South Coast Air Basin. The rule mandates that government agencies procure and use certified street sweepers for routine street sweeping. To support implementation, South Coast AQMD developed a testing protocol to certify street sweepers based on pick-up efficiency and PM10 emissions. Manufacturers undergo independent testing to obtain certification, and the list of approved equipment is updated periodically to reflect new certifications and emerging information.[88]

[88] South Coast AQMD, Rule 1186 Certified Street Sweepers. https://www.aqmd.gov/docs/default-source/rule-book/support-documents/rule-1186/certified-street-sweepers-equipment-list-6-2-2021.pdf

4.0 Summary Checklist

As described in Section 2, almost all PM10 measurements that exceeded the level of the NAAQS were caused by exceptional events. By excluding these measurement data, PM10 design values in the Basin have not exceeded the NAAQS during the first maintenance period (2013–2023) and the 2024 monitoring data is consistent with continued attainment. South Coast AQMD is preparing exceptional event demonstrations for those exceedances that are regulatory significant.

Table 6-4 summarizes the elements that need to be satisfied in order to meet CAA requirements as well as conform to U.S. EPA's guidance. Section 3.1 demonstrates continued attainment of the PM10 NAAQS through 2033. Section 3.2 commits South Coast AQMD to maintain a future PM10 monitoring network and to verify continued attainment of the PM10 NAAQS by reviewing inputs and assumptions used for the emission inventory when new information becomes available. If South Coast AQMD finds that these inputs have changed significantly, South Coast AQMD will update the existing inventory in coordination with CARB, evaluate the revised inventory against the inventories presented in this maintenance plan, and evaluate the potential impacts. Chapter 7 includes transportation conformity budgets. Section 3.4 establishes contingency provisions that are triggered by a measured violation of the PM10 NAAQS.

TABLE 6-4
SUMMARY CHECKLIST OF DOCUMENT REFERENCES

CAA/U.S. EPA Requirement	Document Reference
Attainment inventory	Chapter 3; Appendix III
Maintenance demonstration	Section 3.1
Verification of continued attainment	Section 3.2
Transportation conformity	Section 3.3; Chapter 7
Contingency provisions	Section 3.4

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 7: TRANSPORTATION CONFORMITY

Introduction

The California Air Resources Board (CARB) has prepared the motor vehicle emissions budget (MVEB)[89] for the South Coast Air Basin Maintenance Plans for the 1987 24-hour PM10 and 1997 annual and 24-hour PM2.5 National Ambient Air Quality Standards (NAAQS) (South Coast Air Basin Maintenance Plans for PM2.5 and PM10 NAAQS). The MVEB is the maximum allowable emissions from motor vehicles within nonattainment and maintenance areas and is used for determining whether transportation plans and projects conform to the applicable State Implementation Plan (SIP).

Transportation conformity is the federal regulatory process for linking and coordinating transportation and air quality planning through the MVEB established in the SIP. Under section 176(c) of the Clean Air Act (Act), federal agencies may not approve or fund transportation plans and projects unless they are consistent with the regional SIP. In addition, conformity with the SIP requires that transportation activities do not (1) cause or contribute to new air quality violations, (2) increase the frequency or severity of any existing violation, or (3) delay the timely attainment of NAAQS. Therefore, quantifying on-road motor vehicle emissions and comparing those emissions with a budget established in the SIP determines transportation conformity between air quality and transportation planning.

The MVEBs are set for each criteria pollutant or its precursors for each milestone year and the attainment year of the SIP. Subsequent transportation plans and programs produced by transportation planning agencies must demonstrate that the emissions from the proposed plan, program, or project do not exceed the MVEBs established in the applicable SIP. The MVEBs established in this SIP apply as a "ceiling" or limit on transportation emissions for the Southern California Association of Governments (SCAG) metropolitan planning organization (MPO) for the years in which they are defined and for all subsequent years until another year for which a different budget is specified, or until a SIP revision modifies the budget. For the South Coast Air Basin Maintenance Plans for PM2.5 and PM10 NAAQS, the maintenance years of the SIP (also referred to as the plan analysis years) are 2030 and 2033 for the 1987 24-hour PM10 NAAQS, and 2033 and 2039 for the 1997 annual and 24-hour PM2.5 NAAQS, both for the annual season.

Methodology

The MVEB for the South Coast Maintenance Plans for PM2.5 and PM10 is established based on guidance from the U.S. EPA on the motor vehicle emission categories and precursors that must be considered in transportation conformity determinations, as found in the transportation conformity regulation and final rules as described below.

[89] Federal transportation conformity regulations are found in 40 CFR Part 51, subpart T – Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. of the Federal Transit Laws. Part 93, subpart A of this chapter was revised by the EPA in the August 15, 1997 Federal Register.

The MVEB must be clearly identified, precisely quantified, and consistent with applicable Act requirements. Further, it should be consistent with the emission inventory and control measures included in the South Coast Maintenance Plans for PM2.5 and PM10 NAAQS.

The South Coast Maintenance Plans for PM2.5 and PM10 NAAQS establishes the MVEB for primary emissions of PM2.5 and PM10 from motor vehicle exhaust, tire and brake wear, and paved, unpaved, and construction road dust, as well as the precursors of nitrous oxides (NOx), reactive organic gases (ROG), respectively, with respect to the standards, except that PM2.5 budgets include only NOx as PM2.5 precursor, pursuant 40 CFR 93.102 (b)(2)(iv).[90] This section discusses budgets for annual average daily emissions set for the milestone years of 2030 and 2033 for the 1987 PM10 standard and 2033 and 2039 for the 1997 PM2.5 standards. The MVEB presented below uses emission rates from California's motor vehicle emission model, EMFAC2021 (V.1.0.2),[91] with SCAG's activity data (VMT and speed distributions). The activity data are from their 2025 Federal Transportation Improvement Program (FTIP).[92]

On November 15, 2022, the U.S. EPA approved EMFAC2021 for use in SIPs and for demonstrating transportation conformity.[93] The EMFAC model estimates emissions from two combustion processes (running and start exhaust) and four evaporative processes (hot soak, running losses, diurnal, and resting losses). The California Emissions Projection Analysis Model (CEPAM) 2022 v1.00 was used to calculate emissions from mobile-adjacent area sources, including paved, unpaved, and construction road dust.[94] However, recent actions by the federal government and Congress challenged a series of CARB's regulations of which reductions are critical to attain multiple NAAQS in California. The rules affected by these recent federal actions and reflected in EMFAC2021 are the Advanced Clean Trucks (ACT) and the Heavy-Duty Low NOx Omnibus (Omnibus) regulations. Therefore, the MVEB in these maintenance plans was adjusted to remove the emissions benefits from these regulations. In addition, the estimated emissions were adjusted to account for the Heavy-Duty Inspection and Maintenance (HD I/M) Program,[95] reflecting U.S. EPA's latest decision to include a portion of the regulation into the SIP.

[90] ROG, sulfur dioxide (SO2) and ammonia (NH3) emissions from motor vehicles do not contribute to ambient PM2.5 significantly in the South Coast Air Basin. On-road motor vehicles account for approximately 12%, 8% and 26%, respectively, of the total anthropogenic ROG, SO2 and NH3 emissions in the Basin in 2033. Therefore, those pollutants are not included in the MVEB.

[91] More information on data sources can be found in the EMFAC technical support documentation at: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation

[92] More information can be found at: 2025 FTIP Program. Per SCAG, this travel activity data is identical to those included in the 2024 RTP amendment 1, which was used in the current Maintenance Plans.

[93] U.S. EPA approval of EMFAC2021 can be found at 87 FR 68483: federalregister.gov

[94] More information on data sources can be found at: https://ww2.arb.ca.gov/criteria-pollutant-emission-inventory-data

[95] Clean Truck Check (HD I/M) | California Air Resources Board

The MVEBs for the South Coast 1987 PM10 and 1997 PM2.5 Maintenance Plan were developed to be consistent with the on-road emissions inventory[96] and maintenance demonstration using the following method:

1) Used the EMFAC2021 v1.02 model to produce the on-road motor vehicle emissions totals (average annual day) for the appropriate pollutants (NOx, ROG, and PM10 or PM2.5, respectively, according to the standard) using 2025 FTIP activity data.
2) Applied USEPA-approved off-model adjustment factors to account for federal actions revoking ACT and Omnibus regulations.
3) Applied the off-model HD I/M adjustment factors to account for recently adopted regulations.
4) Used the CEPAM2022 v1.00 model to produce construction, paved, and unpaved road dust (PM10 or PM2.5, respectively, according to the standard) emissions totals; and
5) Rounded the totals for NOx, ROG, and PM10 or PM2.5, respectively, to the nearest tenth ton.

Motor Vehicle Emissions Budget

The MVEBs in Tables 7-1 and 7-2 were established according to the methodology outlined above and in consultation[97] with SCAG, South Coast AQMD, CARB, U.S. EPA, the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). The MVEB is consistent with the emission inventories and control measures in the 2025 FTIP. These budgets will be effective once the U.S. EPA determines they are adequate.

Table 7-1 below contains the detailed MVEB for the milestone years for the South Coast Air Basin (1987 24-hour PM10 standard). Table 7-2 below presents the detailed MVEB for the South Coast Air Basin of 1997 annual and 24-hour PM2.5 standards. The emissions are estimated using the EMFAC2021 and CEPAM2022 models, and adjusted for recent federal actions, including the revocation of previously approved waivers for the ACT and the Omnibus regulations, using off-model adjustments for NOx, ROG, PM2.5, and PM10 emissions. The final MVEB is rounded upwards to the nearest whole ton and tenth of a ton.

[96] More information about the on-road motor vehicle emission budgets can be found in Appendix III.
[97] More information about the on-road motor vehicle emission budgets can be found in Appendix III.

TABLE 7-1
MOTOR VEHICLE EMISSIONS BUDGET FOR THE 1987 PM10 STANDARD (ANNUAL SEASON)

South Coast Totals (Tons/Day)	2030			2033		
	NOx	ROG	PM10	NOx	ROG	PM10
Vehicular Exhaust (including brake and tire wear for PM10)	57.84	43.96	9.74	50.98	40.04	9.63
Increases from removal of emissions benefits[a]	2.85	0.06	0.07	4.73	0.13	0.15
Reductions from HD I/M[b]	10.74	0.00	0.09	11.70	0.00	0.08
Construction Road Dust	0.00	0.00	2.68	0.00	0.00	2.73
Paved Road Dust	0.00	0.00	58.98	0.00	0.00	59.50
Unpaved Road Dust[c]	0.00	0.00	12.25	0.00	0.00	12.25
Total[d]	49.95	44.02	83.64	44.02	40.17	84.17
Motor Vehicle Emissions Budget[e]	50	45	84	45	41	85

[a] This reflects increases from the removal of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus, and Warranty Phase I Regulations adjustment factors submitted November 21th, 2025
[b] This reflects reductions from the SIP-approved portion of the Heavy Duty Inspection/Maintenance Regulation. CARB submitted the adjustment factor to U.S. EPA for approval on March 26, 2026.
[c] AP-42 methods for road dust Section 13.2.1, Paved Roads and Section 13.2.2, Unpaved Roads.
[d] Values may not add up due to rounding
[e] Motor Vehicle Emissions Budgets calculated are rounded up to the nearest tpd for emissions higher than 20 tpd, and to the nearest tenth of a tpd for emissions lower than 20 tpd.

Source: EMFAC2021 v1.02 and CEPAM2022 v1.00

TABLE 7-2
MOTOR VEHICLE EMISSIONS BUDGET FOR THE 1997 PM2.5 ANNUAL AND 24-HR STANDARDS (ANNUAL SEASON)

South Coast Totals (Tons/Day)	2033		2039	
	NOx	PM2.5	NOx	PM2.5
Vehicular Exhaust (including brake and tire wear for PM2.5)	50.98	3.44	42.95	3.31
Increases from removal of emissions benefits[a]	4.73	0.06	8.24	0.14
Reductions from HD I/M[b]	11.70	0.08	12.95	0.08
Construction Road Dust	0.00	0.27	0.00	0.28
Paved Road Dust[c]	0.00	8.90	0.00	9.02
Unpaved Road Dust	0.00	1.22	0.00	1.22
Total[d]	44.02	13.82	38.25	13.91
Motor Vehicle Emissions Budget[e]	45	13.9	39	14

[a] This reflects increases from the removal of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus, and Warranty Phase I Regulations adjustment factors submitted November 21th, 2025
[b] This reflects reductions from the SIP-approved portion of the Heavy Duty Inspection/Maintenance Regulation. CARB submitted the adjustment factor to U.S. EPA for approval on March 26, 2026.
[c] AP-42 methods for road dust Section 13.2.1, Paved Roads and Section 13.2.2, Unpaved Roads.
[d] Values may not add up due to rounding

[e] Motor Vehicle Emissions Budgets calculated are rounded up to the nearest tpd for emissions higher than 20 tpd, and to the nearest tenth of a tpd for emissions lower than 20 tpd.
Source: EMFAC2021 v1.02 and CEPAM2022 v1.00

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 8: PUBLIC PROCESS

Public Process

The Draft South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS were released on May 14, 2026 to solicit public review and comments. The public process will include one public consultation meeting on May 20, 2026, and a briefing to South Coast AQMD's Mobile Source Committee is scheduled for May 15, 2026. A public hearing will be held at South Coast AQMD's Governing Board meeting on August 7, 2026, subject to change. Notification of the public hearing will be published in major newspapers in each county. Throughout the process, email updates will be sent to interested parties.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

CHAPTER 9: CALIFORNIA ENVIRONMENTAL QUALITY ACT AND SOCIOECONOMIC IMPACTS

California Environmental Quality Act (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Sections 15002(k) and 15061, the proposed project (South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS) is exempt from CEQA pursuant to CEQA Guidelines Sections 15061(b)(3) and 15308. Further, there is no substantial evidence indicating that any of the exceptions set forth in CEQA Guidelines Section 15300.2 apply to the proposed project. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062, and if the proposed project is approved, the Notice of Exemption will be filed for posting with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties, and with the State Clearinghouse of the Governor's Office of Land Use and Climate Innovation.

Socioeconomic Impact Assessment

No Socioeconomic Impact Assessment is required pursuant to Health and Safety Code Sections 40440.8 and 40728.5 because the proposed project is not a rule or regulation within the meaning of those statutes. Further, since the proposed project is administrative in nature, no socioeconomic impacts are expected.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

APPENDIX I: PM10 EXCEPTIONAL EVENTS DURING FIRST MAINTENANCE PERIOD

Treatment of Exceptional Events

In order to evaluate trends in concentrations and implications for attainment, we remove the PM10 data that is influenced by suspected exceptional events. Exceptional events are those data points where the concentration was caused by a natural event or activity that is unlikely to reoccur. In the case of PM10, wildfires or high winds can cause exceptional events. Staff used a methodology that is consistent with the U.S. EPA's exceptional event guidance to remove exceptional events[1]:

- There is a clear causal relationship between the event and a monitored exceedance
- The event is not reasonably controllable or preventable because it is a natural event or an event caused by human activity that is unlikely to recur at a particular location
- In the case of a high wind dust event, high wind speeds are present and the dust that the wind entrains is transported to a monitor site. In addition, wind speeds in the source region must be high enough to entrain natural soils or overwhelm reasonable controls on anthropogenic sources. For the purposes of this analysis, a sustained wind speed of at least 25 mph recommended by U.S. EPA was used to identify events with winds that were sufficient to entrain natural soil or overwhelm reasonable controls on anthropogenic sources.

This analysis uses two separate methodologies to identify station-days that meet the criteria above. The events identified with these two methodologies are called "exceedance exceptional events" and "potential exceptional events." These two classes of exceptional events are collectively referred to as "suspected exceptional events" throughout this document. Additionally, events that affect regulatory decisions such as the attainment status are called "regulatory significant exceptional event" in this document. The exceedance exceptional events and potential exceptional events are defined next.

Exceedance exceptional events: For the purposes of this analysis, exceedances where the sustained winds fell into Category 1, 2, or 3, or the likely cause was wildfire smoke or fireworks were considered to be "exceedance exceptional events" in this appendix and chapter 6. The sustained wind categories are defined as:

Category 1 – The sustained wind speeds measured at the air quality stations when the PM10 concentrations were elevated were higher than 25 mph.

Category 2 – The sustained wind speeds measured at the nearby (within 5 miles) weather stations when the PM10 concentrations were elevated were higher than 25 mph.

[1] United States Environmental Protection Agency. 2019. Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Influenced by High Wind Dust Events Under the 2016 Exceptional Events Rule. Memorandum from Richard Wayland to Regional Air Division Directors, Regions 1 - 10. April 4. Available at: https://www.epa.gov/sites/production/files/2019-04/documents/high_wind_dust_event_guidance.pdf

Category 3 – The sustained wind speeds measured at the upwind weather stations when the PM10 concentrations were elevated were higher than 25 mph. The distance of the weather station to the air quality station was more than 5 miles but was located along the route of dust transport.

Category 4 – The sustained wind speeds when the PM10 concentrations were elevated were less than 25 mph.

All exceedances measured during the last maintenance period are evaluated holistically by considering the magnitude of the exceedance, the presence of upwind wildfires/Santa Ana winds /thunderstorm outflow, windspeeds at the exceeding monitor and in areas directly upwind, and sources of dust. Table I-1 summarizes all of the exceedances recorded in the last maintenance period and details the results of this analysis.

Potential Exceptional Events: Measurements that do not exceed the NAAQS, yet generally meet the definition of an exceptional event are called "potential exceptional events" in this appendix and chapter 6. However, there are far too many of these measurements over the past maintenance period to holistically evaluate each value. Therefore, a screening methodology was implemented based on nearby meteorological data and co-located or near-located PM2.5 data. Potential high wind exceptional events are determined as the days when 3-minute average daily maximum wind speeds near a monitor exceeded 25 mph. Since dust may be entrained in a region with high winds upwind of a monitor, wind measurements at nearby anemometers in an area sharing similar meteorological characteristics as the PM10 monitor of interest were also considered. The South Coast Air Basin was divided into "zones" (Figure), and when winds exceeding 25 mph occur at any wind speed monitor in a zone, all the PM10 measurements in that zone are removed for that day. While this screening criteria provides only an approximate estimate of the days that were influenced by exceptional events, it allows for a methodical and consistent evaluation of a decade of measurements at every monitor in the South Coast Air Basin. Data influenced by potential wildfire exceptional events is identified by selecting days when the maximum daily average PM2.5 concentration in the South Coast Air Basin exceeded 35 $\mu g\ m^{-3}$. While this technique may also remove measurements collected during wintertime PM2.5 exceedances that are not wildfire related, these exceedance days typically have stagnant or low winds, and therefore tend to have only a slight contribution to coarse PM and generally low PM10 concentrations. All PM10 measurements that were likely influenced by wildfires based on this screening definition were removed from this analysis.

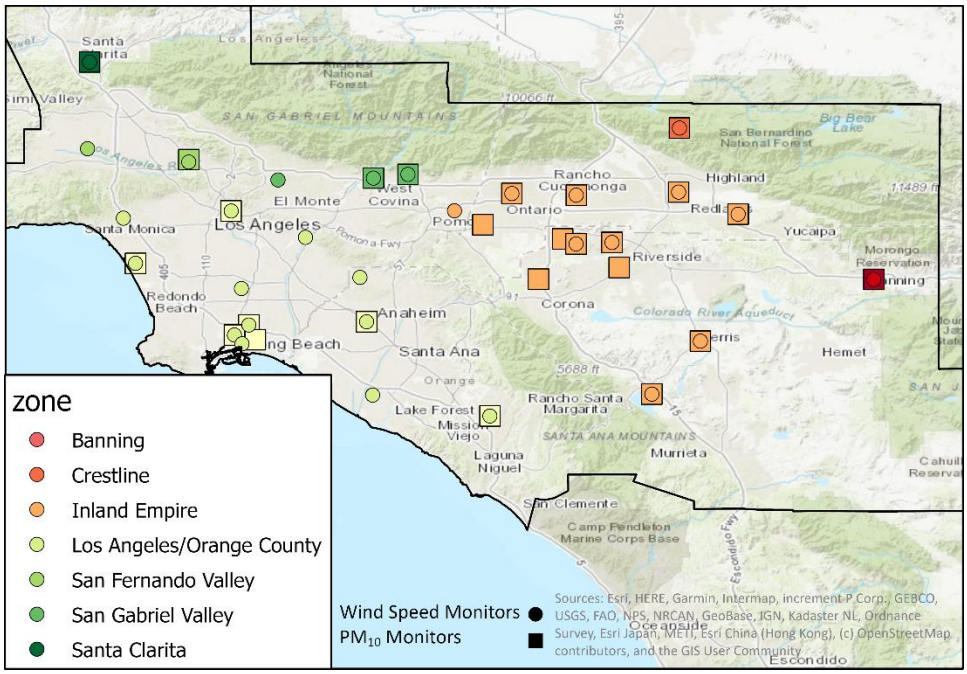


FIGURE I-1
ZONES SHARING SIMILAR METEOROLOGICAL CHARACTERISTICS USED TO IDENTIFY POTENTIAL EXCEPTIONAL EVENTS CAUSED BY HIGH WINDS.
● - WIND SPEED MONITORS. ■ – PM10 MONITORS.

Analysis of PM10 Exceedances

There were 40 PM10 exceedances in the South Coast air basin during the first maintenance period for the 1987 24-Hour PM10 NAAQS (2010 – 2024), listed in Table I-1. Three exceedances were caused by the Bobcat and El Dorado wildfires, one by Independence Day fireworks, one unknown but potentially by wind-blown dust or ash, and the others were caused by wind-blown dust or ash. The meteorological conditions during these events are consistent with exceptional high-wind events. South Coast AQMD is preparing exceptional event demonstrations for the exceedances at Mira Loma (Van Buren) on October 18, 2024 and November 6, 2024 given these events are considered to be regulatory significant. Due to resource limitations at South Coast AQMD and U.S. EPA, exceptional event demonstrations are only prepared for the subset of regulatory significant exceptional events. The exceedances caused by exceptional events will be removed from design value calculations upon concurrence of the exceptional event demonstrations by U.S. EPA. Removing these exceedances, the South Coast Air Basin has continued to maintain attainment of the PM10 standard during the first maintenance period.

TABLE I-1
SUMMARY OF ALL PM10 EXCEEDANCE EVENTS IN THE FIRST MAINTENANCE PERIOD (2010 – 2024)
IN THE SOUTH COAST AIR BASIN

No	Date	Station (POC) [2]	24-hr PM10 (µg/m³)	Sustained Winds Category[3]	Likely Cause	Exceedance Exceptional Event Criteria	Description of Event
1	11/6/2024	MLVB (3) [4] FONT (3)	300 170	Category 2	Windblown dust	Meets screening criteria. Preparing demonstration for MLVB.	Santa Ana wind event from 3-10 AM. A windblown dust advisory was issued for the Inland Empire the previous day and expanded on 11/6 to cover most of the South Coast AQMD jurisdiction. NWS issued red flag warnings and wind watches.
2	10/18/2024	MLVB (3)	160	Category 3	Windblown dust	Meets screening criteria. Preparing demonstration.	Santa Ana wind event from 6 AM to 1 PM. As ash was emitted from recent burn scars, a windblown dust and ash advisory was issued the same day for the entire South Coast AQMD jurisdiction. NWS issued red flag warnings and wind advisories.
3	9/8/2024	MLVB (3)	170	Category 4	Unknown (potentially hyperlocal source or windblown dust or ash)	Does **not** meet screening criteria	Since midnight, hourly PM10 ranged from 90 to 220 µg/m³ with concurrent PM2.5 making up 40% of PM10. A single-hour PM10 spike of 1450 µg/m³ (5% PM2.5, 15 mph average wind 1-min max 27 mph) occurred at 2PM. Five hours within this period were flagged in AQS as wildfire smoke impacted. Smoke advisory issued the previous day was expanded on 9/8 to cover the entire South Coast AQMD jurisdiction. No NWS advisories.
4	7/5/2024	GLEN (3)	190	Category 4	Fireworks	Meets screening criteria	Independence Day fireworks with 82% of PM10 in the PM2.5 size fraction.
5	10/29/2023	MLVB (3)	290	Category 1	Windblown dust	Meets screening criteria. May	Santa Ana wind event throughout the day. A windblown dust advisory and NWS high wind and red flag warnings were issued the same day for the Inland

[2] ANAH – Anaheim; GLEN – Glendora; MLVB - Mira Loma (Van Buren); UPLA - Upland; SNBO – San Bernardino; ELSI - Lake Elsinore; HDSN – Long Beach (Hudson); PERI – Perris; FONT - Fontana
[3] As defined in the text on Page # 1
[4] Exceptional Event Demonstrations are being prepared by South Coast AQMD for these stations/dates

No	Date	Station (POC) [2]	24-hr PM10 (µg/m^3)	Sustained Winds Category[3]	Likely Cause	Exceedance Exceptional Event Criteria	Description of Event
						prepare a demonstration if needed.	Empire, parts of Orange County and the Coachella Valley.
6	7/31/2023	RIVR (3) MLVB (3) ELSI (3) SNBO (3)	170 170 190 180	Category 4	Windblown dust	Does **not** meet screening criteria	Thunderstorm outflows in the desert generated dust in the Coachella Valley, which was gradually transported to the Inland Empire between 7 AM and 2 PM. A dust advisory issued the same day mentioned dust in the Inland Empire despite the lack of winds. No NWS advisories.
7	10/7/2022	SNBO (3)	180	Category 4	Windblown dust	Does **not** meet screening criteria	Residual dust from a widespread haboob in the desert which occurred on the previous day necessitated the extension and expansion of a dust advisory to cover the Inland Empire. The large dust cloud moved over the area and gradually settled under light winds. No NWS advisories.
8	11/25/2021	MLVB (3)	230	Category 1	Windblown dust	Meets screening criteria	Strong Santa Ana wind event from 1 AM to 7 PM. Windblown dust advisory and NWS wind, dust and red flag warnings issued the previous day for most of the South Coast AQMD jurisdiction.
9	10/11/2021	SNBO (3)	180	Category 3	Windblown dust	Meets screening criteria	Strong onshore wind event. Windblown dust advisory and NWS wind/ dust advisories were issued on 10/10/2021 for the Coachella Valley but expanded to cover the entire South Coast AQMD jurisdiction the next day.
10	2/25/2021	MLVB (3)	160	Category 2	Windblown dust	Meets screening criteria	Santa Ana wind event with the strongest winds in the early hours of the day. Windblown dust advisory and NWS high wind warnings were issued the previous day.
11	10/26/2020	ANAH (3), GLEN (3), MLVB (3), UPLA (3), SNBO (3), ELSI (3)	300, 170, 330, 180, 180, 190	Category 2	Windblown dust	All **but GLEN** meet screening criteria	Santa Ana wind event in the morning preceded wildfires that afternoon. PM10 concentrations increased with wind speeds in the morning hours.
12	09/11/2020 - 09/12/2020	GLEN(3), MLVB (1),	230, 160, 170	Category 4	Wildfire smoke	Meets screening	Bobcat and El Dorado fires burning during this time period. PM2.5 concentrations also elevated above

No	Date	Station (POC) [2]	24-hr PM10 (µg/m^3)	Sustained Winds Category[3]	Likely Cause	Exceedance Exceptional Event Criteria	Description of Event
		MLVB (3)				criteria	NAAQS. No high winds during these days.
13	10/30/2019	MLVB (3)	170	Category 3	Windblown dust	Meets screening criteria	Santa Ana wind event. PM10 concentrations increased with onset of Santa Ana winds.
14	10/10/2019	MLVB (3)[5]	280	Category 3	Windblown dust	Meets screening criteria	Santa Ana wind event. PM10 concentrations increased with onset of Santa Ana winds. Blowing dust reported at Riverside Municipal Airport.
15	04/09/2019	HDSN (1)[5]	160	Category 2	Windblown dust	Meets screening criteria	Strong westerly winds across basin. PM10 measurements at CELA and ANAH increased with winds in the afternoon. PM10 spiked at SLMZ at 800 µg/m^3 as well. Windblown dust advisory in effect for San Bernardino and Riverside Counties.
16	11/08/2018	MLVB (3)	230	Category 3	Windblown dust and/or ash	Meets screening criteria	Santa Ana wind event. Dust and ash possibly emitted from Holy Fire burn scar. PM10 concentrations increased with onset of Santa Ana winds.
17	07/09/2018	UPLA (3)	160	Category 4	Windblown dust	Does **not** meet screening criteria	Outflows from thunderstorms in the southwest U.S. deserts carried dust and sand into the Coachella Valley and South Coast Air Basin. See windblown dust advisory issued for this day. The Valley Fire in Forest Falls, San Bernardino County was also burning during this time, but winds near the fire should have kept smoke out of basin until overnight hours.
18	12/05/2017	SNBO (3)	160	Category 2	Windblown dust	Meets screening criteria	Santa Ana winds from the NE. NWS had high wind warnings in place for storm. No windblown dust advisory in place. Some hours with sustained wind speeds of 25 mph or greater.
19	12/04/2017	MLVB (3)	260	Category 3	Windblown dust	Meets screening criteria	Santa Ana winds from the NE. NWS had high wind warnings in place for storm. No windblown dust advisory in place. Some hours with sustained wind speeds of 25 mph or greater.
20	10/09/2017	MLVB (3)	250	Category 1	Windblown dust	Meets screening criteria	Santa Ana winds from the NE. NWS had wind advisory in place for Inland Empire, Inland Orange County, and Coachella Valley.
21	07/30/2016	SNBO (2),	280, 280,	Category 3	Windblown	Meets	Outflows from thunderstorms in the southwest U.S.

