

Technical Support Document
for the
Proposed Action
on the South Coast 2007 AQMP for PM_{2.5}
and the South Coast Portions of the Revised
2007 State Strategy

Air Division
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Acronyms & Terms

μ : micron (one millionth)
AERR: Air Emissions Report Rule, 40 CFR part 51, subpart A
APCD: air pollution control district
AQMD: air quality management district
AQMP: air quality management plan
AQS: Air Quality Subsystem
ARB: California Air Resources Board (also CARB)
BAR – California Bureau of Automotive Repair
BARCT: best available retrofit control technology
BC: black carbon
CAA: Federal Clean Air Act as amended in 1990
CALMET: a diagnostic 3- dimensional meteorological model
CAMx: Comprehensive Air Quality Model with extensions
CARB: California Air Resources Board (also ARB)
CCR: California Code of Regulations
CEFS: California Emissions Forecasting and Planning Inventory System
CEIDARS: California Emissions Inventory Development and Reporting System
CERR: Consolidated Emissions Reporting Rule, 40 CFR part 51, subpart A
CFR: Code of Federal Regulations
CMAQ: Congestion Mitigation and Air Quality funds
CMB: chemical mass balance
CO: carbon monoxide
CPM: condensable particulate matter
CTG: Control Techniques Guidelines
CSBA: California Small Business Alliance
District: South Coast Air Quality Management District
DPR: California Department of Pesticide Regulation
EC: elemental carbon
EGU: electrical generating unit
EPA: United States Environmental Protection Agency
FDDA: Four Dimensional Data Assimilation
FEM: federal equivalent method
FHWA: Federal Highway Administration
Fine particulate matter: $PM_{2.5}$
FMVCP: Federal motor vehicle control program
FR: Federal Register
FRM – federal reference method
FTA: Federal Transit Administration
ICE – internal combustion engine
MATES: Multiple Air Toxics Exposure Study
MCR – mid-course review
MM5 – Mesoscale model
MPO: metropolitan planning organization

MVEB – motor vehicle emissions budget
NAAQS: national ambient air quality standard
NCEP - National Centers for Environmental Prediction
NH₃: ammonia
NO₂: nitrogen dioxide
NO_x: oxides of nitrogen
NYQ: not yet quantified
O₃: ozone
OC – organic carbon
OTAQ: EPA’s Office of Transportation and Air Quality
PBL: planetary boundary layer
PM – particulate matter
PM₁₀: particulate matter with a diameter of 10 µm or less, includes PM_{2.5}
PM_{2.5}: particulate matter with a diameter of 2.5 µm or less
RACM: reasonably available control measures
RACT: reasonably available control technology
RAMS: Regional Atmospheric Modeling System
RFP reasonable further progress
RH: relative humidity
ROG: reactive organic gases, used interchangeably with “VOC”
RRF – relative response factor
RTIP – regional transportation improvement program
RTP – regional transportation plan
SC – South Coast
SCAQMD: South Coast Air Quality Management District
SCE: Southern California Edison
SCOS97: Southern California Ozone Study 1997
SIP: state implementation plan
SJV: San Joaquin Valley
SJVAPCD: San Joaquin Valley Air Pollution Control District
SMAT: Speciated Modeled Attainment Test
SO₂: sulfur dioxide
SO_x: oxides of sulfur
SSI: Size Selective Inlet
STMPRAG: Scientific, Technical, and Modeling Peer Review Advisory Group
TCM: transportation control measures
tpd: tons per day
TSD: technical support document
UAM: Urban Airshed Model -
UAMAERO-LT: Urban Airshed Model
UFP: ultrafine particle
UTM – Universal transverse Mercator
VMT: vehicle miles traveled
VOC: volatile organic compounds
WOE weight of evidence
WRAP: Western Regional Air Partnership

WRF: Weather Research and Forecasting
WSPA: Western States Petroleum Association

Technical Support Document for the Proposed Action on the South Coast 2007 AQMP for PM_{2.5} and the South Coast Portions of the Revised 2007 State Strategy

I. Introduction and Background

This document provides supporting information and analysis for EPA's proposed rulemaking actions on the South Coast Air Quality Management District's 2007 AQMP (June 2007) and the related portions of the California Air Resources Board's *State Strategy for California's 2007 State Implementation Plan* (September 27, 2007) as revised and updated on April 24, 2009. It identifies the Clean Air Act (CAA) requirements for PM_{2.5} plans and EPA's regulatory and policy guidance interpreting these requirements. It also describes the elements of the South Coast 2007 AQMP and 2007 State Strategy intended to address these requirements and EPA's evaluation of whether the state submittals meet them.

A. The National Ambient Air Quality Standards for Fine Particulate (PM_{2.5})

1. The PM_{2.5} National Ambient Air Quality Standards

a. Level and Form of the Standard

On July 18, 1997, EPA established new national ambient air quality standards (NAAQS) for PM_{2.5}. 62 FR 38652.¹ The annual standards are set at a level of 15 micrograms per cubic meter (μm^3), as determined by the 3-year average of annual mean PM_{2.5} concentrations. The 24-hour standards were set at a level of 65 μm^3 , as determined by the 3-year average of the 98th percentile of 24-hour concentrations. 40 CFR § 50.13.

b. Health Effects

EPA established air quality standards for PM_{2.5} based on evidence from numerous health studies demonstrating that serious health effects are associated with exposures to elevated levels of PM_{2.5}. Epidemiological studies have shown statistically significant correlations between elevated PM_{2.5} levels and premature mortality. Other important effects associated with PM_{2.5} exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted

¹ The original annual and daily standards for particulate matter generally less than or equal to 10 micrometers in diameter (also referred to as PM₁₀) were established in 1987. In the 1997 PM NAAQS revision, EPA also revised the standards for PM₁₀ but these revised PM₁₀ standards were later vacated by the court, and the 1987 PM₁₀ standards remained in effect. In the 2006 NAAQS revision, the 24-hour PM₁₀ standards were retained but the annual standards were revoked. The South Coast nonattainment area is designated and classified as serious nonattainment for the PM₁₀ NAAQS. See 40 CFR part 81.305.

activity days), changes in lung function and increased respiratory symptoms, as well as new evidence for more subtle indicators of cardiovascular health. Individuals particularly sensitive to PM_{2.5} exposure include older adults, people with heart and lung disease, and children. See, EPA, *Air Quality Criteria for Particulate Matter*, No. EPA/600/P-99/002aF and EPA/600/P-99/002bF, October 2004.

Attainment of the 1997 PM_{2.5} standards is estimated to lead to reductions in health impacts, including tens of thousands fewer premature deaths each year, thousands fewer hospital admissions and emergency room visits each year, hundreds of thousands fewer absences from work and school, and hundreds of thousands fewer respiratory illnesses in children annually. See 72 FR 20586, 20587 (April 25, 2007).

c. Revisions to the 24-Hour PM_{2.5} Standard

On October 17, 2006, EPA completed another review of the NAAQS for PM. With regard to the primary standards, the 24-hour PM_{2.5} standards were strengthened to a level of 35 µ/m³, based on the 3-year average of the 98th percentile of 24-hour concentrations. The annual standards remained unchanged. 71 FR 61144 (October 17, 2006). Attainment of the 2006 PM_{2.5} standards is estimated to lead to additional reductions in health impacts over the 1997 standard, including approximately 1,200 to 13,000 fewer premature deaths each year, 1,630 fewer hospital admissions and 1,200 fewer emergency room visits for asthma each year, 350,000 fewer absences from work and school, and 155,300 fewer respiratory illnesses in children annually. 72 FR 20586, 20587.

On November 13, 2009, EPA designated the South Coast, along with other areas in the Country, as nonattainment for the 2006 24-hour PM_{2.5} standard. 74 FR 58688. California is now required to submit a plan demonstrating attainment of this standard by December 14, 2012. The South Coast 2007 AQMP address only the 1997 24-hour PM_{2.5} standards of 65 µg/m³ and annual standards of 15 µg/m³.

2. Implementing the PM_{2.5} NAAQS

a. Designations

The process for designating areas either attaining or not attaining following promulgation of a new or revised NAAQS is contained in CAA section 107(d)(1). Under this section, each State Governor or Tribal leader has an opportunity to recommend air quality designations, including the appropriate boundaries for areas to EPA. Under CAA section 107, State and Tribal recommendations are due within one year of promulgation of a new NAAQS. In the case of the 1997 PM_{2.5} standards, however, Congress amended section 107 to extend the schedule for EPA to initiate the designations process until 3 calendar years of air quality data, measured at Federal Reference Method monitors, were gathered. See section 6102(c)(1)(d) of the Transportation Equity Act for the 21st Century. EPA and State air quality agencies initiated the monitoring process for the PM_{2.5} NAAQS in 1999 and deployed all air quality monitors by January 2001.

By no later than 120 days prior to promulgating designations, EPA is required to notify States or Tribes of any intended modifications to their boundaries that EPA deems necessary.

States and Tribes then have an opportunity to provide a demonstration as to why the proposed modifications suggested by EPA are inappropriate. Whether or not a State or Tribe provides a recommendation, EPA must promulgate the designation that it deems appropriate.

In April 2003, EPA requested that California to submit its designation recommendations, based on ambient air quality data from 2001 to 2003, and supporting documentation to EPA by February 15, 2004. California submitted its recommendations on February 11, 2004. See Letter, Catherine Witherspoon, CARB, to Wayne Nastri, EPA-Region 9, February 11, 2004. On December 17, 2004, EPA issued final PM_{2.5} designations for areas violating the 1997 standards, including the San Joaquin Valley air basin. They were published in the **Federal Register** on January 5, 2005 (70 FR 944) and became effective on April 5, 2005. The designations are codified at 40 CFR part 83, subpart C.

The nonattainment designation for an area starts the process whereby a State must develop an implementation plan that includes, among other things, a demonstration showing how it will attain the ambient standards by the attainment dates required in the CAA. Under section 172(b), States have up to 3 years after EPA’s final designations to submit their SIPs to EPA. The SIPs demonstrating attainment of the 1997 PM_{2.5} standards were due on April 5, 2008, 3 years after the effective date of the designations.

b. PM_{2.5} Planning Requirements

To assist states in developing effective plans to address their PM_{2.5} nonattainment problem, EPA issued the “Clean Air Fine Particulate Implementation Rule,” also known as the PM_{2.5} implementation rule. 72 FR 20586 (April 25, 2007), codified at 40 CFR part 51, subpart Z. We proposed this rule on November 1, 2005 at 70 FR 65984. EPA issued this rule in accordance with the statutory requirements of the CAA set forth in subpart 1 of Part D of Title 1, *i.e.*, sections 171–179B.

The PM_{2.5} implementation rule covers most CAA requirements for PM_{2.5} State implementation plans. A list of these CAA requirements, the corresponding provision in the PM_{2.5} implementation plan and preamble are given in Table IA-1 below.

Table IA-1				
CAA Requirements for PM_{2.5} Attainment State Implementation Plans				
CAA Section	PM _{2.5} Implementation Rule		Description	TSD
	Rule	Preamble		
172(a)(2)(A)	§51.1004	20600	Attainment date and attainment date extensions	II.E.
172(b)	§51.1002(a)	20599	SIP submittal date	I.B.3.
172(c)(1)	§51.1010	20609--20633	Reasonably available control measures (including reasonably available control technology)	II.D.
172(c)(1)	§ 51.1007(a)	20601-20602	Demonstration of expeditious attainment	II.F.

Table IA-1				
CAA Requirements for PM_{2.5} Attainment State Implementation Plans				
CAA Section	PM _{2.5} Implementation Rule		Description	TSD
	Rule	Preamble		
172(c)(2)	§ 51.1009	20633-20640	Reasonable further progress	II.H.
172(c)(3)	§ 51.1008	20647-20651	Emission inventory	II.A.
172(c)(6)	§ 51.1007(b) § 51.1010(b)	20601-20602 20658-20660	Enforceable limitation limits, other control measures, means or techniques and schedules and timetables for compliance as necessary for attainment	II.D. & F.
172(c)(7)	§ 51.1002(b)	20600	CAA section 110(a)(2) requirements	N/A
172(c)(9)	§ 51.1012	20642-20645	Contingency measures for failure to attain or make reasonable further progress	II.J.
302(g)	§ 51.1002(c)	20589-20597	PM _{2.5} precursors to be evaluated for control	II.C.
172(c)(1)	§ 51.1007(b)	20629	Timing of emission reductions for attainment	II.D. & F.
176(c)	93.118(e)	20645-20646	Motor vehicle emissions budgets	I.D.
172(c)(2) & (6)	§ 51.1011	20640	Mid-course review	II.I.
110(a)(2)(K)	§ 51.1007(a), § 51.112 and Appendix W	20605-20609	Air Quality Modeling	II.F.

In June 2007, a petition to the EPA Administrator was filed on behalf of several public health and environmental groups requesting reconsideration of four provisions in the PM_{2.5} implementation rule. See Earthjustice, “Petition for Reconsideration in the Matter of the Final Clean Air Fine Particulate Implementation Rule,” June 25, 2008. These provisions are:

1. Presuming that compliance with the (now vacated) Clean Air Interstate Rule satisfies the NO_x, SO₂ and PM_{2.5} RACT requirements for electric generating units (EGUs). 72 FR 20586 (April 25, 2007), at 20623-28.
2. Allowing States to defer establishing emission limits for condensable PM until January 1, 2011. 72 FR 20586 (April 25, 2007), at 20652 (codified at 40 CFR § 51.1002(c)).
3. Revising the criteria for analyzing the economic feasibility of RACT from a presumption that a given source must bear a cost similar to other sources and that to a consideration of whether the cost of a measure is reasonable for the regulated entity to bear, in light of benefits. 72 FR 20586 (April 25, 2007), at 20619.

4. Allowing States to use emissions reductions from outside of the nonattainment area to demonstration RFP. 72 FR 20586 (April 25, 2007), at 20636.

The disputed provisions of the PM_{2.5} implementation rule are, for the most part, not relevant to today's proposal because California did not rely on them in developing the nonattainment area plan for the South Coast PM_{2.5} nonattainment area. We address each of these provisions later in this TSD: the first three in section II.D. (RACM/RACT) and the fourth in section II.H. (RFP).

B. PM_{2.5} Air Quality in the South Coast

The South Coast PM_{2.5} nonattainment area is located in the southern part of California. It comprises portions of Los Angeles County, all of Orange County, and the urbanized portions of San Bernardino and Riverside Counties. It is home to almost 18 million people and is the nation's leading area for goods movement. See Figure IB-1 for a map of the South Coast nonattainment area and the major sources of air pollution in the nonattainment area. The local air district with primary responsibility for developing a plan to attain the PM_{2.5} NAAQS in this area is the South Coast Air Quality Management District ("SCAQMD" or "District"). For a complete description of the PM_{2.5} nonattainment area, please refer to 40 CFR part 81.305.

1. PM_{2.5} Levels in the South Coast

Annual PM_{2.5} levels in South Coast are some of the highest recorded in the United States at 19 µg/m³ for the 2007-2009 period. See EPA, Air Quality System, Design Value Report, August 26, 2010. Since comprehensive monitoring began for PM_{2.5} in the South Coast in the late 1990s, the area has seen a significant decline in ambient levels, especially in the 2002-2010 time period. See Figures IB-2 and IB-3. Figure IB-4 is a map of the current monitoring system in the South Coast.