No	Date	Station (POC) [2]	24-hr PM10 (µg/m^3)	Sustained Winds Category[3]	Likely Cause	Exceedance Exceptional Event Criteria	Description of Event
		SNBO (3), UPLA (3)	180		dust	screening criteria	deserts carried dust and sand into the Coachella Valley and South Coast Air Basin. The NWS did not have any watches, warnings, or advisories in place, but mentioned in a public information statement that widespread dust from thunderstorm gust fronts were occurring in the area. PM10 was elevated across the entire Basin.
22	12/26/2015	SNBO (2)	190	Category 3	Windblown dust	Meets screening criteria	Sustained winds at Ontario International Airport of 38 mph and visibility down to 2.5 miles. NWS had high wind warnings in effect. Winds from the N and NE.
23	09/09/2015	PERI (1)	190	Category 2	Windblown dust	Meets screening criteria	Possible outflows from thunderstorms. Otherwise unknown cause.
24	11/16/2014	SNBO (3)	160	Category 3	Windblown dust	Meets screening criteria	Santa Ana wind event caused widespread blowing dust. NWS had high wind warnings issued for the area. South Coast AQMD had a Windblown Dust Advisory issued.
25	11/12/2013	MLVB (3)	170	Category 4	Windblown dust	Does **not** meet screening criteria	Offshore winds. No NWS or South Coast AQMD warnings or advisories during this period.
26	10/04/2013	MLVB (3), SNBO (3)	290, 180	Category 2	Windblown dust	Meets screening criteria	Santa Ana wind event. NWS had high wind warnings in place for the area.

Regulatory Significant Exceptional Events

On October 18 and November 6, 2024, strong offshore pressure gradients resulted in strong Santa Ana winds in Southern California. Strong Santa Ana winds from the northeast blew into the Inland Empire through Cajon Pass, causing high PM10 concentrations at the Mira Loma Van Buren monitoring station. South Coast AQMD is submitting an exceptional events demonstration to the U.S. EPA to request exclusion of the two day's measurements from comparison with the 1987 24-Hour PM10 NAAQS for the South Coast Air Basin.

Regulatory Significance of the Events

The PM10 exceedances caused by the windblown dust events on October 18 and November 6, 2024 at Mira Loma Van Buren will affect the attainment status for the 1987 24-Hour PM10 NAAQS for the Basin. The Basin will maintain attainment of the PM10 NAAQS in 2024 only after removing both the October 18 and November 6, 2024 exceedances.

The PM10 data that were affected by exceptional events and are requested for exclusion in the exceptional events demonstration are listed in Table I-2. After removing the PM10 samples in the table, the 2022-2024 PM10 design value at Mira Loma decreases from 1.7 days to 1.0 days (Table I-3). The design value for the basin is based on the maximum monitor design value. Mira Loma Van Buren POC 3 is the only monitor that exceeded the PM10 NAAQS in 2022-2024. Thus, upon U.S. EPA concurrence on the exceptional events demonstration, samples associated with exceptional events will be removed from design value calculation and the PM10 design value of the Basin decreases to 1.0, and the Basin will therefore remain in attainment of the PM10 NAAQS (Table I-4).

TABLE I-2
LIST OF PM10 SAMPLES THAT WERE AFFECTED BY EXCEPTIONAL EVENTS

Date of Event	Type of Event	AQS Flag	Site AQS ID	Site Name	Exceedance Concentration [$\mu g\ m^{-3}$]	Notes
10/18/2024	High wind	RJ	060658005/ POC 3	Mira Loma (Van Buren)	160	Windblown dust due to gusty Santa Ana winds above 25 mph
11/6/2024	High wind	RJ	060658005/ POC 3	Mira Loma (Van Buren)	300	Windblown dust due to gusty Santa Ana winds above 25 mph

TABLE I-3
IMPACT OF THE EXCEPTIONAL EVENTS ON THE 2022-2024 PM10 DESIGN VALUE OF THE AFFECTED STATIONS

Site (AQS ID)	2022-2024 design value (without EPA concurrence on all events listed in Table I-2 above)	2022-2024 design value (with EPA concurrence on all events listed in Table I-2 above)
Mira Loma (Van Buren) (060658005/POC3)	1.7	1.0

TABLE I-4
IMPACT OF THE EXCEPTIONAL EVENTS ON THE 2022-2024 PM10 DESIGN VALUE OF THE BASIN

Basin Maximum Site (AQS ID)	2022-2024 design value (without EPA concurrence on all events listed in Table I-2 above)	2022-2024 design value (with EPA concurrence on all events listed in Table I-2 above)
Mira Loma (Van Buren) (060658005/POC3)	1.7	1.0

Contents of the Exceptional Events Demonstration

The exceptional events demonstration includes the required elements to provide evidence that the events were caused by high wind exceptional events, including the following:

1. A narrative conceptual model that describes the events and a discussion of how emissions from the events led to the exceedances at Mira Loma (Van Buren)
2. Analyses comparing the event-influenced concentrations to concentrations at the same monitoring site at other times
3. A demonstration that the events were both not reasonably controllable and not reasonably preventable
4. A demonstration that the events were natural events
5. A demonstration that the events affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedances
6. Documentation that South Coast AQMD followed the public comment process

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

APPENDIX II: RECENT METEOROLOGY

Introduction

This appendix includes analysis of meteorological data during the 2010-2024 time period in support of the PM10 maintenance demonstration (Chapter 6) and the PM2.5 redesignation requests (Chapters 4 and 5).

Precipitation

Precipitation during the 2010 - 2024 period in the National Oceanic and Atmospheric Administration (NOAA) South Coast Drainage Climate Division, which overlaps the South Coast Air Basin, was slightly lower than the average in prior decades (Figure 6-3)[1]. Average annual precipitation was 15.9 inches from 2010 - 2024 compared with 18.1 inches during 1990 – 2009 in the NOAA South Coast Drainage Climate Division. The precipitation conditions during 2010 – 2024 were not conducive to lower PM concentrations since precipitation tended to be lower than average during this period.

Figure II-1 shows that the precipitation from October 2024 through February 2025 was 4.69 inches, the fourth lowest wintertime precipitation since 1990, and significantly lower than prior years since 2018. November through December 2024 had the least precipitation in November through December months since 2017. Less precipitation is conducive to higher PM10 and PM2.5 concentrations since less wet deposition results in higher PM concentrations. Additionally, precipitation is associated with unstable weather and storms, which also tend to reduce concentrations. The impacts of precipitation on PM2.5 concentrations are especially important during November, December, and January since the highest PM2.5 concentrations except for Independence Day fireworks tend to occur during those months. Thus, the lower precipitation in November and December 2024 compared with prior years is conducive to higher PM2.5 concentrations.

[1] Rainfall data for NOAA South Coast Drainage Climate Division: NOAA National Centers for Environmental information, Climate at a Glance: Divisional Time Series, published July 2025, retrieved on August 7, 2025 from https://www.ncdc.noaa.gov/cag/

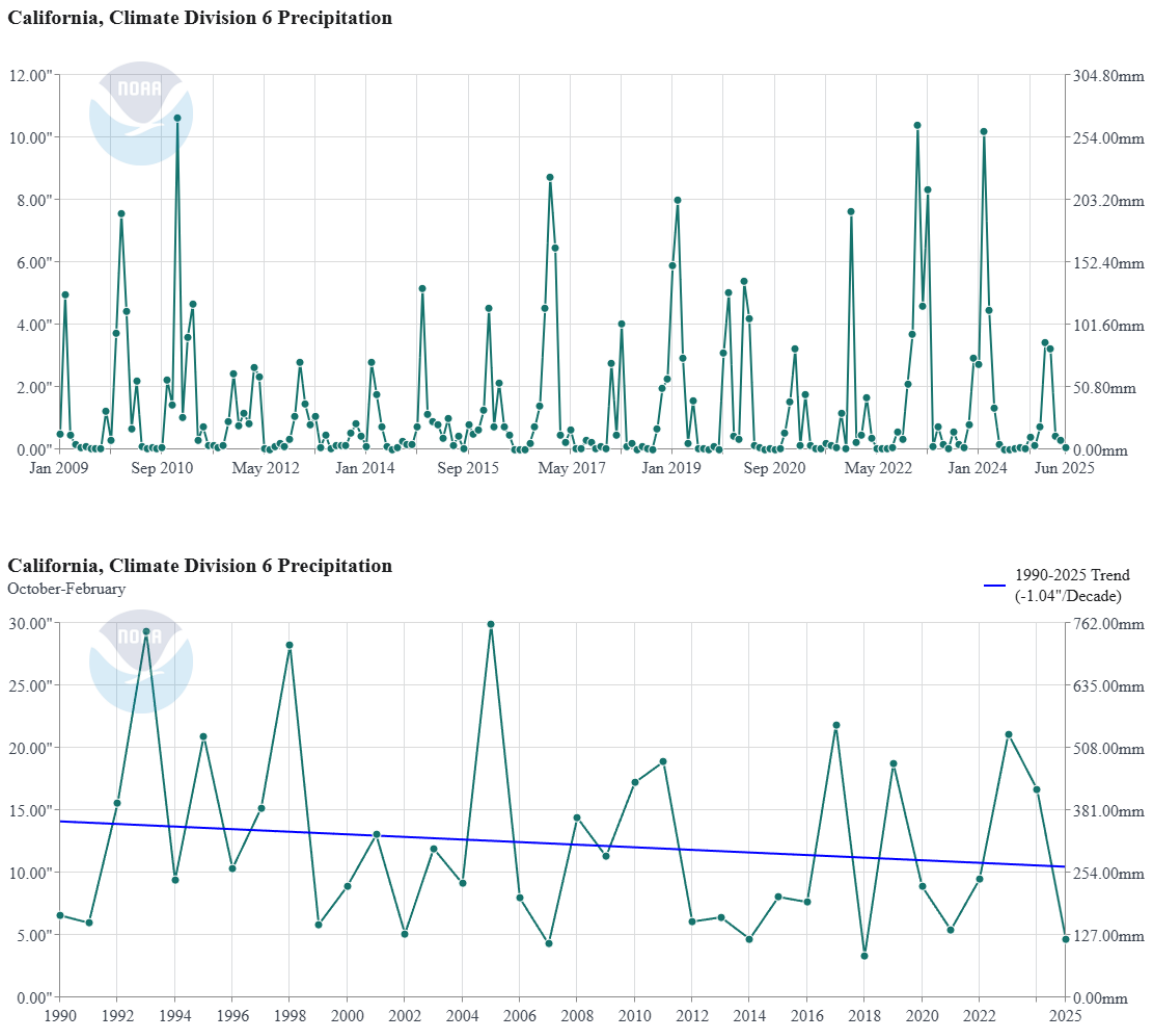


FIGURE II-1: MONTHLY PRECIPITATION (TOP) AND TREND OF OCTOBER THROUGH FEBRUARY PRECIPITATION FROM 1990 TO 2025 IN THE SOUTH COAST DRAINAGE DIVISION

Meteorological Factors Influencing Transport, Mixing, and Dispersion

Meteorological factors including surface wind speeds, mixed layer height, turbulent velocities in the surface layer, and surface friction velocity influence PM emissions and mixing, transport, and dispersion of PM. However, their influence on PM concentrations is complex. Wind speeds are correlated with surface friction velocity and turbulent velocities. Higher surface friction velocity causes increased fugitive dust emissions from surfaces but is associated with increased dispersion which tends to decrease PM concentrations. The relationship between these factors and concentrations varies over the South Coast Air Basin. Since these factors do not have a direct relationship with PM concentrations that could be applied throughout the South Coast Air Basin, we did not evaluate trends of these meteorological factors. However, a more than 10-year period is likely to represent most of the variation of these factors and it is

unlikely that systematic trends in these factors contributed to lower PM concentrations over the 2010 – 2024 period.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

APPENDIX III: EMISSIONS INVENTORY

1. Introduction

The emissions inventory for this Plan builds upon previous inventories developed for the 2022 Air Quality Management Plan (AQMP) and South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard adopted in June of 2024 (hereinafter referred to as the 2024 PM2.5 Plan).[1] The 2022 AQMP inventory was based on socioeconomic data and vehicle activity from the Southern California Association of Governments' (SCAG) 2020 Regional Transportation Plan (RTP), with 2018 as the base year, including reported facility emissions for that year. Similarly, the 2024 PM2.5 Plan used 2018 as the base year but incorporated a major update by transitioning from EMFAC2017 to EMFAC2021 for estimating emissions from on-road mobile sources.

This Plan includes two key updates to the inventory used in the 2024 PM2.5 Plan. First, on-road vehicle emissions have been revised using updated activity data from SCAG's 2024 RTP, combined with EMFAC2021. Second, facility emissions are now based on reported data from 2023. Emissions from all other source categories remain consistent with those used in the 2022 AQMP.

Future baseline emissions incorporate projected economic growth consistent with the those incorporated in the 2022 AQMP and the 2024 PM2.5 Plan and reflect adopted regulatory measures and their compliance schedules. The regulations incorporated in this Plan's baseline emissions are the same as those included in the 2024 PM2.5 Plan.

2. Inventory Description

The emissions inventory is divided into two major source classifications: stationary and mobile sources. Stationary sources of emissions include point sources and area sources. Point sources are large facilities such as power plants and refineries and report their emissions data to South Coast AQMD. Area sources are smaller or more diffuse stationary sources that are too numerous or small to be tracked individually. Mobile sources include on-road vehicles – which include all motor vehicles that operate on public roads, such as cars, trucks, and buses – and non-road vehicles not intended for use on roads, such as construction and agricultural equipment, lawn and garden machinery, locomotives, aircraft, and ships.

Stationary Sources

Point Sources

Point sources include large stationary facilities such as power plants, refineries, or manufacturing sites. These facilities operate permitted equipment registered with the South Coast AQMD and report their annual

[1] South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard. Available at: https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan

emissions data to South Coast AQMD through the Annual Emissions Reporting (AER) Program. Emissions are calculated using throughput data, emission factors, and control efficiency. Facilities are further categorized using EPA Source Classification Codes (SCCs) and North American Industry Classification System (NAICS) codes to enable detailed inventory development to account for the applicable rules and project emissions to future years. The point source inventory in this plan is based on reported data in 2023, which included 910 facilities. Smaller facilities not covered under AER are accounted for in the area source inventory.

Area Sources

Area sources encompass emissions from numerous small or diffuse sources, such as gasoline stations, consumer products, residential equipment, and road dust. Their emissions are estimated from consumption data, sales report, activity data from various reports etc. These are spatially allocated using demographic surrogates like population and land use. South Coast AQMD and CARB jointly developed the area source inventory for about 400 categories, with updated methodologies based on revised data and regulations.

Mobile Sources

On-Road Mobile Sources

On-road emissions are calculated using CARB's EMFAC2021 model and travel activity data provided by the Southern California Association of Governments (SCAG) from its adopted 2024 RTP. The EMFAC2021 model incorporates regulations adopted at the development of the model. They are for example, Advanced Clean Cars Program, Innovative Clean Transit (ICT) Regulation, Zero Emission Airport Shuttle Bus Regulation, Advanced Clean Trucks (ACT), and Heavy-Duty Low NOx Omnibus Regulations. EMFAC2021 does not include the Heavy-Duty Inspection and Maintenance (I/M) Regulation (also referred to as the Clean Truck Check program), or Advanced Clean Fleets Regulations as these regulations were adopted after the model was finalized.

However, recent actions by the federal government and the U.S. Congress affected California's authority to regulate mobile sources. The U.S. Congress rescinded the waiver to implement Advanced Clean Cars II (ACC II),[2] Advanced Clean Trucks (ACT) and Zero Emissions Airport Shuttle Bus regulations,[3] and Heavy-duty Low NOx Omnibus.[4] In addition, U.S. EPA disapproved the implementation of HD I/M program for out-of-state trucks operating within California.[5] The emissions benefits from these regulations, except for ACC II, were

[2] U.S. House of Representatives (2025). H.J. Res. 88, 119th Congress. https://www.congress.gov/bill/119th-congress/house-joint-resolution/88
[3] U.S. House of Representatives (2025). H.J. Res. 87, 119th Congress. https://www.congress.gov/bill/119th-congress/house-joint-resolution/87
[4] U.S. House of Representatives (2025). H.J. Res. 89, 119th Congress. https://www.congress.gov/bill/119th-congress/house-joint-resolution/89
[5] U.S. EPA, Air Plan Revisions; California; Heavy-Duty Vehicle Inspection and Maintenance Program, 91 Fed. Reg. 5325, February 6, 2026. https://www.federalregister.gov/documents/2026/02/06/2026-02350/air-plan-revisions-california-heavy-duty-vehicle-inspection-and-maintenance-program

reflected in the baseline emissions, but those reductions cannot be accounted for in a SIP inventory. Therefore, CARB developed adjustment factors to remove those benefits from the baseline emissions estimated with EMFAC2021, which were approved by U.S. EPA.[6] The on-road baseline emissions presented in this Plan incorporate those adjustment factors.

Compared to the 2020 RTP, the 2024 RTP projects lower total vehicle miles traveled (VMT) across all vehicle categories except for light heavy-duty vehicles (Shown in Figure III-1). As a result of this reduced vehicle activity, emissions calculated using 2024 RTP data are lower than those based on the 2020 RTP. For instance, as shown in Figure III-2, NOx emissions for the 2023 base year are 12 tons per day (tpd) lower than the estimates based on the 2020 RTP. This difference narrows in future years, with 5 tpd lower by 2033 and 2039.

[6] Approval letter by U.S. EPA of the off-model adjustment factors to Remove the Impact of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus and Warranty Phase I Regulations: https://ww2.arb.ca.gov/sites/default/files/2025-12/EPA%20Off-Model%20Adjustment%20Factors%20Approval%20Letter.pdf
and partial disapproval of the Heavy-Duty Vehicle Inspection and Maintenance Program (Clean Truck Check Program), U.S. EPA, Air Plan Revisions; California; Heavy-Duty Vehicle Inspection and Maintenance Program, 91 Fed. Reg. 5325, February 6, 2026. https://www.federalregister.gov/documents/2026/02/06/2026-02350/air-plan-revisions-california-heavy-duty-vehicle-inspection-and-maintenance-program

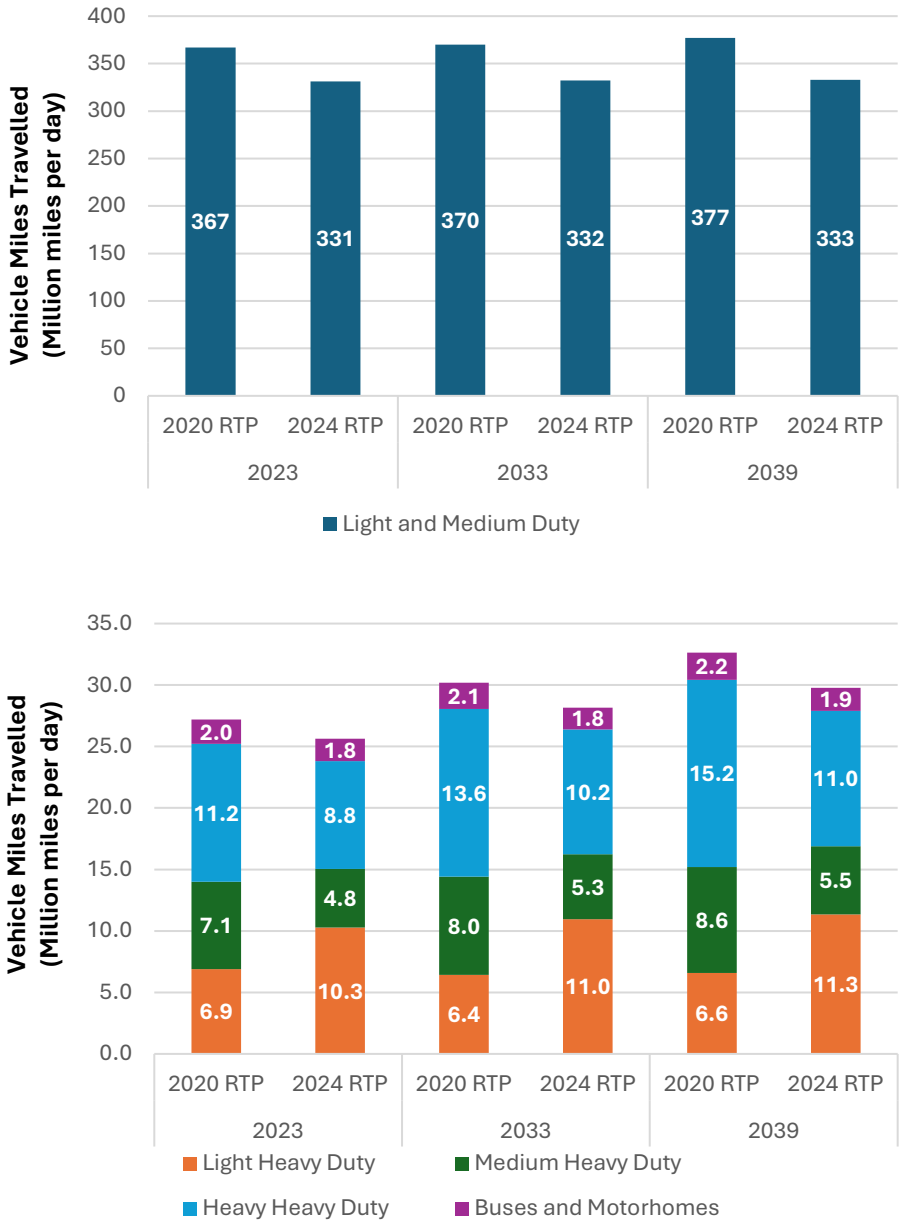


FIGURE III-1
COMPARISON OF VEHICLE ACTIVITIES BETWEEN THE 2020 RTP AND THE 2024 RTP FOR MILESTONE YEARS. TOP: LIGHT AND MEDIUM DUTY VEHICLES; BOTTOM: HEAVY DUTY TRUCKS, BUSES AND MOTOR HOMES.

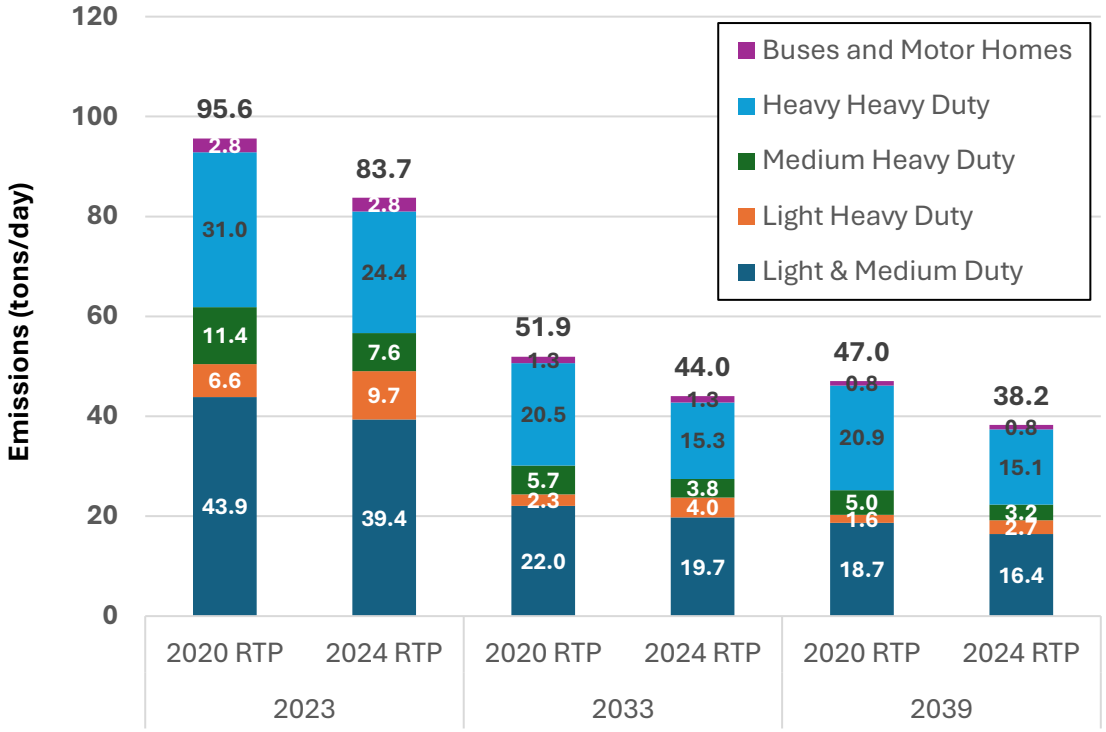


FIGURE III-2
COMPARISON OF ON-ROAD EMISSIONS USING 2020 RTP AND 2024 RTP VEHICLE ACTIVITY

Off-Road Mobile Sources

CARB provides emissions inventories for off-road sources, which include construction and mining equipment, industrial and commercial equipment, lawn and garden equipment, agricultural equipment, ocean-going vessels (OGV), commercial harbor craft, locomotives, cargo handling equipment, pleasure craft, recreational vehicles, and fuel storage and handling. CARB currently maintains separate off-road models for sector-specific equipment categories that align with applicability and scope used by regulatory, incentive, and other air quality programs.[7] A comprehensive web query tool is available to access the most recent model outputs from all off-road categories.[8] Many of the equipment population and activity data are based on data reported through the Diesel Off-Road Online Reporting System (DOORS).[9] DOORS is a tool used by the California Air Resources Board (CARB) to track and report on off-road diesel vehicle fleets. It helps fleet owners meet the requirements of the In-Use Off-Road Diesel-Fueled Fleets Regulation, which aims to reduce

[7] CARB's Mobile Source Emissions Inventory, Off-Road Categories. Available at: https://ww2.arb.ca.gov/our-work/programs/msei/offroad-models
[8] CARB's Off-Road web platform: https://arb.ca.gov/emfac/offroad/
[9] DOORS Resources: https://ww2.arb.ca.gov/our-work/programs/truckstop-resources/road-zone/doors-resources

emissions from these vehicles. Separately from all other off-road categories, aircraft emissions are based on an updated analysis by the South Coast AQMD developed in conjunction with commercial airports in the region.

Filterable and Condensable PM Emissions

Per PM2.5 NAAQS final implementation rule,[10] the SIP emissions inventory is required to separately identify condensable and filterable portions of PM2.5 within primary PM2.5 emissions. Primary PM emissions consist of condensable and filterable portions. Condensable PM is the material that is in vapor phase in stack conditions. The U.S. EPA's Air Emissions Reporting Requirements (AERR) requires states to report annual emissions of filterable and condensable components of PM2.5 and PM10, "as applicable," for large sources for every inventory year and for all sources every third inventory year, beginning with 2011.[11] Subsequent emissions inventory guidance[12] from the U.S. EPA clarifies the meaning of the phrase "as applicable" by providing a list of source types "for which condensable PM is expected by the AERR." Filterable PM comprises "particles that are directly emitted by a source as a solid or liquid [aerosol] at stack or release conditions." Primary PM2.5 is the sum of condensable and filterable PM2.5 emissions. Category specific conversion factors developed by CARB and used in previous SIP revisions including the 2016 AQMP, 2024 PM2.5 Plan and the Imperial County 2018 SIP[13] were applied in the current analysis to estimate condensable PM. Filterable PM was calculated by subtracting the condensable from the total PM2.5 primary emissions. Mobile sources emit PM in both filterable and condensable form; however, the AERR does not require states to report filterable and condensable PM separately for mobile sources. Therefore, the condensable and filterable PM2.5 emissions presented here include only those from stationary point and area sources.

Future Projections of Emissions

For stationary sources, future emissions were forecasted differently for the sources belonging to RECLAIM from those that are not in RECLAIM. The South Coast AQMD's RECLAIM is a market-based cap-and-trade program to reduce SOx and NOx emissions. Future changes in emissions from the RECLAIM universe are subject to the allocation cap defined in South Coast AQMD's rule 2002 that sets limits to total emissions of NOx and SOx for that particular group of sources. Changes in emissions from non-RECLAIM sources are primarily based on demographic and economic growth projections from SCAG's 2020 RTP, as well as other throughput data such as energy consumption projections provided by Southern California Gas Company (SoCalGas) during development of the 2022 AQMP. These forecasts also reflect the impact of existing regulations, with cutoff dates for regulations consistent with those used in the 2022 AQMP. The South Coast AQMD rules included in the future baseline inventories—listed in Table III-1—comprise all rules amended or

[10] 40 CFR 51.1008(a)(1)(iv).
[11] 40 CFR §51.15(a)(1) and §51.30(b)(1).
[12] USEPA. 2017. Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations. Available at: https://www.epa.gov/sites/production/files/2017- 7/documents/ei_guidance_may_2017_final_rev.pdf.
[13] Imperial County 2018 Annual Particulate Matter less than 2.5 microns in Diameter State Implementation Plan, April 2018. Available at https://ww3.arb.ca.gov/planning/sip/planarea/imperial/final_2018_ic_pm25_sip.pdf.

adopted by October 2020, including Rule 1109.1 (Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations), which was adopted in November 2021. In addition, California Air Resources Board (CARB) regulations adopted by December 2021 are incorporated, including the Heavy-Duty Inspection and Maintenance (HD I/M) and Small Off-Road Engine (SORE) regulations.

TABLE III-1
ACCUMULATED EMISSION REDUCTIONS IN TONS PER DAY BY SOUTH COAST AQMD RULES APPLYING TO NON-RECLAIM SOURCES

Rules	Description	Adoption /Amend Date	2033			2039		
			VOC	NOx	PM	VOC	NOx	PM
445	Wood Burning Devices	27-Oct-20	-	-	0.13	-	-	0.13
1109.1	NOx reduction from refinery	5-Nov-21	-	1.17	-	-	4.65	-
1111[a]	Residential NG Heating Furnaces	2-Mar-18		2.38	-	-	4.12	-
1113	Architectural Coatings	5-Feb-16	0.95	-	-	0.95	-	-
1118.1 (non-RECLAIM)[b]	Non-Refinery Flares	4-Jan-19	-	0.12	-	-	0.12	-
1134 (non-RECLAIM)[b]	Stationary Gas Turbine	5-Apr-19	-	0.11	-	-	0.17	-
1135 (non-RECLAIM)[b]	Electricity Generating Facilities	2-Nov-18	-	0.04	-	-	0.04	-
1146 & 1146.1 (non-RECLAIM)[b]	Industrial /Commercial Boilers, Steam Generator, & Process Heaters	7-Dec-18	-	-	-	-	0.06	-
1168	Adhesive and Sealant Applications	6-Oct-17	0.79	-	-	0.79	-	-
1179.1	Combustion Equipment at Publicly Owned Treatment Works Facility	2-Oct-20	-	0.05	-	-	0.05	-
Airport	FBMSM – Commercial Airports	6-Dec-19	-	0.5	-	-	0.5	-

[a]R1111 reduction reflect the implementation schedule for the March 2018 amendment.
[b]The emission reductions for RECLAIM portion are not included to avoid double counting.

Forecast of emissions for non-RECLAIM sources is based on the following equation:

$$FY_i = BY \times CF_i \times GF_i$$

where FY_i is the forecasted emissions of an air pollutant in the Basin for a future year *i*. *BY* refers to the base year emissions of the air pollutant. The control factor, CF_i, is an indicator of the level of control on a specific source category as a result of adopted state and local air quality regulations in year *i*. GF_i is a growth factor

determined for different categories of industry with socioeconomic data for year *i* with respect to base year. Both CF_i and GF_i are unitless factors that reflect a change with respect to the base year, 2018. Stationary point and area source emissions are consistent with those included in the 2022 AQMP, except that 2023 point source emissions are replaced with reported emissions from the AER program.

Emissions from the RECLAIM sources are governed by South Coast AQMD's rule 2002, which limits total emissions from the RECLAIM universe. The 2016 AQMP CMB-05 committed to a transition from the RECLAIM cap-and-trade approach to a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) level controls as soon as practicable. The 2022 AQMP assumed 2025 and 2026 to be the first year without NOx and SOx RECLAIM, respectively, based on the best information available during the development of the AQMP. Accommodating stakeholders' input and parallelly pursuing SOx reductions via rule making, the date was later updated to 2028 to be the first year without NOx RECLAIM and SOx RECLAIM is not assumed to sunset in this Plan. Post-RECLAIM year emissions were treated identically to other stationary sources, i.e. subject to growth and controls by applicable rules.

Uncertainty in the Inventory

An accurate Maintenance Plan relies on a robust emission inventory. Over the years, significant improvements have been made to quantify emission sources for which control measures are developed. Increased use of continuous monitoring and source tests has contributed to the improvement in point source inventories. Technical assistance to facilities and auditing of reported emissions by South Coast AQMD also have improved the accuracy of the emissions inventory. CARB inventory staff collaborates with the South Coat AQMD to ensure the accuracy of these data. The locations of point sources, including stacks, are checked for validity. Area source inventories that rely on average emission factors and regional activities have inherent uncertainty. Area source emissions estimates are developed by both CARB and South Coast AQMD staff, and the methodologies are reviewed by both agencies before their inclusion in the emissions inventory. Industry-specific surveys and source-specific studies during rule development have provided much-needed refinement to the emissions estimates. Many sectors in area sources were revised extensively as well based on the best available emission factors and activity data. Moreover, many improvements are included in the on-road mobile source model EMFAC2021 which estimates emissions from trucks, automobiles, and buses. Improvements and updates are included in the off-road models for locomotives, OGVs, commercial harbor craft, pleasure craft and off-road recreational vehicles, cargo handling equipment, and farm equipment. Mobile categories are verified with CARB mobile source staff for consistency with the on-road and off-road emission models.

CARB maintains and assembles base year emissions in the California Emission Inventory Development and Reporting System (CEIDARS), which is designed with automatic system checks to prevent errors, such as double counting of emission sources. At the final stage, California Emissions Projection Analysis Model (CEPAM), a tool designed and maintained by CARB to model statewide and air district-specific emissions inventory is thoroughly reviewed by CARB staff as well as South Coast AQMD staff to validate the application of growth and control factors, and the output emissions are compared against prior approved versions of CEPAM to identify data anomalies.

Overall, the inventory in this Plan is based on the most current information and estimation methodologies, resulting in the most accurate inventory available. However, there are still areas that could be improved if better data were available. Technology changes and improvements in the area of electric, hybrid, flexible fuel, and fuel cell vehicles, or the change in future gasoline prices, all add uncertainty to the future on-road emissions inventory.

Relative to future growth, there are many challenges involved with making accurate projections, such as where vehicle trips will occur, the distribution between various modes of transportation (such as trucks and trains), as well as estimates for population growth and changes to the number and type of jobs. Forecasts are made with the best information available; nevertheless, they contribute to the overall uncertainty in emission projections. Fortunately, AQMP updates are generally performed every three to five years; thereby allowing for frequent improvements and adjustments to the inventories.

3. Emissions

Base Year Emissions

Table III-2 shows the base year (2023) annual average emissions inventory for the South Coast Air Basin by major source category, and Figure III-3 shows the breakdown of emissions by major source type. On-road and off-road mobile sources are the largest contributors to the Basin's total NOx emissions whereas large facilities in the RECLAIM program, such as refineries, are the largest source of SOx. For all other pollutants – VOC, PM10, PM2.5, and NH3 – area sources are the largest contributor to emissions.

TABLE III-2
2023 AVERAGE ANNUAL DAY EMISSIONS BY MAJOR SOURCE CATEGORY
IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.10	21.57	2.01	4.88	4.84	6.96
Waste Disposal	15.08	1.04	0.55	0.29	0.29	5.76
Cleaning and Surface Coatings	35.72	0.03	0.00	1.52	1.46	0.12
Petroleum Production and Marketing	18.28	0.19	0.28	1.01	0.70	0.05
Industrial Processes	10.74	0.21	0.07	10.08	5.00	9.11
Solvent Evaporation	125.36	0.00	0.00	0.03	0.02	1.20
Residential Fuel Combustion	8.97	18.99	0.34	6.96	6.78	0.11
Farming Operations	1.06	0.00	0.00	0.68	0.14	5.87
Construction And Demolition	0.00	0.00	0.00	23.59	2.36	0.00
Paved Road Dust	0.00	0.00	0.00	57.21	8.56	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.74	1.67	0.00
Commercial Cooking	1.12	0.00	0.00	11.79	11.79	0.00
Residential Ammonia						26.90
Other Miscellaneous Sources	0.50	0.16	0.03	2.32	0.91	0.03
RECLAIM		11.97	4.49			
Total Stationary and Area Sources	**221.93**	**54.16**	**7.78**	**137.12**	**44.52**	**56.11**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	55.94	39.35	1.17	6.80	2.46	12.22
Heavy-Duty Vehicles	3.54	41.63	0.28	2.85	1.19	4.43
Buses and Motorhomes	0.43	2.75	0.02	0.21	0.09	0.87
Total On-Road Sources	**59.91**	**83.73**	**1.47**	**9.86**	**3.73**	**17.52**
Other Mobile Sources						
Aircraft	3.35	17.77	1.54	0.73	0.65	0.00
Trains	0.69	16.13	0.02	0.37	0.34	0.01
Ocean-Going Vessels and Harbor Craft	9.80	36.90	2.08	0.95	0.88	0.03
Off-Road Equipment	49.41	42.88	0.10	2.22	1.94	0.08
Other Off-Road Sources	18.55	2.87	0.00	0.73	0.55	0.01
Total Other Mobile Sources	**81.81**	**116.55**	**3.76**	**5.00**	**4.36**	**0.12**
Total Anthropogenic Sources	**363.65**	**254.44**	**13.00**	**151.98**	**52.63**	**73.75**

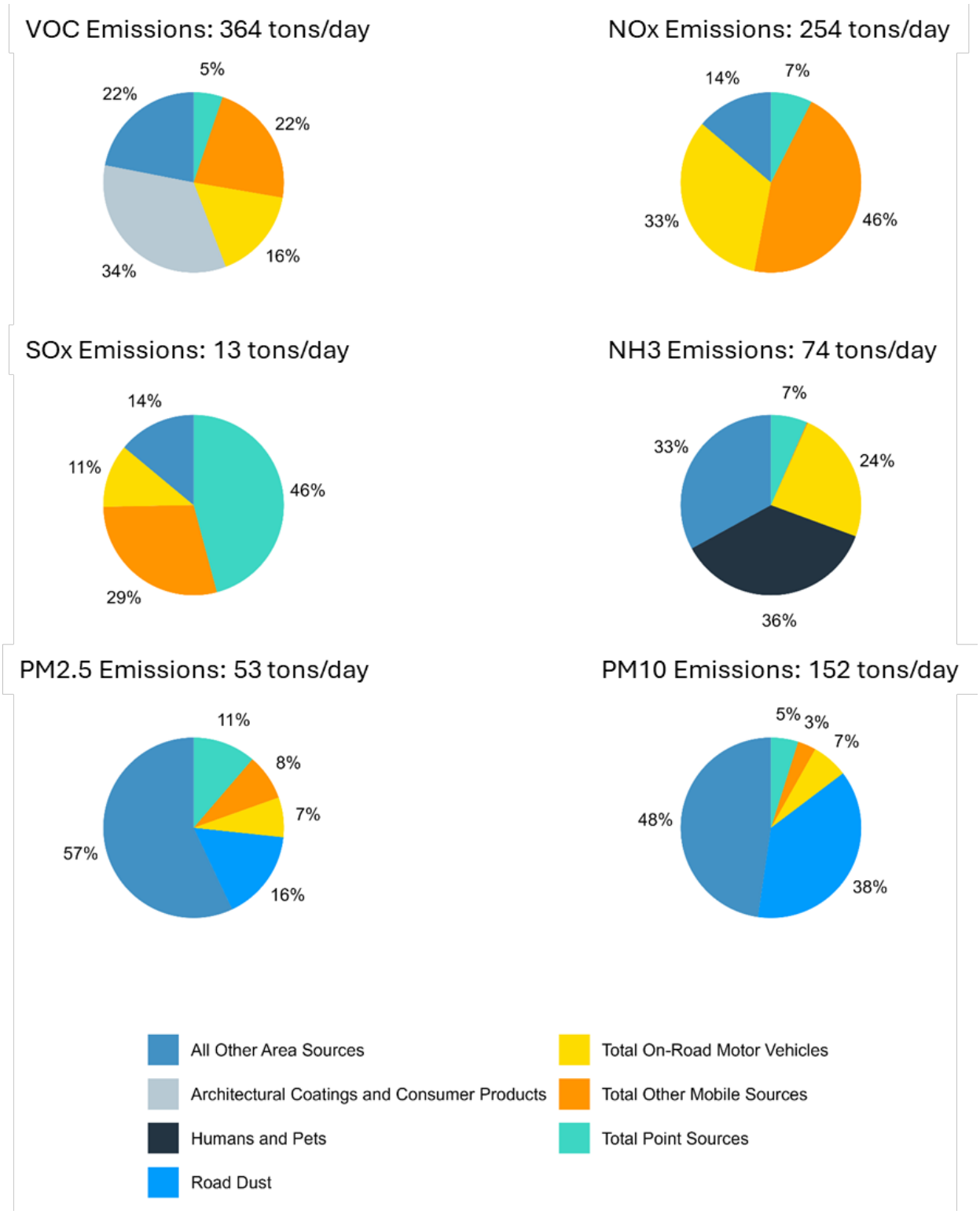


FIGURE III-3
2023 EMISSIONS BY MAJOR SOURCES
(ANNUAL AVERAGE)

Figures III-4 and III-5 present the top 10 sources of PM2.5 and PM10 emissions in 2023, along with their estimated emissions. In the South Coast Air Basin, the largest contributors to PM2.5 emissions are commercial cooking, paved road dust, and residential fuel combustion. For PM10, the dominant sources are road dust and construction and demolition activities.

Figures III-6 through III-9 show the top 10 sources of PM precursor emissions, NOx, SOx, VOC, and NH3, and indicating:

- The primary sources of NOx emissions are mobile sources, including off-road equipment, heavy-duty trucks, ships, and residential fuel combustion,
- Major SOx emissions come from RECLAIM sources and marine vessels,
- VOC emissions are largely from consumer products, as well as small gasoline-powered off-road equipment and gasoline vehicles, and
- The leading source of NH3 is biological emissions from human perspiration and pets, followed by industrial ammonia use and on-road vehicle emissions.

More detailed emissions inventories by major source categories can be found in Attachment I of this Plan.

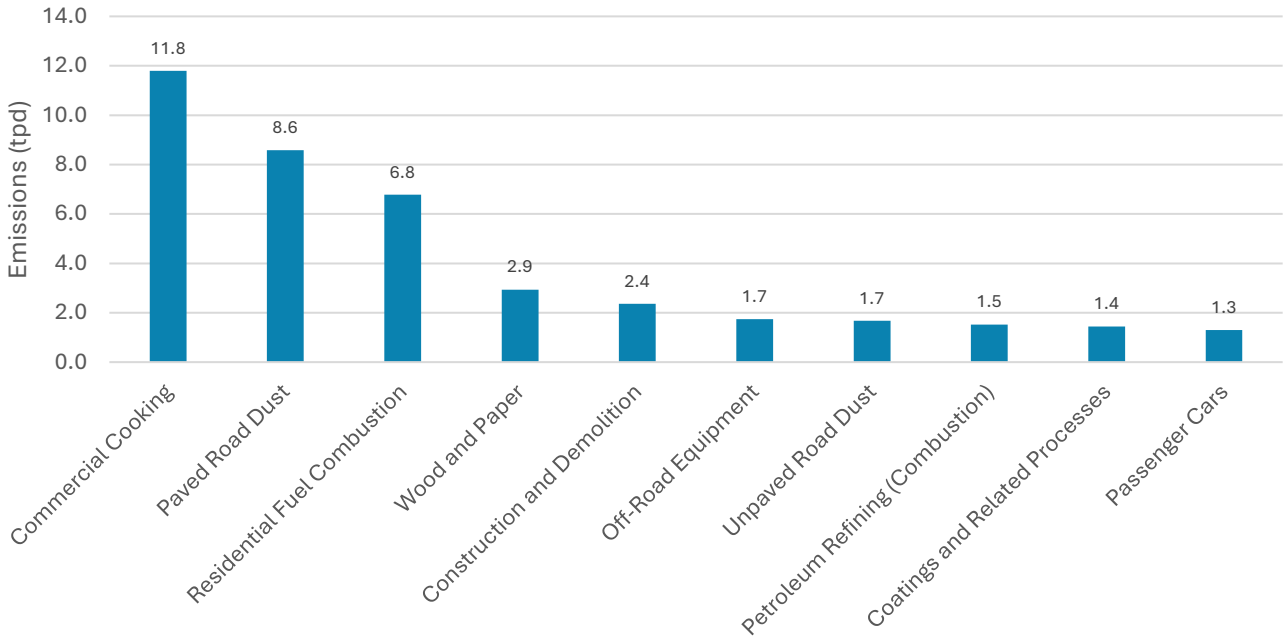


FIGURE III-4
TOP 10 PM2.5 SOURCES IN 2023

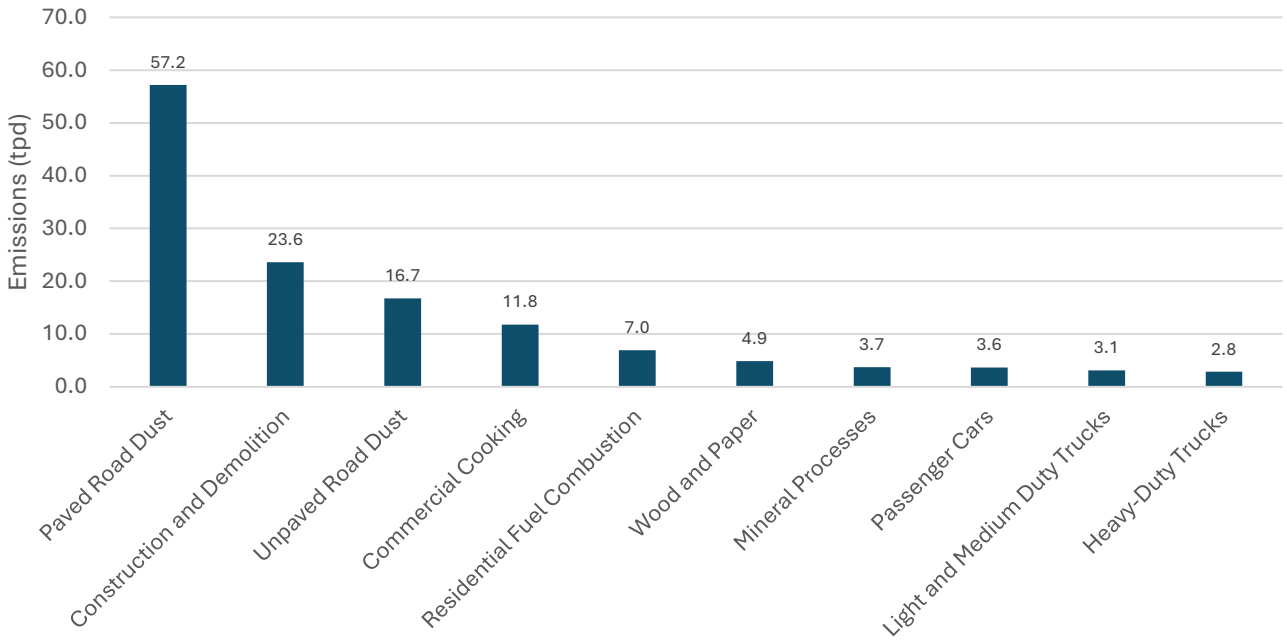


FIGURE III-5
TOP 10 PM10 SOURCES IN 2023

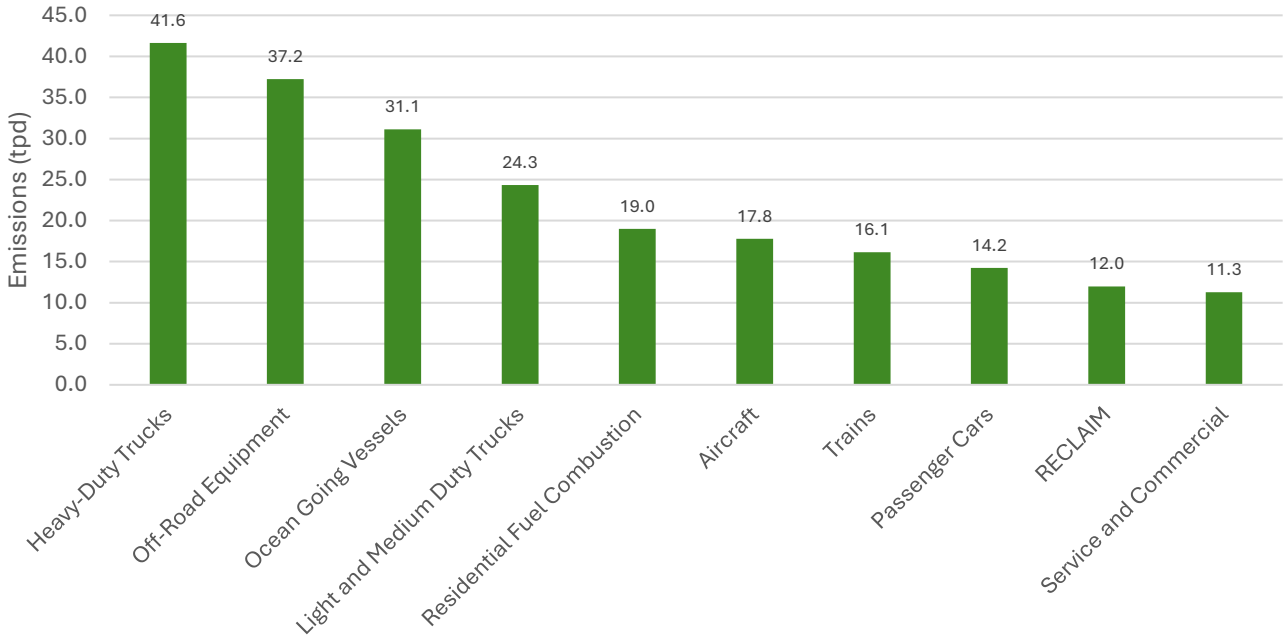


FIGURE III-6
TOP 10 NOX SOURCES IN 2023. RECLAIM REFERS TO LARGE FACILTIIES SUBJECT TO THE RECLAIM (REGIONAL CLEAN AIR INCENTIVES MARKET) REGULATIONS

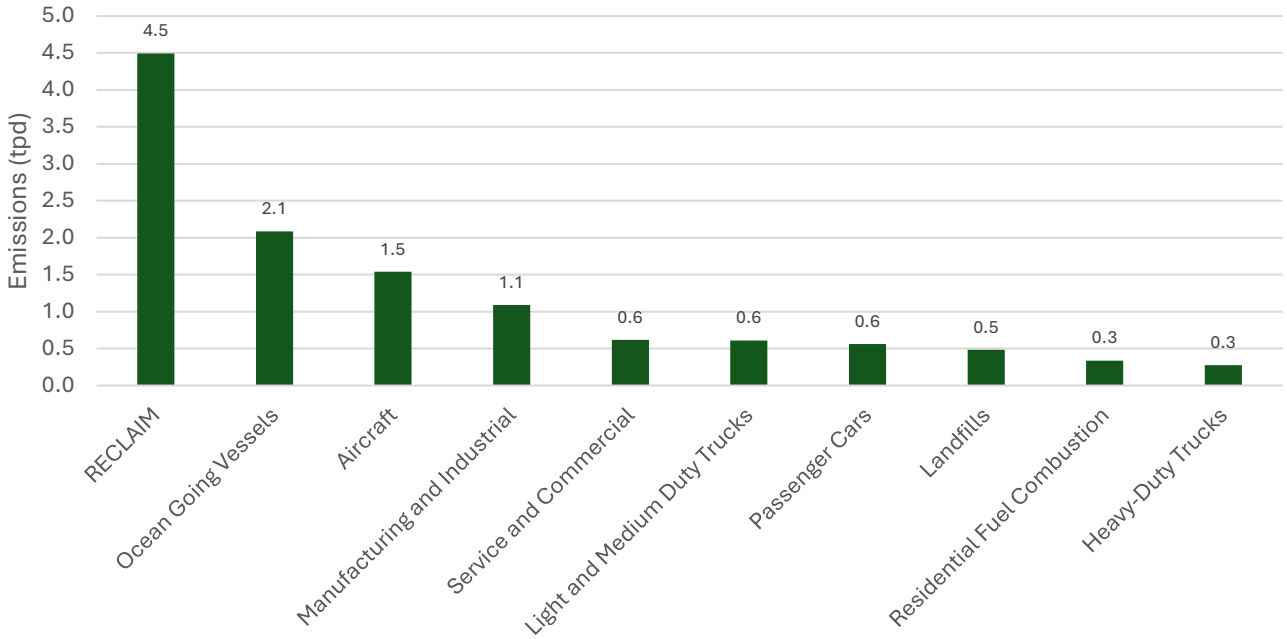


FIGURE III-7
TOP 10 SOX SOURCES IN 2023. RECLAIM REFERS TO LARGE FACILTIIES SUBJECT TO THE RECLAIM (REGIONAL CLEAN AIR INCENTIVES MARKET) REGULATIONS

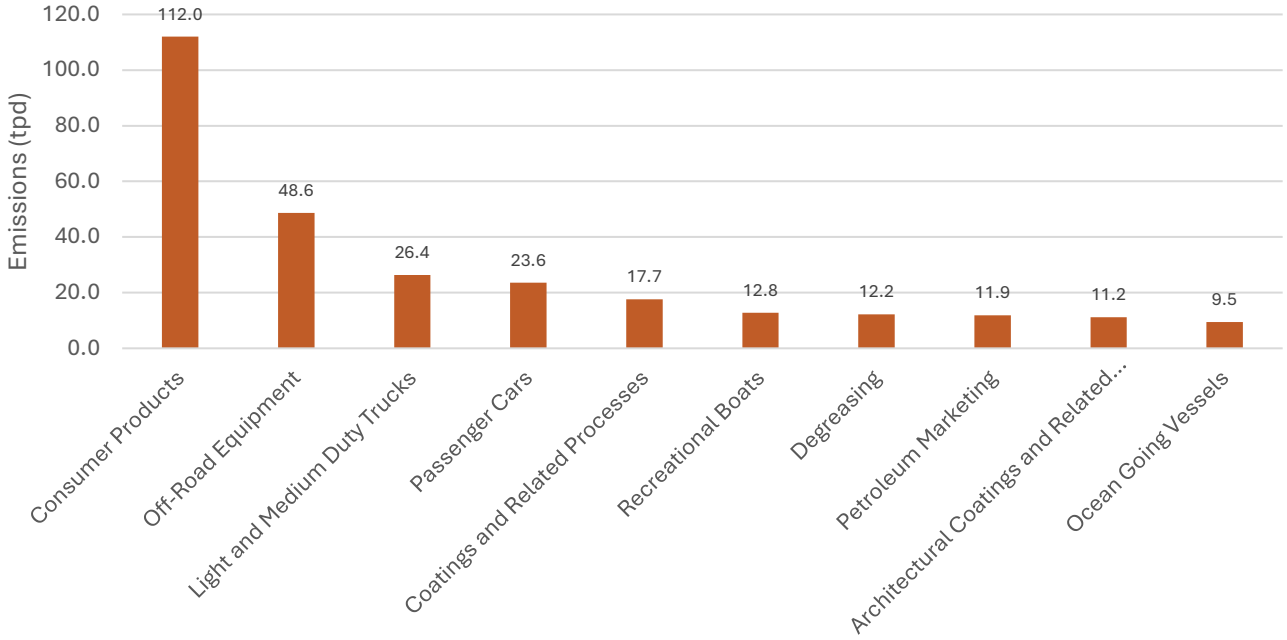


FIGURE III-8
TOP 10 VOC SOURCES IN 2023

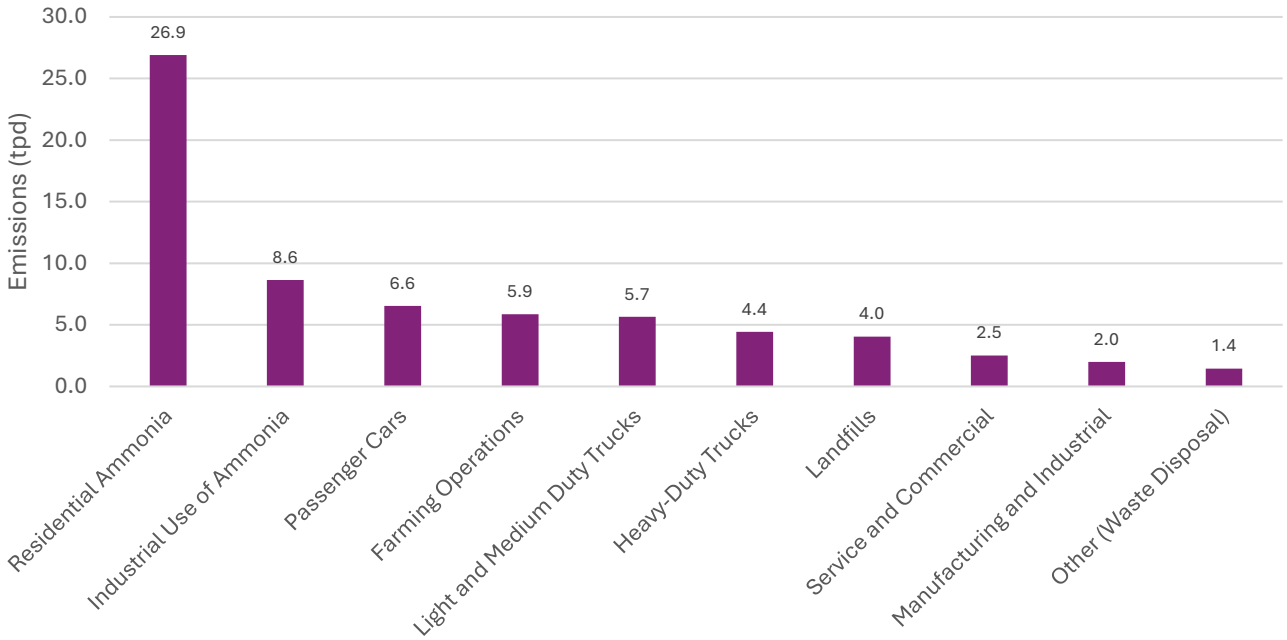


FIGURE III-9
TOP 10 NH3 SOURCES IN 2023

Future Emissions

Tables III-3 and III-4 present the annual average emissions for the years 2033 and 2039. The year 2033 serves as the new maintenance horizon for the 24-hour PM10 NAAQS, while 2039 is the maintenance horizon year for the 24-hour and annual PM2.5 NAAQS. Detailed emissions inventories, including all major stationary and mobile source categories, are provided by Major Source Category in Attachment I.

Although total NOx emissions in the Basin are expected to decline significantly over time, emissions of PM2.5 and PM10 are projected to increase between 2023 and 2039, primarily due to contributions from cooking and road dust. Anticipated growth in population and economic activity is expected to offset emission reductions achieved by stationary combustion and mobile sources in the coming years. This trend is especially evident in area sources, which continue to be the dominant contributors to overall PM2.5 and PM10 emissions in the Basin.

VOC emissions from consumer products are also projected to rise as the population grows. However, total VOC emissions are expected to decline overall, largely due to ongoing reductions from mobile sources. SOx emissions are higher in the future, because the RECLAIM allocation cap reflected in the future inventory is higher than the reported emissions for 2023. Additional increases in SOx emissions are contributed by the growth in ocean-going vessel activity. Meanwhile, NH3 emissions are expected to grow over time, driven by both population growth and increased emissions from vehicles.