Figure IB-1

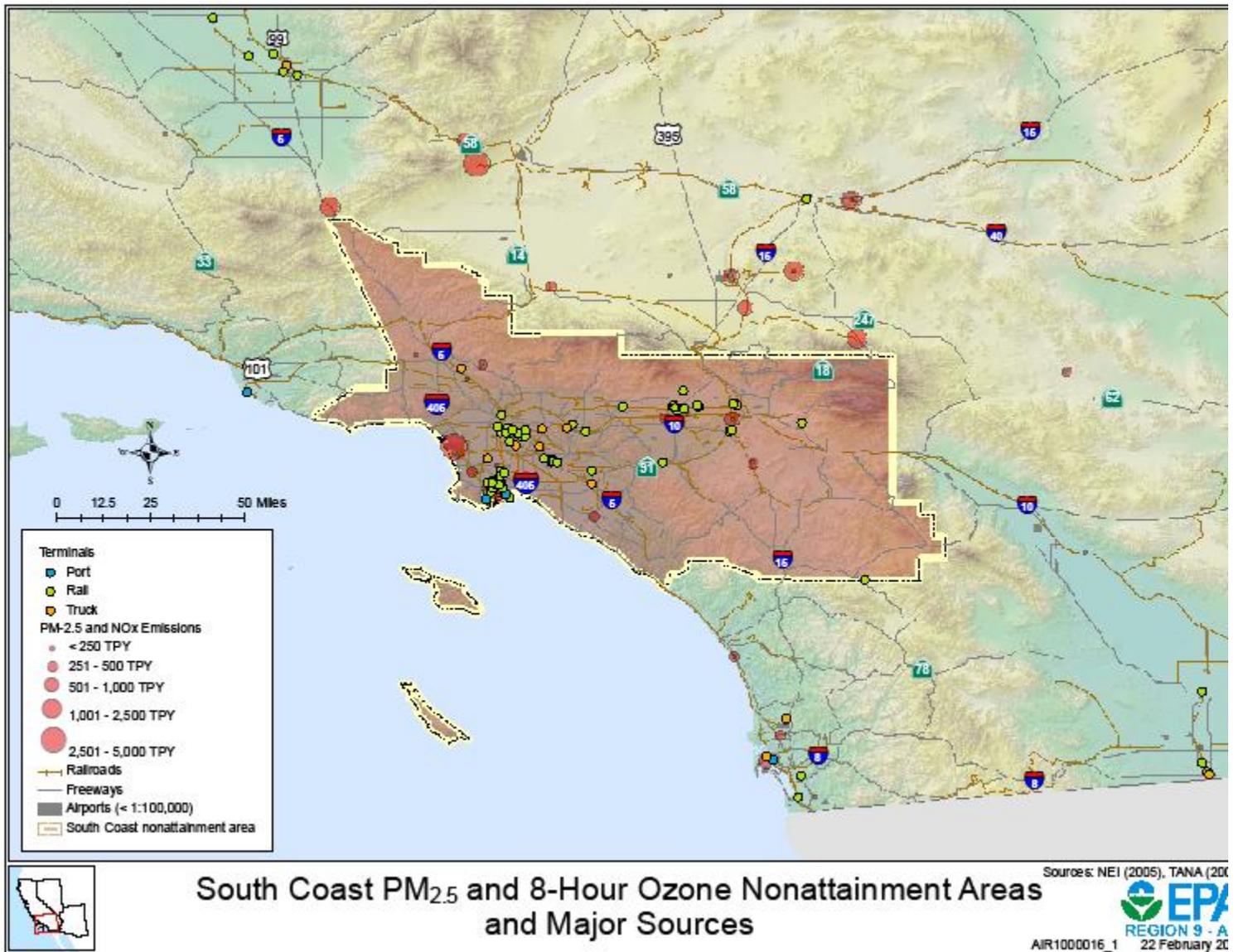


Figure IB-2

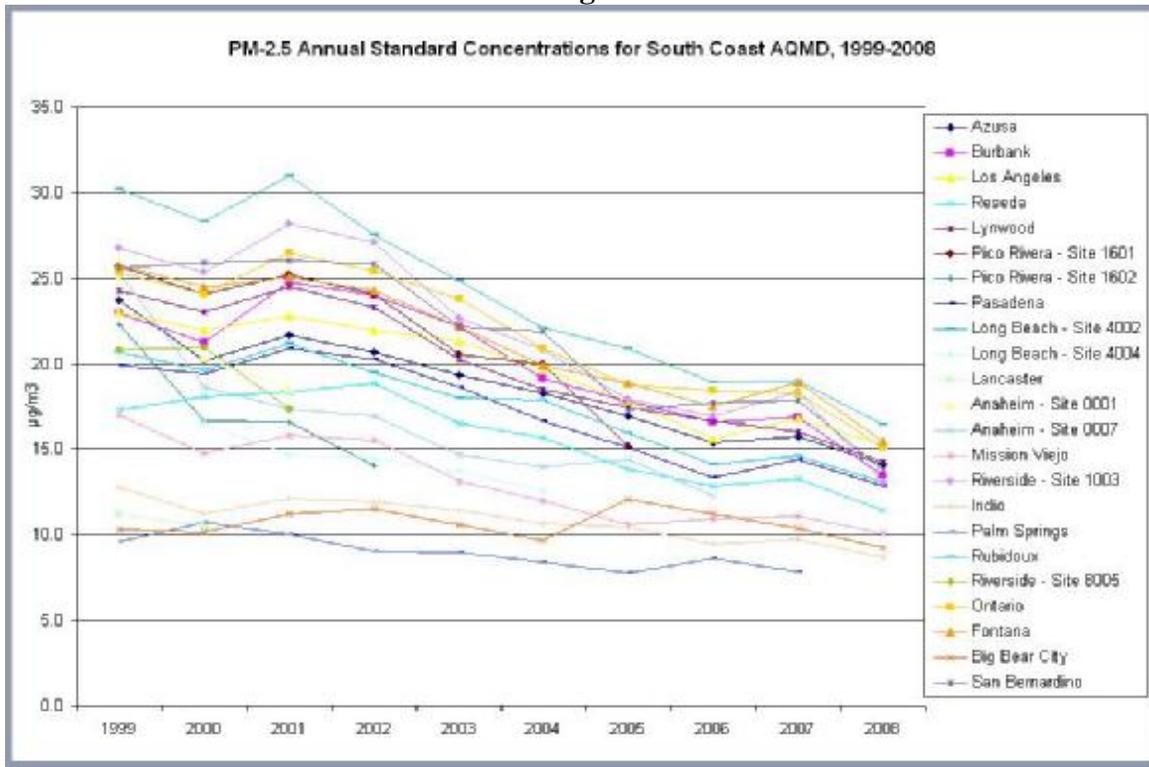


Figure IB-3

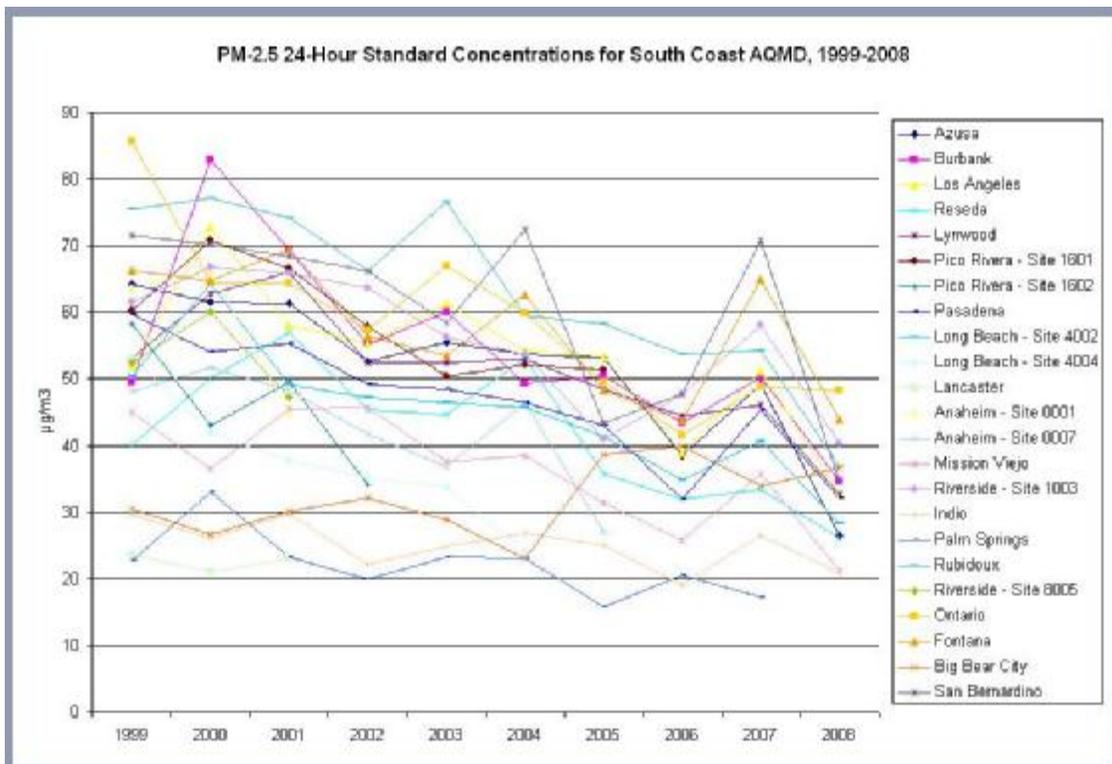
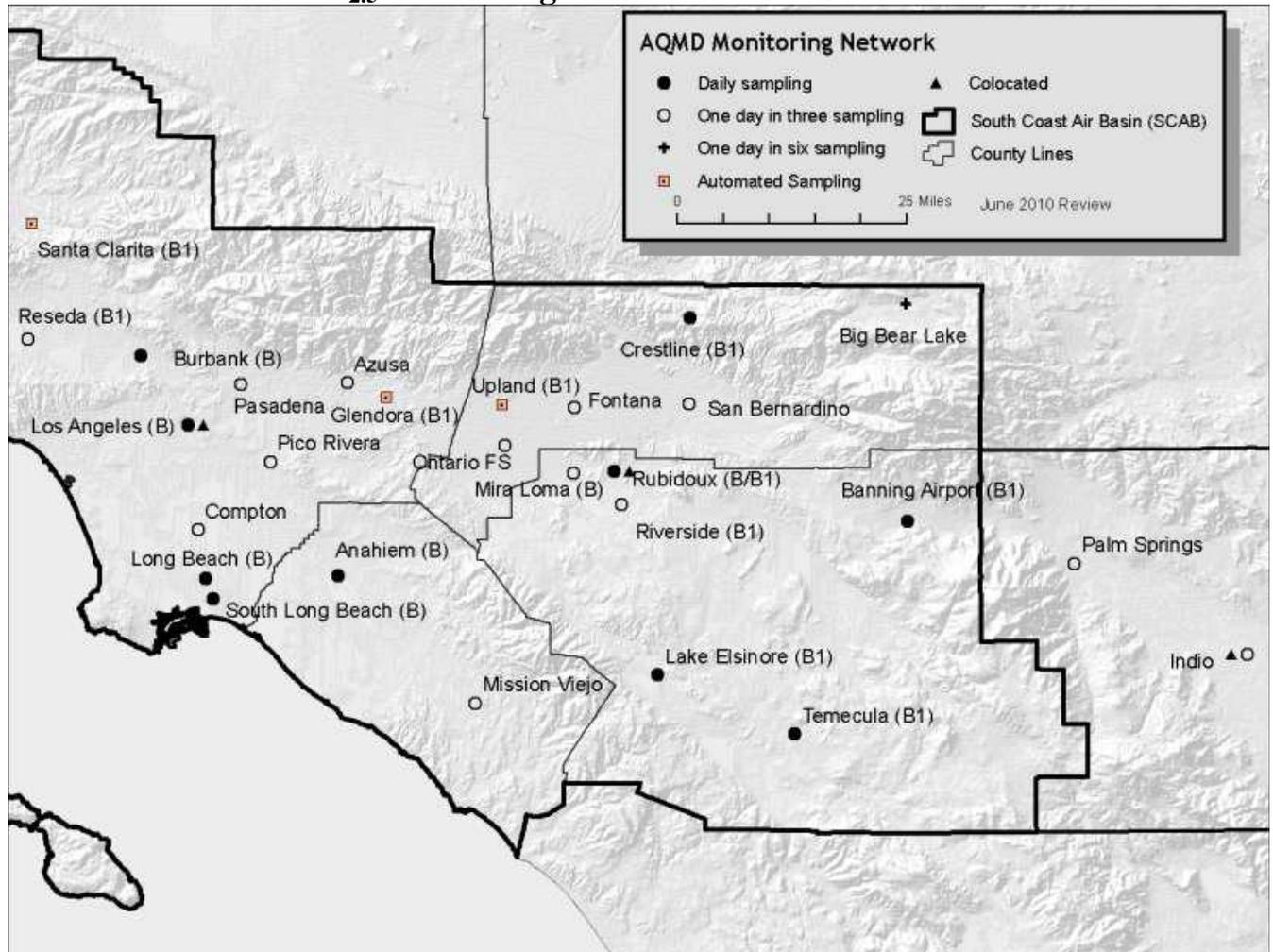


Figure IB-4 – Ambient PM_{2.5} Monitoring Locations In the South Coast Air Basin



From <http://www.aqmd.gov/tao/AQ-Reports/AQMonitoringNetworkPlan/AppendixA.pdf>

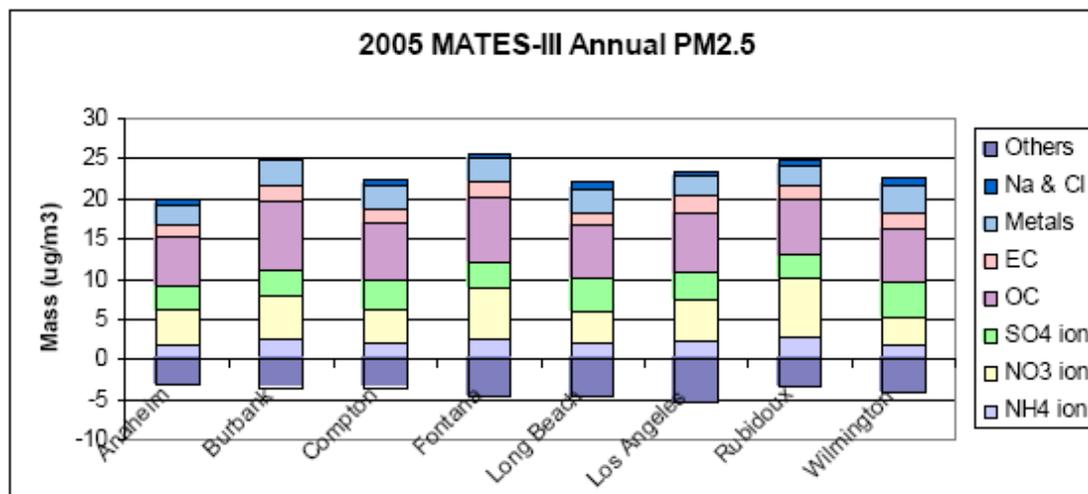
2. Chemical Composition of PM_{2.5} in the South Coast

PM_{2.5} in the air is a complex mixture of components. Common components include: nitrate (NO₃); sulfate (SO₄); ammonium; elemental carbon; a great variety of organic compounds; and inorganic material (including metals, dust, sea salt, and other trace elements) generally referred to as “crustal” material, although it may contain material from other sources. “Primary” particles are emitted directly into the air as a solid or liquid particle (e.g., elemental carbon from diesel engines or fire activities, or condensable organic particles from gasoline engines). “Secondary” particles (e.g., nitrate and sulfate) form in the atmosphere as a result of chemical reactions between precursor pollutants such as NO_x, SO₂, VOC, and ammonia. The South Coast 2007 AQMP includes an updated ammonia inventory.² Understanding the compounds that impact an area’s PM_{2.5} problem is necessary in order to develop control strategies that are effective for attaining the 1997 PM_{2.5} NAAQS. 72 FR 20586, at 20586.

PM_{2.5} in the South Coast Air Basin is overwhelmingly formed as a secondary pollutant. (South Coast 2007 AQMP, page ES-9). Therefore, the South Coast 2007 AQMP relies on reducing precursors to PM_{2.5} and some directly-emitted PM_{2.5} rather than fugitive dust (PM₁₀). In general, the organic carbon (OC) mass accounts for approximately 30 percent of the total mass at each station. Ammonium, sulfate and nitrates account for an approximate 45 percent of the total mass at each location. Rubidoux and Fontana are the most heavily impacted by nitrates. Sulfate is highest in the near coastal or ports of Los Angeles/Long Beach areas, particularly Wilmington and Long Beach. Elemental carbon (EC) and metals measurements were highest at Wilmington, accounting for almost 24 percent of the mass when combined. All sites observed measurable concentrations of sodium and chloride ions reflecting the influence of the marine air as it is transported inland. Figure IB-5 shows the annual distribution of PM_{2.5} species in the South Coast PM_{2.5} nonattainment area

² South Coast 2007 AQMP, Appendix III, page III-1-16, and electronic mail, Kathy Hsiao, SCAQMD, to Wienke Tax, EPA Region 9. dated October 29, 2010.

Figure IB-5: MATES-III 2005 Annual Distribution of PM_{2.5} Species (µg/m³)³



C. California Submittals Constituting the South Coast PM_{2.5} State Implementation Plan

Three submittals or parts of submittals comprise the South Coast PM_{2.5} attainment plan:

1. *Final 2007 Air Quality Management Plan*, SCAQMD, adopted June 1, 2007, submitted with the adopting resolutions and other supporting documentation by CARB on November 28, 2007. See South Coast Air Quality Management District Governing Board Resolution 07-9; CARB Resolution No. 07-41, September 22, 2007; and letter, James N. Goldstene, Executive Officer, CARB to Wayne Nastri, Regional Administrator, EPA Region 9, November 28, 2007 with enclosures. This document will be referenced in this TSD and the Federal Register proposal as the “2007 AQMP” and the “South Coast 2007 AQMP”.
2. *Proposed State Strategy for California’s 2007 State Implementation Plan*, adopted September 27, 2007, submitted with the adopting resolution and other supporting documentation by CARB on November 16, 2007. See CARB Resolution No. 07-28, September 27, 2007 and letter, James N. Goldstene, Executive Officer, CARB, to Wayne Nastri, Regional Administrator, EPA Region 9, November 16, 2007, with enclosures. This document will be referenced in this TSD and the Federal Register proposal as the “2007 State Strategy”.
3. *Status Report on the State Strategy for California’s 2007 State Implementation Plan (SIP) and Proposed Revisions to the SIP Reflecting Implementation of the 2007 State Strategy*, adopted April 24, 2009, submitted with the adopting resolution and other supporting documentation by CARB on August 12, 2009. See CARB Resolution No. 09-34, April 24, 2009 and letter, James N. Goldstene, Executive Officer, CARB, to Laura

³ South Coast 2007 AQMP, Appendix V, p. V-2-4.

Yoshii, Acting Regional Administrator, EPA Region 9, August 12, 2009 with enclosures. This document will be referenced in this TSD and the Federal Register proposal as the “revised 2007 State Strategy”.

Future references to the 2007 State Strategy in this TSD and the Federal Register proposal will be to the Strategy and Plan as revised in 2009, unless explicitly noted otherwise.

D. Public Notice and Hearing Requirements for and Completeness Determinations on SIP Submittals

1. Public Notice and Public Hearing Requirements for SIP Submittals

CAA sections 110(a) and (l) require a State to provide reasonable public notice and hearing prior to the adoption and submittal of a SIP or SIP revision. Thus, every SIP submittal should include evidence that adequate public notice was given and a public hearing was held consistent with EPA’s implementing regulations in 40 CFR § 51.102.

Both the SCAQMD and CARB have satisfied applicable statutory and regulatory requirements for reasonable public notice and hearing prior to adoption and submittal of the South Coast 2007 AQMP and the 2007 State Strategy. The District conducted public workshops, provided public comment periods, and held a public hearing prior to the adoption of the Plan on June 1, 2007. Documentation accompanying the AQMP describes a public and agency outreach effort. See, e.g., the SCAQMD’s Response to Comments on the Draft 2007 Air Quality Management Plan (February 2007), submitted by CARB on November 28, 2007 as enclosure I-E, describing nine regional workshops held from October 24 through December 6, 2006 to discuss the draft 2007 Air Quality Management Plan (AQMP) released on October 10, 2006. The sequence of public meetings held to discuss the elements of the draft State Strategy for California’s 2007 SIP (State Strategy) is described in the CARB staff report developed for the CARB Board’s consideration prior to adoption of the State Strategy. CARB also provide the required public notice and opportunity for public comment prior to its September 27, 2007 public hearing on the South Coast 2007 AQMP. See CARB, Notice of Public Meeting to Consider Approval of the 2007 Air Quality Management Plan for Attaining the Federal 8-hour Ozone and PM_{2.5} Standards in the South Coast Air Basin and the Coachella Valley. See <http://www.arb.ca.gov/board/ma/2007/ma092707.htm> and <http://www.arb.ca.gov/regact/nonreg/scsip07.pdf>.