Figures III-10 and III-11 illustrate the contributions of major source types to overall emissions. In general, area sources contribute an increasing share of VOC, PM2.5, and PM10 emissions in future years, largely driven by population growth and increased vehicle activity. In contrast, the contribution from on-road mobile sources decreases for all pollutants except ammonia (NH3). Notably, on-road emissions are projected to decline almost by half between 2023 and 2039, reflecting cleaner vehicles and current vehicle regulations.

The contribution from point sources to SOx emissions is expected to decline slightly due to ongoing regulatory controls. However, ocean-going vessels, classified under other mobile sources, are projected to contribute a growing share of SOx emissions. Lastly, emissions of NH3 from both on-road sources and population-related activities are expected to increase modestly over time.

TABLE III-3
2033 AVERAGE ANNUAL DAY EMISSIONS BY MAJOR SOURCE CATEGORY
IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.05	29.46	2.03	4.62	4.58	6.31
Waste Disposal	15.87	1.25	0.57	0.31	0.30	6.22
Cleaning and Surface Coatings	37.14	0.08	0.00	1.58	1.52	0.12
Petroleum Production and Marketing	17.72	0.52	0.31	1.01	0.70	0.05
Industrial Processes	10.95	1.21	0.08	10.68	5.35	9.11
Solvent Evaporation	140.80	0.00	0.00	0.03	0.03	1.16
Residential Fuel Combustion	8.86	14.29	0.32	6.77	6.58	0.11
Farming Operations	1.00	0.00	0.00	0.65	0.13	5.79
Construction And Demolition	0.00	0.00	0.00	25.43	2.54	0.00
Paved Road Dust	0.00	0.00	0.00	59.50	8.90	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.73	1.67	0.00
Commercial Cooking	1.18	0.00	0.00	12.50	12.50	0.00
Residential Ammonia						28.49
Other Miscellaneous Sources	0.50	0.16	0.03	2.24	0.90	0.03
RECLAIM			6.08			
Total Stationary and Area Sources	**239.06**	**46.98**	**9.42**	**142.05**	**45.70**	**57.39**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	37.67	19.73	0.95	6.50	2.19	13.63
Heavy-Duty Vehicles	2.22	23.02	0.26	3.02	1.17	5.43
Buses and Motorhomes	0.28	1.27	0.01	0.18	0.07	0.63
Total On-Road Sources	**40.17**	**44.02**	**1.23**	**9.69**	**3.42**	**19.69**
Other Mobile Sources						
Aircraft	3.89	26.24	2.03	0.81	0.72	0.00
Trains	0.69	17.41	0.03	0.36	0.33	0.01
Ocean-Going Vessels and Harbor Craft	10.13	39.22	2.43	1.04	0.96	0.03
Off-Road Equipment	24.30	26.26	0.10	1.37	1.19	0.08
Other Off-Road Sources	13.40	2.68	0.01	0.51	0.39	0.01
Total Other Mobile Sources	**52.41**	**111.80**	**4.59**	**4.09**	**3.59**	**0.13**
Total Anthropogenic Sources	**331.64**	**202.79**	**15.24**	**155.84**	**52.73**	**77.21**

TABLE III-4
2039 AVERAGE ANNUAL DAY EMISSIONS BY MAJOR SOURCE CATEGORY
IN THE SOUTH COAST AIR BASIN (TONS PER DAY)

	VOC	NOX	SOX	PM10	PM2.5	NH3
Stationary and Area Sources						
Fuel Combustion	5.06	29.10	2.05	4.56	4.51	6.11
Waste Disposal	16.20	1.27	0.58	0.32	0.31	6.38
Cleaning and Surface Coatings	37.17	0.07	0.00	1.58	1.52	0.12
Petroleum Production and Marketing	18.00	0.51	0.33	1.01	0.70	0.05
Industrial Processes	10.96	1.20	0.08	10.72	5.37	9.11
Solvent Evaporation	150.61	0.00	0.00	0.03	0.03	1.14
Residential Fuel Combustion	8.85	12.99	0.32	6.76	6.57	0.11
Farming Operations	0.97	0.00	0.00	0.64	0.12	5.72
Construction And Demolition	0.00	0.00	0.00	26.47	2.65	0.00
Paved Road Dust	0.00	0.00	0.00	60.30	9.02	0.00
Unpaved Road Dust	0.00	0.00	0.00	16.73	1.67	0.00
Commercial Cooking	1.22	0.00	0.00	12.91	12.91	0.00
Residential Ammonia						29.33
Other Miscellaneous Sources	0.50	0.16	0.03	2.20	0.89	0.03
RECLAIM			6.08			
Total Stationary and Area Sources	**249.55**	**45.31**	**9.47**	**144.22**	**46.27**	**58.10**
On-Road Motor Vehicles						
Light and Medium Duty Vehicles	32.95	16.44	0.90	6.37	2.09	13.79
Heavy-Duty Vehicles	2.07	20.96	0.26	3.20	1.23	5.87
Buses and Motorhomes	0.22	0.85	0.01	0.17	0.06	0.43
Total On-Road Sources	**35.23**	**38.25**	**1.17**	**9.75**	**3.38**	**20.09**
Other Mobile Sources						
Aircraft	3.91	27.85	2.09	0.82	0.73	0.00
Trains	0.57	14.51	0.03	0.28	0.26	0.02
Ocean-Going Vessels and Harbor Craft	10.34	34.34	2.64	1.10	1.02	0.03
Off-Road Equipment	18.11	22.84	0.10	1.21	1.03	0.06
Other Off-Road Sources	11.71	2.63	0.01	0.44	0.33	0.01
Total Other Mobile Sources	**44.65**	**102.16**	**4.86**	**3.84**	**3.37**	**0.12**
Total Anthropogenic Sources	**329.43**	**185.72**	**15.50**	**157.81**	**53.05**	**78.31**

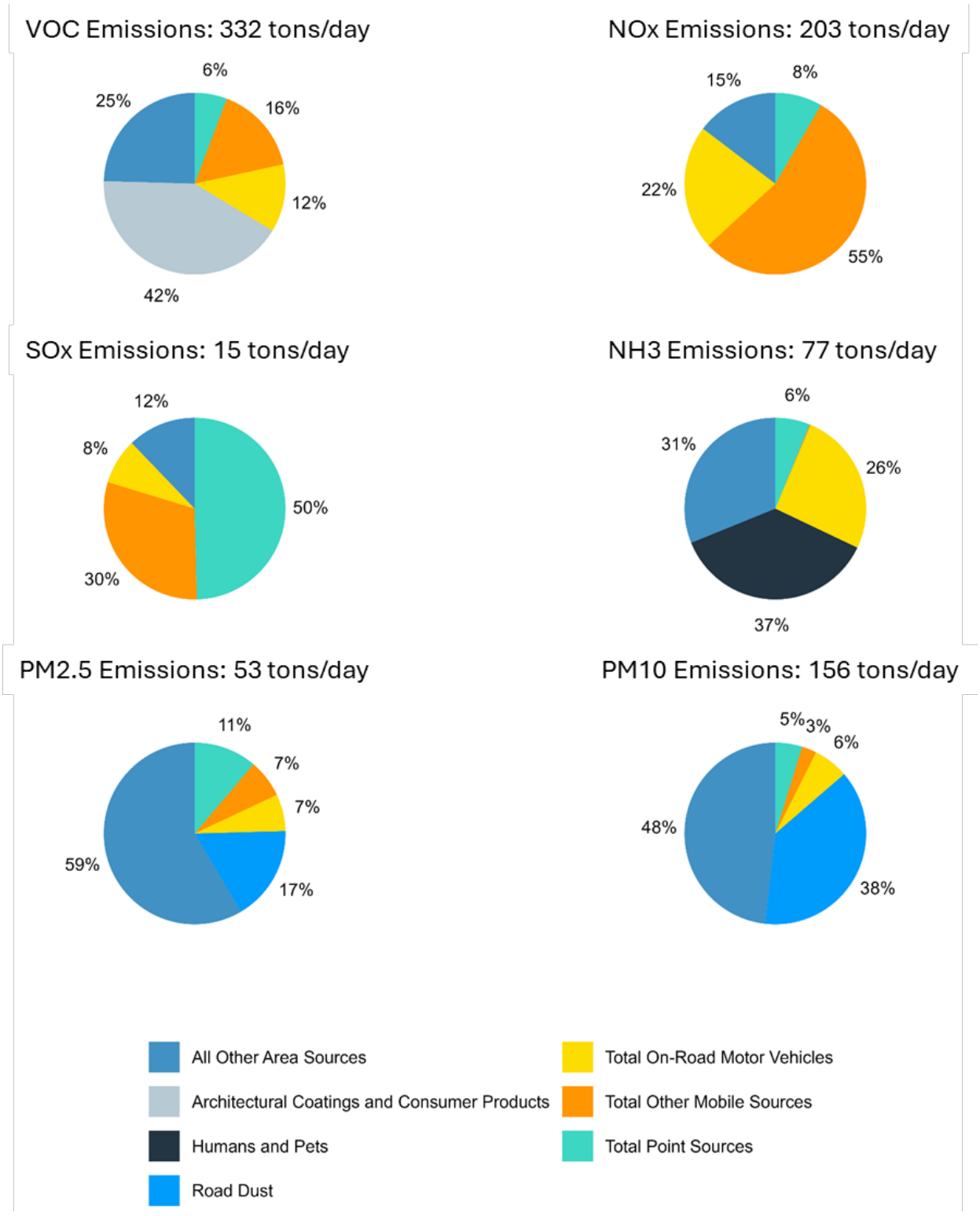


FIGURE III-10
2033 EMISSIONS BY MAJOR SOURCES
(ANNUAL AVERAGE)

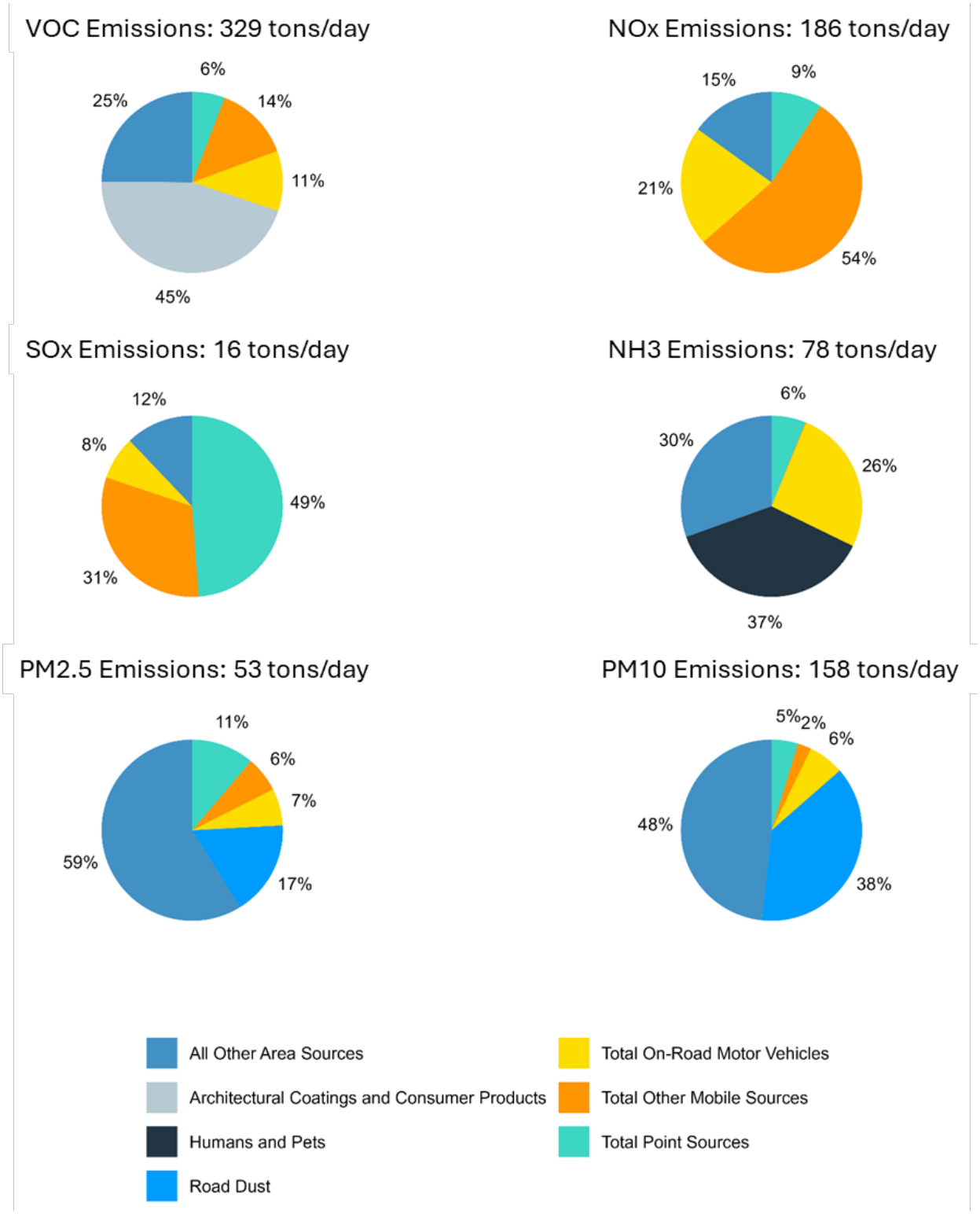


FIGURE III-11
2039 EMISSIONS BY MAJOR SOURCES
(ANNUAL AVERAGE)

Figures III-12 through III-17 present the top 10 emission sources for each pollutant in 2023, and how these rankings change in 2033 and 2039. Overall, the top sources of PM2.5 remain consistent across the years, with commercial cooking and paved road dust continuing to drive the overall increase in total PM2.5 emissions. Similarly, the top 10 PM10 sources maintain the same order over time.

In contrast, the top sources of NOx shift over the years due to regulatory impacts on on-road vehicles. While emissions from ocean-going vessels fluctuate over time, aircraft emissions are projected to increase substantially. For SOx, while RECLAIM remains the main source of emissions, and emissions from aircraft and the industrial and manufacturing sectors become increasingly significant.

For VOC, consumer products remain the largest source, while emissions from gasoline-powered off-road equipment and gasoline vehicles continue to decline. The ranking of NH3 sources remains largely unchanged, though emissions associated with human and pet perspiration steadily increase over time.

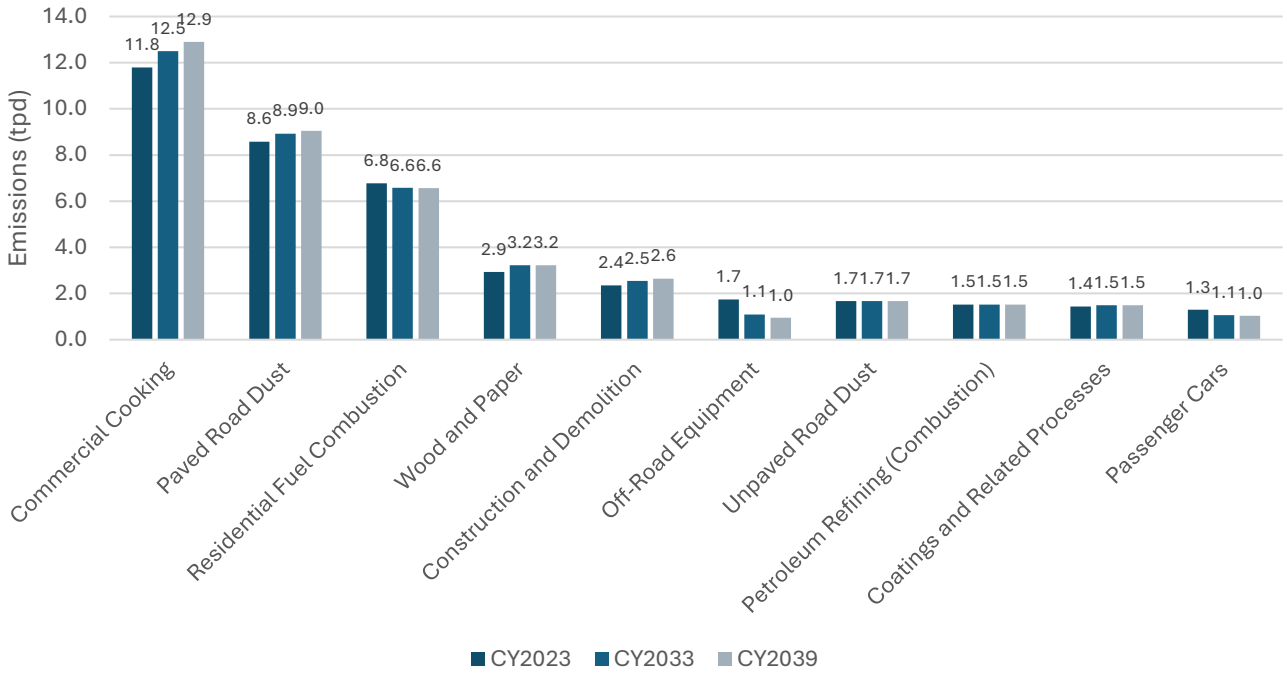


FIGURE III-12
TOP 10 PM2.5 SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

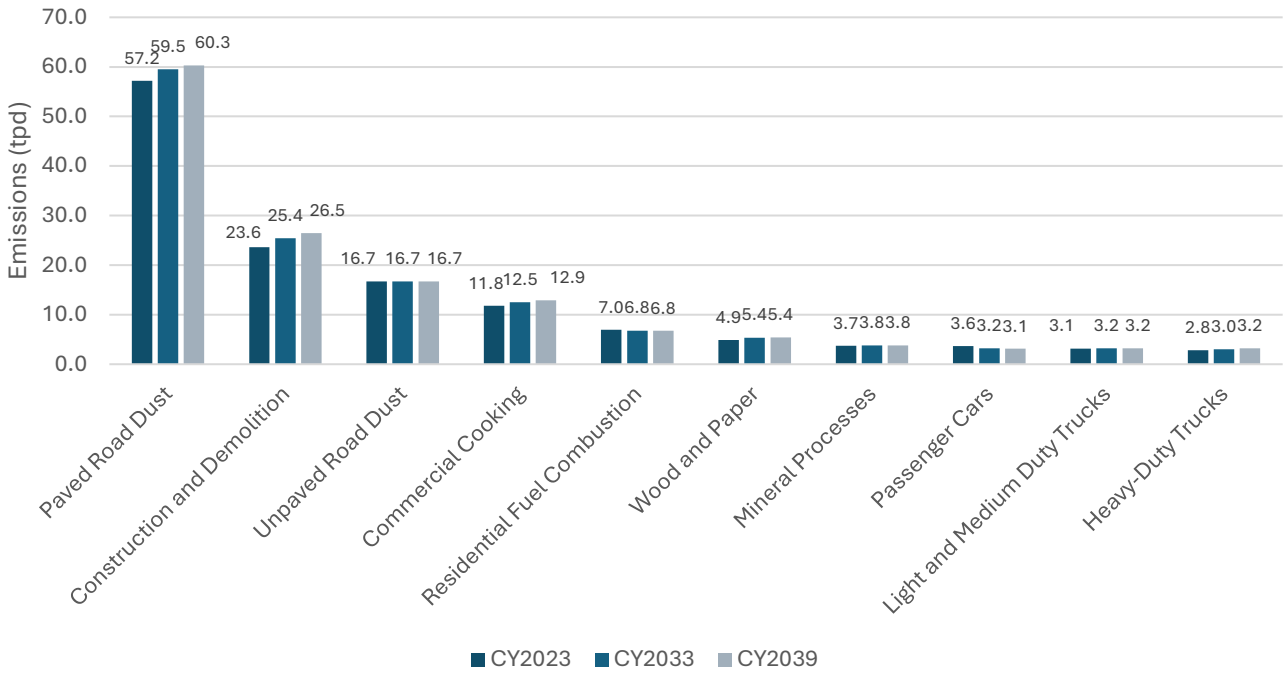


FIGURE III-13
TOP 10 PM10 SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

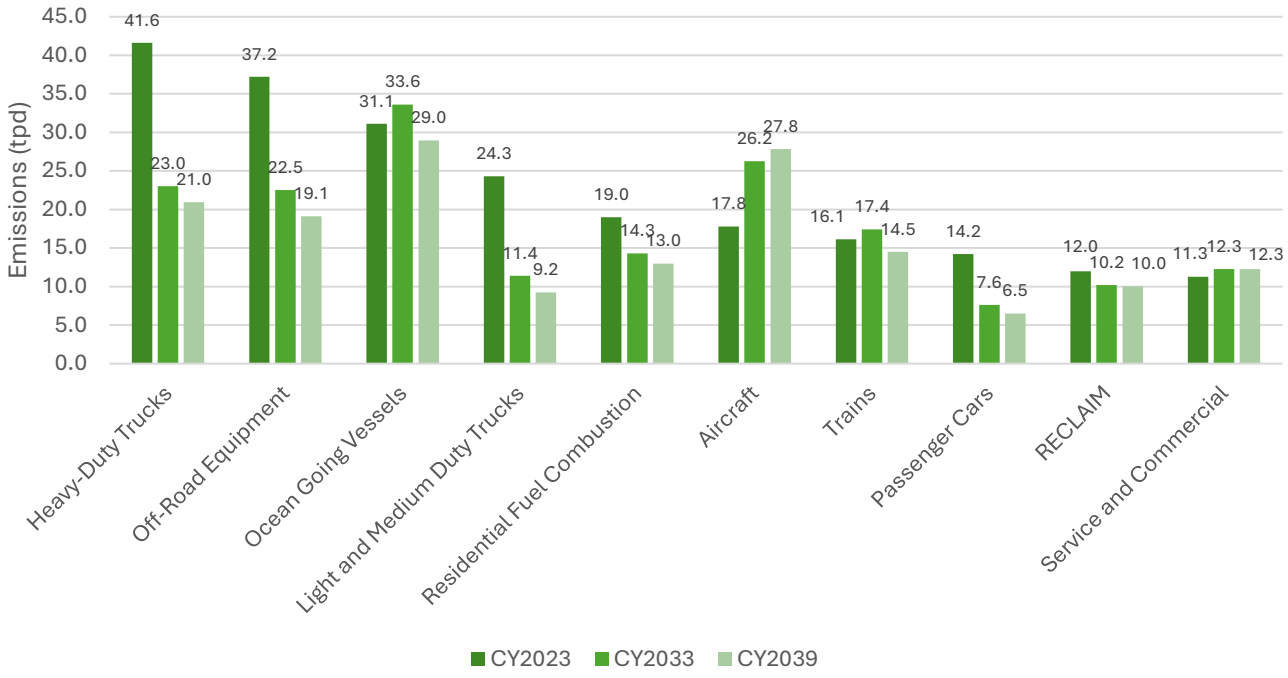


FIGURE III-14
TOP 10 NOX SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

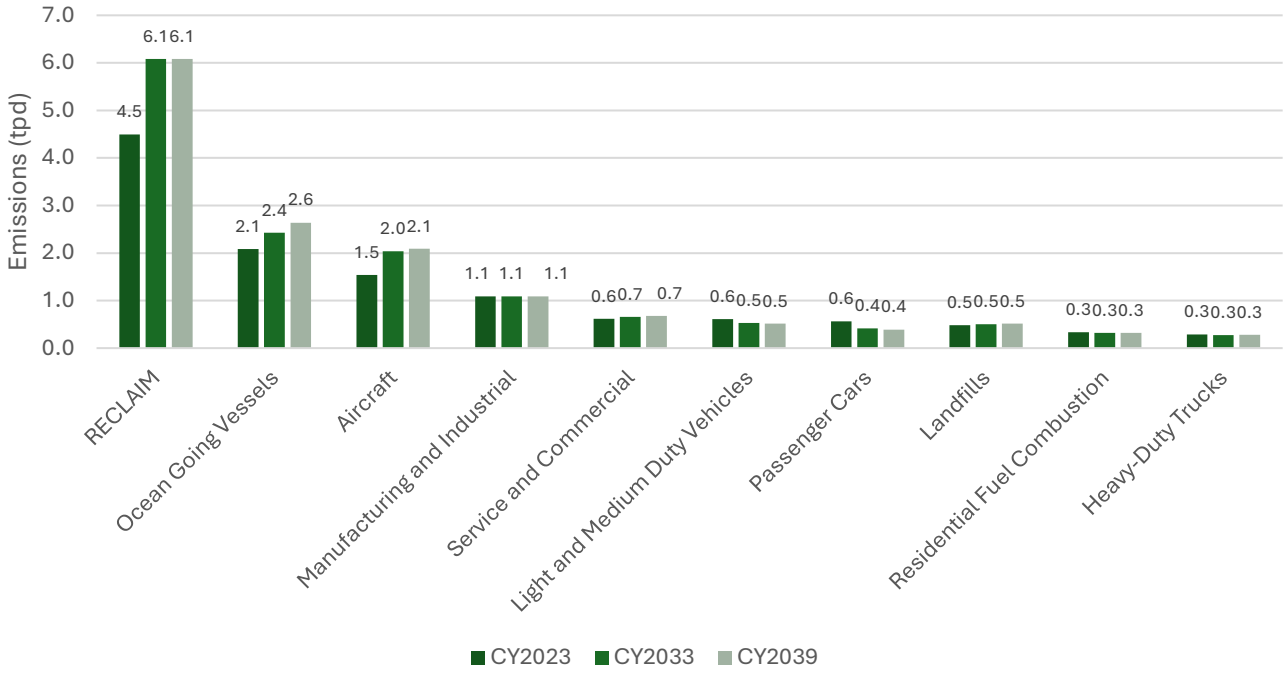


FIGURE III-15
TOP 10 SOX SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

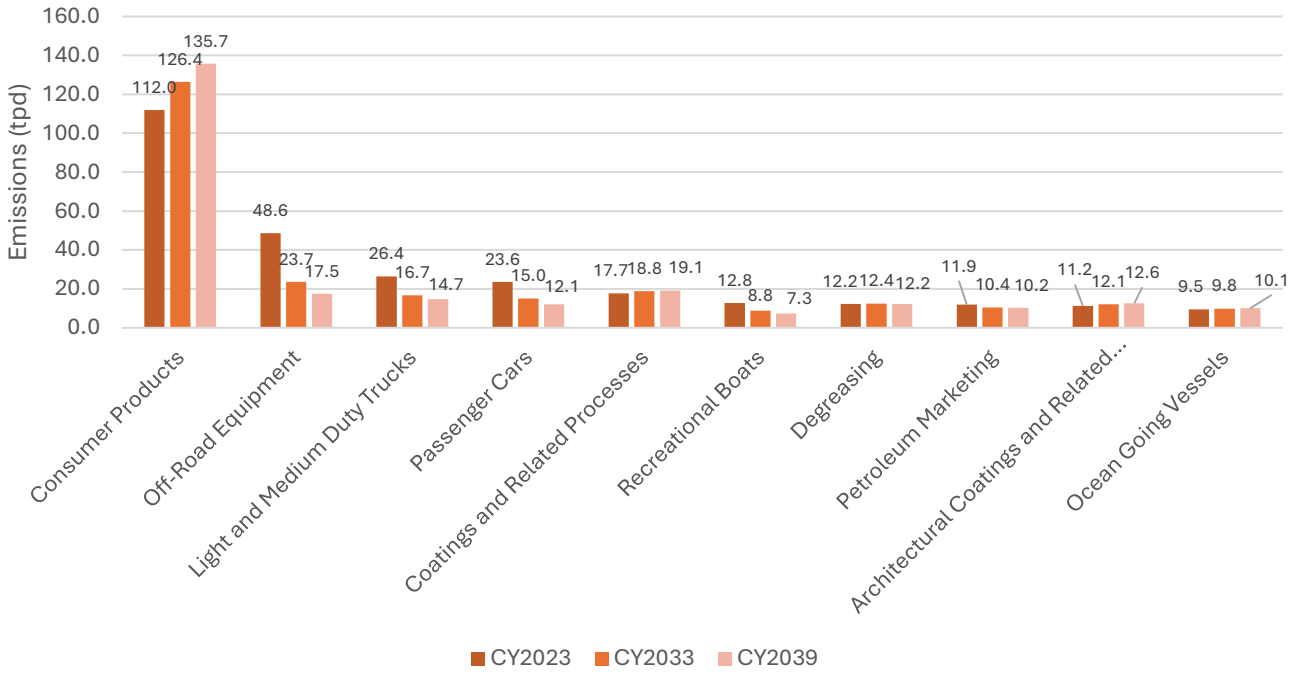


FIGURE III-16
TOP 10 VOC SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

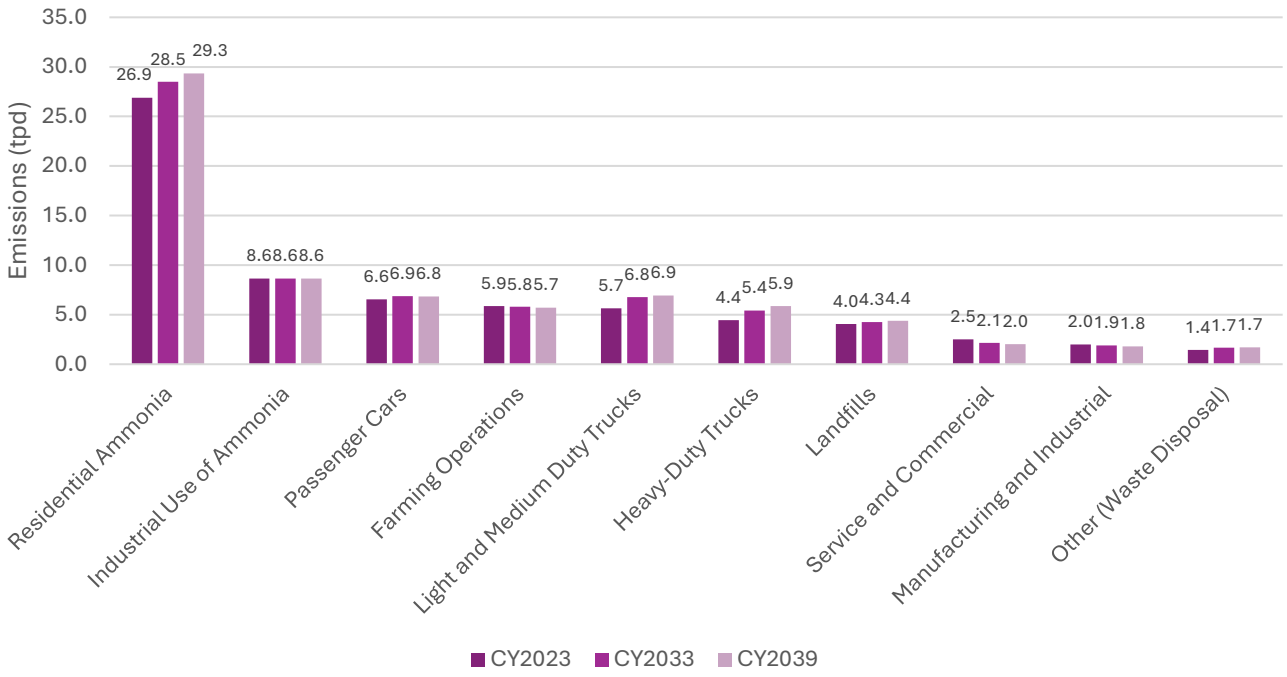


FIGURE III-17
TOP 10 NH3 SOURCES IN FUTURE YEARS IN COMPARISON WITH 2023

Condensable and Filterable Portions of PM2.5 Emissions

Estimates of condensable and filterable portions of PM2.5 emissions were developed for the base year 2023 and future milestone years 2033 and 2039. Figure III-18 presents annual average emissions of total primary (direct), condensable, and filterable PM2.5 for these three years.