CARB also conducted public workshops, provided public comment periods, and held a public hearing prior to its adoption of the 2007 State Strategy on September 27, 2007. CARB, Notice of Public Meeting to Consider Approval of the Proposed State Strategy for California’s State Implementation Plan (SIP) for the Federal 8-Hour Ozone and PM_{2.5} Standards, May 7, 2007. CARB also provide the required public notice, opportunity for public comment, and public hearing prior to its April 24, 2009 adoption of revisions to the Strategy. See CARB, Notice of Public Hearing to Consider a Status Report on the State Strategy for California’s 2007 State Implementation Plan and Consider Approval of a Proposed Revision to the State Implementation Plan Reflecting Implementation of the 2007 State Strategy, March 24, 2009.

2. Completeness Determinations on SIP Submittals

CAA section 110(k)(1) requires EPA to determine whether a SIP submittal is complete within 60 days of receipt. This section also provides that any plan that we have not affirmatively determined to be complete or incomplete will become complete six months after the day of submittal by operation of law. A completeness review allows us to determine if the submittal includes all the necessary items and information we need to act on it.

We make completeness determinations using criteria we have established in 40 CFR part 51, Appendix V. These criteria fall into two categories: administrative information and technical support information. The administrative information provides documentation that the State has followed basic administrative procedures during the SIP-adoption process and thus we have a legally-adopted SIP revision in front of us. The technical support information provides us the information we need to determine the impact of the proposed revision on attainment and maintenance of the air quality standards.

We notify a state of our completeness determination by letter unless the submittal become complete by operation of law. A finding of completeness does not approve the submittal as part of the SIP nor does it indicate that the submittal is approvable. It does start the 12 month clock we have to act on the SIP submittal. See CAA section 110(k)(2).

The November 28, 2007 submittal of the South Coast 2007 AQMP became complete by operation of law on May 28, 2008. The November 16, 2007 submittal of the 2007 State Strategy and the August 12, 2009 submittal of the 2009 revisions to the State Strategy became complete by operation of law on May 16, 2008 and February 12, 2010, respectively.

II. Evaluation of the South Coast 2007 AQMP for PM_{2.5} and the Revised 2007 State Strategy

A. Emissions Inventories

1. Requirements for Emission Inventories

CAA section 172(c)(3) requires states to submit “comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant.” Pursuant to this section, the PM_{2.5} implementation rule requires State to submit, within three years of the designation of one of its areas as nonattainment, a statewide emission inventories for direct PM_{2.5} emissions and emissions of PM_{2.5} precursors. These inventories should meet the data requirements of EPA’s Consolidated Emissions Reporting Rule (“CERR,” codified at 40 CFR part 51 subpart A). § 51.1008(a)(1).⁴ Direct PM_{2.5} includes condensable PM. §51.1000 “Direct PM_{2.5}”. PM_{2.5} precursors are NO_x, SO₂, VOCs, and ammonia, and the state must report inventories for each, even if it has determined that control of any of these precursors is not necessary for attainment. 72 FR 20586 (April 25, 2007), at 20648.

The PM_{2.5} implementation rule also requires states to submit a baseline emission inventory as part of the attainment and RFP demonstrations in their PM_{2.5} attainment plans. The base year for this inventory should be calendar year 2002 or other suitable year for areas initially designated nonattainment for the PM_{2.5} in 2004-2005. § 51.1008(b). The baseline inventory should be appropriate for the geographical area addressed by the PM_{2.5} attainment plan and consistent with applicable EPA guidance. 72 FR 20586 (April 25, 2007), at 20648. States are also required to submit any additional emission inventory information needed to support its attainment and RFP demonstrations. § 51.1008(a)(2).

EPA has issued the “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/ R-99-006, November 2005 (available at: <http://www.epa.gov/ttn/chief/eidocs/eiguid/index.html>). EPA developed this guidance document to complement the CERR and to provide specific guidance on how to develop baseline emissions inventories for 8-hour ozone, PM_{2.5}, and regional haze SIPs.

The emissions inventories required under the PM_{2.5} implementation rule (as opposed to the CERR) are SIP provisions that must be approved by EPA under CAA section 110(k) and are subject to public hearing requirements pursuant to section 110(a)(2). States should include in their SIP submittals documentation explaining how the emissions data were calculated. In

⁴In late 2008, EPA promulgated the Air Emissions Reporting Rule (AERR) at 73 FR 76539 (December 17, 2008). The AERR updated the CERR reporting requirements by consolidating and harmonizing new emissions reporting requirements with pre-existing sets of reporting requirements under the NO_x SIP Call (which does not apply to California). Because this AERR was not finalized until after the submittal of the South Coast 2007 AQMP, its data requirements, in that they differ from the CERR requirements, do not apply to the South Coast 2007 AQMP.

estimating mobile source emissions, States should use the latest emissions models and planning assumptions available at the time the SIP is developed. 72 FR 20586 (April 25, 2007), at 20647. For California, the latest emissions model means the then most recently EPA approved version of EMFAC. Currently this is EMFAC2007. See 68 FR 3464 (January 18, 2008).

2. Emissions Inventories in the South Coast 2007 AQMP

Note: We discuss the CARB's statewide inventory to provide background to our evaluation of the emission inventories in the South Coast 2007 AQMP. We are not proposing any SIP action on the statewide inventory here, only on the South Coast inventories. EPA will address the statewide inventory in a separate rulemaking.

CARB submitted statewide inventories for direct PM_{2.5} and PM_{2.5} precursors (except for ammonia) as part of the 2007 State Strategy. See Appendix A for the emission inventory output tables and Appendix F for documentation of the emissions inventory. Inventories are provided for the base year of 2002 and baseline years of 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2017, 2018, 2020, and 2023.⁵ These statewide emissions inventories are assembled and maintained by CARB in the California Emission Inventory Development and Reporting System (CEIDARS) and the California Emission Forecasting and Planning Inventory System (CEFS) databases. Both systems are described in Appendix F. In 2004, CARB submitted the 2002 base year inventory including all necessary data elements to EPA as required by the CERR.

These inventories in Appendix A are summer season planning inventories on which the 2007 State Strategy is based. Baseline inventories incorporate reductions from control measures adopted prior to December 2006. South Coast 2007 AQMP, page 3-11, and 2007 State Strategy, Appendix A, p. 1. Specific adjustments for State and District rules adopted in the 2004 to 2006 time period, as well as adjustments to among other things, heavy duty truck VMT in 2005 and pesticide emissions, are described in the introductory section to Appendix A.

The baseline planning inventories for direct PM_{2.5} and all PM_{2.5} precursors (including ammonia) for the South Coast PM_{2.5} nonattainment area together with additional documentation for the inventories are found in Appendices III and V of the South Coast 2007 AQMP and additional documentation from the District.⁶ Average annual day, winter planning day and average summer planning inventories are provided for PM_{2.5} and PM_{2.5} precursors for the year 2005 (the reference year for the air quality modeling) and the years 2008, 2010, 2011, 2014, 2017, 2020, 2023, and 2030. The inventories use EMFAC2007 for estimating on-road motor vehicle emissions. See South Coast 2007 AQMP page 3-1. These inventories provide the basis for the control measure analysis and the RFP and attainment demonstrations.

As a starting point for the South Coast 2007 AQMP's inventories, the District used CARB's 2002 base year inventory. All inventories include emissions from point, area, on-road,

⁵ The Revised 2007 State Strategy and the 2007 South Coast AQMP address both the 8-hour ozone standard and the PM_{2.5} standards; therefore, baseline inventories are given not only for years of importance for PM_{2.5} plans but also ones of importance for 8-hour ozone plans.

⁶ Electronic mail from Kathy Hsiao, SCAQMD to Wienke Tax, EPA Region 9, RE: NH₃ numbers for SCAB, dated October 29, 2010.

and non-road engines. None specifically show emissions from non-anthropogenic sources (that is, natural sources) although inventories developed for input into the air quality modeling do include such sources. South Coast 2007 AQMP, p. 1-4. The 2002 Inventory was projected to 2005 and future years using CEFS. South Coast AQMP, Appendix III, p. III-1-1.

A summary of the baseline annual average and winter planning inventories for the years 2005, 2008, 2011 and 2014 from the South Coast 2007 AQMP is provided in Table IIA-1 below.

3. EPA's Evaluation and Conclusion

The emissions inventories were made available to the public for comment at the same time as the draft South Coast 2007 AQMP, and were subject to public hearing as part of final version of the Plan. See South Coast Air Quality Management District Governing Board Resolution 07-9: June 1, 2007, p. 2.

Consistent with the PM_{2.5} implementation rule, the South Coast 2007 AQMP uses a 2002 base year inventory. When considered together with the inventory documentation in Appendix F of the State Strategy and the air quality modeling documentation in Appendix III of the Plan, it contains all the elements required by EPA's emission inventory guidance. The inventories are based on the best and most current information available at the time the plan was developed, address all source categories and use the latest EPA-approved version of the State's mobile source emissions model, EMFAC2007.

Based on our evaluation discussed above, we propose to find that the 2002 emission inventory in the 2007 State Strategy and the South Coast 2007 AQMP meet the CAA section 172(c)(3) requirement for "comprehensive, accurate, current, inventory of actual emissions from all sources of the relevant pollutant" at the time of their submittal in 2007. We also find that the baseline inventories in the South Coast 2007 AQMP provide an adequate basis for the reasonably available control measure, reasonable further progress, and attainment demonstrations in the Plan.

Table IIA-1
Emission Inventory Summary for the South Coast PM_{2.5} Nonattainment Area
(tons per day)

	Annual Average Day				Winter Average Day			
	2005	2008	2011	2014	2005	2008	2011	2014
NO _x								
Stationary and Area Sources	95.09	86.8	78.47	76.38	104.12	96.23	88.02	86.19
On-Road Mobile Sources	576.05	435.44	361.40	292.24	620.74	468.25	387.13	312.38
Off-Road Mobile Sources	358.03	331.56	303.05	285.02	351.54	324.28	295.95	277.99
Total	1029.17	853.7	742.92	653.64	1076.41	888.76	771.10	676.56
VOC								
Stationary and Area Sources	266.77	245.08	250.41	256.56	271.85	252.71	258.42	264.80
On-Road Mobile Sources	298.07	210.35	171.66	144.06	315.68	223.19	182.09	152.84
Off-Road Mobile Sources	175.03	152.56	137.37	127.09	158.34	137.67	124.64	115.56
Total	739.87	607.99	559.44	527.71	745.87	613.57	565.15	533.20
PM _{2.5}								
Stationary and Area Sources	64.72	65.19	66.75	68.53	76.86	77.64	79.52	81.63
On-Road Mobile Sources	19.76	17.75	17.30	16.83	19.80	17.78	17.33	16.85
Off-Road Mobile Sources	21.11	18.56	17.47	16.26	19.75	17.04	15.74	14.26
Total	105.59	101.50	101.52	101.62	116.41	112.46	112.59	112.74

Table IIA-1								
Emission Inventory Summary for the South Coast PM_{2.5} Nonattainment Area								
(tons per day)								
	Annual Average Day				Winter Average Day			
	2005	2008	2011	2014	2005	2008	2011	2014
SO_x								
Stationary Sources	22.18	16.60	16.35	16.24	23.02	17.46	17.20	17.10
Area Sources								
On-Road Mobile Sources	4.34	2.10	2.15	2.22	4.29	2.05	2.10	2.18
Off-Road Mobile Sources	35.20	22.17	21.51	24.38	35.16	22.14	21.48	24.35
Total	61.72	40.87	40.01	42.84	62.47	41.65	40.78	43.63
NH₃								
Stationary Sources	75	n/a	n/a	68	n/a	n/a	n/a	n/a
Area Sources								
On-Road Mobile Sources	29	n/a	n/a	15	n/a	n/a	n/a	n/a
Off-Road Mobile Sources	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	104	n/a	n/a	83	n/a	n/a	n/a	n/a

Source: South Coast 2007 AQMP, Appendix III, Tables A-2, A-3, A-5, A-6, C-2, C-3, C-5, C-6 and electronic mail from Kathy Hsiao, SCAQMD to Wienke Tax, EPA Region 9, "RE: NH3 numbers for SCAB," dated October 29, 2010. n/a = not available

B. Air Quality Modeling

1. Requirements for Air Quality Modeling

CAA section 172(c)(1) requires states to submit a plan which “shall provide for attainment of the national primary ambient air quality standards.” Pursuant to this section, the PM_{2.5} implementation rule requires the State to submit, within three years of the designation of one of its areas as nonattainment, an attainment demonstration showing that the area will attain the annual and 24 – hour standards as expeditiously as practicable.

The PM_{2.5} implementation rule requires states to submit an attainment demonstration based on modeling results. 40 CFR § 51.1007, Attainment demonstration and modeling requirements, (a) states that “For any area designated as nonattainment for the PM_{2.5} NAAQS, the State must submit an attainment demonstration showing that the area will attain the annual and 24-hour standards as expeditiously as practicable. The demonstration must meet the requirements of 40 CFR § 51.112 and Appendix W of this part (available at http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf.) and must include inventory data, modeling results, and emission reduction analyses on which the State has based its projected attainment date. The attainment date justified by the demonstration must be consistent with the requirements of 40 CFR § 51.1004(a). The modeled strategies must be consistent with requirements in 40 CFR § 51.1009 for RFP and in 40 CFR § 51.1010 for RACT and RACM. The attainment demonstration and supporting air quality modeling should be consistent with EPA’s PM_{2.5} modeling guidance.” 72 FR 20586, 20665.

EPA has issued the “Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, , PM_{2.5} and Regional Haze,” EPA - 454/B-07-002, April 2007, available at: <http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rh-guidance.pdf> (Guidance).

Overview of the EPA Recommended Modeled Attainment Test for PM_{2.5}

A modeled attainment test is an exercise in which an air quality model is used to simulate current and future air quality. If future estimates PM_{2.5} concentrations are less than the NAAQS, then this element of the attainment test is satisfied. Our recommended test is one in which model estimates are used in a “relative” rather than “absolute” sense. That is, we take the ratio of the model’s future to current (baseline) predictions at monitors. We call these ratios, relative response factors (RRF). Future PM_{2.5} concentrations are estimated at existing monitoring sites by multiplying a modeled relative response factor at locations “near” each monitor by the observation-based, monitor-specific, “baseline” design value. The resulting predicted “future concentrations” are compared to NAAQS.

The PM_{2.5} attainment test reflects the fact that PM_{2.5} is a mixture. In the test, ambient PM_{2.5} is divided into major components. These are: mass associated with sulfates, nitrates, ammonium, organic carbon, elemental carbon, particle bound water, “other” primary inorganic particulate matter, and passively collected mass.

A separate RRF is calculated for each of the PM_{2.5} components (except passive mass). We call each of these site-specific ratios, component-specific RRFs. Future PM_{2.5} design values are estimated at existing monitoring sites by multiplying modeled relative response factors “near” each monitor times the observed “component specific design value”. This latter quantity is estimated using measured site-specific design values for PM_{2.5} in concert with available measured composition data. Future site-specific PM_{2.5} design values at a site are estimated by adding the future year values of the seven PM_{2.5} components. If all future site-specific PM_{2.5} design values are less than or equal to the concentration specified in the NAAQS, the test is passed.⁷

2. Overview of the Conceptual Description, Modeling Approach, and Modeling Protocol in the South Coast 2007 AQMP

The South Coast 2007 AQMP provides information on the air quality modeling, air quality data, and meteorological data in Appendix V. Chapter 1 discusses the overall modeling approach for PM_{2.5} as well as other pollutants. Chapter 2 provides a discussion of the analysis for PM_{2.5}. The Modeling Protocol is provided in Attachment 3 to Appendix V. The following description of the modeling approach is provided in Appendix V, Chapter 1, Chapter 2, and Attachment 3.

a. Conceptual Description

The federal reference method (FRM) data depicted in Figure V-2-3, below, clearly delineates the extent of the PM_{2.5} problem in the Basin. PM_{2.5} is essentially a combustion generated pollutant and with the volume of traffic flow, numbers of sources (both point and area) located in the region, concentrations exceed the annual federal standard (15 µg/m³) throughout the South Coast nonattainment area. The area with the highest annual concentration includes southwest San Bernardino and Northwest Riverside Counties. These areas have design values exceeding 20 µg/m³ and encompass both the Fontana and Rubidoux air monitoring stations. It is important to note that the areas with the highest concentrations are directly downwind of a major ammonia source area associated with dairies and poultry farming. These industries are rapidly moving from the Basin and are expected to contribute significantly less to particulate formation in future years.⁸

⁷ Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze”, EPA -454/B-07-002, April 2007 p. 15-16.

⁸ South Coast 2007 AQMP, Appendix V p. V-2-10.