Total primary PM2.5 emissions from stationary point and area sources are projected to increase slightly—by 1.2 tpd (2.7%) from 2023 to 2033, and by an additional 0.6 tpd (1.3%) from 2033 to 2039. These modest increases reflect growth in both condensable and filterable PM2.5 emissions and are primarily driven by anticipated increases in population and economic activity within the Basin.

Table III-5 lists the top five source categories contributing to condensable PM2.5 emissions for 2023, 2033, and 2039. Commercial cooking remains the dominant source, accounting for 83% of condensable PM2.5 in 2033 and 84% in 2039. Combined, the top five sources represent over 97% of total condensable PM2.5 emissions in both future years.

Table III-6 shows the top five sources of filterable PM2.5. Paved road dust is the leading contributor across all years, followed by emissions from residential fuel combustion and various industrial activities and unpaved road dust. These top five categories account for approximately 72% of total filterable PM2.5 in 2033 and 2039.

A more detailed breakdown of emissions by major source category is provided in Attachment II.

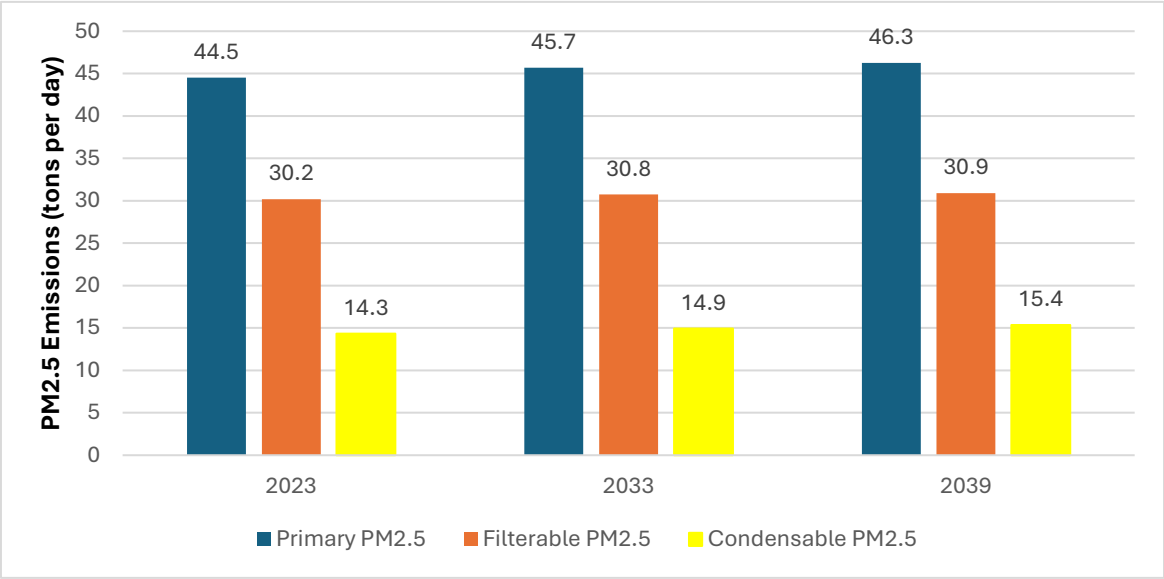


FIGURE III-18
ANNUAL AVERAGE PRIMARY, FILTERABLE AND CONDENSABLE PM2.5 EMISSIONS

TABLE III-5
TOP 5 CATEGORIES EMITTING CONDENSABLE PM2.5 (TONS PER DAY)

Category	2023	2033	2039
Cooking	11.76	12.47	12.87
Residential Fuel Combustion	0.82	0.77	0.76
Petroleum Refining (Combustion)	0.82	0.82	0.82
Electric Utilities	0.36	0.29	0.29
Service and Commercial Fuel Combustion	0.17	0.18	0.19

TABLE III-6
TOP 5 CATEGORIES EMITTING FILTERABLE PM2.5 (TONS PER DAY)

Category	2023	2033	2039
Paved Road Dust	8.56	8.90	9.02
Residential Fuel Combustion	5.95	5.82	5.81
Wood and Paper	2.93	3.22	3.23
Construction and Demolition	2.36	2.54	2.65
Unpaved Road Dust	1.67	1.67	1.67

4. Impact of Recently Adopted Rules and Regulations

This section includes rules and regulations that were adopted after the development of the 2022 AQMP and emission reductions from them. This section also discusses latest adjustments in emission reductions in CARB's regulations which were affected by recent actions by U.S. Congress, U.S. EPA, and CARB and legal challenges.

Recently Adopted Rules by South Coast AQMD

Table III-7 lists the South Coast AQMD's regulations to convert the RECLAIM program to a traditional command-and-control structure. As of December of 2024, South Coast AQMD has adopted eleven so-called 'landing' rules to achieve the Best Available Retrofit Control Technology (BARCT) level control and transition out of RECLAIM program to a traditional command-and-control structure. The landing rules were not incorporated in the baseline emissions. At the time of the 2022 AQMP development, many of these rules were still in progress and it was uncertain whether the reductions would be considered as implementing the allocation caps specified in Rule 2002, which is commonly referred as "RECLAIM shave." To prevent double counting, the 2022 AQMP assumed that the reductions from the landing rules were assumed to be included in the RECLAIM shave. Since then, the majority of the landing rules have been adopted, and it is evident that the landing rules achieve reductions exceeding the requirements of the RECLAIM shave over a longer timeframe. Given the maturity of the RECLAIM shave in 2022, any reductions in excess of the 2022 "shave" reductions are considered new reductions. Consequently, the net NOx reductions from landing rules beyond the shave are projected to be 2.92 and 3.09 tpd by 2033 and 2039, respectively.

Among landing rules, Rule 1109.1 was reflected in the baseline emissions of the 2022 AQMP and no changes associated with the rule was introduced in this Plan. Rule 11091.1 implements both Rule 2002, RECLAIM allocation cap and the BARCT level requirements set by the 2016 AQMP CMB-05. The reductions attributed to the BARCT level controls are 4.29 and 4.65 tpd by 2033 and 2039, respectively. And, the shave portion is 2.35 tpd NOx reduction.

TABLE III-7
NOX REDUCTIONS IN TONS PER DAY FROM SOUTH COAST AQMD'S REGULATIONS TO CONVERT THE RECLAIM PROGRAM TO A COMMAND-AND-CONTROL STRUCTURE

Adopted/Amended Date	District Rule	Implementation Schedule		2033 Reduction in excess of 2022 reductions (tpd)	2039 Reduction in excess of 2022 reductions (tpd)
		Start Year	End Year		
11/1/2019	Rule 1110.2 – Control of Emissions from Gaseous- and Liquid-fueled Engines	2020	2029	0.21	0.21
1/4/2019	Rule 1118.1 – Control of Emissions from Non-Refinery Flares	2022	2025	0.03	0.03
4/5/2019	Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines	2024	2027	1.66	1.66
11/2/2018	Rule 1135 – Electricity Generating Facilities	2020	2025	0.18	0.18
10/4/2024	Rule 1135 – Electricity Generating Facilities	2024	2030	0.15*	0.15*
12/7/2018	Rule 1146 & 1146.1 – Emissions of Oxides of Nitrogen from Industrial, Institutional, Commercial Boilers, Steam Generators, and Process Heaters	2019	2033	0.08	0.08
12/7/2018	Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Heaters and Small Boilers and Process Heaters	2022	2023	0.002	0.002
5/6/2022	Rule 1147 – NOx Reductions from Miscellaneous Sources	2024	2059	0.45	0.56
8/6/2021	Rule 1147.1 – NOx Reductions from Aggregate Dryers	2025	2057	0.01	0.01
4/1/2022	Rule 1147.2 – NOx Reductions from Metal Melting and Heating Furnaces	2026	2057	0.39	0.42
8/4/2023	Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens	2024	2036	0.03	0.04
12/6/2024	R1159.1 – NOx Reductions from Nitric Acid Tanks	2029	2029	0.06	0.06
Cumulative reductions from the landing rules listed above**				**2.92**	**3.09**

* The October 2024 amendment to R1135 for the Catalina Island EGU delays the implementation schedule from November amendment to R1135, which targets all EGU facilities within the South Coast Air Basin. The reduction amount is not double counted in the cumulative reductions for all RECLAIM landing rules.

** Reductions are calculated for each rule individually. Because some sources are affected by more than one rule, the compounded emission reductions are slightly lower than the sum of reductions from individual rules.

There are 16 rules for non-RECLAIM sources that were adopted or amended after the cut-off date of this Plan (October 2020 expect for Rule 1109.1) and through the end of 2024. Table III-8 lists the resulting future accumulated annual average criteria pollutants emission reductions in 2033 and 2039. By 2033 and 2039, the estimated accumulated NOx reductions are 1.59 and 3.00 tpd, respectively. The corresponding accumulated reductions for SOx are 0.06 tpd in both years; for VOC, 3.83 tpd and 3.88 tpd, respectively for 2033 and 2039; and for PM2.5, 0.04 tpd in both years. Those quantified emission reductions were not reflected into the baseline emissions or accounted for in the future design value calculations. However, these reductions will further ensure that the basin maintains the attainment status for the standards discussed in this Plan.

TABLE III-8
ACCUMULATED EMISSION REDUCTIONS IN TONS PER DAY BY POST-2022 AQMP SOUTH COAST AQMD RULES FOR NON-RECLAIM SOURCES

Adoption Date	District Rule	Implementation Schedule		Net SIP Reduction by 2033 (tpd)	Net SIP Reduction by 2039 (tpd)
		Start Year	End Year		
6/7/2024	Rule 463 – Organic Liquid Storage	2024	2050	1.46 (VOC)	1.51 (VOC)
9/1/2023	Rule 1111 – Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces	2012	2050	0.05 (NOx)	0.29 (NOx)
4/5/2024	Rule 1118 – Control of Emissions from Refinery Flares	2026	2030	0.09 (NOx) 0.06 (SOx)	0.09 (NOx) 0.06 (SOx)
10/4/2024	Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities	2024	2030	0.01 (PM2.5)	0.01 (PM2.5)
6/7/2024	Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	2029	2058	0.58 (NOx)	1.66 (NOx)
5/6/2022	Rule 1147 – NOx Reductions from Miscellaneous Sources	2024	2059	0.32 (NOx)	0.40 (NOx)
8/6/2021	Rule 1147.1 – NOx Reductions from Aggregate Dryers	2025	2057	0.01 (NOx)	0.01 (NOx)
4/1/2022	Rule 1147.2 – NOx Reductions from Metal Melting and Heating Furnaces	2026	2057	0.06 (NOx)	0.07 (NOx)
8/2/2024	Rule 1148.1 – Oil and Gas Production Wells	2025	2027	0.18 (VOC) 0.08 (NOx)	0.18 (VOC) 0.08 (NOx)
2/5/2021	Rule 1150.3 – Emissions of Oxides of Nitrogen from Combustion Equipment at Landfills	2021	2031	0.15 (NOx)	0.15 (NOx)

10/4/2024	Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations	2024	2033	0.19 (VOC)	0.19 (VOC)
8/4/2023	Rule 1153.1 – Emissions of Oxides of Nitrogen from Commercial Food Ovens	2024	2036	0.03 (NOx)	0.04 (NOx)
12/6/2024	Rule 1159.1 – Control of NOx Emissions from Nitric Acid Tanks	2029	2029	0.02 (NOx)	0.02 (NOx)
9/6/2024	Rule 1165 – Control of Emissions from Municipal Solid Waste Incinerators	2029	2029	0.20 (NOx) 0.03 (PM2.5)	0.20 (NOx) 0.03 (PM2.5)
11/4/2022	Rule 1168 – VOC reductions from adhesive and sealant applications	2017	2028	-0.14 (VOC)	-0.14 (VOC)
11/1/2024	Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants	2026	2026	2.14 (VOC)	2.14 (VOC)
Cumulative NOx reductions from the non-RECLAIM rules listed above				**1.59**	**3.00**
Cumulative SOx reductions from the non-RECLAIM rules listed above				**0.06**	**0.06**
Cumulative VOC reductions from the non-RECLAIM rules listed above				**3.83**	**3.88**
Cumulative PM2.5 reductions from the non-RECLAIM rules listed above				**0.04**	**0.04**

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

APPENDIX IV: MAINTENANCE DEMONSTRATION METHODOLOGY

1. Introduction

In this Redesignation Requests and Maintenance plan (Plan), a proportional rollback method is used to project future design values (DVs) and determine that the South Coast Air Basin will remain below the National Ambient Air Quality Standards (NAAQS) levels for the 1997 annual PM2.5, the 1997 24-hour PM2.5, and the 1987 24-hour PM10 NAAQS. This Appendix provides detailed description of the proportional rollback method, relevant measurement data, emissions used in the rollback method and discussions on uncertainties associated with the approach and recent regulatory actions.

2. Methodology

2.1 Rollback Approach

The proportional rollback method is a simplified technique that estimates future PM2.5 or PM10 concentrations by applying projected emission changes to base year's DV. Figure IV-1 illustrates the rollback approach, which has been used before for the Yuba City-Marysville area[1]. This method assumes a linear relationship between PM2.5 concentrations and emissions including its precursors — primarily directly emitted PM2.5, nitrogen oxides (NOx), and sulfur oxides (SOx). Using this approach, the monitored base-year DV is disaggregated into its major chemical components: ammonium sulfate, ammonium nitrate, and other species. Each component is then scaled independently based on the ratio of future-year to base-year emissions of the relevant pollutants or precursors. Detailed emissions inventory is presented in Chapter 3 and Appendix III of this Plan. The estimated concentrations serve as projected future DV, which are then compared against the relevant NAAQS.

More specifically, the proportional rollback method requires three major elements: (1) base year DV, (2) representative composition of PM concentrations, and (3) base and future years' emissions. This technique estimates future DV components by scaling the base year concentrations according to projected changes in precursor emissions. The method allows each chemical component to respond differently based on its sensitivity to emission changes.

For each component, the future DV is calculated using the following equations:

$$DV_{nitrate,future} = DV_{nitrate,base} \times (1 + \%\,\Delta NO_x \times R_{NOx \rightarrow nitrate})$$

$$DV_{sulfate,future} = DV_{sulfate,base} \times (1 + \%\,\Delta SO_x \times R_{SOx \rightarrow sulfate})$$

$$DV_{other,future} = DV_{other,base} \times (1 + \%\,\Delta primary\ PM \times R_{PM \rightarrow other})$$

[1] Yuba City-Marysville PM2.5 Nonattainment Area Redesignation Request and Maintenance Plan. Available at: https://www.fraqmd.org/files/b107d865b/YC-Marysville+PM2_5+Maintenance+Plan+and+Redesignation+Request+Final.pdf

$$DV_{future} = DV_{nitrate,future} + DV_{sulfate,future} + DV_{other,future}$$

Where:

- $DV_{nitrate,base}$, $DV_{sulfate,base}$, and $DV_{other,base}$ are the nitrate, sulfate and other contributions to the base year design value, derived from measured speciated data.
- $\%\,\Delta NO_x$, $\%\,\Delta SO_x$, and $\%\,\Delta primary\ PM$ represent the projected percentage change in NOx, SO_x, and directly emitted PM2.5 or PM10 emissions between the base and future years. Reduction in emissions is computed as a negative value, and an increase in emissions is computed as a positive value.
- $R_{NOx \rightarrow nitrate}$ is the sensitivity ratio linking NOx emission reductions to changes in ammonium nitrate mass. $R_{SOx \rightarrow sulfate}$ is the sensitivity ratio linking SO_x reductions to changes in ammonium sulfate mass and $R_{PM \rightarrow other}$ linking direct PM emission reductions to the "other" category mass that includes organic matter (OM), elemental carbon (EC) and all other PM species.

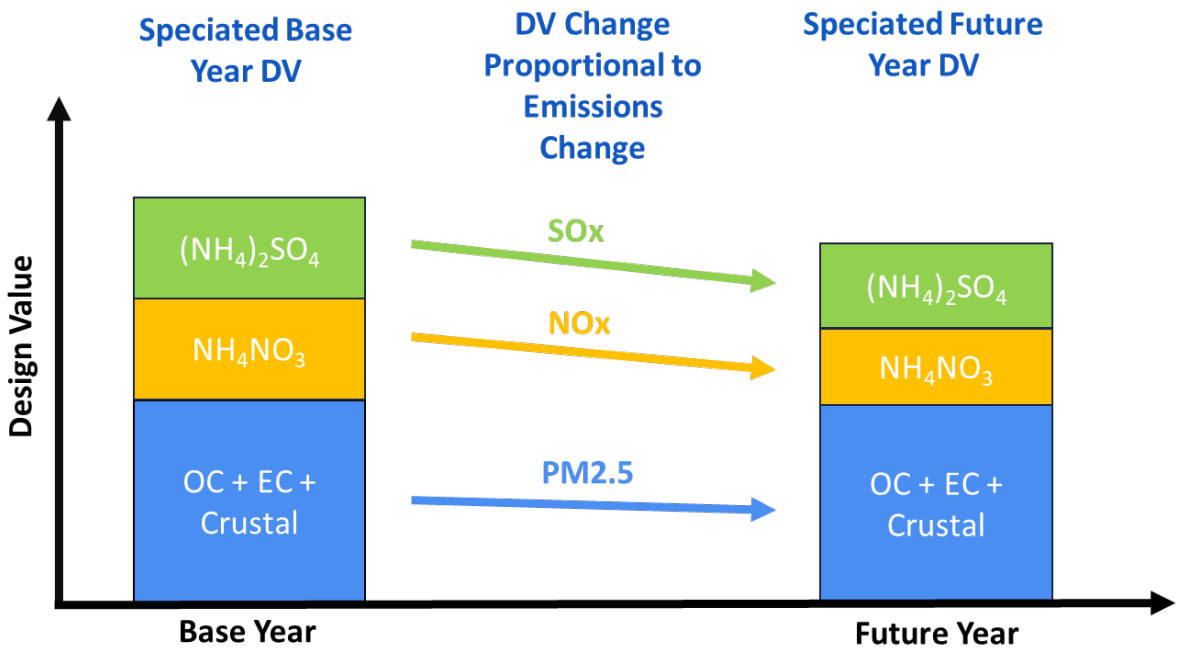


FIGURE IV-1
ILLUSTRATION OF THE PROPORTIONAL ROLLBACK METHOD TO PROJECT FUTURE DV

In this demonstration, sensitivity ratios linking emission reductions to changes in PM2.5 component concentrations were developed to support the proportional rollback methodology for projecting future PM2.5 design values. These ratios were derived from photochemical model simulations using the

modeling framework developed for the 2024 PM2.5 Plan. The framework was configured to simulate PM2.5 concentrations for both the base year (2018) and the future milestone attainment year (2030) and was applied to support the plan's precursor demonstration.[2]

The modeling involved a full-year air quality simulation for Southern California, encompassing the entire South Coast Air Basin. For this plan, 2030 was selected as the reference year for estimating sensitivity ratios because it reflects the chemical regime expected between the base year (2023) and the maintenance horizon years (2033 and 2039).

In addition to the 2030 baseline simulation, four sensitivity runs were performed. In each run, only one pollutant was reduced across the basin relative to the 2030 baseline:

1. 30% reduction in NOx
2. 30% reduction in SOx
3. 30% reduction in volatile organic compounds (VOC)
4. 15% reduction in direct PM2.5

For each case, the modeled annual average concentrations of nitrate, sulfate, and other PM2.5 components were calculated and compared with the baseline to determine the percentage change in each component. Sensitivity ratios were then derived by dividing the relative change in each PM2.5 component by the corresponding change in its precursor.

The expression used to calculate the sensitivity ratios are as follows:

$$R_{NOx \rightarrow nitrate} = \frac{(Annual\ NO3_{baseline} - Annual\ NO3_{0.7\ NOx})}{Annual\ NO3_{baseline}} \Big/ 30\%$$

$$R_{SOx \rightarrow sulfate} = \frac{(Annual\ SO4_{baseline} - Annual\ SO4_{0.7\ SOx})}{Annual\ SO4_{baseline}} \Big/ 30\%$$

$$R_{VOC \rightarrow OM} = \frac{(Annual\ OM_{baseline} - Annual\ OM_{0.7\ VOC})}{Annual\ OM_{baseline}} \Big/ 30\%$$

$$R_{PM \rightarrow other} = \frac{(Annual\ Other_{baseline} - Annual\ Other_{0.85\ PM2.5})}{Annual\ Other_{baseline}} \Big/ 15\%$$

[2] Precursor Demonstration, Appendix VI. South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard. Available at: https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan

Where:

- $Annual\ NO3_{baseline}$, $Annual\ SO4_{baseline}$, $Annual\ OM_{baseline}$, are the modeled annual average concentrations of nitrate, sulfate and OM for a specific station in the 2030 baseline. $Annual\ Other_{baseline}$ is the modeled annual average concentration of the 'Other' fraction which is the sum of OM, EC and all other PM components.

- $Annual\ NO3_{0.7NOx}$, $Annual\ SO4_{0.7SOx}$, $Annual\ OM_{0.7VOC}$ and $Annual\ Other_{0.85PM2.5}$ are the modeled annual average concentration of nitrate, sulfate, OM and Other, in the respective sensitivity runs where each individual precursor is scaled down.

For NOx, the basin-wide average sensitivity ratio was 0.75, slightly higher than the value used in other plans (e.g., 0.70 for Yuba City–Marysville). For sulfate, a ratio of 1.0 was adopted, even though the modeled response was about 0.27. Similarly, the modeled ratio of 0.67 for the "other" category was replaced with 1.0 to maintain a conservative approach. Because SOx and direct PM emissions are projected to increase in future years, using a ratio of 1.0 for these species provides a precautionary estimate of future sulfate and "other" concentrations. The VOC-to-OM sensitivity ratio was estimated at 0.08, indicating minimal responsiveness of OM to VOC emission changes; therefore, OM was not treated separately as a major design value component in the proportional rollback analysis. Overall, these conservative assumptions—particularly for SO_x and direct PM—amplify estimated impacts on sulfate and "other" species, ensuring projected design values are not underestimated and adding a margin of safety to the maintenance demonstration.

2.2 PM Mass and Chemical Species Measurements

In this Plan, the 2024 DVs—calculated from the three-year period 2022 to 2024—serve as the base year DVs for the maintenance demonstration. The 24-hour PM2.5, annual PM2.5, and 24-hour PM10 design values are based on measured total PM2.5 and PM10 mass concentrations collected throughout the South Coast Air Basin. Detailed information regarding the monitoring network and station locations is provided in the Annual Air Quality Monitoring Network Plan.[3] The chemical composition of both PM2.5 and PM10 was determined using speciated measurements from four representative monitoring sites in the Basin: Los Angeles, Fontana, Rubidoux, and Anaheim. These sites are part of the Chemical Speciation Network (CSN) and were strategically selected to reflect the range of aerosol characteristics across the Basin's four counties. Riverside-Rubidoux used to be the Basin's design site and is one of locations with high PM2.5 values in the Basin. Fontana and Anaheim experience high concentrations within their respective counties, and the Los Angeles site was intended to capture the characteristics of an emission source area.

PM2.5 speciation data were obtained from samples collected on a one-in-six-day schedule. The samples were collected over 24 hours on Teflon and nylon filters in the MetOne SASS/SuperSASS sampler and on quartz filters in the URG 3000N sampler. Teflon filters are analyzed for Crustal or soil elements; nylon filters

[3] The Annual Air Quality Monitoring Network Plan. Available at: https://www.aqmd.gov/home/air-quality/clean-air-plans/monitoring-network-plan

are analyzed for ions and quartz filters are analyzed for carbon. The analysis in this Plan focused on several major PM2.5 components, including nitrate, sulfate, ammonium, organic and elemental carbon, crustal material, and salts. In contrast to PM2.5, PM10 speciation measurements are more limited, with available data covering only sulfate, nitrate, and chloride. These samples were collected on either a one-in-three-day or one-in-six-day schedule at the same monitoring sites used for PM2.5 speciation. All PM10 speciation data are accessible through the U.S. EPA's Air Quality System (AQS) database.

2.3 Speciation for 24-hour PM2.5

This section provides details of how PM2.5 chemical composition data were developed for this Plan. For the 24-hour attainment demonstration, the U.S. EPA's guidance [4] recommends that the determination of species fractions be based on the top 10% of days in each quarter. Given that CSN samples were collected every 6 days, this typically yields two data points per quarter. During data selection, samples from July 4th and 5th were excluded as they are typically considered exceptional events and inappropriate to characterize a general high PM2.5 days. Figures IV-2 to IV-5 depict the measured PM2.5 chemical composition of the two days with the highest PM2.5 concentrations in each quarter of 2024 at the four CSN sites. In general, PM2.5 mass concentrations are the highest in the fourth quarter for Los Angeles and Anaheim. Organic carbon (OC), along with secondary nitrate (NO_3) and sulfate (SO_4), are the dominate contributors to the total PM2.5 mass. Ammonium (NH_4) is another significant component.

The U.S. EPA recommends estimating OC concentrations through the Sulfate, Adjusted Nitrate, Derived Water, Inferred Carbon Hybrid (SANDWICH) material balance method. According to the SANDWICH method, OC is estimated by mass balance, defined as the difference between the measured mass and the sum of all inorganic species, water and a filter blank of 0.2 µg/m^3.

The OC derived by mass balance is further constrained by a floor and a ceiling. The floor value is equal to the measured OC mass, except when the speciation mass exceeds the Federal Reference Method (FRM) PM2.5 mass. In this case, the measured OC is scaled by the ratio of the FRM mass to speciation mass; this value then defines the OC floor. While the U.S. EPA's guidance recommends setting the ceiling to 0.8 times the FRM mass, this resulted in large OC fractions that were not supported by the field measurements taken in the Basin. Thus, the OC ceiling was lowered to 0.5 times the FRM mass, which is consistent with a previous study [5] and the previous PM plan.[6]

[4] U.S. EPA, Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze. Available at: https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

[5] Hayes, P. L., et al. (2013), Organic aerosol composition and sources in Pasadena, California during the 2010 CalNex campaign, *J. Geophys. Res. Atmos.*, 118, 9233–9257, doi:10.1002/jgrd.50530.

[6] South Coast Air Basin Attainment Plan for the 2012 Annual PM2.5 Standard. Available at: https://www.aqmd.gov/home/air-quality/air-quality-management-plans/other-state-implementation-plan-(sip)-revisions/2012-annual-pm2-5-plan.

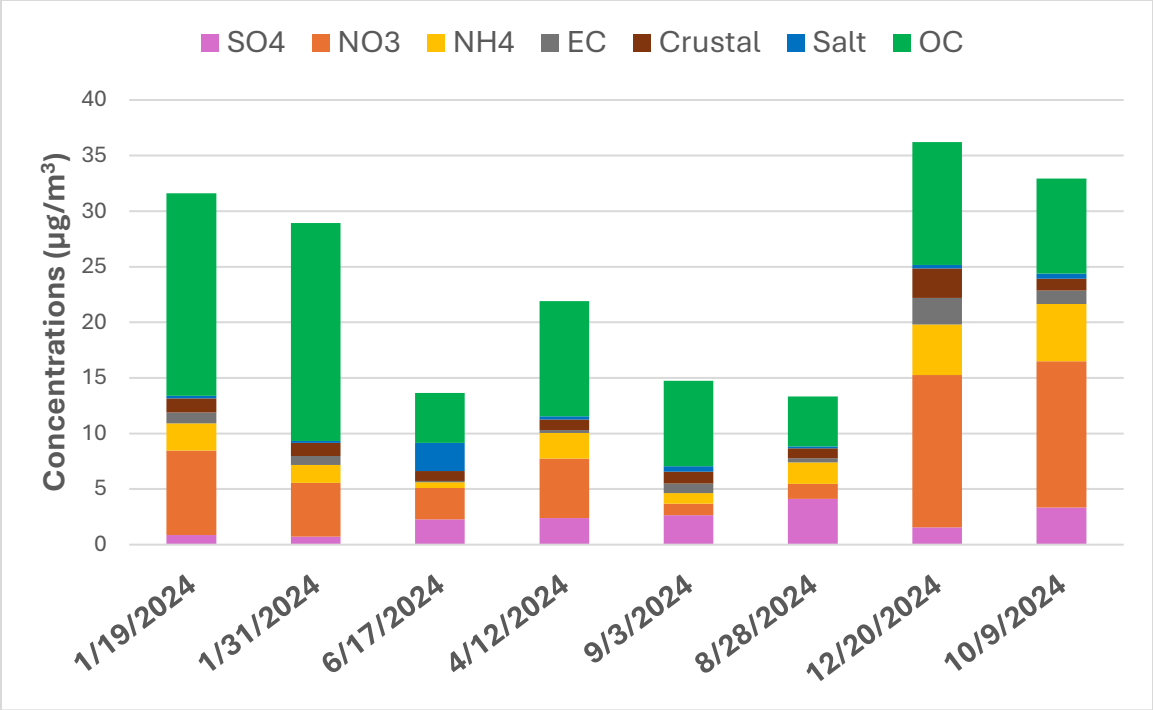


FIGURE IV-2
LOS ANGELES QUARTERLY TOP-TWO DAY 24-HOUR PM2.5 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

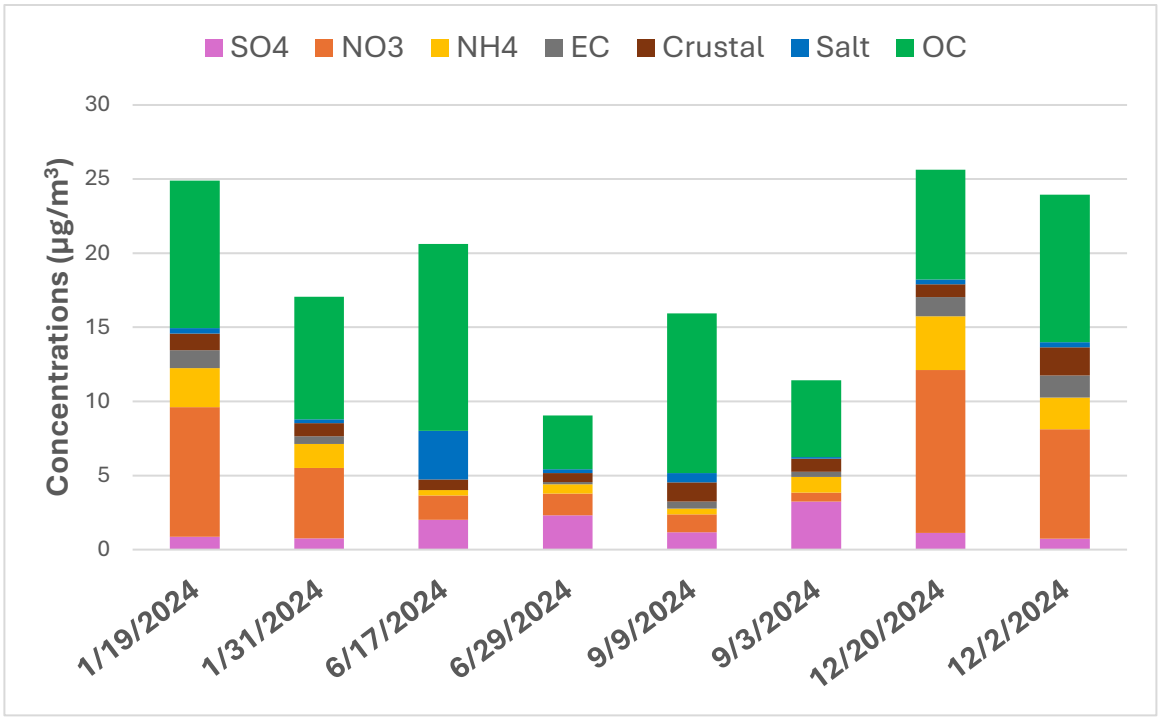


FIGURE IV-3
ANAHEIM QUARTERLY TOP-TWO DAY 24-HOUR CHEMICAL COMPONENT CONCENTRATIONS IN 2024

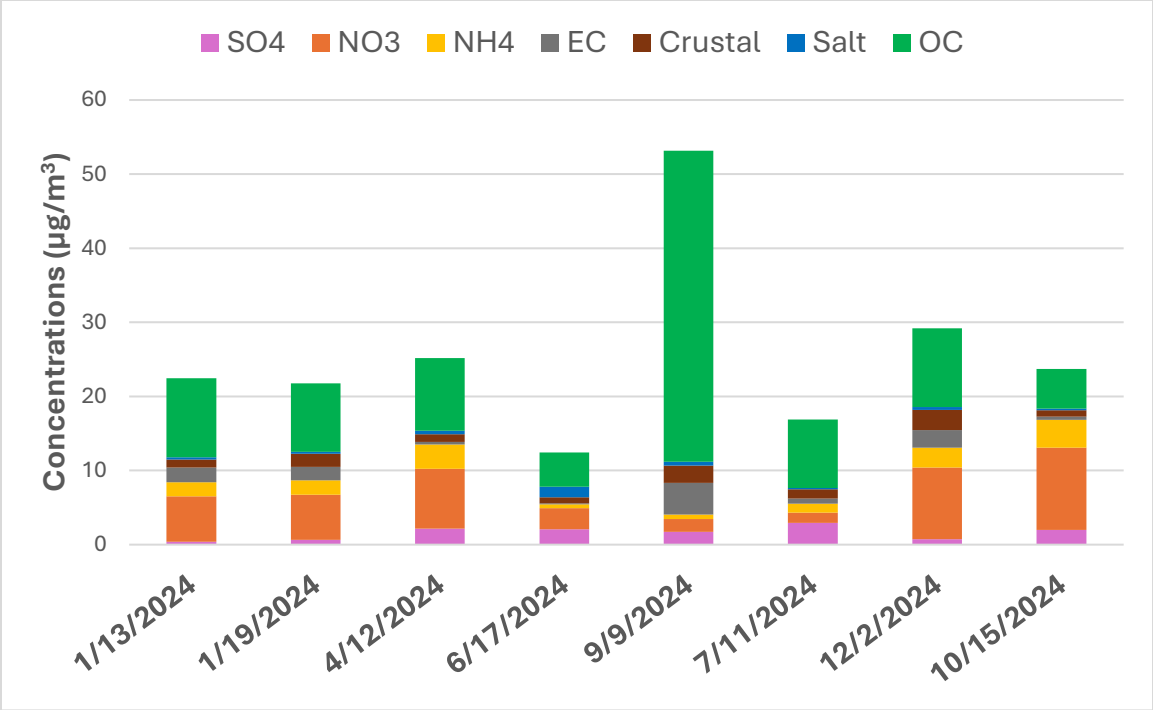


FIGURE IV-4
RUBIDOUX QUARTERLY TOP-TWO DAY 24-HOUR PM2.5 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

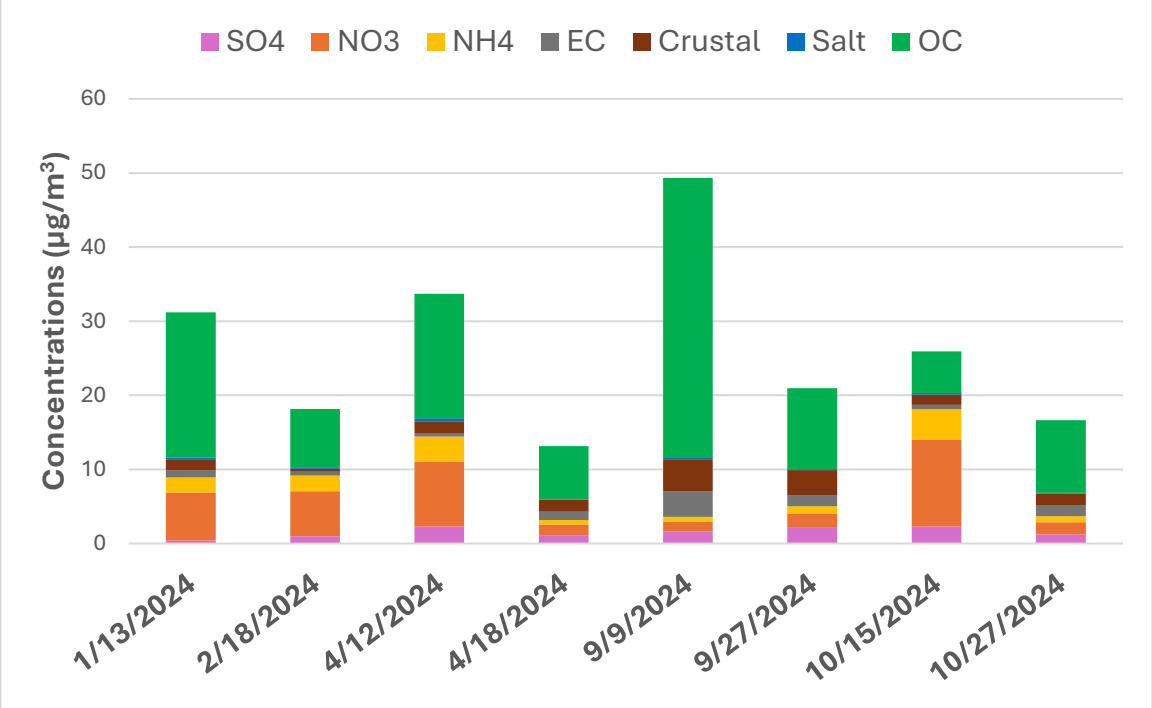


FIGURE IV-5
FONTANA QUARTERLY TOP-TWO DAY 24-HOUR PM2.5 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

Figures IV-6 to IV-9 depict the species fractional splits for the 7 primary components and associated water for the four CSN sites averaged over 2022-2024 after SANDWICH was applied. OC and NO_3 were the dominate PM2.5 components, with OC mass fractions peaking at approximately 50% in the third quarter (Q3) and decreasing to around 30% during the cooler seasons (Q1 or Q4). The Anaheim and Los Angeles sites exhibited higher OC fractions compared to the other two sites, likely due to enhanced secondary organic carbon formation. At these same locations, during the fourth quarter—when total PM2.5 concentrations reach their annual maximum—the nitrate fraction increases substantially, approaching levels comparable to the organic matter fraction, confirming nitrate contributes to high PM levels. Across all four sites, the increased PM2.5 levels were primarily driven by elevated nitrate concentrations. For example, the nitrate fractions in the annual PM2.5 were 14%-18%, while they are 18%-24% in the high 24-hour PM2.5 days. Chemical compositions of annual PM2.5 are provided in the next section in detail. At the same time, the Rubidoux and Fontana sites showed a higher fraction of EC than the other two sites.

In order to conduct the proportional rollback method, observed mass concentrations of PM2.5 were divided into 3 components: ammonium sulfate, ammonium nitrate, and other species. For monitoring stations without speciated measurements, the speciation profile is taken from the nearest CSN site. To determine the mass associated with nitrates, we assume retained nitrate is all ammonium nitrate. Thus, using the ratio of the molecular weight of ammonium to that of nitrate, the ammonium associated with nitrates (NH_4NO_3) can be derived directly from the estimated retained nitrate as: $NH_4NO_3 = 0.29* NO_3$. The ammonium associated with sulfate is obtained from the difference between the total measured NH_4 and NH_4NO_3. The final ammonium sulfate and ammonium nitrate fraction is shown in Figure IV-10.

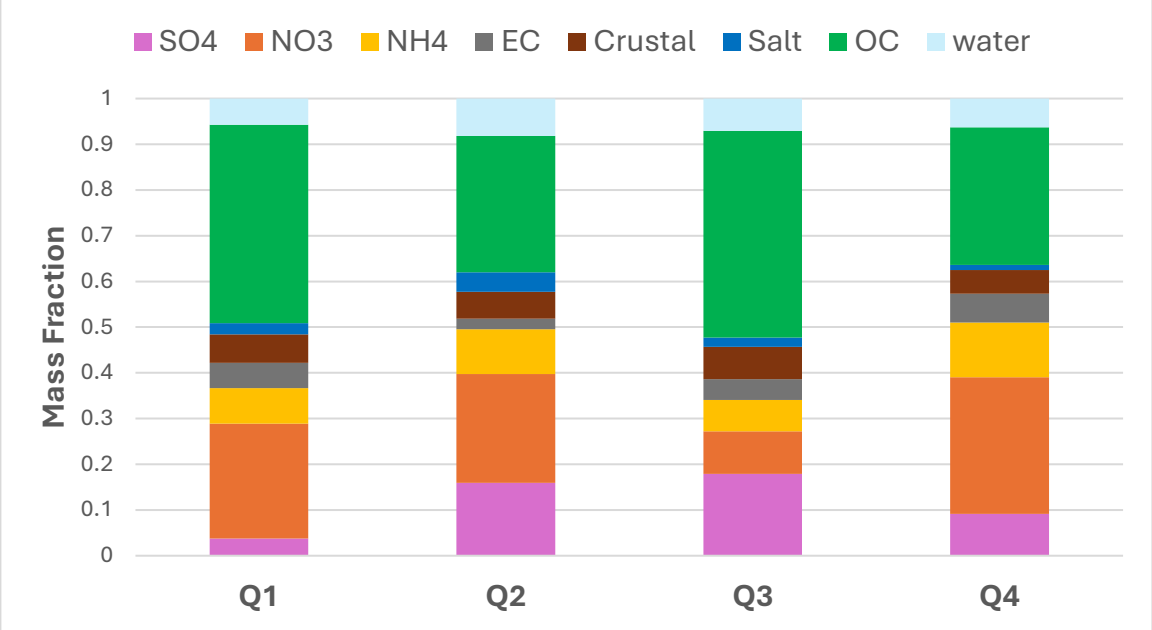


FIGURE IV-6
LOS ANGELES QUARTERLY PM2.5 SPECIES FRACTION AFTER SANDWICH METHOD IN 2022-2024

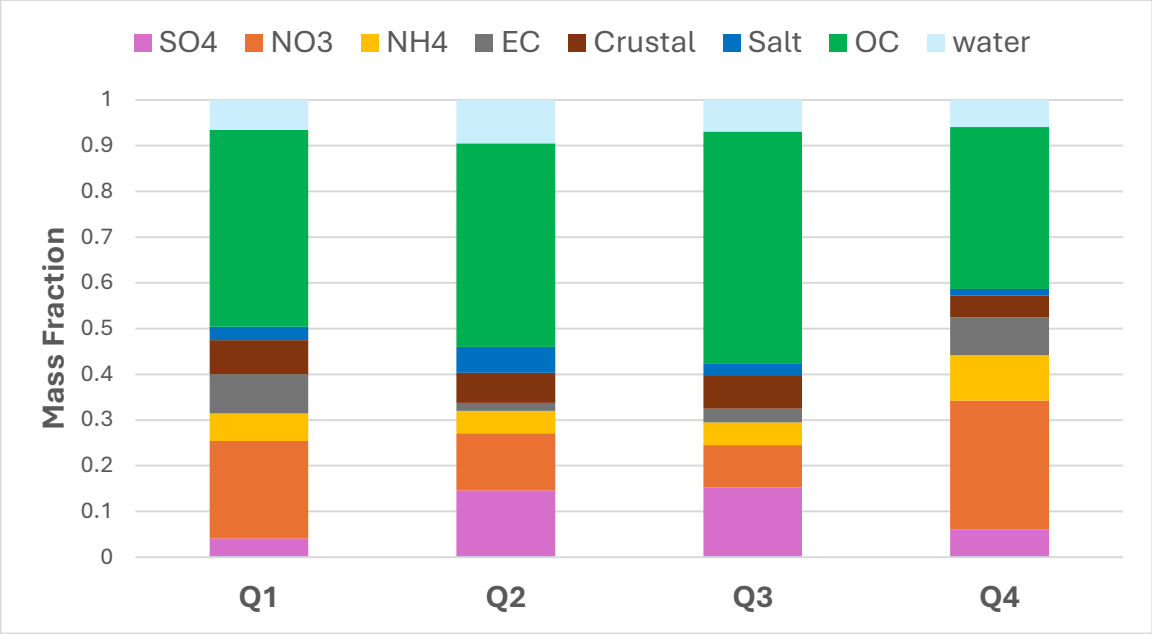


FIGURE IV-7
ANAHEIM QUARTERLY PM2.5 SPECIES FRACTION AFTER SANDWICH METHOD IN 2022-2024

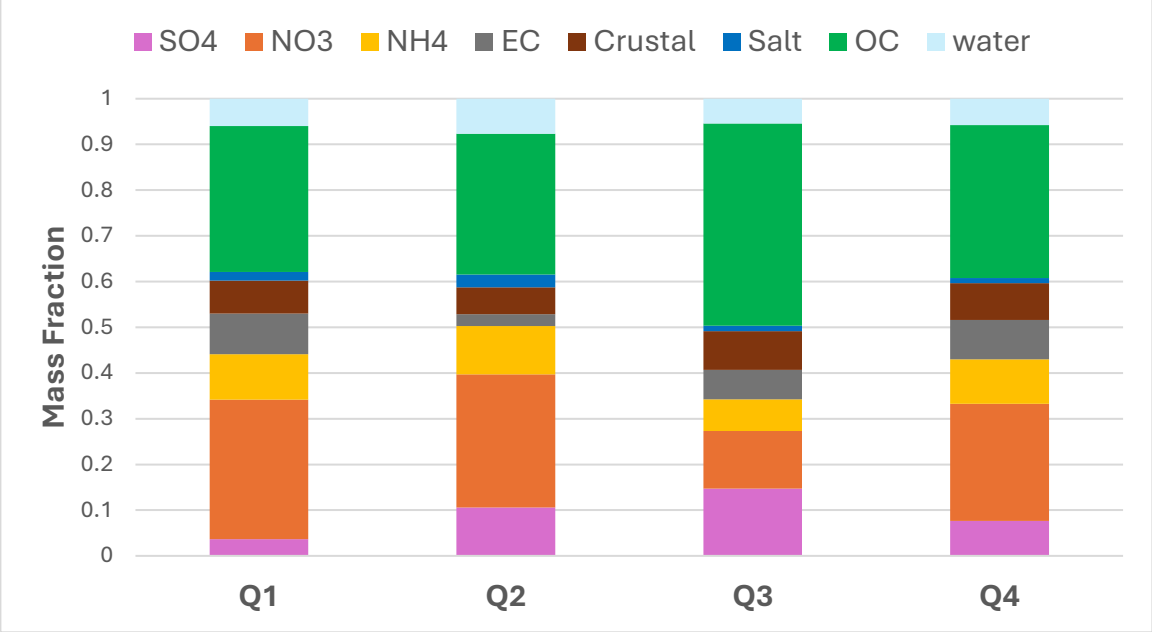


FIGURE IV-8
RUBIDOUX QUARTERLY PM2.5 SPECIES FRACTION AFTER SANDWICH METHOD IN 2022-2024

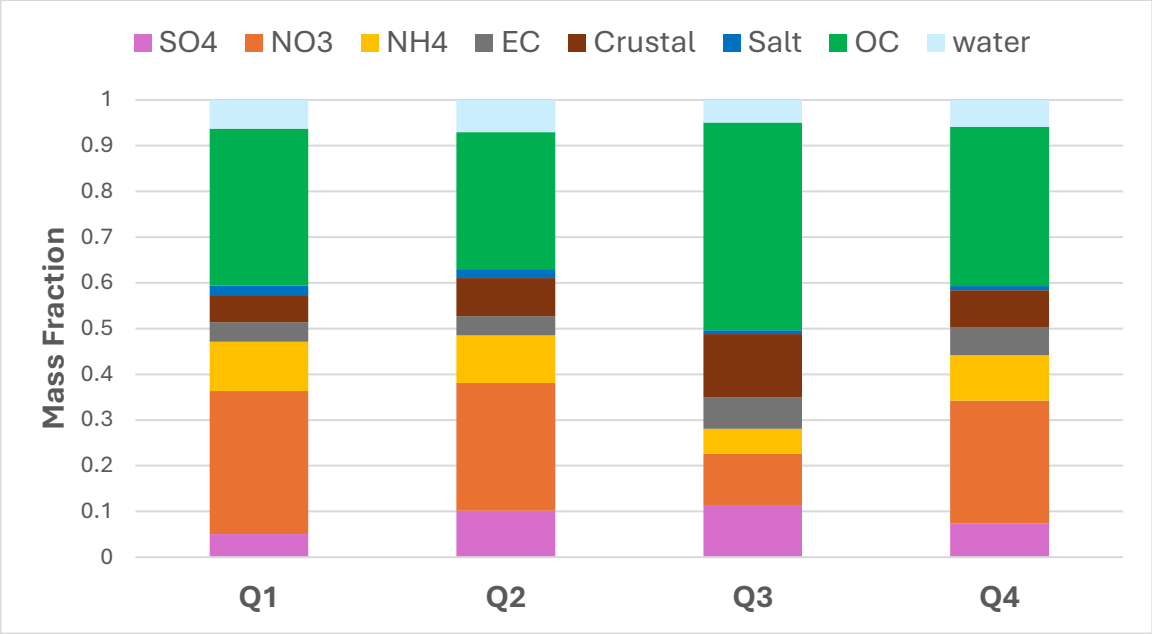


FIGURE IV-9
FONTANA QUARTERLY PM2.5 SPECIES FRACTION AFTER SANDWICH METHOD IN 2022-2024

The pie chart reveals that Fontana and Rubidoux exhibit the highest ammonium nitrate fractions, accounting for 31% and 32% of the total 24-hour PM2.5 mass, respectively. This indicates that approximately one-third of the PM2.5 mass at these inland sites is attributable to ammonium nitrate. In contrast, Anaheim shows the lowest nitrate contribution at 23%, suggesting a relatively greater influence from non-nitrate primary or organic sources. Ammonium sulfate contributions are more consistent, ranging between 11% and 14% across all four sites. The "Other" fraction remains dominant, particularly at Anaheim, where it accounts for 66% of the PM2.5 mass. While Figures IV-8-9 show higher elemental carbon (EC) fractions at Rubidoux and Fontana, this is not reflected as prominently in the pie chart. This is because the "Other" category also includes secondary organic aerosols and components beyond EC, which may mask the specific EC contribution when aggregated. Compared to annual average day (shown in the next section and Figure IV-15), the pie charts confirm larger presence of ammonium nitrate on high PM2.5 days.

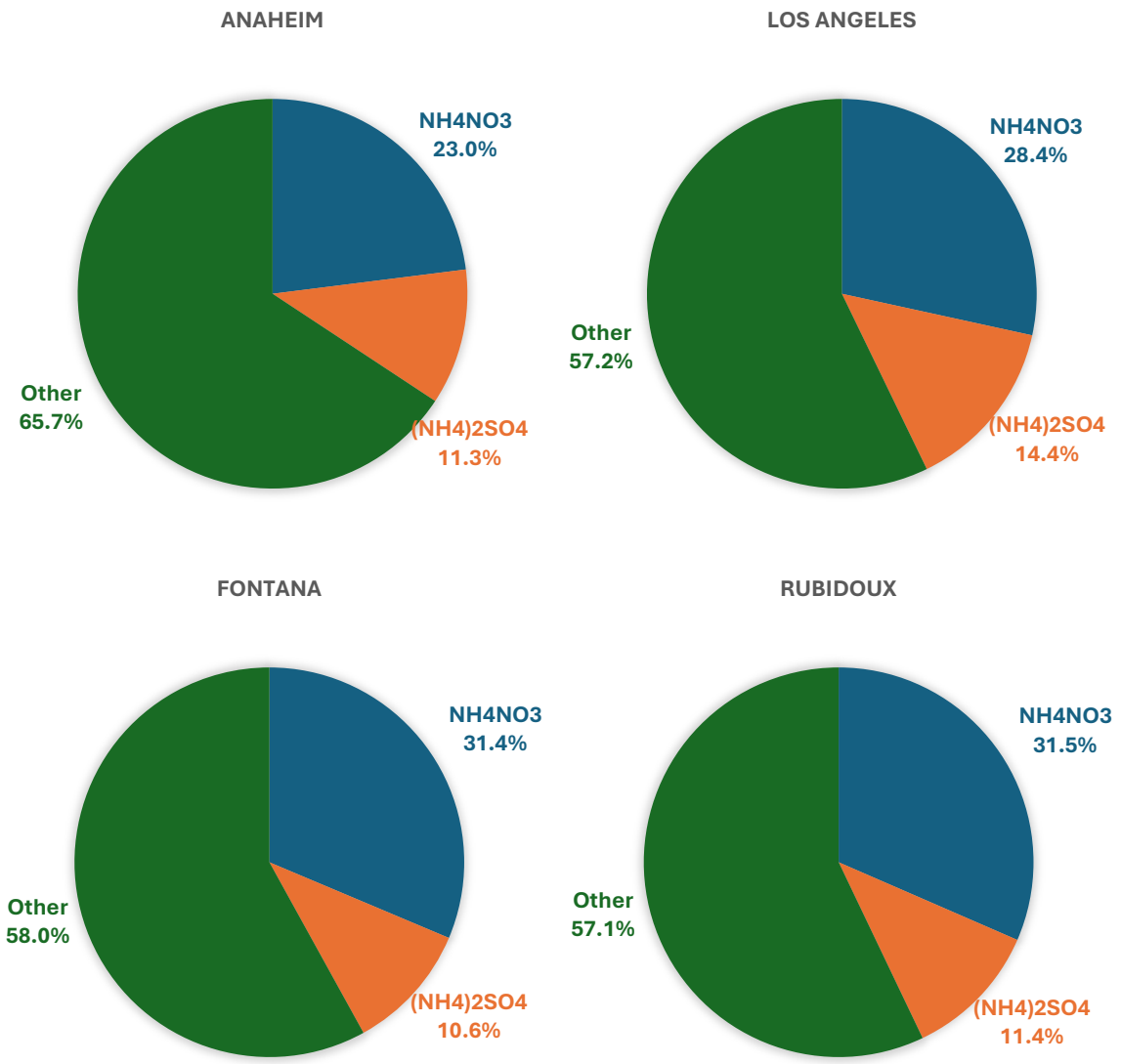


FIGURE IV-10
MEASURED 24-HOUR PM2.5 CHEMICAL COMPOSITIONS USED IN THE PROPORTIONAL ROLLBACK METHOD

2.4 Speciation for Annual PM2.5

For the annual PM2.5 composition calculations, the U.S. EPA's guidance[7] recommends first computing the quarterly mean PM2.5 concentrations and quarterly mean chemical composition (including adjusted nitrate, sulfate, elemental carbon, ammonium, other primary particles, salt and measured organic carbon

[7] U.S. EPA, Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze. Available at: https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

mass) for each monitoring site. These quarterly averages are then used as inputs to the SANDWICH method, which calculates the final quarterly species fractions.

To generate annual speciation profiles, the 3-year average (2022-2024) is calculated by averaging the quarterly data across all four quarters over the three years. It is important to note that in this analysis, quarterly mean PM2.5 concentrations were derived from Federal Reference Method (FRM) air quality data, while chemical component data were obtained from the CSN measurements. Because the FRM PM2.5 data has a higher sampling frequency than CSN data, only dates where both FRM PM2.5 and CSN chemical measurements were available were used to calculate quarterly mean concentrations of individual species.

Figures IV-11 to IV-14 show the quarterly mean PM2.5 chemical composition at the four CSN monitoring sites. Across all sites during 2022–2024, mean PM2.5 mass concentrations were generally higher in the fourth quarter, and reach lowest in the first quarter, likely due in part to increased rainfall during the colder season. The dominant contributors to total PM2.5 mass are organic matter, secondary nitrate, and sulfate, which together account for approximately 64%-77% of the total PM2.5 mass. Organic matter peaks in the third quarter (Q3), primarily due to increased photochemical activity and enhanced biogenic emissions during the summer months. In contrast, nitrate concentrations are lowest in Q3, likely because elevated temperatures promote the dissociation of ammonium nitrate, shifting nitrate from the particle phase to the gas phase.

Differences in chemical composition can be observed across the four monitoring sites. Fontana and Rubidoux exhibit relatively higher crustal fractions, often exceeding 10% in all four quarters, whereas Los Angeles and Anaheim generally show crustal mass fractions below 10%. Fontana and Rubidoux are located in the inland region of Southern California, which includes more undeveloped land, dry soils, and open spaces compared to dense urban centers like Los Angeles and Anaheim. These conditions make the area more prone to windblown dust, especially during dry and windy periods, contributing to the elevated crustal mass observed at these sites.

For the future DV calculations, observed annual average PM2.5 mass concentrations were divided into three major components: ammonium sulfate, ammonium nitrate, and other species. The mass associated with nitrates is assumed to be entirely ammonium nitrate. The ammonium associated with sulfates was derived by subtracting the ammonium tied to nitrate from the total measured ammonium. The results are shown in Figure IV-15.

Anaheim exhibits the lowest nitrate contributions (18%) to Annual PM2.5 mass, compared to Los Angeles (22%), Fontana and Rubidoux (23%). This spatial pattern highlights a relatively less influence of nitrate-related secondary formation in this area. Ammonium sulfate concentrations are relatively higher in Anaheim and Los Angeles, ranging from 14% to 15%, with Fontana showing the lowest proportion (11%). Across all four locations, the “Other” component remains the dominant contributor, reflecting a substantial share of primary emissions such as organic carbon, elemental carbon and crustal material.