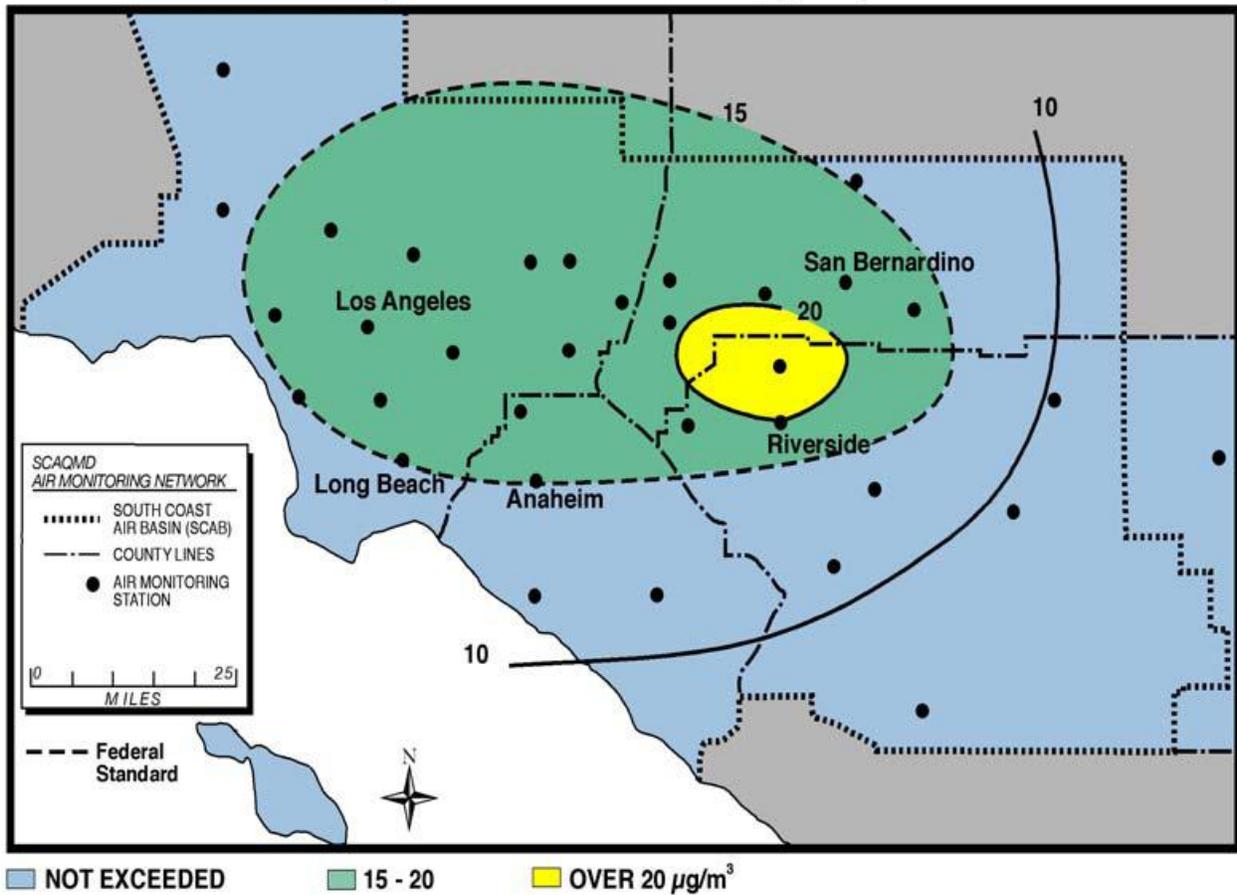


Figure V-2-3 2005 South Coast Air Basin Annual PM_{2.5} (µg/m³)⁹

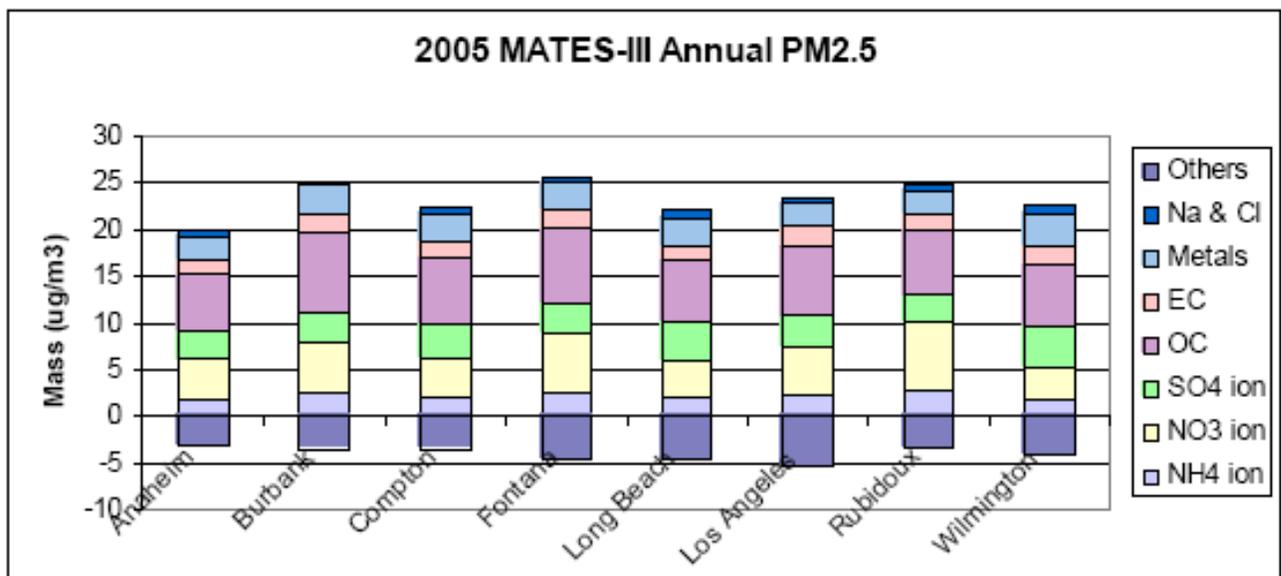


Figure V-2-1: MATES-III 2005 Annual Distribution of PM_{2.5} Species (µg/m³)

⁹ South Coast 2007 AQMP, Appendix V, p. V-2-11.

In general, the organic carbon mass accounts for approximately 30 percent of the total mass (adjusted for the negative contribution of the other category) at each station. Ammonium, sulfate and nitrates account for an approximate 45 percent of the total mass at each location. Rubidoux and Fontana are the most heavily impacted by nitrates. Sulfate is highest in the near coastal or ports of Los Angeles/Long Beach areas, particularly Wilmington and Long Beach. EC and metals measurements were highest at Wilmington accounting for almost 24 percent of the mass when combined. All sites observed measurable concentrations of sodium and chloride ions reflecting the influence of the marine air as it is transported inland.¹⁰

b. Annual PM_{2.5} Modeling Approach

In the Final 2007 AQMP, CAMx annual average PM_{2.5} modeling simulations were generated for 2005, 2014 and 2020 baseline emissions and 2014 and 2020 controlled emissions scenarios. The 2005 CAMx simulation was conducted using baseline monthly temperature and humidity corrected emissions, for a weekday, Saturday and Sunday activity profile. Seasonal boundary conditions were extracted from the Western Regional Air Partnership (WRAP) regional modeling simulations (initialized from global air quality model output) in support of the Regional Haze Rule demonstrations. The simulations were driven by MM5 meteorological fields; five day-simulations with a one day “ramp-up” period using NCEP model initialization.¹¹

CAMx simulations used the same region (5 km squared grid, 280 easting and 3650 northing, 65 by 40 grid cells) as that used for the 2003 UAMAERO-LT analyses. The vertical structure was increased to 11 layers (compared with the 5-layer analysis of UAMAERO-LT), but less than the 19 layers used for the MM5 simulations in an effort to conserve computational resources. MM5 was used to generate the meteorological profile for each day in 2005. The MM5 simulations were generated for the larger SCOS97 modeling domain employing a 5 km square grid and fit to the smaller PM_{2.5} grid.

The MM5 simulations were initialized from NCEP analyses and run for 5-day increments without the four-dimensional-data-assimilation (FDDA) option. Speciated PM_{2.5} data measured from the District’s Multiple Air Toxic Evaluation Program (MATES-III) during 2005 provided the characterization for evaluation and validation of the CAMx annual and episodic demonstrations.

Model performance was evaluated against monitored particulate PM_{2.5} air quality data for six species (ammonium, nitrates, sulfates, organic carbon, elemental carbon, and primary) and total particulate mass. Annual data from eight MATES-III monitoring sites, including Los Angeles, Anaheim, Wilmington, Long Beach, Compton, Burbank, Rubidoux, and Fontana, were used in the validation. The future year attainment demonstration was analyzed for 2014 controlled emissions, thus enabling an annual demonstration based on a control strategy that would be fully implemented by January 1, 2015.

Future year PM_{2.5} air quality (2014 and 2020) was determined using site and species specific RRF’s applied to 2005 PM_{2.5} design values per EPA guidance documents. The quarterly

¹⁰ South Coast 2007 AQMP, Appendix V, p.V-2-5.

¹¹ South Coast 2007 AQMP, Appendix V, p. V-1-7, V-1-8.

RRF's were calculated from the controlled 2014 simulation and the 2005 baseline simulation. The design values were determined from the federal reference method Size Selective Inlet (SSI) High-Vol PM_{2.5} data measured at the District's air monitoring network from 2003-2005. The SSI PM_{2.5} design values were calculated by quarter then apportioned by species based on the distribution observed in the MATES-III data.

c. Episodic 24-Hr Average PM_{2.5} Modeling Approach

Two options are provided to determine RRFs for the future year 24-hour average PM_{2.5} attainment demonstration. The first option uses episodic modeling with day-specific emissions for representative meteorological episodes to calculate RRFs and apply the RRF to the design value. The second approach proposed by EPA relies on an average response to implementation of emissions control for the top 25 percentile of days in each quarter of the annual model simulation. The maximum 24-hour PM_{2.5} design value (based on 2003-2005 data) for the Basin (64.8 µg/m³) meets the current federal standard. Of great interest is how will the 24 hour PM_{2.5} concentration fair compared to the new standard of 35 µg/m³ when that standard become effective in 2010. On the basis of our initial simulations and analysis, the District staff feels that the future design calculation based on the top 25 percentile day, quarterly is more conservative than the episodic modeling. AQMD recommends the use of the 25 percentile approach.¹²

Episodic Simulations

The first approach to determine future year 24-hour maximum or 98th percentile PM_{2.5} impacts relied on the simulation of one or more representative peak PM_{2.5} episodes where observed concentrations exceed 65 µg/m³. The peak PM_{2.5} 24-hour average concentration observed in the Basin during the 2005 MATES-III monitoring program (110 µg/m³ at Rubidoux) occurred on October 22, 2005. Episode specific emissions for the peak and preceding days were temperature and humidity corrected and MM5/FDDA simulations were generated to provide the meteorological input.¹³

Quarterly Top 25 Percentile

For this approach, the 2005 observational data are sorted by quarter of year and further into the top 25 percent of days in each quarter. PM_{2.5} RRFs are calculated on a quarterly basis from the future and base year annual simulations for only those days in the top 25 percentile per quarter. The quarterly RRFs for the "top 25 percent days" are then applied to the quarterly 24-hour average PM_{2.5} design values to develop quarterly future year design values which are later aggregated into an annual 24-hour future year design value to assess attainment. (The measured quarterly 24-hour average PM_{2.5} design values were comprised of the 98th percentile data in each quarter for the years 2003, 2004 and 2005). Several variations of the episodic and quarterly top 25 percentile future year calculations were conducted and are presented and discussed in Chapter 2.¹⁴

¹² South Coast 2007 AQMP, Appendix V, p. V-1-8

¹³ South Coast 2007 AQMP, Appendix V, p. V-1-9

¹⁴ South Coast 2007 AQMP, Appendix V, p. V-1-9

d. Modeling Protocol, Peer Review, and Advisory Committee

The Modeling Protocol for Ozone and Particulate Matter Modeling in Support of the South Coast Air Quality Management District 2007 Air Quality Management Plan Update *Draft Report* May 9, 2006, and a Summary of Preliminary Critiques of Peer Reviewers of the Modeling Protocol are included in the South Coast 2007 AQMP.¹⁵

The protocol for the South Coast 2007 AQMP was reviewed by a technical and advisory group.

The Scientific, Technical, and Modeling Peer Review Advisory Group (STMPRAG) role expands upon that of the MWG and includes experts in socioeconomic assessment and human health, providing review of AQMD modeling, monitoring and related scientific issues. The STMPRAG assists AQMD in resolving technical issues related to air quality and socio-economic modeling by providing ongoing technical review and consensus of procedures and analyses. The STMPRAG consists of approximately 20 members appointed by the Governing Board, with representatives from USEPA, CARB, Southern California Association of Governments (SCAG), the California Small Business Alliance (CSBA), Southern California Edison (SCE), Western States Petroleum Association (WSPA), and technical experts from universities and consultant firms.¹⁶

3. Air Quality Model Selection

EPA Recommendations

A model should meet several general criteria for it to be a candidate for consideration in an attainment demonstration or uniform rate of progress assessment. These general criteria are consistent with requirements in 40 CFR 51.112 and 40 CFR part 51, Appendix W (U.S. EPA, 2005d). We are not recommending a specific model for use in attainment demonstration or uniform rate of progress assessment. At present, there is no single model which has been extensively tested and shown to be clearly superior than its alternatives. Thus, 40 CFR Part 51 Appendix W does not identify a “preferred model” for use in attainment demonstrations of the NAAQS for . Based on the language in 40CFR Part 51 Appendix W, models used for these purposes should meet requirements for “alternative models”.¹⁷

States/Tribes should use a non-proprietary model, which is a model whose source code is available for free (or for a “reasonable” cost). Furthermore, the user must be able to revise the code to perform diagnostic analyses and/or to improve the model’s ability to describe observations in a credible manner. Several additional prerequisites should be met for a model to be used to support an attainment demonstration.

¹⁵ South Coast 2007 AQMP, Appendix V, Attachments 3 and 4.

¹⁶ South Coast 2007 AQMP, Appendix V, Attachment 3, p.20 *DRAFT* Modeling Protocol for Ozone And Particulate Matter Modeling in Support of the South Coast Air Quality Management District 2007 Air Quality Management Plan Update *Draft Report* May 9, 2006.

¹⁷ Guidance p.136.

- (1) It should have received and been revised in response to a scientific peer review.
- (2) It should be appropriate for the specific application on a theoretical basis.
- (3) It should be used with a data base which is adequate to support its application.
- (4) It should be shown to have performed well in past ozone or PM modeling applications. (If the application is the first for a particular model, then the State should note why it believes the new model is expected to perform sufficiently.)
- (5) It should be applied consistently with a protocol on methods and procedures.

South Coast 2007 AQMP

The selection process, models considered, issues, and comments for the air quality and meteorological models are discussed in the modeling protocol on pages 25-27, and summarized in Table 3: Summary of Proposed 2007 AQMP Model Selection and Application, of the modeling protocol.¹⁸

The Final South Coast 2007 AQMP employs CAMx using the “one atmosphere” approach comprised of the CB-IV gas phased chemistry and a static two-mode particle size aerosol module as the particulate modeling platform.¹⁹

The preliminary PM_{2.5} modeling approach crafted for the South Coast 2007 AQMP was to move the empirical AERO-LT chemistry from the UAM to CAMx to take advantage of the advanced dispersion platform. Parallel testing was conducted to evaluate the CAMx/AERO-LT performance against CAMx using the “one atmosphere” approach comprised of the CB-IV chemistry and a static two-mode particle size aerosol module. The results of the analysis indicated that the two model/chemistry packages were performing similarly and that the speed of simulating an annual average using CAMx “one atmosphere” was approximately equal to that of the AERO-LT combination. As a consequence, the PM_{2.5} modeling approach shifted to the use of the CAMx “one atmosphere” as the primary tool.²⁰

Discussion

EPA believes that the modeling platform selected for the 2007 was appropriate for the PM_{2.5} modeling which was used as a basis for the attainment demonstration in the 2007 AQMP.

4. Episode Selection

EPA Recommendations

The South Coast 2007 AQMP uses the first of the two recommended approaches, described below.

¹⁸ South Coast 2007 AQMP, Appendix V, Attachment 3, p.13-18 *DRAFT* Modeling Protocol for Ozone And Particulate Matter Modeling in Support of the South Coast Air Quality Management District 2007 Air Quality Management Plan Update *Draft Report* May 9, 2006.

¹⁹ South Coast 2007 AQMP, Appendix V, p. V-1-6.

²⁰ South Coast 2007 AQMP, Appendix V, p. V-1-7.

Model every day for a full year (or multiple years). This is recommended for both dispersion modeling of primary PM_{2.5} components and photochemical modeling of secondary and primary components. Many areas that violate the 24-hour PM_{2.5} NAAQS will also violate the annual PM_{2.5} NAAQS. Therefore, full year modeling may already exist or is being planned for the annual NAAQS attainment test. States that have nonattainment areas that violate both PM_{2.5} standards should take advantage of planning opportunities to address both standards at the same time. Modeling at least a full year will also help ensure that a sufficient number of days are included in the RRF calculations.²¹

South Coast 2007 AQMP

Annual PM_{2.5} Modeling

In the Final 2007 AQMP, CAMx annual average PM_{2.5} modeling simulations were generated for 2005, 2014 and 2020 baseline emissions and 2014 and 2020 controlled emissions scenarios. The 2005 CAMx simulation was conducted using baseline monthly temperature and humidity corrected emissions, for a weekday, Saturday, and Sunday activity profile.²²

Episodic Simulations

The first approach to determine future year 24-hour maximum or 98th percentile PM_{2.5} impacts relied on the simulation of one or more representative peak PM_{2.5} episodes where observed concentrations exceed 65 µg/m³. The peak PM_{2.5} 24-hour average concentration observed in the Basin during the 2005 MATES-III monitoring program (110 µg/m³ at Rubidoux) occurred on October 22, 2005. Episode specific emissions for the peak and preceding days were temperature and humidity corrected and MM5/FDDA simulations were generated to provide the meteorological input.

Discussion

EPA believes that the modeling of the full year for 2005, and along with the episode specific modeling meets EPA recommendations for episode selection.

5. Domain Size and Spatial Resolution

a. Domain Size

EPA Recommendations

The principal determinants of model domain size are the nature PM_{2.5} problem and the scale of the emissions which impact the nonattainment area. Isolated nonattainment areas that are

²¹ Guidance p. 147

²² South Coast 2007 AQMP, Appendix V, p. V-1-8.

not impacted by regional transport of PM and its precursors may be able to use a relatively small domain. Some areas of the western U.S. may fall into this category. The modeling domain should be designed so that all major upwind source areas that influence the downwind nonattainment area are included in the modeling domain. The influence of boundary conditions should be minimized to the extent possible.²³

South Coast 2007 AQMP

Modeling Domain

The CAMx modeling domain was defined by 2600 5 km squared grid cells a Universal Transverse Mercator (UTM) projection beginning at 275 easting through 3670 northing, using a 65 by 40 grid cell structure. This is same grid specification that was used for the 2003 UAMAERO-LT analyses. Figure V-2-4 depicts the modeling domain.

The PM_{2.5} domain extends approximately 80 km offshore to the west of the middle Basin. The domain captures the international shipping routes that extend parallel to the coast (northwest and southeast) and due west from the port areas. The northern boundary of the domain extends to Santa Barbara County and Kern County while the southern boundary resides primarily in Northern San Diego County. The desert portions of Riverside, San Bernardino and Imperial counties define the eastern²⁴ boundary of the modeling domain. The modeling domain is smaller than both the ozone modeling and MM5 domain. The vertical structure for the CAMx modeling was increased to 8 layers of varying depth (compared with the 5-layer analysis of UAMAERO-LT) but less than the 19 layers used for the MM5 simulations in effort to conserve computational resources. The top of the modeling domain was set at 5,000 m.

²³ Guidance p. 152

²⁴ South Coast AQMP, Appendix V, p. V-2-15, V-2-16.



Figure V-2-4: PM_{2.5} Modeling Domain

Discussion

EPA believes that the air quality model domain size is appropriate, considering the nature of the PM_{2.5} problem, and the scale of the emissions which impact the nonattainment area. EPA believes that the modeling domain is sufficiently large so that all major upwind source areas that influence the downwind nonattainment area are included in the modeling domain, and the influence of boundary conditions are minimized to the extent possible.

b. Horizontal Resolution

EPA Recommendations

The bottom line of the preceding discussion is that we feel comfortable recommending that States may use grid cell sizes as large as 12 km for urban scale applications addressing secondary components of particulate matter. We are less sure about an acceptable upper limit for cell size in applications addressing primary components. We believe it is prudent to assume that, in some cases, cells as small as 4 km (or possibly smaller) are needed. Those implementing the modeling/analysis protocol may wish to perform a diagnostic test using a grid model without chemistry to see whether estimated RRF's for primary components are affected if one decreases

the grid cell size from 12 km to 4km. Alternatively, large sources of primary PM can be modeled with a dispersion model or a combination of grid and dispersion models (see Section 5.3).²⁵

South Coast 2007 AQMP

For the South Coast 2007 AQMP ozone, particulate and meteorological modeling, a horizontal grid resolution of 5 km is proposed to be used for the air quality modeling. No grid nesting is anticipated. This resolution is consistent with the grid resolution used in earlier photochemical modeling studies for the South Coast Air Basin and for San Diego. In addition, this will reduce resources needed to create gridded emissions, which are based on 5 km grid cells²⁶

Discussion

EPA believes the grid resolution of 5 km is meets EPA recommendations for this application.

c. Vertical Layers

EPA Recommendations

There is no correct minimum number of vertical layers needed in an attainment demonstration. The vertical resolution will vary depending on the application. Recent applications of one atmosphere models (with model tops at 100mb) have used anywhere from 12 to 21 vertical layers with 8-15 layers approximately within the boundary layer (below 2500m) and 4-6 layers above the PBL.²⁷

South Coast 2007 AQMP

The vertical structure for the CAMx modeling was increased to 8 layers of varying depth (compared with the 5-layer analysis of UAMAERO-LT) but less than the 19 layers used for the MM5 simulations in effort to conserve computational resources. The top of the modeling domain was set at 5,000 m.²⁸ The modeling protocol includes a table which lists the Vertical Structures for the CAMx Ozone and PM Simulations with Corresponding MM5 Meteorological Model Layers.²⁹

²⁵ Guidance p. 157

²⁶ South Coast 2007 AQMP, Appendix V, Attachment 3, Modeling protocol p.34.

²⁷ Guidance p. 159

²⁸ South Coast 2007 AQMP, Appendix V, p V-2-16.

²⁹ 2007 AQMP, Appendix V, Attachment 3, p.38 *DRAFT* Modeling Protocol

TABLE 6
Vertical Structures for the CAMx Ozone and PM Simulations
with Corresponding MM5 Meteorological Model Layers

MM5 Vertical Layer Heights (34)				Ozone Model Layers (16)		PM Model Layers (8)	
No.	Sigma	Height (m AGL)	Depth (m)	Height (m AGL)	Depth (m)	Height (m AGL)	Depth (m)
...				
24	0.500	4816	604	4816	1172	4816	2216
23	0.550	4212	568				
22	0.600	3644	536	3644	1044		
21	0.650	3108	508				
20	0.700	2600	388	2600	670	2600	670
19	0.740	2212	282				
18	0.770	1930	274	1930	274	1930	627
17	0.800	1657	178	1657	178		
16	0.820	1478	175	1478	175		
15	0.840	1303	172	1303	172	1303	508
14	0.860	1130	169	1130	169		
13	0.880	961	167	961	167		
12	0.900	794	82	794	164	794	325
11	0.910	712	82				
10	0.920	631	81	631	161		
9	0.930	550	80				
8	0.940	469	80	469	159	469	315
7	0.950	389	79				
6	0.960	310	78	310	156		
5	0.970	232	78				
4	0.980	154	39	154	78	154	116
3	0.985	115	39				
2	0.990	77	38	77	38		
1	0.995	38	38	38	38	38	38
0	1.000	0	0				

Discussion

EPA believes that the number of vertical layers in the 2007 AQMP meets EPA's recommendation for number of vertical layers.

6. Initial and Boundary Conditions

EPA Recommendations

If there is no larger regional model application available, then it is recommended that background boundary conditions be used to specify initial and boundary concentrations for the attainment demonstration modeling. However, concentration fields derived from a larger domain regional or global chemistry model (i.e. nesting approach) is considered more credible than the

assumption of static concentrations, since the pollutant concentration fields reflect simulated atmospheric chemical and physical processes driven by assimilated meteorological observations. Therefore, we recommend using boundary conditions derived from a regional or global scale model, whenever possible. Diagnostic testing which indicates a large impact on the model results from initial or boundary conditions may indicate that the domain is not large enough or the ramp-up period is too short. In either case, it should generally be assumed that initial and boundary conditions do not change in the future. The use of altered initial or boundary conditions in the future year should be documented and justified.³⁰

South Coast 2007 AQMP

Boundary, Top Conditions

One of the more difficult tasks of the modeling analysis was to determine a method to define the boundary and top conditions for the PM_{2.5} simulations. Three options were considered for the analysis: (1) assume clean conditions, (2) use the ozone modeling to generate concentration files at the PM_{2.5} grid boundary, or (3) use hemispheric or global chemistry model output to specify the boundaries. Option-3 with minor adjustments was selected for the attainment demonstration.

The Western Regional Air Partnership (WRAP) has been simulating hemispheric particulates with a focus on the western U.S. as part of the Regional Haze Rule demonstration using CAMx on a coarse grid extending into the Pacific Ocean. Model output from the WRAP analysis for model year 2002 was extracted and converted to develop hourly boundary conditions for the PM_{2.5} modeling analyses. For this analysis it is assumed that little uncertainty is introduced into the modeling using the 2002 boundary data. The WRAP modeling used CB-IV gaseous chemistry as does the Final 2007 AQMP PM_{2.5} CAMx modeling. The WRAP modeling was conducted on a Lambert Conformal grid and therefore specification of the boundary conditions required remapping to the UTM coordinate system. Additional vertical layer averaging and remapping to the PM_{2.5} grid assumed that the concentration is uniform across each vertical layer.

The boundary and top concentration input files for the PM model were created on a month by month basis. The files were derived by averaging the WRAP simulation concentrations at each boundary point, vertical layer for each hour of the day over the course of a month. The values of the various boundary species were averaged over the entire top of the modeling domain for every hour in a month to create the top concentration files. The CAMx top concentration file only uses one concentration value for the top of the model for the entire simulation. Table V-2-7 provides the representative results for February and August. Initial PM_{2.5} performance with the WRAP boundary conditions suggested that Sox concentrations along the western boundary in the shipping lanes were too low. A minimum concentration of 5 ppb SO₂ was set for the southern boundary extending westward from the San Diego coast to approximately 20 km offshore after which the concentration was phased to a value less than 1 ppb at the extreme southwest corner of the modeling domain. A similar adjustment was made along the

³⁰ Guidance p. 154.

north-south boundary with SO₂ being set at 5 ppb from the coast of Santa Barbara south to approximately 15 km offshore, again being reduced to less than 1 ppb at the southwest corner of the domain.³¹

Future Boundary, Top and Initial Air Quality Conditions

For the future year scenarios, the boundary, region top and ambient air quality concentrations were adjusted to reflect projected emissions reductions from the 2005 base-year.

Discussion

EPA believes that the boundary and top conditions are appropriate for this application. The South Coast 2007 AQMP states that the future year initial and boundary conditions were adjusted, but does not discuss the methodology for this adjustment. The methodology should be discussed in the mid-course correction.

7. Meteorological Model

EPA Recommendations

a. Meteorological Model Selection

A description of the methods used to generate the meteorological fields should be included in the modeling protocol. In cases in which standard meteorological modeling (e.g., MM5, RAMS, or WRF in a retrospective analysis mode) is not used, it is recommended that a detailed description of the technique that is used to generate the three-dimensional meteorological fields be shared with the appropriate EPA regional office(s) prior to conducting the air quality modeling analysis.³²

b. Meteorological Model Domain

It is expected that most attainment demonstrations will cover large areas and use nested grids. The outermost grid should capture all upwind areas that can reasonably be expected to influence local concentrations of ozone, and/or . In terms of selecting an appropriate meteorological modeling domain, one should extend the grid 3 to 6 cells beyond the domains of each air quality modeling grid to avoid boundary effects. For example, if 4 km grid cells are to be used in the fine portion of a nested regional air quality model, then the meteorological fields at this detail would need to extend 12-24 km beyond the bounds of the 4 km grid used for air quality predictions. In terms of grid resolution, EPA recommends that the dynamic meteorological models use the same grid resolution as desired for the air quality model applications. In some cases, however, this may not always be feasible. One possible reason for modeling with meteorology using a different grid resolution is in the case of unacceptable model performance from the meteorological model at the desired grid resolution. In other instances, the

³¹ South Coast 2007 AQMP, Appendix V, p. V-2-17.

³² Guidance p. 161.

need for finer resolution may be emissions-driven more than meteorologically-driven and the costs do not warrant the generation of additional resolution in the meteorological data. In these specific situations it is recommended that the air quality model application use available results from meteorological models on the next coarser scale (i.e., 36 km for a desired 12 km estimate, 12 km for a desired 4 km estimate). The coarse grid meteorological fields can be mapped to the more finely resolved air quality modeling domain.

c. Data Assimilation

As noted above, the use of FDDA helps to keep the model predictions from widely diverging from what was actually observed to occur at a particular point in time/space. However, if used improperly, FDDA can significantly degrade overall model performance and introduce computational artifacts (Tesche and McNally, 2001). Inappropriately strong nudging coefficients can distort the magnitude of the physical terms in the underlying atmospheric thermodynamic equations and result in "patchwork" meteorological fields with strong gradients between near-site grid cells and the remainder of the grid. Additionally, if specific meteorological features are expected to be important for predicting the location and amount of pollution formed, based on an area's conceptual model, then the meteorological modeling should be set up to ensure that FDDA does not prevent the model from forming these features (e.g. nocturnal low-level wind jets). In general, analysis nudging strengths should be no greater than 1.0×10^{-4} for winds and temperatures and 1.0×10^{-5} for humidity. In the case of observation nudging (i.e., FDDA based on individual observations as opposed to analysis fields), it is recommended that the resultant meteorological fields be examined to ensure that the results over the entire domain are still consistent. Further, based on past experience, we recommend against using FDDA below the boundary layer for thermodynamic variables like temperature and humidity because of the potential for spurious convection. If the dynamic model is applied without FDDA, it is suggested that the simulation durations be shorter than 24 hours.

d. Meteorological Model Performance

Operational Evaluation: The operational evaluation results should focus on the values and distributions of specific meteorological parameters as paired with and compared to observed data. It is recommended that the observation - model matching be paired as closely as possible in space and time. Typical statistical comparisons of the key meteorological parameters¹⁰⁵ will include: comparisons of the means, mean bias, mean normalized bias, mean absolute error, mean absolute normalized error, root mean square error (systematic and unsystematic), and an index of agreement. For modeling exercises over large domains and entire ozone seasons or years, it is recommended that the operational evaluation be broken down into individual segments such as geographic subregions and/or months/seasons to allow for a more comprehensive assessment of the meteorological strengths and weaknesses.³³

³³ Guidance p. 163-167.

South Coast 2007 AQMP

The selection process for the meteorological model is discussed in the Model Protocol.³⁴ The models considered are listed in Table 3: Summary of Proposed 2007 AQMP Model Selection and Application.³⁵

South Coast 2007 AQMP Meteorological Modeling Approach

The SCOS97 field study generated a dataset with a relatively high spatial density of meteorological observations. While this dataset suggests that an objective/diagnostic model could be adequate to develop the meteorological parameter fields required for air quality modeling of the August SCOS97 episode, there are large portions of the modeling domain—such as over the ocean or the inland desert—where there are few observations. The approach for the 2007 AQMP modeling will be to use the MM5 prognostic model with a 5 km grid resolution. The meteorological boundary conditions for MM5 are generated using the output from a Global Climate Model (GCM) with a relatively coarse grid of 45 km. The MM5 prognostic model uses more accurate and complete physics than the diagnostic models used previously. The MM5 has relatively good replication of meteorological features of the Basin, such as the coastal eddies, Santa Ana winds, recirculation, & strong inversions. The recent air quality models are designed to use inputs from the prognostic models, such as MM5, and the use of such a model is strongly encouraged by USEPA. In the past, the use of MM5 meteorological fields in air quality models has brought limited success in the prediction of peak ozone concentrations that result from extreme meteorological conditions and complex distribution of precursor emissions. However, the prediction of ozone with MM5 meteorological fields on most days is comparable to the results using other models. Since the air quality model will be employed in more of a relative sense for the 2007 AQMP, with the use of relative reduction factors instead of peak concentration comparisons, the MM5 is an appropriate choice for the AQMP modeling. The premise is that the magnitude of RRF will reflect the ozone concentration resulting from the various meteorological episode classifications. With the use of the MM5 meteorological model, the AQMP modeling effort will move closer to the “one atmosphere” air quality modeling perspective (i.e., ozone and fine particles simulated with the same model). The successful application of this prognostic model is critical for the development of multipollutant control strategies. Several MM5 initialization fields and data ingest options are also being explored for the 2007 AQMP modeling effort:³⁶

- MM5 model initialized with the National Centers for Environmental Prediction (NCEP) 12 km ETA/North American Model (NAM);
- MM5 model with Aerospace Corp 3DVAR forecast fields;
- Weather Research and Forecasting (WRF) community model using Aerospace Corporation 3DVAR;
- MM5 model with NCEP database of upper air and surface observations and the

³⁴ 2007 AQMP, Appendix V, Attachment 3.

³⁵ 2007 AQMP, Appendix V, Attachment 3, p. 13.

³⁶ 2007 AQMP, Appendix V, Attachment 3, p. 24.

1 degree by 1 degree Global Tropospheric Analysis

- Above method of MM5 with NCEP database and Global Tropospheric Analysis and four-dimensional data assimilation (FDDA) of AQMD station meteorological data (this method is more mass consistent, but may be difficult to capture localized wind impacts (e.g., transport to San Fernando Valley);
- Hybrid CALMET with MM5 as background field

Meteorological Modeling Domain

Nested domains of 15 km and 5 km are defined within MM5 to simulate meteorological fields for the fine grid scale of the modeling domain. The modeling domain for MM5 is defined in a Lambert-Conformal projection with two parallels to account for curvature of the Earth within the modeling domain over such a large region. Figure 1 shows the nested MM5 domains. Figure 2 shows the finest scale (interior) MM5 domain, covering most of southern California. The vertical structure of MM5 is defined in a terrain-following, “sigma” coordinate system based upon a normalized pressure index. The 30 vertical layers defined for MM5 to approximately 15,000 m above ground level (AGL) can be transformed to fit the requirements of any air quality model. The MM5 meteorological fields are converted from Lambert-Conformal projection to UTM coordinates for input into the air quality models.