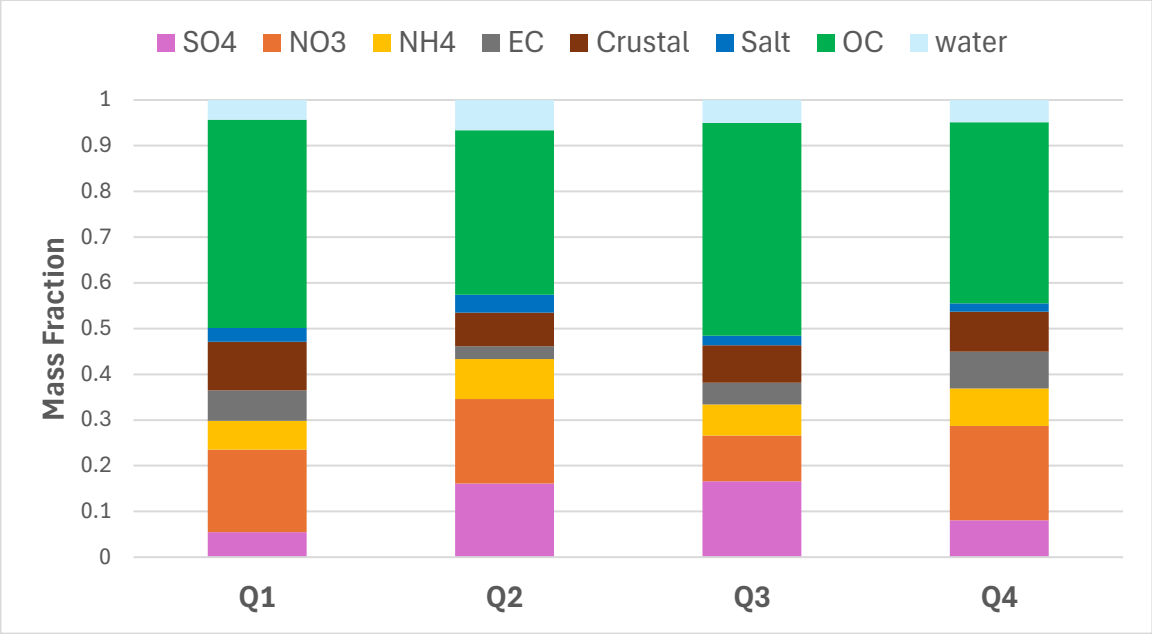


FIGURE IV-11
LOS ANGELES QUARTERLY AVERAGED PM2.5 SPECIES FRACTION AFTER SANDWICH IN 2022-2024

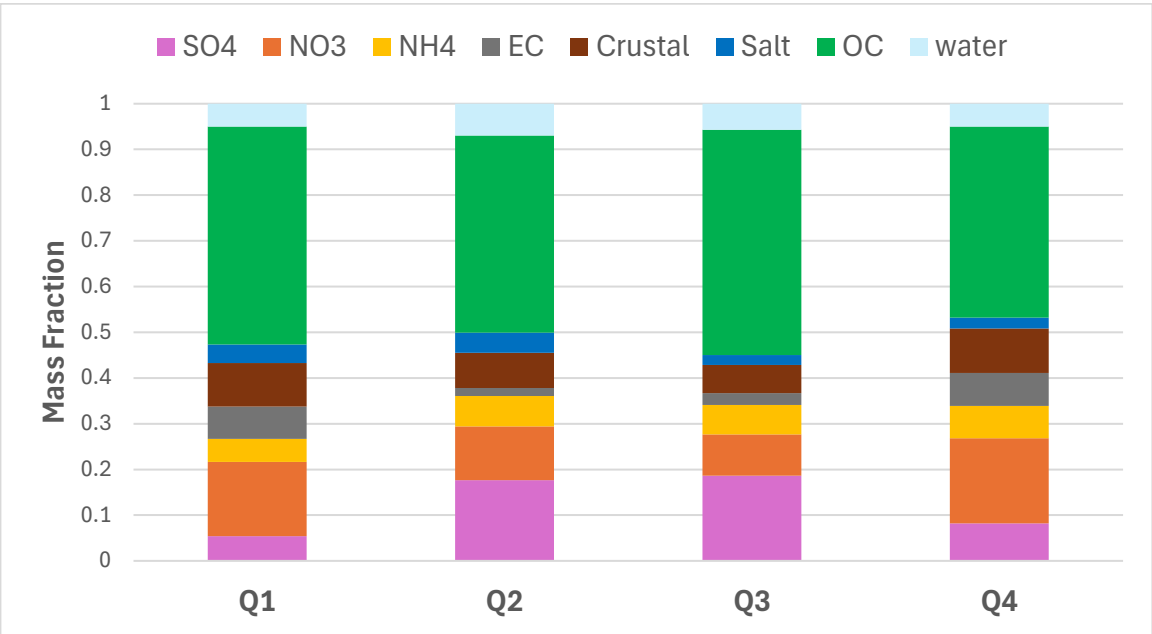


FIGURE IV-12
ANAHEIM QUARTERLY AVERAGED PM2.5 SPECIES FRACTION AFTER SANDWICH IN 2022-2024

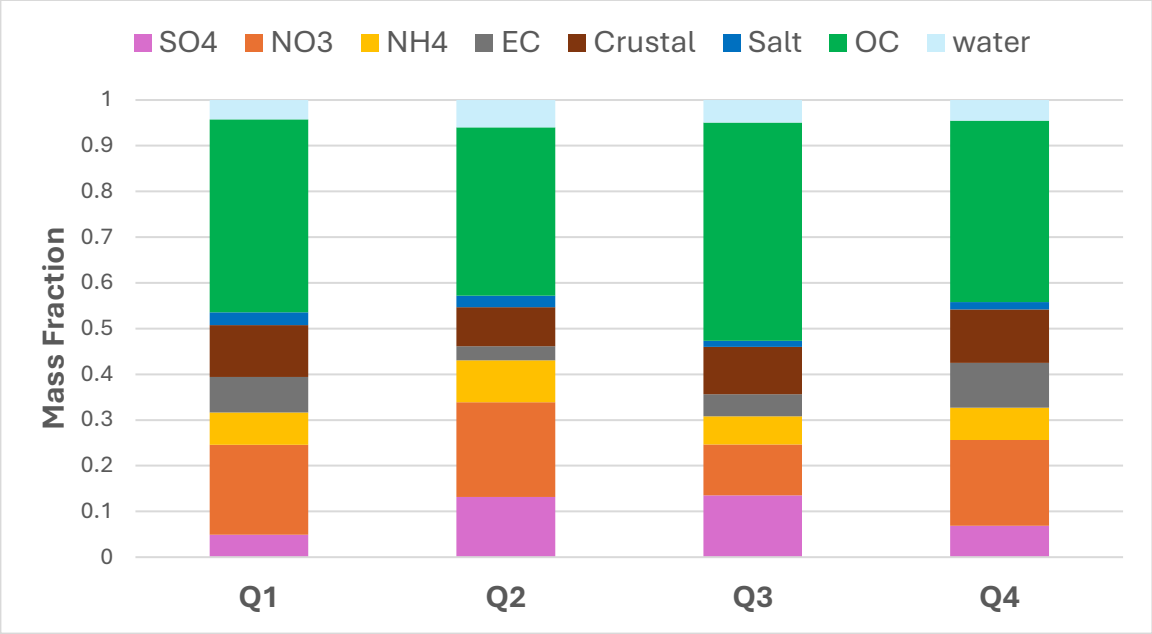


FIGURE IV-13
RUBIDOUX QUARTERLY AVERAGED PM2.5 SPECIES FRACTION AFTER SANDWICH IN 2022-2024

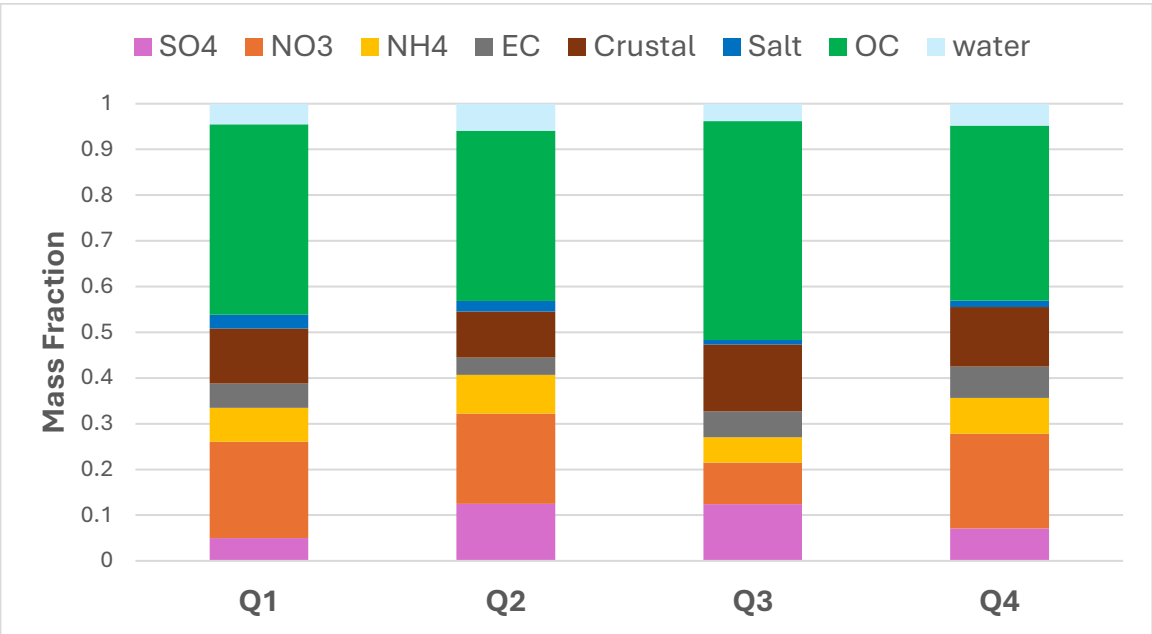


FIGURE IV-14
FONTANA QUARTERLY AVERAGED PM2.5 SPECIES FRACTION AFTER SANDWICH IN 2022-2024

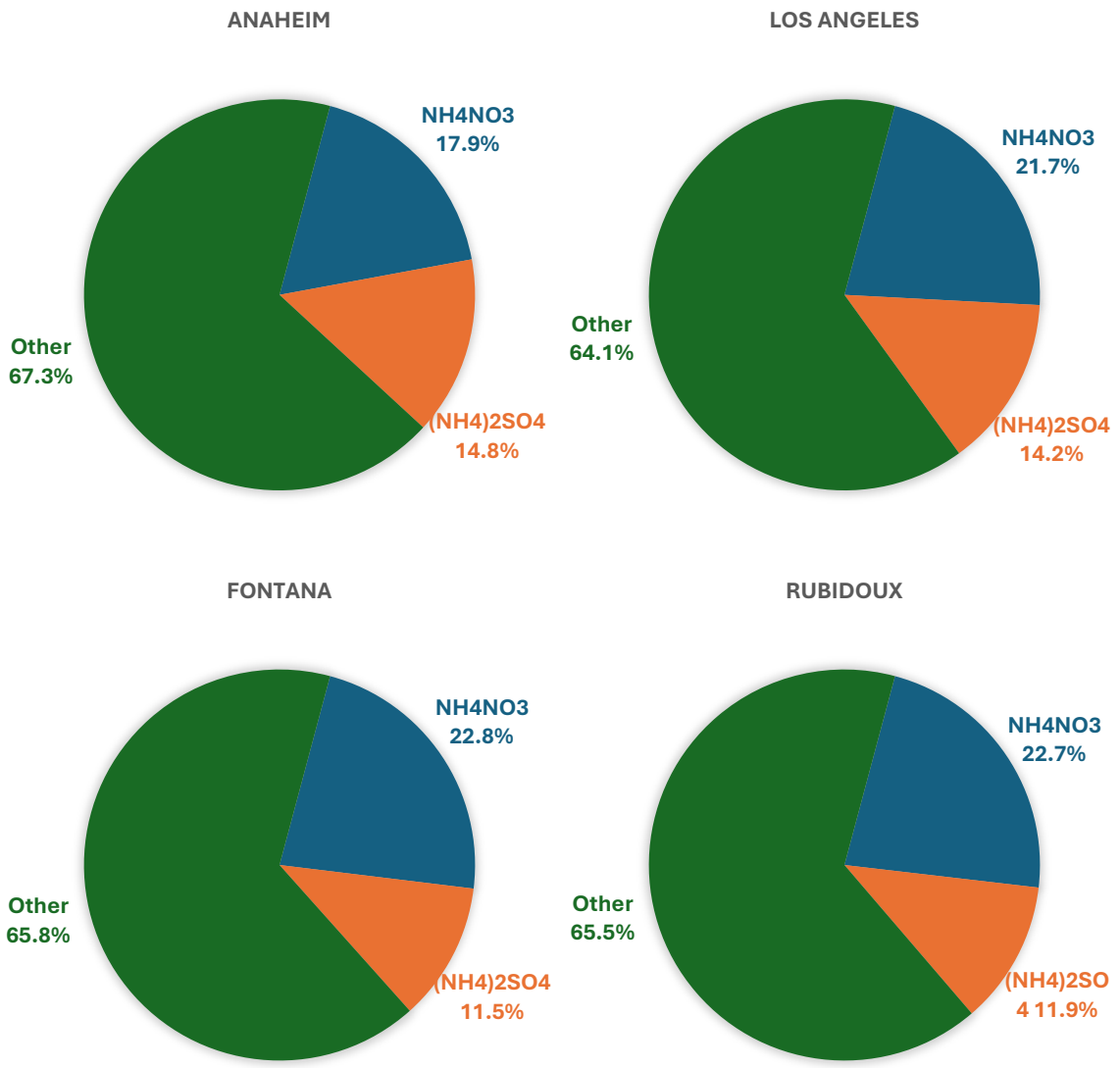


FIGURE IV-15
MEASURED ANNUAL PM2.5 CHEMICAL COMPOSITIONS USED IN THE PROPORTIONAL ROLLBACK METHOD

2.5 Speciation for 24-hour PM10

In this section, speciation analysis for 24-hour PM10 was conducted to support the projection of future PM10 concentrations and to understand the chemical composition of PM10 mass at different monitoring locations. Similar to the 24-hour PM2.5 approach, high PM10 days are defined as the top 10% of available PM10 mass and chemical measurements. Only days with valid measurements for both PM10 mass and chemical species were included in the analysis. For the period of 2022-2024, July 4th and 5th data are excluded due to atypical human behaviors affecting air quality. Since only sulfate and nitrate are required

in the rollback method, chloride is not included in the analysis. Figures IV-16 to IV-19 depict the measured PM10 and chemical compositions of high PM10 days in each quarter at the four sites.

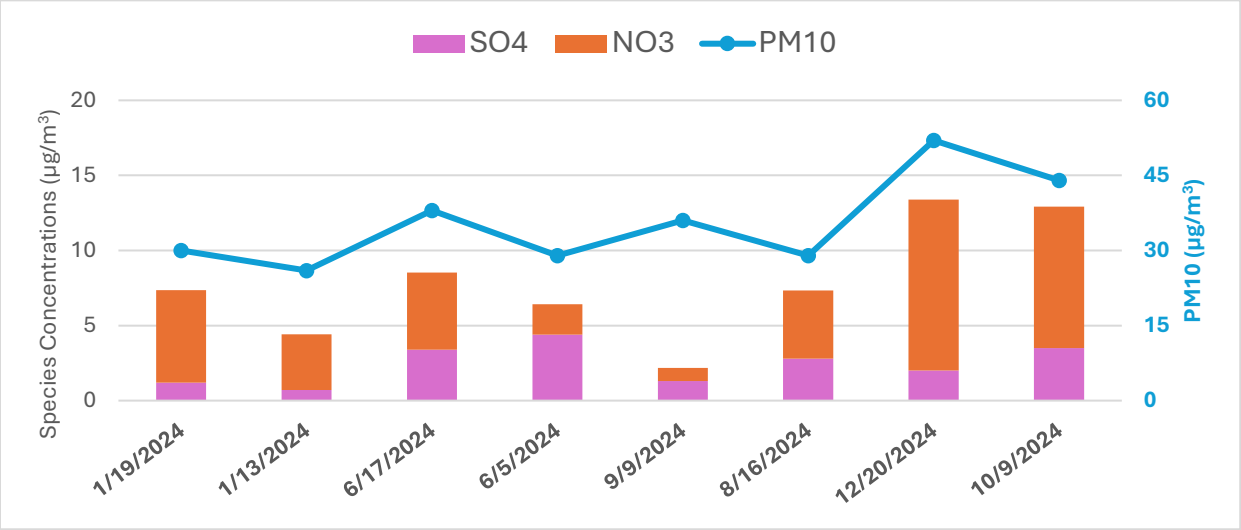


FIGURE IV-16
LOS ANGELES QUARTERLY TOP-10% DAY 24-HOUR PM10 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

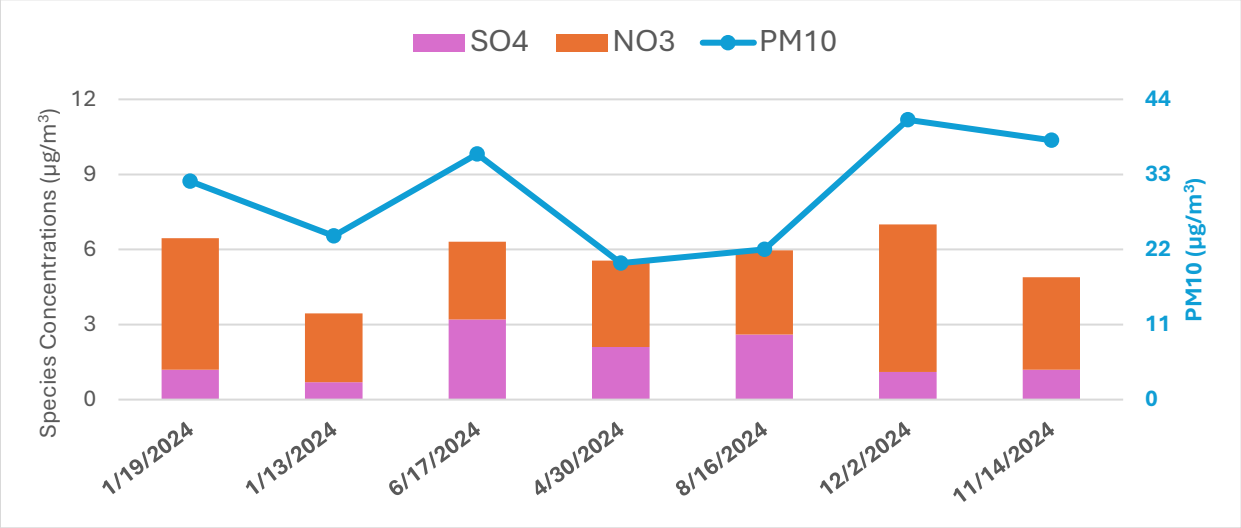


FIGURE IV-17
ANAHEIM QUARTERLY TOP-10% DAY 24-HOUR PM10 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

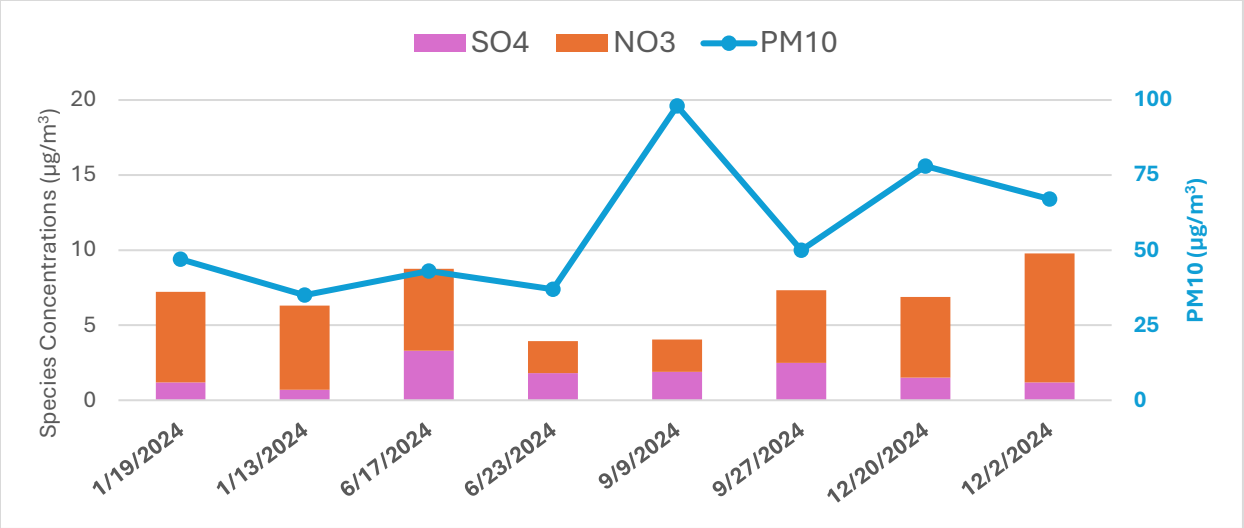


FIGURE IV-18
RUBIDOUX QUARTERLY TOP-10% DAY 24-HOUR PM10 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

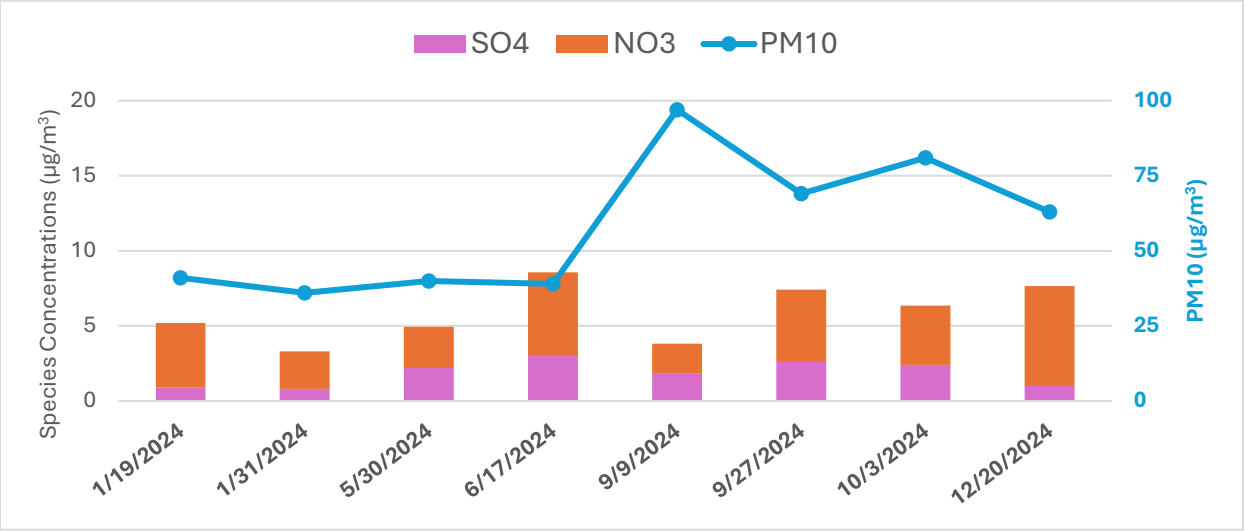


FIGURE IV-19
FONTANA QUARTERLY TOP-10% DAY 24-HOUR PM10 CHEMICAL COMPONENT CONCENTRATIONS IN 2024

The sulfate and nitrate values presented are based on data reported at standard temperature and pressure (STP), as this was the only form available from the U.S. EPA's AQS database. To maintain consistency in calculating species mass fractions, the total PM10 mass presented and used for speciation fraction derivation was also taken from STP data. However, for the design value calculations, PM10 concentrations reported under local conditions (LC) were used. The final chemical composition profiles were averaged across three years and across all four quarters. It is important to note that sulfate and nitrate together account for an average of 15-26% of the total PM10 mass at the four measurement sites; therefore, these profiles represent only a limited characterization of overall PM10 composition.

The observed 24-hour PM10 concentrations at each monitoring site were decomposed into ammonium nitrate, ammonium sulfate and "other species" to facilitate component-based projection. Because ammonium is not routinely measured for PM10, the concentrations of ammonium sulfate and ammonium nitrate were estimated based on the assumption of complete neutralization by ammonium. Specifically, the following molecular weight-based conversion factors were applied: $(NH_4)_2SO_4 = 1.375*SO_4$ and $NH_4NO_3 = 1.29*NO_3$. The remaining mass - defined as the difference between total PM10 and the sum of ammonium sulfate and ammonium nitrate - was categorized as "other species", which likely includes crustal material, elemental carbon, sea salt, organic matter, and other primary species. The final chemical composition is presented in Figure IV-20.

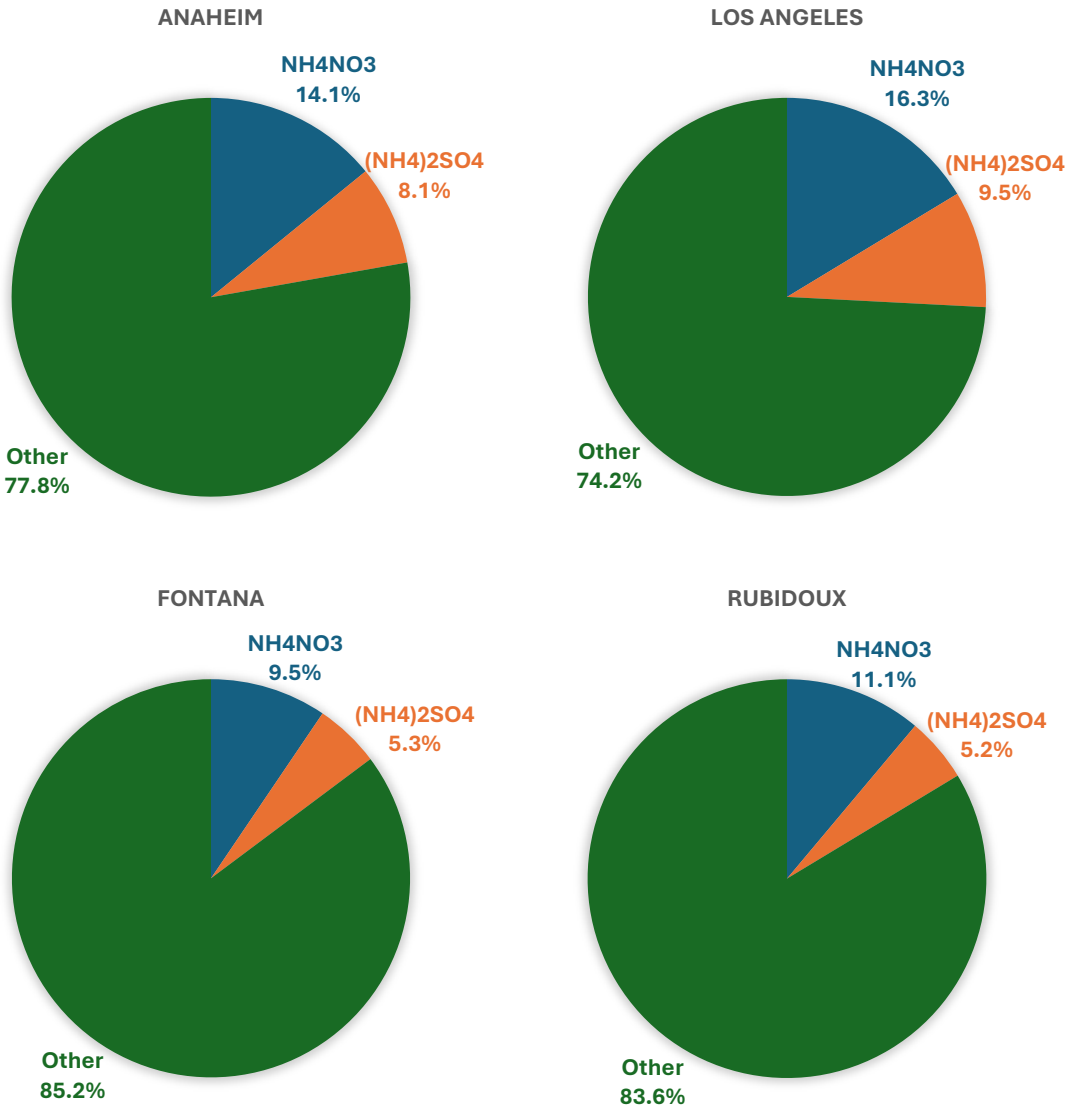


FIGURE IV-20
MEASURED 24-HOUR PM10 CHEMICAL COMPOSITIONS USED IN THE PROPORTIONAL ROLLBACK METHOD

The pie chart illustrates that inorganic ammonium nitrate and sulfate contribute a small fraction (between 14.8% and 25.8%) to the total PM10 mass across all monitoring sites, significantly less than their contribution to PM2.5. Los Angeles stands out with the highest ammonium nitrate contribution at 16.3%, indicating a slightly greater influence from secondary aerosol formation compared to other sites. Overall, the chemical speciation of PM10 is dominated by other components, suggesting that primary sources such as crustal material and coarse particles play a more substantial role in PM10 mass composition.

2.6 Emissions Changes

This section presents emissions of direct PM2.5 and PM10 and their precursors in the South Coast Air Basin from 2023 through 2039. Details of emissions inventory are presented in Chapter 3 and Appendix III of this Plan. The trends are summarized in Table IV-1.

TABLE IV-1
PROJECTED DAILY EMISSIONS OF NOX, SOX, DIRECTLY EMITTED PM2.5, AND PM10 IN THE SOUTH COAST AIR BASIN FROM 2023 TO 2039

Year	NOx (tons per day)	SOx (tons per day)	PM2.5 (tons per day)	PM10 (tons per day)
2023	254.4	13.0	52.6	152.0
2033	202.8	15.2	52.7	155.8
2039	185.7	15.5	53.0	157.8
Emission Change from 2023 to 2039 (%)	-27%	19%	1%	4%

Basin total NOx emissions are projected to decline steadily from 254.4 tons per day in 2023 to 185.7 tons per day in 2039 – a total reduction of approximately 27%. In contrast to the downward trend in NOx, emissions of SOx, PM2.5 and PM10 show upward trends over the same period. SOx emissions increase from 13.0 tons per day in 2023 to 15.5 tons per day in 2039. Direct PM2.5 emissions are projected to rise from 52.6 tons per day in 2023 to 53.0 tons per day in 2039, while PM10 emissions increase more noticeably – from 152.0 tons per day to 157.8 tons per day, an approximate 4% increase over the projection period.