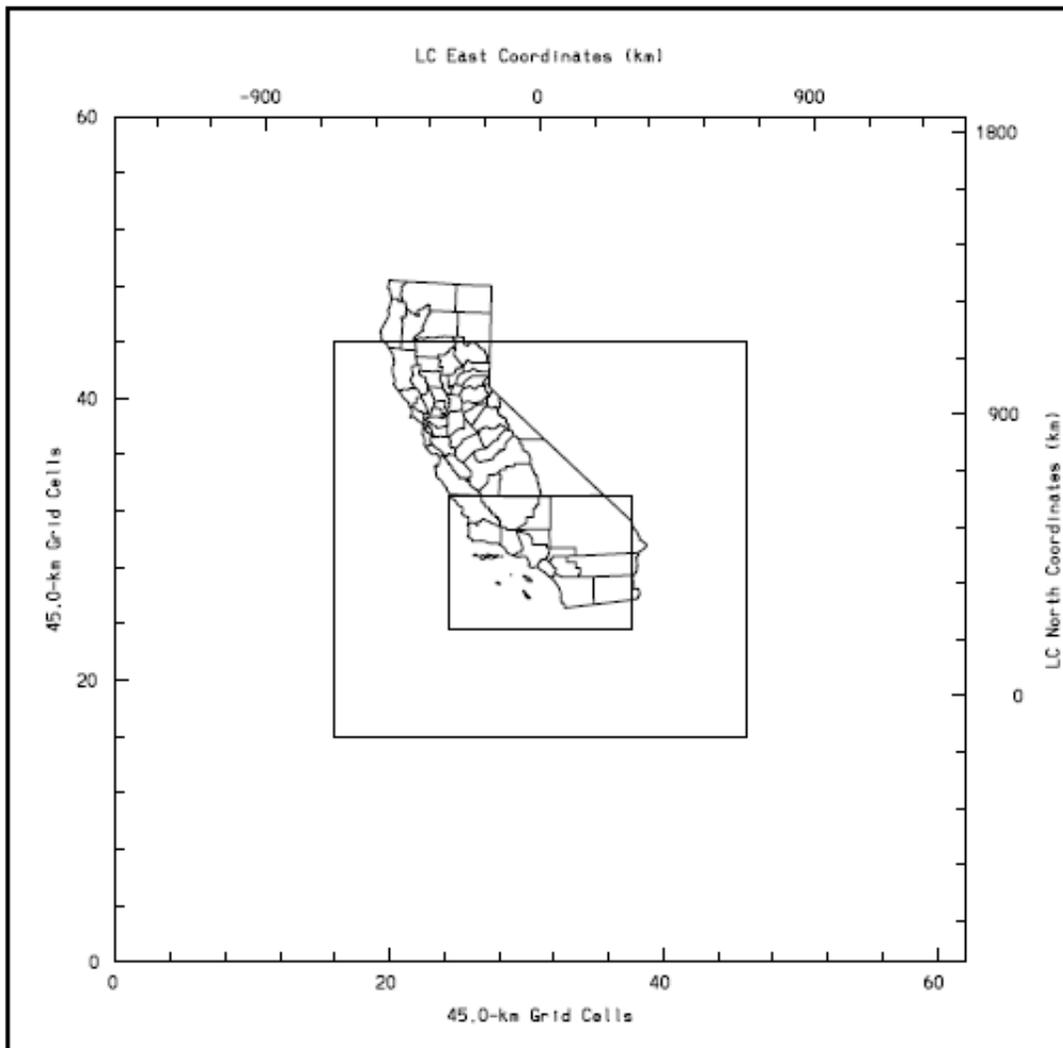


Figure 1: Nested MM5 Domains³⁷

The horizontal grid resolution of the outermost domain is 45 km, for the middle domain is 15 km, and for the fine scale domain is 5 km.

Vertical Resolution

For the terrain-following MM5 model, the proposed vertical layer consists of 34 layers to a height of over 15,000 meters AGL,(as shown in Table 6, Vertical Structures for the CAMx Ozone and PM Simulations with Corresponding MM5 Meteorological Model Layers, below). For input into the air quality model, the 34 layers are reduced to match the vertical resolution of the ozone or particulate matter air quality.³⁸

³⁷ South Coast 2007 AQMP, Appendix V, Attachment 3, p. 30.

³⁸ South Coast 2007 AQMP, Appendix V, Attachment 3, p. 33.

TABLE 6
Vertical Structures for the CAMx Ozone and PM Simulations
with Corresponding MM5 Meteorological Model Layers

MM5 Vertical Layer Heights (34)				Ozone Model Layers (16)		PM Model Layers (8)	
No.	Sigma	Height (m AGL)	Depth (m)	Height (m AGL)	Depth (m)	Height (m AGL)	Depth (m)
...				
24	0.500	4816	604	4816	1172	4816	2216
23	0.550	4212	568				
22	0.600	3644	536	3644	1044		
21	0.650	3108	508				
20	0.700	2600	388	2600	670	2600	670
19	0.740	2212	282				
18	0.770	1930	274	1930	274	1930	627
17	0.800	1657	178	1657	178		
16	0.820	1478	175	1478	175		
15	0.840	1303	172	1303	172	1303	508
14	0.860	1130	169	1130	169		
13	0.880	961	167	961	167		
12	0.900	794	82	794	164	794	325
11	0.910	712	82				
10	0.920	631	81	631	161		
9	0.930	550	80				
8	0.940	469	80	469	159	469	315
7	0.950	389	79				
6	0.960	310	78	310	156		
5	0.970	232	78				
4	0.980	154	39	154	78	154	116
3	0.985	115	39				
2	0.990	77	38	77	38		
1	0.995	38	38	38	38	38	38
0	1.000	0	0				

Qualitative and Quantitative Analyses

The South Coast 2007 AQMP indicates that Qualitative and Quantitative Analyses for the meteorological modeling have been performed.³⁹

Discussion

EPA believes the meteorological model choice, domain, horizontal resolution and vertical resolution are appropriate for this application. The South Coast 2007 AQMP discusses

³⁹ South Coast 2007 AQMP, Appendix V, Attachment 3, p. 52

Qualitative and Quantitative Analysis for the meteorological modeling. The results of the analysis should be included in the mid- course correction.

8. Air Quality Model Performance

EPA Recommendations

PM_{2.5} consists of many components and is typically measured with a 24-hour averaging time. The individual components of PM_{2.5} should be evaluated individually. In fact, it is more important to evaluate the components of PM_{2.5} than to evaluate total PM_{2.5} itself. Apparent “good performance” for total PM_{2.5} does not indicate whether modeled PM_{2.5} is predicted for “the right reasons” (the proper mix of components). If performance of the major components is good, then performance for total PM_{2.5} should also be good. This section contains some analyses that have been found to be particularly useful for PM analyses (such as fractional bias and error). We also show examples of some new types of display plots such as “soccer plots” and “bugle plots”. Soccer plots provide a convenient way to display a summary of model performance (including bias and error at the same time). Bugle plots have variable bias and error goals, based on ambient concentrations. This allows for a higher percentage error and bias at very low concentrations. This recognizes the fact that models often have difficulty in accurately predicting near background concentrations. It may be useful to prioritize examination of model performance within and near the non-attainment area(s) of interest. Additionally, priority may be placed on examination of the days that are potentially used in the attainment test (the days > 65 ug/m³ for 24-hour PM_{2.5}).

Statistics: We recommend calculating statistics for components of PM_{2.5}, and PM precursors. Useful metrics include mean fractional bias and mean fractional error, normalized mean bias, and normalized mean error. Formulas for estimating these metrics at an individual monitoring site, j, are given in the Guidance.⁴⁰ Other statistics such as mean bias, mean error, root mean square error, correlation coefficients, etc. should also be calculated to the extent that they provide meaningful information and defined in Appendix A of the Guidance. Appendix B provides a summary of recent model performance evaluations conducted by other modeling groups.

• **Mean Fractional Bias (percent):** Normalized bias can become very large when a minimum threshold is not used. Fractional bias is used as a substitute. The fractional bias for cases with factors of 2 under- and over-prediction are -67 and + 67 percent, respectively (as opposed to -50 and +100 percent, when using normalized bias). Fractional bias is a useful indicator because it has the advantage of equally weighting positive and negative bias estimates. The single largest disadvantage is that the predicted concentration is found in both the numerator and denominator.

• **Mean Fractional Error (percent):** Normalized error can become very large when a minimum threshold is not used. Therefore fractional error is used as a substitute. It is similar to the fractional bias except the absolute value of the difference is used so that the error is always positive.

⁴⁰ Guidance p. 202-207.

• **Normalized Mean Bias (percent):** This performance statistic is used as a normalization to facilitate a range of concentration magnitudes. This statistic averages the difference (model - observed) over the sum of observed values. Normalized mean bias is a useful model performance indicator because it avoids over inflating the observed range of values.

• **Normalized Mean Error (percent):** This performance statistic is used as a normalization of the mean error to facilitate a range of concentration magnitudes. This statistic averages the difference (model - observed) over the sum of observed values. Normalized mean error is a useful model performance indicator because it avoids overinflating the observed range of values.

Averaging Times: Since modeling for the PM_{2.5} NAAQS and regional haze will likely require modeling different times of year, season-specific statistics and graphic displays are helpful for evaluating and diagnosing model performance. Statistics and graphics can be averaged for various time scales. For example, statistical metrics and scatter plots can show daily averaged ambient modeled pairs, monthly averaged pairs, quarterly (or seasonal averaged) pairs, or annual average pairs. Each of these averaging times can provide useful information. We recommend a range of different averaging times for annual or seasonal modeling. At a minimum, States should examine daily averaged pairs and seasonal (or quarterly) averaged pairs. It should be noted that statistics and plots tend to look “better” as the averaging time increases from daily to monthly to quarterly to annual. As such, daily pairs should always be examined to ensure a detailed look at model performance on the time scale of the FRM and STN measurements (24-hour average).

South Coast 2007 AQMP

Model Performance Statistics are presented in the South Coast 2007 AQMP, Appendix V, pages V-2-26 through V-2-47 and in Appendix V, Attachment 2. A summary of the air quality model performance is presented below.

PM_{2.5} Component Species Performance Evaluation for the MATES-III Sites

In general, nitrate and ammonium tend to be over predicted by an average 2 µg/m³ or less at most sites. Ammonium model performance at Rubidoux and Fontana are approximately within 35 percent of observations and within 20 percent or less for nitrate. On average, sulfate is nominally under-predicted however; OC and EC are well simulated at all stations. Model performance for the crustal-others category indicates an average over-prediction of about 1 µg/m³ or 25 percent above observations. Overall, the prediction of total mass reflects the model performance for ammonium, nitrate and the others with a tendency for over-prediction at about an average level of 4 µg/m³ or approximately 20 percent above observations.⁴¹

⁴¹ South Coast 2007 AQMP, Appendix V, p. V-2-25.

Table V-2-11b: CAMx 2005 Base Year Nitrate Model Predictions (µg/m³)

Locations	Mean Observed	Mean Predicted	Mean Bias	Mean Error	Normalized Mean Bias	Normalized Mean Error
All Stations	5.35	7.67	2.31	3.98	0.43	0.74
Anaheim	4.55	7.10	2.55	3.50	0.56	0.77
Burbank	5.85	6.49	0.64	3.44	0.11	0.59
Compton	4.46	7.93	3.47	4.12	0.78	0.92
Fontana	6.76	7.65	0.90	4.38	0.13	0.65
N Long Beach	4.04	6.52	2.48	3.38	0.61	0.84
Los Angeles	5.81	8.86	3.05	4.39	0.52	0.76
Rubidoux	7.67	9.68	2.01	4.81	0.26	0.63
Wilmington	3.37	5.51	2.14	2.87	0.63	0.85

Table V-2-11g: CAMx 2005 Base Year Total Mass Model Predictions (µg/m³)

Locations	Mean Observed	Mean Predicted	Mean Bias	Mean Error	Normalized Mean Bias	Normalized Mean Error
All Stations	19.62	26.14	6.52	10.49	0.33	0.53
Anaheim	17.63	24.45	6.81	8.84	0.39	0.50
Burbank	21.94	20.72	-1.22	8.76	-0.06	0.40
Compton	18.83	29.22	10.39	12.24	0.55	0.65
Fontana	21.44	23.42	1.98	9.29	0.09	0.43
N Long Beach	17.43	27.84	10.41	11.22	0.60	0.64
Los Angeles	19.15	29.38	10.23	12.47	0.53	0.65
Rubidoux	21.85	27.05	5.21	10.32	0.24	0.47
Wilmington	18.35	25.33	6.98	10.02	0.38	0.55

Annual Average SSI Mass Performance Evaluation

In general, the 2005 base year simulations over-predict observed PM_{2.5} measurements by the FRM methodology. The over prediction is greatest in the western Basin, in particular metropolitan Los Angeles County. Over prediction in the San Gabriel Valley and eastern Basin is within 60 percent of observations (with the exception of Big Bear Lake which is significantly under-predicted.) Southern Orange County, Ventura County and the northern desert stations are reasonably well simulated.⁴²

⁴² South Coast 2007 AQMP, Appendix V, V-2-47.

Table V-2-12: CAMx Predicted and FRM Observed 2005 Base-Year Annual Average PM_{2.5}⁴³

Location	Predicted Annual Average Concentration (µg/m ³)	Observed Annual Average Concentration (µg/m ³)	Percentage Prediction Error
Azusa	20.4	17.0	20.0
Big Bear	2.3	12.1	-81.7
Lynwood	30.4	17.5	73.7
Mission Viejo	16.8	10.7	57.0
Ontario	30.3	18.8	61.2
Pasadena	21.4	15.1	41.7
Reseda	17.2	13.9	23.7
Riverside Magnolia	26.7	18.0	48.3
San Bernardino	28.2	17.0	65.9
Lancaster-AV	6.8	8.9	-23.6
Victorville-MD	13.5	9.4	43.6
El Rio-SCCAB	12.0	10.6	13.2
Piru-SCCAB	7.1	9.3	-23.7
Simi Valley-SCCAB	8.9	11.2	-20.5
Thousand Oaks-SCCAB	11.2	10.5	6.7

Discussion

EPA believes that model performance was adequate.

9. Modeled Attainment Test

a. PM_{2.5} Annual NAAQS

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SMAT Annual PM_{2.5} Attainment Demonstration

As previously outlined, the SMAT is conducted on a quarterly basis using the CAMx model output for the six species from the 2005 base-year and the 2014 controlled emissions. Quarterly RRFs determined from the modeling are applied to the MATES-III/Sandwich modified quarterly design value component species. Bonded water is calculated from the concentrations of ammonium, nitrate and sulfate using the AIM polynomial regression equation. Bonded water is not directly reduced by an RRF but is recalculated after applying the RRFs to the ammonium, sulfate and nitrate. Finally, the blank is added to the mass. Tables V-2-15a through V-2-15c provide the 2014 baseline PM_{2.5} air quality at the eight key sites, the predicted PM_{2.5} based on the CARB emissions reduction plan and the estimation of the 2015 controlled annual average PM_{2.5} adding the District's emissions reduction overlay to the CARB plan. Without implementing any additional controls, PM_{2.5} concentrations at the key sites will not meet the federal standard by 2015. Regional concentrations of PM_{2.5} will be lower with implementation of the CARB plan however the maximum predicted PM_{2.5} concentration, will continue to

⁴³ South Coast 2007 AQMP, Appendix V, p. V-2-47.

exceed the federal standard by approximately four (4) percent. With implementation of the District overlay to the CARB plan, all stations will meet the federal standard of 15.0 µg/m³. The PM_{2.5} annual attainment demonstration calculations using the SMAT and RRFs are provided in Tables V-A- 1a through V-A-1h in Attachment A.⁴⁴

2014 Predicted Baseline PM_{2.5}⁴⁵

Location	NH4	NO3	SO4	OC	EC	Metals/ Others	Water	Blank	PM2.5 Mass
Anaheim	1.4	3.3	2.5	2.0	1.3	2.0	1.5	0.5	14.5
Burbank	1.8	4.1	2.4	3.2	1.7	2.1	1.6	0.5	17.4
Compton	1.6	3.6	2.9	2.5	1.6	2.0	1.7	0.5	16.5
Fontana	1.9	4.8	2.5	1.6	1.9	2.6	1.7	0.5	17.6
Los Angeles	2.0	4.8	2.9	1.1	1.9	2.1	2.1	0.5	17.3
Long Beach	1.6	3.3	3.0	1.5	1.3	1.9	1.6	0.5	14.6
Rubidoux	2.1	5.6	2.4	2.1	1.7	2.2	1.9	0.5	18.5
Wilmington	1.4	2.7	3.0	1.5	1.7	1.9	1.5	0.5	14.2

2014 Predicted PM_{2.5} with CARB Measures

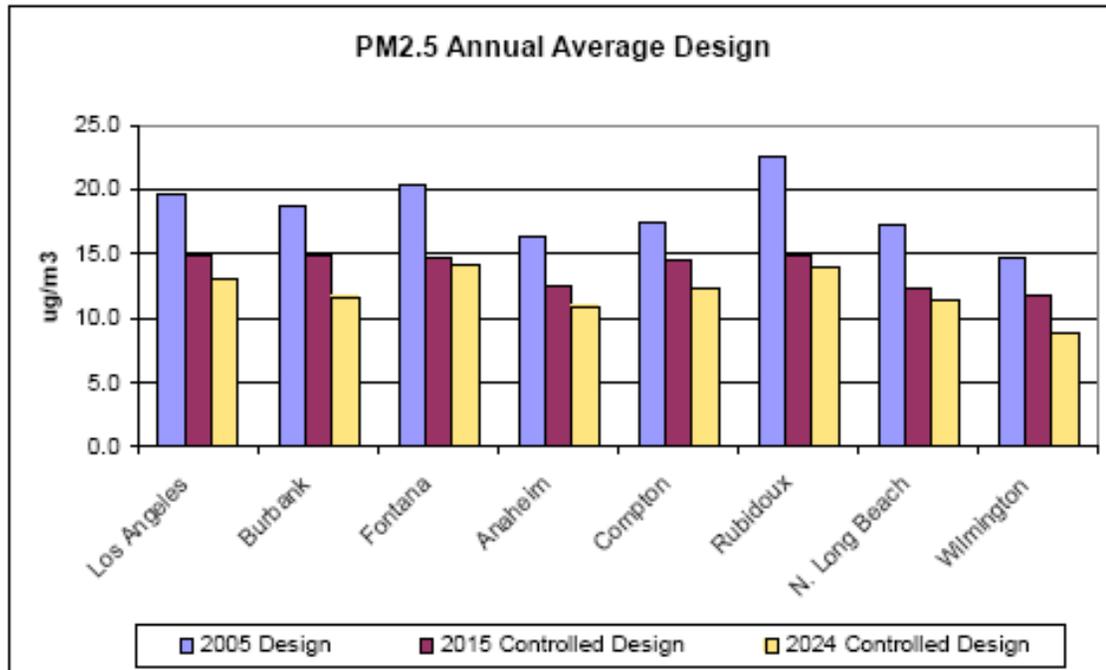
Location	NH4	NO3	SO4	OC	EC	Metals/ Others	Water	Blank	PM2.5 Mass
Anaheim	1.2	2.9	2.0	1.7	1.2	1.9	1.3	0.5	12.6
Burbank	1.6	3.7	1.9	2.9	1.6	2.0	1.4	0.5	15.5
Compton	1.5	3.4	2.3	2.2	1.5	1.9	1.5	0.5	14.7
Fontana	1.6	4.0	2.0	1.4	1.8	2.5	1.4	0.5	15.2
Los Angeles	1.8	4.4	2.3	0.9	1.7	2.1	1.8	0.5	15.4
Long Beach	1.4	3.1	2.3	1.3	1.2	1.7	1.4	0.5	12.9
Rubidoux	1.7	4.5	1.9	1.9	1.6	2.1	1.5	0.5	15.7
Wilmington	1.2	2.5	2.2	1.4	1.4	1.7	1.3	0.5	12.1

2014 Predicted PM_{2.5} with CARB Measures and District Overlay

Location	NH4	NO3	SO4	OC	EC	Metals/ Others	Water	Blank	PM2.5 Mass
Anaheim	1.2	2.7	1.9	1.7	1.1	1.9	1.2	0.5	12.3
Burbank	1.5	3.5	1.9	2.8	1.5	2.0	1.3	0.5	14.9
Compton	1.4	3.4	2.2	2.2	1.4	1.9	1.5	0.5	14.5
Fontana	1.5	3.7	2.0	1.4	1.7	2.5	1.4	0.5	14.7
Los Angeles	1.7	4.2	2.2	0.9	1.6	2.0	1.7	0.5	14.9
Long Beach	1.4	3.0	2.3	1.3	1.2	1.7	1.4	0.5	12.7
Rubidoux	1.6	4.1	1.9	1.8	1.5	2.1	1.4	0.5	15.0
Wilmington	1.1	2.4	2.2	1.3	1.4	1.6	1.2	0.5	11.8

⁴⁴ South Coast 2007 AQMP, Appendix V, p. V-2-52.

⁴⁵ South Coast 2007 AQMP, Appendix V, p. V-2-53.



b. 24 Hour NAAQS

South Coast 2007 AQMP

The 2007 AQMP 2005 Basin maximum design value (64.8 µg/m³) meets the federal 24-hour average PM_{2.5} standard of 65 µg/m³. The SMAT for the 24-hour standard is presented to assure that the PM_{2.5} episodic levels continue to lower and that the Basin continues to meet the standard in 2015 and beyond. Six methods are discussed in the 2007 AQMP and applied to the Sandwich modified MATES-III quarterly design values and episodic PM_{2.5} data to quantify future year PM_{2.5} reductions.⁴⁶

Episodic 24-Hr Average PM_{2.5} Modeling Approach

Per our PM_{2.5} guidance, two options are provided to determine RRFs for the future year 24-hour average PM_{2.5} attainment demonstration. The first option uses episodic modeling with day-specific emissions for representative meteorological episodes to calculate RRFs and apply the RRF to the design value. The second approach proposed by EPA relies on an average response to implementation of emissions control for the top 25 percentile of days in each quarter of the annual model simulation. The maximum 24-hour PM_{2.5} design value (based on 2003-2005 data) for the Basin (64.8 µg/m³) meets the current federal standard. Of great interest is how will the 24-hour PM_{2.5} concentration fare compared to the new standard of 35 µg/m³ when that standard become effective in 2010. On the basis of our initial simulations and analysis, the District staff feels that the future design calculation based on the top 25 percentile day, quarterly is more

⁴⁶ South Coast 2007 AQMP, Appendix V, p. V-2-54.

conservative than the episodic modeling. AQMD recommends the use of the 25 percentile approach.⁴⁷

Episodic Simulations

The first approach to determine future year 24-hour maximum or 98th percentile PM_{2.5} impacts relied on the simulation of one or more representative peak PM_{2.5} episodes where observed concentrations exceed 65 µg/m³. The peak PM_{2.5} 24-hour average concentration observed in the Basin during the 2005 MATES-III monitoring program (110 µg/m³ at Rubidoux) occurred on October 22, 2005. Episode specific emissions for the peak and preceding days were temperature and humidity corrected and MM5/FDDA simulations were generated to provide the meteorological input.⁴⁸

Quarterly Top 25 Percentile

For this approach, the 2005 observational data are sorted by quarter of year and further into the top 25 percent of days in each quarter. PM_{2.5} RRFs are calculated on a quarterly basis from the future and base year annual simulations for only those days in the top 25 percentile per quarter. The quarterly RRFs for the “top 25 percent days” are then applied to the quarterly 24-hour average PM_{2.5} design values to develop quarterly future year design values which are later aggregated into an annual 24-hour future year design value to assess attainment. (The measured quarterly 24-hour average PM_{2.5} design values were comprised of the 98th percentile data in each quarter for the years 2003, 2004 and 2005). Several variations of the episodic and quarterly top 25 percentile future year calculations were conducted and are presented and discussed in Chapter 2.⁴⁹

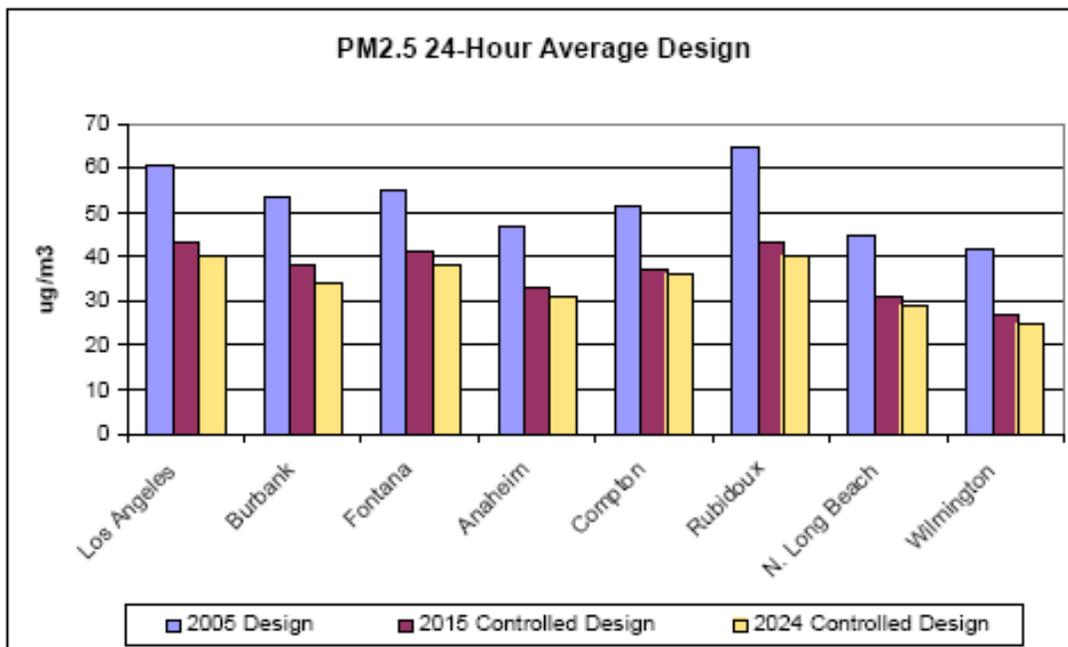
Table V-2-16: Summary of Methodologies to Calculate 2015 24-Hour Average Design Value (µg/m³)⁵⁰ presents the results of the six tests at eight sites in the basin. The maximum value for any monitoring site for any method is 56.6 µg/m³ at Compton. All of the tests demonstrate continued attainment of the 24-hour average PM_{2.5} standard of 65 µg/m³ in 2015.

⁴⁷ South Coast 2007 AQMP, Appendix V, p. V-1-9.

⁴⁸ South Coast 2007 AQMP, Appendix V, p. V-1-9.

⁴⁹ South Coast 2007 AQMP, Appendix V, p. V-1-9.

⁵⁰ South Coast 2007 AQMP, Appendix V, p. V-2-58.



c. Unmonitored area analysis

EPA Recommendations

An additional review is necessary, particularly in nonattainment areas where the ozone or PM_{2.5} monitoring network just meets or minimally exceeds the size of the network required to report data to Air Quality System (AQS). This review is intended to ensure that a control strategy leads to reductions in ozone or PM_{2.5} at other locations which could have baseline (and future) design values exceeding the NAAQS were a monitor deployed there. The test is called an “unmonitored area analysis”. The purpose of the analysis is to use a combination of model output and ambient data to identify areas that might exceed the NAAQS if monitors were located there. The unmonitored area analysis should identify areas where future year design values are predicted to be greater than the NAAQS. The unmonitored area analysis for a particular nonattainment area is intended to address potential problems within or near that nonattainment area. The analysis should include, at a minimum, all nonattainment counties and counties surrounding the nonattainment area (located within the State). In order to examine unmonitored areas in all portions of the domain, it is recommended to use interpolated spatial fields of ambient data combined with gridded modeled outputs.⁵¹

Gradient adjusted spatial fields are first created for the base year. Future year estimates can then be created by applying gridded RRFs to the gradient adjusted spatial fields. The basic steps are as follows:

⁵¹ Guidance p. 30.

- 1) Interpolate base year ambient data to create a set of spatial fields.
- 2) Adjust the spatial fields using gridded model output gradients (base year values).
- 3) Apply gridded model RRFs to the gradient adjusted spatial fields.
- 4) Determine if any unmonitored areas are predicted to exceed the NAAQS in the future.

South Coast 2007 AQMP

2015 CAMx Grid-Cell Evaluation

Figure V-2-15 presents the grid cell extrapolated of 2005 PM_{2.5} annual design values. Only grid cells over the federal standard are darkened. Extrapolation was based on distance weighted interpolation scheme using design values from sites inside and outside the Basin to enhance the spatial representation. The pattern depicted by the grid cell design display closely matches the pattern of annual average PM_{2.5} presented in Figure V-2-3, in the AQMP.

Using a similar interpolation scheme, the relative percentage contributions of the six component species at the eight MATES-III sites was extrapolated to each cell in the basin. Predicted 2015 PM_{2.5} concentrations at the grid cell level (without using multi-cell averaging) was estimated each grid cell by multiplying the speciated RRFs from the CAMx simulations by the relative percentage concentrations of the six components contributing to the grid cell mass and the interpolated grid cell design value. Figure V-2-16 presents the 2015 baseline distribution. PM_{2.5} levels will be reduced regionally with implementing additional control measure however, almost 60 percent of the population of the Basin will continue to breathe air quality above the federal standard. With the Final South Coast 2007 AQMP control strategy in place no cells in the South Coast PM_{2.5} nonattainment area will be above the federal standard.⁵²

Discussion

EPA believes the 2015 CAMx Grid-Cell Evaluation analysis adequately addresses the EPA's recommendation to perform a test to ensure that a control strategy leads to reductions in PM_{2.5} at other locations which could have baseline (and future) design values exceeding the NAAQS were a monitor deployed there.

d. Attainment Date Extension

South Coast 2007 AQMP

Under the federal Clean Air Act, the Basin must comply with the federal PM_{2.5} air quality standards by April, 2010 [Section 172(a)(2)(A)]. An extension of up-to five years could be granted if attainment cannot be demonstrated and several other conditions are satisfied. A simulation of 2010 annual average PM_{2.5} was conducted to substantiate the severity of the PM_{2.5} problem in the Basin. The simulation used the projected emissions for 2009 which included all existing and adopted control measures that will be implemented prior to 2010. The resulting 2010 future-year design value (17.9 µg/m³) failed to meet the federal standard. As a consequence and as indicated in Chapter 1, the

⁵² South Coast 2007 AQMP, Appendix V, p. V- 2-54, V-2-55

District is formally requesting U.S. EPA to grant the five-year extension based upon the severity of the problem and the modeled attainment demonstration that clearly indicates that significant reductions in daily emissions of PM_{2.5}, NO_x, VOC and SO_x are required to meet the 2015 attainment date.⁵³

Discussion

EPA believes that the South Coast 2007 AQMP modeling provided in the 2007 AQMP is adequate to support the District's conclusion that the annual PM_{2.5} standard will not be met in 2010.

9. Weight of Evidence

EPA Recommendations

States/Tribes should always perform complementary analyses of air quality, emissions and meteorological data, and consider modeling outputs other than the results of the attainment test. Such analyses are instrumental in guiding the conduct of an air quality modeling application. Sometimes, the results of corroboratory analyses may be used in a weight of evidence determination to show that attainment is likely despite modeled results which may be inconclusive. The further the attainment test is from being passed, the more compelling contrary evidence produced by corroboratory analyses must be to draw a conclusion differing from that implied by the modeled attainment test results.⁵⁴

Table 2.1 Guidelines For Weight of Evidence Determinations

Results of Modeled Attainment Test			Supplemental Analyses
Ozone	Annual PM _{2.5}	24-Hour PM _{2.5}	
Future Design Value < 82 ppb, all monitor sites	Future Design Value <14.5 ug/m ³ , all monitor sites	Future Design Value <62 ug/m ³ , all monitor sites	Basic supplemental analyses should be completed to confirm the outcome of the modeled attainment test
Future Design Value 82 - 87 ppb, at one or more sites/grid cells	Future Design Value 14.5-15.5 ug/m ³ , at one or more sites/grid cells	Future Design Value 62-67 ug/m ³ , at one or more sites/grid cells	A weight of evidence demonstration should be conducted to determine if aggregate supplemental analyses support the modeled attainment test
Future Design Value ≥ 88 ppb, at one or more sites/grid cells	Future Design Value ≥ 15.5 ug/m ³ , at one or more sites/grid cells	Future Design Value ≥ 68 ug/m ³ , at one or more sites/grid cells	More qualitative results are less likely to support a conclusion differing from the outcome of the modeled attainment test ¹² .

⁵³ South Coast 2007 AQMP, Appendix V, p. V-2-48.

⁵⁴ Guidance p. 17.

Discussion

The modeled attainment test predicted a 2014 annual concentration of 15.0 µg/m³ Rubidoux.⁵⁵ Based on the table, Guidelines for a Weight of Evidence Determination, above, a weight of evidence determination is recommended to determine if additional analyses support the modeled attainment test. EPA guidance lists three types of analyses that are recommended for this demonstration: 1) additional modeling, 2) analyses of trends in ambient air quality and emissions, and 3) observational models and diagnostic analyses.⁵⁶ The consistent improvement in ambient PM_{2.5} concentrations throughout the South Coast air basin and the expected continuing emissions decreases that are described in the South Cast Plan both indicate that the modeled attainment test results are reasonable.

Suggestions for the mid-course correction WOE: trends in ambient air quality and emissions

While the weight of evidence from the South Coast AQMP supports the air quality modeling, which indicates the basin will attain the annual PM_{2.5} standard by 2015, the upcoming mid course review of this plan provides an opportunity for the District to update the analyses, and provide new data. EPA encourages the District to consider the following suggestions of issues to address in the weight of evidence portion of the upcoming mid course review.

For the analyses of trends in ambient air quality and emissions to more accurately reflect changes due to air quality management efforts, ambient air quality concentrations should be adjusted for meteorology, changes in actual emissions for the area should be reflected yearly, and the trend should be evaluated in light of a strong conceptual model of how PM_{2.5} is formed in the area.⁵⁷ While it is difficult to achieve a quantifiable normalization of the ambient data for meteorology, the trends discussion in the weight of evidence, for the mid-course correction, should include a qualitative discussion of expected effects of observed meteorology trends or abnormalities on the observed ambient PM_{2.5} concentration.

For emissions, the District states that the emissions reductions expected from 2005 to 2014 are consistent with the reductions observed from 2002 to 2005.⁵⁸ Additional discussion regarding the size and location of the emission reductions observed from 2002 to 2005 should be included in the mid-course correction. The District argues that given these expected continuing emissions reductions, and the observed trend at four monitoring stations of 4.5 percent annual improvement rate, the basin is projected to reach attainment by 2015.⁵⁹ For the mid-course correction, it would strengthen this argument to use the conceptual model to discuss why these sites are expected to be representative of the basin, and if different trends have been observed at other stations. Also, more complete information about where emission reductions where the emission reductions are expected to occur in the basin from 2005 to 2014 in relation to these sites should be included in the mid-course correction. The WOE for the mid-course correction should clarify how the average percent reductions in ambient concentrations and emissions were

⁵⁵ South Coast 2007 AQMP, Appendix V, p. V-2-53.

⁵⁷ Guidance p. 102.

⁵⁸ South Coast 2007 AQMP, Appendix V, p. V-2-60-61.

⁵⁹ South Coast 2007 AQMP, Appendix V, p. V-2-60-61.