As NOx is a major precursor to secondary nitrate, the significant decrease in NOx is expected to result in lower ambient nitrate concentrations in the future. SOx is the primary precursor to sulfate, and with a increasing SOx emissions, sulfate concentrations are expected to increase. PM2.5 and PM10 emission changes will affect the primary contributions to particulate mass. The direction and magnitude of overall PM concentration changes will ultimately depend on the relative mass fractions of secondary and primary components.

3. Future Design Values

3.1 24-hour PM2.5

The 2024 DVs and its estimated chemical species are shown in Table IV-2 and used as the foundation to estimate future 24-hour PM2.5 DV contributions. These projections were developed by applying anticipated emission changes to occur through 2033 and 2039. Following the method described in section 2.1, the resulting projected 24-hour PM2.5 DVs for 2033 and 2039 are presented in Table IV-3. As shown, all monitoring sites listed in the table are projected to have DVs well below 65 µg/m^3, maintaining attainment of the 1997 24-hour PM2.5 NAAQS through the year 2039.

TABLE IV-2
2024 DV FOR 24-HOUR PM2.5 AND DV CONTRIBUTIONS FROM DIFFERENT COMPONENTS

Station	2024 DV (µg/m^3)	DV Contribution (%)			DV Contribution (µg/m^3)		
		NH_4NO_3	$(NH_4)_2SO_4$	Other	NH_4NO_3	$(NH_4)_2SO_4$	Other
Anaheim	25	23.0%	11.3%	65.7%	5.75	2.82	16.43
Big Bear	29	31.4%	10.6%	58.0%	9.09	3.08	16.83
Compton	32	28.4%	14.4%	57.2%	9.10	4.61	18.30
Fontana	35	31.4%	10.6%	58.0%	10.97	3.72	20.31
Long Beach near-road	26	28.4%	14.4%	57.2%	7.39	3.74	14.87
Los Angeles	26	28.4%	14.4%	57.2%	7.39	3.74	14.87
Mira Loma	34	31.5%	11.4%	57.1%	10.72	3.87	19.41
Ontario-near-road	31	31.4%	10.6%	58.0%	9.72	3.29	17.99
Pasadena	26	28.4%	14.4%	57.2%	7.39	3.74	14.87
Pico Rivera	30	28.4%	14.4%	57.2%	8.53	4.32	17.15
Reseda	26	28.4%	14.4%	57.2%	7.39	3.74	14.87
Riverside	28	31.5%	11.4%	57.1%	8.83	3.19	15.99
San Bernardino	30	31.4%	10.6%	58.0%	9.41	3.19	17.41
Long Beach	22	28.4%	14.4%	57.2%	6.25	3.17	12.58

TABLE IV-3
PROJECTED 24-HOUR PM2.5 BASED ON THE PROPORTIONAL ROLLBACK METHOD

Station	2033 Chemical Components and DV ($\mu g/m^3$)				2039 Chemical Components and DV ($\mu g/m^3$)			
	NH_4NO_3	$(NH_4)_2SO_4$	Other	DV	NH_4NO_3	$(NH_4)_2SO_4$	Other	DV
Anaheim	4.88	3.30	16.46	25	4.59	3.36	16.56	25
Big Bear	7.71	3.61	16.86	28	7.25	3.67	16.96	28
Compton	7.71	5.40	18.33	31	7.25	5.49	18.44	31
Fontana	9.30	4.36	20.35	34	8.75	4.43	20.47	34
Long Beach near-road	6.27	4.39	14.89	26	5.89	4.46	14.98	25
Los Angeles	6.27	4.39	14.89	26	5.89	4.46	14.98	25
Mira Loma	9.09	4.53	19.45	33	8.55	4.61	19.56	33
Ontario near-road	8.24	3.86	18.02	30	7.75	3.93	18.13	30
Pasadena	6.27	4.39	14.89	26	5.89	4.46	14.98	25
Pico Rivera	7.23	5.06	17.19	29	6.80	5.15	17.29	29
Reseda	6.27	4.39	14.89	26	5.89	4.46	14.98	25
Riverside	7.48	3.73	16.01	27	7.04	3.80	16.11	27
San Bernardino	7.97	3.74	17.44	29	7.50	3.80	17.54	29
Long Beach	5.30	3.71	12.60	22	4.99	3.78	12.68	21

2.2 Annual PM2.5

The base year (2024) DV contributions were shown in Table IV-4 and used as the basis for estimating future annual PM2.5 DV contributions. Emission reductions projected through 2033 and 2039 were applied to each PM2.5 component using the same sensitivity factors as 24-hour PM2.5 demonstration calculations. The resulting projected annual PM2.5 concentrations based on the projected emissions are presented in Table IV-5. As shown, all monitoring sites are projected to have DVs well below 15 µg/m^3, maintaining attainment of the annual PM2.5 NAAQS through the year 2039.

TABLE IV-4
2024 DV FOR ANNUAL PM2.5 AND DV CONTRIBUTIONS FROM DIFFERENT COMPONENTS

Station	2024 DV (µg/m^3)	DV Contribution (%)			DV Contribution (µg/m^3)		
		NH_4NO_3	$(NH_4)_2SO_4$	Other	NH_4NO_3	$(NH_4)_2SO_4$	Other
Anaheim	9.8	17.9%	14.8%	67.3%	1.76	1.45	6.60
Big Bear	7.4	22.8%	11.5%	65.8%	1.68	0.85	4.87
Compton	11.9	21.7%	14.2%	64.1%	2.58	1.69	7.63
Fontana	11.9	22.8%	11.5%	65.8%	2.71	1.36	7.83
Long Beach near- road	11.5	21.7%	14.2%	64.1%	2.49	1.63	7.38
Los Angeles	11.2	21.7%	14.2%	64.1%	2.43	1.59	7.18
Mira Loma	12.4	22.7%	11.9%	65.5%	2.81	1.47	8.12
Ontario near-road	12.9	22.8%	11.5%	65.8%	2.94	1.48	8.48
Pasadena	10	21.7%	14.2%	64.1%	2.17	1.42	6.41
Pico Rivera	11.5	21.7%	14.2%	64.1%	2.49	1.63	7.38
Reseda	9.2	21.7%	14.2%	64.1%	1.99	1.31	5.90
Riverside	11.3	22.7%	11.9%	65.5%	2.56	1.34	7.40
San Bernardino	11.7	22.8%	11.5%	65.8%	2.66	1.34	7.70
Long Beach	9.2	21.7%	14.2%	64.1%	1.99	1.31	5.90

TABLE IV-5

PROJECTED ANNUAL PM2.5 BASED ON THE PROPORTIONAL ROLLBACK METHOD

	2033 DV Contribution (µg/m^3)				2039 DV Contribution (µg/m^3)			
Station	**NH_4NO_3**	**$(NH_4)_2SO_4$**	**Other**	**DV**	**NH_4NO_3**	**$(NH_4)_2SO_4$**	**Other**	**DV**
Anaheim	1.49	1.70	6.61	9.8	1.40	1.73	6.65	9.8
Big Bear	1.43	0.99	4.88	7.3	1.34	1.01	4.91	7.3
Compton	2.19	1.98	7.65	11.8	2.06	2.01	7.69	11.8
Fontana	2.30	1.60	7.84	11.7	2.16	1.63	7.89	11.7
Long Beach near-road	2.11	1.91	7.39	11.4	1.99	1.95	7.43	11.4
Los Angeles	2.06	1.86	7.20	11.1	1.94	1.90	7.24	11.1
Mira Loma	2.38	1.72	8.13	12.2	2.24	1.75	8.18	12.2
Ontario near-road	2.49	1.73	8.50	12.7	2.34	1.76	8.55	12.7
Pasadena	1.84	1.66	6.43	9.9	1.73	1.69	6.46	9.9
Pico Rivera	2.11	1.91	7.39	11.4	1.99	1.95	7.43	11.4
Reseda	1.69	1.53	5.91	9.1	1.59	1.56	5.95	9.1
Riverside	2.17	1.57	7.41	11.2	2.04	1.60	7.45	11.1
San Bernardino	2.26	1.57	7.71	11.5	2.12	1.60	7.76	11.5
Long Beach	1.69	1.53	5.91	9.1	1.59	1.56	5.95	9.1

2.3 24-hour PM10

DV contributions for each monitoring site were presented in Table IV-6. Specifically, different from 24-hour and annual PM2.5, the "other species" category was assumed to correspond to the emission changes of directly emitted PM10. Future DV estimates for 2033 were calculated by applying the corresponding projected emission reductions to each PM10 component. The 24-hour PM10 future DVs are summarized in Table IV-7. As shown in the table, all monitoring sites are expected to maintain attainment of the 24-hour PM10 NAAQS through the year 2033.

TABLE IV-6
2024 DESIGN VALUS FOR 24-HOUR PM10 AND DV CONTRIBUTIONS FROM DIFFERENT COMPONENTS

Station	2024 DV (µg/m^3)	DV Contribution (%)			DV Contribution (µg/m^3)		
		NH_4NO_3	$(NH_4)_2SO_4$	Other	NH_4NO_3	$(NH_4)_2SO_4$	Other
Anaheim	100	14.1%	8.1%	77.8%	14.12	8.09	77.79
Fontana	130	9.5%	5.3%	85.2%	12.31	6.91	110.78
Los Angeles	70	16.3%	9.5%	74.2%	11.44	6.64	51.93
Mira Loma	130	11.1%	5.2%	83.6%	14.44	6.82	108.74
Riverside	120	11.1%	5.2%	83.6%	13.33	6.30	100.37
San Bernardino	130	9.5%	5.3%	85.2%	12.31	6.91	110.78
Long Beach	70	16.3%	9.5%	74.2%	11.44	6.64	51.93
Mission Viejo	30	14.1%	8.1%	77.8%	4.24	2.43	23.34
Banning Airport	100	11.1%	5.2%	83.6%	11.11	5.25	83.64
Crestline	50	9.5%	5.3%	85.2%	4.73	2.66	42.61
Redlands	70	9.5%	5.3%	85.2%	6.63	3.72	59.65
Santa Clarita	70	16.3%	9.5%	74.2%	11.44	6.64	51.93
Glendora	80	16.3%	9.5%	74.2%	13.07	7.59	59.34

TABLE IV-7
PROJECTED 2033 24-HOUR PM10 BASED ON THE PROPORTIONAL ROLLBACK METHOD

Station	2033 DV Contribution - Baseline Scenario (µg/m^3)			
	NH_4NO_3	$(NH_4)_2SO_4$	Other	DV
Anaheim	11.97	9.48	79.77	101
Fontana	10.44	8.09	113.60	132
Los Angeles	9.70	7.78	53.24	71
Mira Loma	12.24	7.99	111.50	132
Riverside	11.30	7.38	102.92	122
San Bernardino	10.44	8.09	113.60	132
Long Beach	9.70	7.78	53.24	71
Mission Viejo	3.59	2.84	23.93	30
Banning Airport	9.42	6.15	85.77	101
Crestline	4.01	3.11	43.69	51
Redlands	5.62	4.36	61.17	71
Santa Clarita	9.70	7.78	53.24	71
Glendora	11.08	8.89	60.85	81

2.4 Weight of Evidence

The maintenance demonstration included in this Plan employed several overly conservative approaches to ensure maintenance of the PM standards through the future maintenance horizon years.

First, baseline emissions do not reflect rules that are adopted in 2021 and afterwards. There are 12 rules applying to large point sources (RECLAIM sources) and 16 rules for smaller point and area sources. The reductions from these rules are not included in the DV calculation but provide additional assurance that future DVs are likely even lower than those presented in this Plan due to the additional reductions anticipated from these rules. Details of these rules can be found in Appendix III and chapter 3 in this Plan.

Second, the proportional rollback calculations used to project future DVs incorporated conservative sensitivity ratios to ensure a more cautious estimation of future PM concentrations. For ammonium nitrate, a sensitivity ratio of 0.75 was used to relate NOx emission changes to nitrate concentrations. This approach is more conservative than assuming a one-to-one relationship between NOx reductions and nitrate decreases, resulting in smaller projected reductions in nitrate-related PM2.5 mass for the same NOx emission decline. For sulfate and other PM components, a sensitivity ratio of 1.0 was applied to estimate the impact of SOx and direct PM emissions, even though in-house CMAQ modeling results

indicated lower values. Because SOx and direct PM2.5 emissions are projected to increase slightly over time, using a higher sensitivity ratio magnifies the estimated effect of these increases on future PM levels.

In all, considering reductions not reflected in the baseline emissions and the conservative assumptions in the proportional rollback method, the maintenance demonstration in this Plan is technically robust and provides assurance that the South Coast Air Basin will maintain attainment of the 1997 24-hour and annual PM2.5 NAAQS through 2039 and 1987 24-hour PM10 NAAQS through 2033.

4. Summary and Conclusions

This maintenance demonstration confirms that the South Coast Air Basin is expected to continue meeting the 1997 24-hour and annual PM2.5 NAAQS through the year 2039, and 1987 24-hour PM10 NAAQS through the year 2033. The maintenance demonstration relied on the proportional rollback method, applying projected emission reductions to measured PM design values and chemical composition data collected during the 2022–2024 period. Chemical speciation data of PM2.5 and PM10 provided insight into the dominant chemical constituents and their sensitivity to precursor emission changes. Future design value projections, based on anticipated reductions in NOx and other pollutants, consistently remain below the applicable NAAQS thresholds across all monitored sites. Overall, the results provide strong evidence that the region will maintain attainment of the federal air quality standards for PM2.5 and PM10 over the maintenance period.

South Coast Air Basin Redesignation Requests and Maintenance Plans for PM2.5 and PM10 NAAQS

APPENDIX V: CONTINGENCY PROVISION TRIGGER VALUES AND FUTURE EXCEPTIONAL EVENTS

Introduction

The contingency provision trigger value is calculated as part of the contingency provisions for the 1997 Annual PM2.5 NAAQS maintenance plan, the 1997 24-Hour PM2.5 NAAQS maintenance plan, and the 1987 24-Hour PM10 maintenance plan. See chapters 4, 5, and 6 for details of the contingency provisions. This appendix describes how the trigger values are calculated.

Contingency Provision Trigger Calculation

The same schedule is used to calculate PM2.5 and PM10 contingency provision trigger values, with the appropriate calculation method defined in 40 CFR Part 50 (Appendix N and K to part 50) used for each pollutant. In each of the years from 2026 to 2039 or until a second PM2.5 maintenance plan is approved by the U.S. EPA[1], South Coast AQMD will calculate the contingency provision trigger values by the end of April each year using the PM2.5 or PM10 samples collected up until December 31st of the previous year. The four-month period provides sufficient time for data to be reported to AQS, which must be reported by 90 days after the end of the calendar quarter in which they are collected, with one additional month to allow for analysis. South Coast AQMD may conduct analysis of potential contingency provision exceptional events after calculating the contingency provision trigger value and if needed, will be submitted by the end of May to revise the contingency provision trigger value[2]. If no contingency provision exceptional event demonstrations (CEEDs) are submitted, the contingency provision will be triggered as soon as practicable, but no later than June 1. If South Coast AQMD determines that the PM2.5 1997 Annual or 24-Hour PM2.5 design values would exceed the NAAQS even before data collection is complete for the year, South Coast AQMD will begin calculation of the contingency provision trigger and analysis of potential contingency provision exceptional events early, using partial data for the year. Then the contingency provision will be triggered as soon as practicable but no later than June 1 of the following year.

South Coast AQMD will additionally calculate the PM10 contingency provision trigger value using partial data by four months after the three quarters ending March 31, June 30, and September 30. South Coast AQMD may conduct analysis of potential contingency provision exceptional events after calculating the contingency provision trigger value and if needed, will submit any CEEDs by the end of the fifth month after each quarter to revise the contingency provision trigger value. If no CEEDs are submitted and the PM10 contingency provision is triggered by the quarterly value, South Coast AQMD will start implementing the contingency provision as soon as practicable, but no later than five months after the end of the quarter. The calculation will assume that no PM10 exceedances will occur and the sampling schedule will not be modified in the remainder of the year.

[1] At this point, the procedures outlined in the second maintenance plan will be implemented.
[2] CEEDs will only be submitted for regulatory significant events so it should be assumed that all submitted CEEDs would bring the contingency provision trigger value below the standard unless it is rejected by U.S. EPA or CARB

Measurements meeting any of the following criteria will be excluded when calculating the contingency provision trigger value:

- A contingency provision exceptional event demonstration addressing the measurement has been submitted to CARB and U.S. EPA and it has not been disagreed upon.
- Measurements with exceptional event demonstrations that have been concurred upon by CARB and U.S. EPA.

The procedure of calculating the 24-hour or annual PM2.5 design value defined in 40 CFR Part 50 (Appendix N to part 50) will be followed for PM2.5, and the procedure in 40 CFR Part 50 (Appendix K to part 50) will be followed for PM10 to determine the trigger value. The contingency provision is triggered if the contingency provision trigger value exceeds 1.0 for PM10, 65 $\mu g/m^3$ for 24-hour PM2.5, or 15.0 $\mu g/m^3$ for annual PM2.5.

Annual calculation of the PM2.5 contingency provision trigger is useful because most non-exceptional PM2.5 24-hour exceedances and higher concentrations driving the annual PM2.5 design value in the South Coast Air Basin occur in November and December, and so the 3-year PM2.5 24-hour and annual design value usually is determined by data recorded in the last quarter of the year. Calculating the contingency provision trigger after the end of the year reduces effort spent on analyzing potential PM2.5 exceptional events for the contingency provision trigger that may not eventually be needed if non-exceptional exceedances caused a violation of the NAAQS.

Contingency Provision Exceptional Event Demonstrations

A fraction of the exceedances of the 1997 24-hour average PM2.5 NAAQS and the 1987 24-Hour PM10 NAAQS in the South Coast Air Basin are attributed to exceptional events, usually caused by wildfires and fireworks or windblown dust. The measurements during exceptional events are removed from contingency provision trigger value calculations if the criteria for designation as an exceptional event can be demonstrated. Thus, the South Coast AQMD has developed a weight-of-evidence data analysis methodology to identify exceedances that were due to exceptional events to avoid unnecessarily triggering the contingency provision.

To determine whether potential contingency provision exceptional event(s) exist, South Coast AQMD will remove event(s) from the data and calculate the contingency provision trigger value following the procedure described in the previous section. If the contingency provision trigger value is below the PM2.5 or PM10 NAAQS only after removing the event(s), the events are potential contingency provision exceptional event(s). The potential contingency provision exceptional event(s) can happen on any days in the three-year period of the data used to calculate the contingency provision trigger value. If there are multiple potential contingency provision exceptional events, South Coast AQMD will generally find the combination with the minimum number of days and stations that could bring the contingency provision trigger value below the NAAQS.

If South Coast AQMD staff believe that there has been a potential contingency provision exceptional event in the last three years, the South Coast AQMD will provide CARB and U.S. EPA a contingency provision exceptional event demonstration (CEED) supporting this assertion. The CEED is a weight-of-evidence analysis that uses similar criteria that are used to demonstrate exceptional events but would be less resource intensive for all three agencies. U.S. EPA agreement with contingency provision exceptional event demonstrations does not constitute a concurrence on an exceptional event demonstration and the data subject to a CEED is not excluded from design value calculations.

The next sections list the types of data that may be used to support a CEED. Other types of data and analysis not listed in the sections below may be used depending on the nature of the event and the available data. The CEED is a weight-of-evidence analysis and it might not need to contain all the data listed below. The CEED need only provide an analysis that is sufficient to reasonably establish that the event meets the following criteria:

- There is a causal relationship between the event and the exceedance
- And, the event was not both reasonably controllable and not reasonably preventable,
- And, the event was caused by human activity that is unlikely to recur at a particular location or was a natural event.

More specifically, in the case of an exceedance due to the use of fireworks, the CEED need only provide an analysis that is sufficient to reasonably establish that the fireworks event meets the following criteria:

- There is a causal relationship between the event and the exceedance
- The use of fireworks is integral to traditional national, ethnic, or other cultural events

The following sections detail the criteria that will be evaluated when developing a CEED for the three most common causes of PM10 and PM2.5 exceedances that may meet the criteria above, wildfires, high winds, and fireworks. However, other causes may meet these criteria. In this case, South Coast AQMD will consult with U.S. EPA and CARB staff to determine what types of evidence would be appropriate.

Wildfires

Wildfires are common causes of exceedances of the 24-hour PM2.5 NAAQS in the South Coast Air Basin. South Coast AQMD will use a weight of evidence approach to exclude contingency provision exceptional events from the contingency provision trigger value that were caused by wildfires. In general, South Coast AQMD will use some or all of the following criteria to determine if wildfires could have caused the event:

Analysis/Product	**Criteria**
South Coast AQMD advisories	South Coast AQMD has issued a smoke or ash advisory due to wildfire
Hourly or 24-hour PM2.5 measurements	Simultaneous increase of hourly or 24-hour $PM_{2.5}$ measurements with the beginning of the fire

Analysis/Product	Criteria
Low-Cost sensor measurements such as PurpleAir	Increase of PM2.5 measured at low-cost sensors consistent with the wildfire location and pollutant transport
Fire reports such as https://inciweb.nwcg.gov/	Fires reported that may influence the monitor
Operational smoke models such as BlueSky and HRRR-Smoke	Models show transport of smoke from fire to the monitor
Satellite Imagery (i.e. MODIS, GOES)	Satellite shows presence of smoke at monitored area or transport of smoke
Webcam Imagery	Webcam images show presence of smoke at monitored area or transport of smoke
Back trajectory	Models show transport occurred from smoke-producing wildfire
Wind roses and pollution roses	Measured or modeled wind directions indicate that the wildfire is upwind of the measurement station
Emission and transport/dispersion modeling	Modeled concentrations that take into account wildfire emissions exceed level of the NAAQS. Uncertainty of model and data inputs are taken into account to determine a range of model estimates.
Social Media	Monitoring for reports of wildfire smoke through social media accounts such as from the National Weather Service, US Forest Service, Caltrans, etc.
History of PM2.5 concentrations in the same season	PM2.5 concentrations are higher than concentrations during the same season over the past five years.
PM2.5 concentration exceedance	The concentration exceeds the NAAQS outside of the November through February period. Over the past five years, the vast majority of exceedances that were not caused by wildfires or cultural events have occurred in the November through February period.
Analysis of co-pollutants	Data such as levoglucosan and CO are elevated, indicating presence of smoke
Fire perimeter	Fire perimeter includes wildland (indicating that the fire may not be reasonably controllable or preventable)

Fireworks

Exceedances of the 24-hour PM2.5 NAAQS and the PM10 NAAQS sometimes occur on July 4th or 5th because of smoke emissions from fireworks. Exceedances are also possible in select areas on January 1st due to fireworks on New Year's Eve. According to Title 40 in the Code of Federal Regulations[3], fireworks that are significantly integral to traditional national, ethnic, or other cultural events are considered exceptional events. If the measured PM2.5 or PM10 exceedance occurs on January 1st, July 4th or July 5th,

[3] 40 CFR § 50.14 Treatment of air quality monitoring data influenced by exceptional events

or if fireworks are suspected to have caused the exceedance on another date, then South Coast AQMD will conduct investigation to determine if fireworks emissions could have caused the exceedance. South Coast AQMD will analyze the hourly PM2.5 or PM10 measurements to determine if there is a simultaneous increase of measured PM2.5 with the occurrence of observed or reported fireworks. If hourly PM2.5 or PM10 measurements are not available, then nearby PM2.5 or PM10 monitors or low-cost sensor measurements of PM2.5 or PM10 may be used for this evaluation. South Coast AQMD may also analyze nearby webcams and the composition of filter-based or real-time PM2.5 speciation measurements and evaluate whether the composition is characteristic of fireworks emissions. July 4th and 5th exceedances are common each year due to commercial and "backyard" fireworks displays. PM2.5 and PM10 measurements on adjacent days typically record concentrations well below the standard, as it is expected for the summer months. January 1st exceedances that are caused by fireworks are more challenging to identify as unrelated exceedances are common that time of year and residential wood combustion, which is common in winter months, typically occurs at the same time of day as January 1st fireworks. A more extensive weight of evidence discussion will be required to exclude exceedances on January 1st that are influenced by fireworks. While fireworks generally only significantly impact air quality on July 4th and 5th and January 1st, there may be impacts on other dates. An analysis for exceedances caused by fireworks on other dates will include a discussion on whether those events are significantly integral to traditional national, ethnic, or other cultural events.

Windblown Dust

Windblown dust caused 23 of 26 exceedances of the 24-hour PM10 NAAQS from 2010 - 2024 in the South Coast Air Basin. Thus, these exceptional events are common and are expected to occur within the maintenance period. South Coast AQMD will use a weight of evidence approach to determine if wind-blown dust could have caused a measured exceedance so that the measurements can be excluded from the contingency provision trigger. The analysis will also determine the source of the event and if reasonable emission controls were in place during the event. The criteria to make these determinations will generally include some or all of the following:

Analysis/Product	**Criteria**
South Coast AQMD advisories	South Coast AQMD has issued a wind-blown dust and/or ash advisory due to high winds
NWS high wind warning or wind advisory	NWS has issued a high wind warning or wind advisory covering the portion of the South Coast Air Basin with an exceedance

Hourly PM10 measurements and wind speed measurements	Simultaneous increase of hourly PM10 measurements with increases in measured wind speeds. Timing of hourly PM10 corresponds temporally and spatially with winds above the high wind threshold* at the source area(s).
Satellite Imagery (i.e. MODIS, GOES)	Satellite shows presence of dust at monitored area or transport of dust
Webcam Imagery	Webcam video shows presence of dust at monitored area or transport of dust
Back trajectory	Models show transport occurred from undisturbed soils, areas with high soil erodibility potential or areas where ash or dust may be emitted, such as fire burn scars
PM speciation or PM10/PM2.5 ratio analysis	The speciation or ratio provides a signature that is used to determine the types of sources contributing to the event
Wind roses and pollution roses	Measured or modeled wind directions show upwind areas with undisturbed soils, high soil erodibility potential or areas where ash or dust may be emitted, such as fire burn scars
Wind speed forecast or measurements	Hourly average winds or other sustained wind speeds exceeding the high wind threshold will or have occurred near the exceedance
Emission and transport/dispersion modeling	Modeled concentrations exceed level of the NAAQS. Uncertainty of model and data inputs are taken into account to determine a range of model estimates.
Social Media	Monitoring for reports of windblown dust and/or ash through social media accounts such as from the National Weather Service, US Forest Service, Caltrans, etc.

* The high wind threshold is typically considered to be 25 miles per hour for source regions in the South Coast Air Basin, unless other thresholds are established on a case by case basis

The evaluation of upwind source area for high wind dust events will depend on the specific event. Two high wind dust events characterized by northeasterly Santa Ana winds contributed to PM10 exceedances in 2024 at the Mira Loma Van Buren monitor and exceptional event demonstrations were developed to exclude these days from the design value. If similar events occur in the maintenance period, the evaluation of upwind source area for these events will be based on the upwind sources identified in the 2024 exceptional event demonstrations, along with any updates to potential sources that have occurred since the 2024 event.

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APPENDIX VI: PM2.5 EXCEEDANCES AND SUSPECTED EXCEPTIONAL EVENTS

Table VI-1 lists PM2.5 measurements during 2022 – 2024 that were likely caused by fireworks. These measurements are removed from the "suspected fireworks events removed" design values in chapters 4 and 5.

TABLE VI-1: PM2.5 MEASUREMENTS DURING 2022-2024 THAT WERE LIKELY CAUSED BY FIREWORKS

State Code	County Code	Site Number	Date	Site Name	Concentration [µg m^{-3}]	Likely Cause
06	037	1103	7/4/2024	Los Angeles-North Main Street	38.6	Independence Day Fireworks
06	037	1103	7/5/2024	Los Angeles-North Main Street	54.9	Independence Day Fireworks
06	037	1201	7/5/2024	Reseda	38.5	Independence Day Fireworks
06	037	1302	7/4/2022	Compton	39.2	Independence Day Fireworks
06	037	1302	7/4/2024	Compton	41.1	Independence Day Fireworks
06	037	1602	7/4/2022	Pico Rivera #2	53.8	Independence Day Fireworks
06	037	1602	7/5/2023	Pico Rivera #2	60.7	Independence Day Fireworks
06	037	1602	7/5/2024	Pico Rivera #2	68.2	Independence Day Fireworks
06	037	2005	7/5/2023	Pasadena	52	Independence Day Fireworks
06	037	2005	7/5/2024	Pasadena	117.2	Independence Day Fireworks
06	059	0007	7/4/2023	Anaheim	45.6	Independence Day Fireworks
06	059	0007	7/4/2024	Anaheim	35.7	Independence Day Fireworks
06	065	8001	7/5/2022	Rubidoux	38.5	Independence Day Fireworks
06	065	8001	7/5/2023	Rubidoux	74.3	Independence Day Fireworks
06	065	8001	7/5/2024	Rubidoux	54.7	Independence Day Fireworks
06	065	8005	7/5/2023	Mira Loma (Van Buren)	69	Independence Day Fireworks
06	065	8005	7/5/2024	Mira Loma (Van Buren)	55.7	Independence Day Fireworks
06	071	0027	7/5/2022	Ontario-Route 60 Near Road	41.8	Independence Day Fireworks
06	071	0027	7/5/2023	Ontario-Route 60 Near Road	105.3	Independence Day Fireworks
06	071	0027	7/5/2024	Ontario-Route 60 Near Road	127.6	Independence Day Fireworks
06	071	2002	7/5/2023	Fontana	101.1	Independence Day Fireworks
06	071	2002	7/5/2024	Fontana	83.4	Independence Day Fireworks
06	071	9004	7/5/2023	San Bernardino	52.9	Independence Day Fireworks
06	071	9004	7/5/2024	San Bernardino	48.8	Independence Day Fireworks