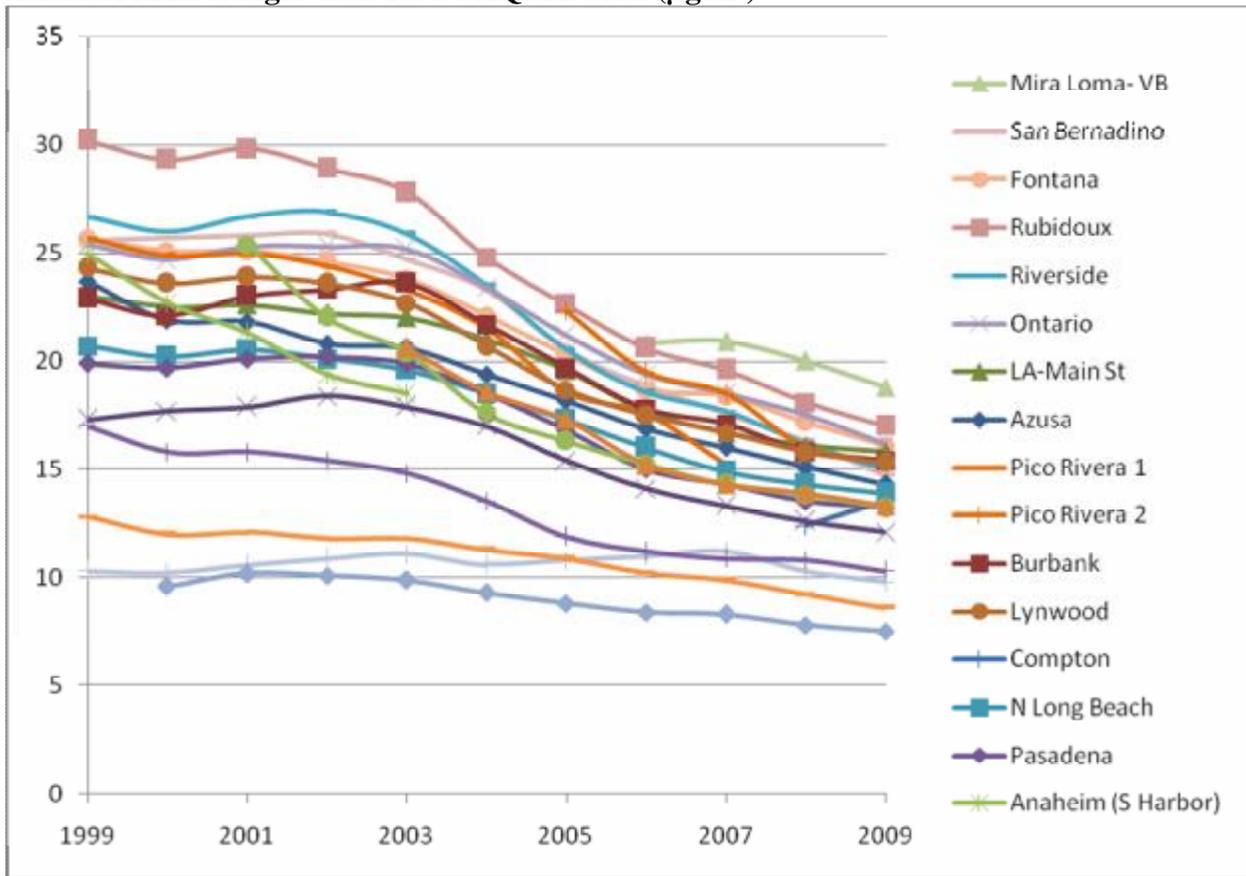
calculated including which years were averaged and which sources were included. Also, a comparison could be made between the expected emissions reductions and observed emission reductions to date for the basin. The District should provide an update of the conceptual model that indicates whether the assumptions about the representative sites or relationships between emissions and trends are still valid.

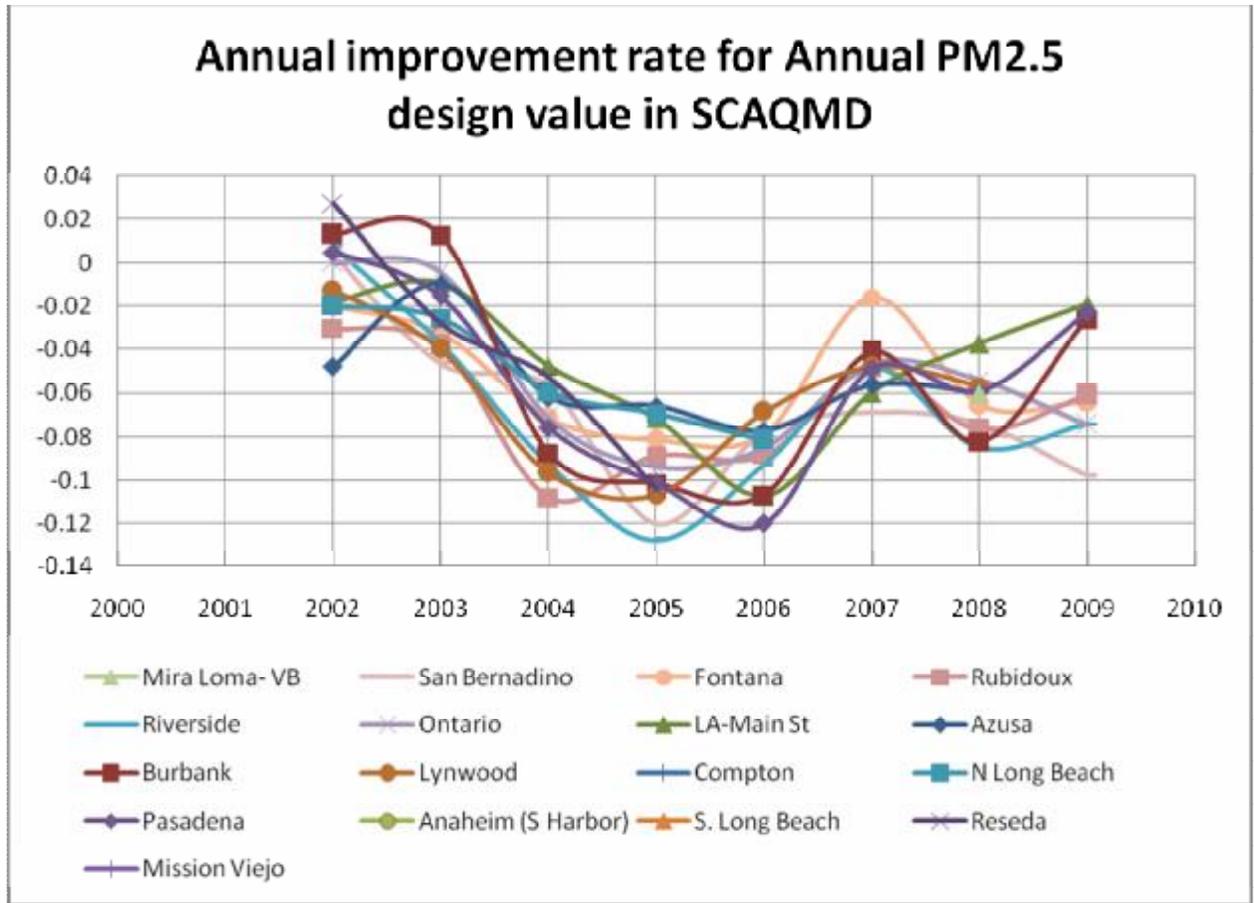
The WOE in the South Coast 2007 AQMP also discusses population and industrial growth and re-distribution, as well as port control strategy and CARB measures.⁶⁰ The WOE for the mid-course correction should provide a qualitative argument, as part of the conceptual model of PM_{2.5} in the basin, how these changes result in changes in precursor and direct PM_{2.5} emissions, and therefore the spatial distribution of or trend in PM_{2.5} concentration in the basin. This discussion should include specifics related to the monitoring sites chosen to evaluate the observed trend.

Data from 2006 to 2009 reflect a smaller annual rate of improvement of ambient PM_{2.5} concentration than the observed rate from 1999 through 2006, as show in the table below. Note that only sites with complete data are presented in the table. For the mid-course correction WOE, the District should evaluate this change both in terms of reasons why the improvement has slowed, but also if it is expected to affect the attainment date.

⁶⁰ South Coast 2007 AQMP, Appendix V, p. V-2-59.

Annual PM_{2.5} design value for SCAQMD Sites (µg/m³)





I-710 Air Monitoring Study

The District conducted the I-710 Air Monitoring Study to investigate near roadway concentrations, understand trends for future control strategies, validate dispersion models, and understand community exposures in near roadway environments. To meet these objectives, SCAQMD conducted daily monitoring PM_{2.5} mass using federal reference methods (FRM) during approximately one month in the winter (February – March 2009) and approximately one month during the summer (July – August 2009) at three sites.

The sites were 15m and 80m downwind of the freeway and several miles upwind of the freeway (as a background measurement). During the two month-long intensive study periods, the District also performed twenty-four-hour filter measurements of TSP lead, PM₁₀ mass, elemental carbon (EC) and organic carbon (OC) in PM₁₀ every other day. VOC Air Toxics were measured in four intervals starting at 5 a.m. (4, 6, 4, and 10-hr intervals) every other day and continuous measurements of ultrafine particle number (UFP), black carbon (BC), PM_{2.5}mass (non-federal equivalent method (FEM)), NO_x, and meteorological parameters were also conducted.

Preliminary results from the study indicate that during the winter monitoring period, and PM_{2.5} values at the 15 meter, 80 meter, and N Long Beach (background) sites were 12.6 µg/m³, 11.5 µg/m³, and 9.59 µg/m³, respectively. During the summer monitoring period, and PM_{2.5} values at the 15 meter, 80 meter, and N Long Beach (background) sites were 15.2 µg/m³, 14.0

µg/m³, and 12.7 µg/m³, respectively. These preliminary results in the presentation “Preliminary Results from the AQMD I-710 Air Monitoring Study,” which is available at: http://www.metro.net/projects_studies/I710/images/AQMD-I-710-Air-Monitoring-Study-to-CAC-February-2010.pdf

Final study results are expected to be available by January 2011. It is important to note that the duration of the study was shorter than what is required to show NAAQS attainment and is therefore not able to be a direct estimate of the expected value in a near-roadway environment. However, the study area includes the most congested highway in the South Coast basin, and therefore, the results likely provide a worst case scenario and do show an incremental decrease in PM_{2.5} concentrations with distance to roadways. SCAQMD continues to monitor BC and NO_x at the 15m site to learn more about the interplay between air quality, meteorology and traffic emissions in the complex near-roadway environment.

The current 24-hour PM_{2.5} design value for the South Coast Air Basin is 49 µg/m³. The maximum modeled future year value of 24 hour PM_{2.5} NAAQS in the South Coast Basin, discussed above, is 56.6 µg/m³ at Compton⁶¹. Based on current monitored and future modeled data, EPA believes the 24 hour PM_{2.5} mass will continue to be well below 65 µg/m³. The District’s I-710 Air Monitoring Study will be available at the time of the submittal of the mid- course review. The data should be discussed as part of the weight of evidence discussion for the mid-course review.

10. Conclusion

The modeling used for the attainment demonstration was made available to the public for comment at the same time as the draft 2007 PM_{2.5} plan, and was subject to public hearing as part of final version of the Plan.

The air quality modeling documentation in Appendix V of the South Coast 2007 AQMP contains all the elements required by EPA’s modeling guidance. The modeling is based on the best and most current information available at the time the South Coast 2007 AQMP was developed. Based on our evaluation, discussed above, we propose to find that the modeling analysis used for the attainment demonstration in the South Coast 2007 AQMP for attainment of the 1997 PM_{2.5} NAAQS meets the CAA section 172(c)(1) requirement that the plan “shall provide for attainment of the national primary ambient air quality standards” at the time of their submittal in 2007, and that the modeling in the South Coast 2007 AQMP provides an adequate basis for the PM_{2.5} reasonably available control measure, reasonable further progress, and attainment demonstrations in the South Coast 2007 AQMP.

⁶¹South Coast 2007 AQMP, Appendix V, p. V-2-58.

C. PM_{2.5} Attainment Plan Precursors

1. Requirements for the Control of PM_{2.5} Precursors

EPA recognizes NO_x, SO₂, VOC, and ammonia as the main precursor gases associated with the formation of secondary PM_{2.5} in the ambient air. These gas-phase precursors undergo chemical reactions in the atmosphere to form secondary particulate matter. Formation of secondary PM_{2.5} depends on numerous factors including the concentrations of precursors; the concentrations of other gaseous reactive species; atmospheric conditions including solar radiation, temperature, and relative humidity (RH); and the interactions of precursors with preexisting particles and with cloud or fog droplets. 72 FR 20586 (April 25, 2007), at 20589.

EPA recognizes NO_x, SO₂, VOC, and ammonia as precursors of PM_{2.5} because these pollutants can contribute to the formation of PM_{2.5} in the ambient air. As discussed previously, states must include each in their submitted emissions inventory in order to assure the information on all pollutants and precursors that contribute to PM_{2.5} concentrations is available. 72 FR 20586 (April 25, 2007), at 20589 and 40 CFR § 51.1008(a)(1). However, the overall contribution of different precursors to PM_{2.5} formation, and the effectiveness of alternative potential control measures, will vary by location. Thus, the precursors a state should regulate for attaining the PM_{2.5} NAAQS will also vary to some extent from area to area. 72 FR 20586, at 20589.

In the PM_{2.5} implementation rule, EPA did not make a finding that all potential PM_{2.5} precursors must be controlled in each specific nonattainment area. See 72 FR 20586 (April 25, 2007), at 20589. Instead, for reasons explained in the rule, a state must evaluate control measures for sources of SO₂ in addition to sources of direct PM_{2.5} in all nonattainment areas. 40 CFR § 51.1002(c) and (c)(1). A state must also evaluate control measures for sources of NO_x unless the state and/or EPA determine that controls on sources of NO_x emissions would not significantly reduce PM_{2.5} concentrations in the specific nonattainment area. 40 CFR § 51.1002(c)(2). By contrast, EPA has determined in the PM_{2.5} implementation rule that a state does not need to address controls for sources of VOC and ammonia unless the state and/or EPA make a technical demonstration that such controls would significantly contribute to reducing PM_{2.5} concentrations in the nonattainment area. 40 CFR § 51.1002(c)(3) and (4). Such a demonstration is required “if the administrative record related to the development of its SIP shows that the presumption is not technically justified for that area.” 40 CFR § 51.1002(c)(5)

“Significant contributor” in this context means that a significant reduction in emissions of the precursor from sources in the area would be projected to provide a significant reduction in PM_{2.5} concentrations in the nonattainment area. 72 FR 20586 (April 25, 2007), at 20590. Although EPA did not establish a quantitative test for determining the significance of such a change, EPA noted that even relatively small reductions in PM_{2.5} concentrations are estimated to result in worthwhile public health benefits. *Id.*

Starting in 2011, states must also address condensable particulate matter (CPM), including estimates of CPM in emissions inventories, modeling, and control strategies.

2. Identification of PM_{2.5} Attainment Plan Precursors in the South Coast 2007 AQMP

The 2007 South coast AQMP does not explicitly identify the pollutants that have been selected as “PM_{2.5} attainment plan precursors as defined in and 40 CFR § 51.1000. The plan addresses NO_x, direct PM_{2.5}, SO_x, and VOC in the RFP and attainment demonstrations and the District’s RACM/RACT analysis and thereby implicitly identifies NO_x, SO_x, and VOC as attainment plan precursors. The South Coast PM_{2.5} attainment demonstration addresses ammonium nitrate and ammonium sulfate since they represent a dominant fraction of PM_{2.5} components and are formed through secondary reactions of the precursors NO_x, SO_x, and ammonia. Ammonium nitrate and ammonium sulfate are controlled through the control of NO_x and SO_x as precursors.

In the South Coast Air Basin, PM_{2.5} can be directly emitted, such as from road dust, diesel soot, combustion products, and other sources (“primary particles”), or formed through atmospheric chemical reactions of precursor gases (“secondary particles”). Examples of secondary particles include sulfates, nitrates, and complex carbon compounds formed from reactions of NO_x, SO_x, VOCs, and ammonia. The District’s analysis indicates that SO_x reductions followed by directly-emitted PM_{2.5} and NO_x reductions provide the greatest ambient PM_{2.5} reductions. VOC reductions can also contribute to improving ambient PM_{2.5} concentrations and will occur concurrently as a result of the District’s 8-hour ozone strategy.⁶²

3. EPA’s Evaluation and Conclusion

EPA concurs with the evaluation in the South Coast 2007 AQMP that controls on direct PM_{2.5}, NO_x, SO_x and VOC are effective pollutants and precursors to control for reaching attainment of the 1997 PM_{2.5} NAAQS.

⁶² South Coast 2007 AQMP, page 5-17.

D. Reasonably Available Control Measures/Reasonably Available Control Technology

1. Requirements for RACM/RACT

CAA section 172(c)(1) requires that each attainment plan “provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]), and shall provide for attainment of the national primary ambient air quality standards.”

We interpret reasonably available control measures (RACM) in these provisions as referring to measures of any type that may be applicable to a wide range of sources, whereas the parenthetical reference to reasonably available control technology (RACT) refers to measures applicable to stationary sources. Thus, RACT is a type of RACM specifically designed for stationary sources. 72 FR 20586 at 20610.

EPA defines RACM as any potential control measure for application to point, area, on-road and non-road emissions source categories that meets the following criteria: the control measure is (1) technologically feasible, (2) economically feasible, (3) does not cause “substantial widespread and long-term adverse impacts”, (4) is not “absurd, unenforceable, or impracticable”, and (5) collectively can advance the attainment date by at least one year. 72 FR 20586 at 20610 We define RACT as the lowest emission limitation that a particular stationary source is capable of meeting by the application of technology (i.e., devices, systems, process modifications, or other apparatus or techniques that reduce air pollution) that is reasonably available considering technological and economic feasibility. 72 FR 20586 at 20610.

For PM_{2.5} attainment plans, EPA is requiring a combined approach to RACM and RACT under subpart 1 of Part D of the CAA. Under this approach, RACM/RACT are measures that a state finds are both reasonably available and contribute to attainment as expeditiously as practicable in its nonattainment area. Thus, what constitutes RACM/RACT in a PM_{2.5} attainment plan is closely tied to that plan’s expeditious attainment demonstration.40 CFR § 51.1010; 72 FR 20586 at 20612. By definition, measures that are neither necessary for meeting the RFP requirement nor help an area attain the NAAQS as expeditiously as practicable are not required RACM/RACT. A state’s attainment plan must include a list of measures considered and information sufficient to show that a state has met all requirements for determination of RACM/RACT. 72 FR 20586 at 20612. A state must evaluate RACM/RACT for each identified PM_{2.5} attainment plan precursor.

Under this combined approach, EPA considers RACT be part of an area's overall RACM obligation. Subpart 1, unlike subparts 2 and 4 of title 1, Part D of the CAA, does not identify specific source categories for which EPA must issue control technology documents or guidelines or identify specific source categories for state evaluation during attainment plan development. 72 FR 20586 at 20610. Because of the variable nature of the PM_{2.5} problem between nonattainment areas, which may require states to develop attainment plans that address widely disparate circumstances, EPA determined that a state should have flexibility with respect to RACT and RACM controls but also that in areas needing significant emission reductions to attain the PM_{2.5}

standards, RACM/RACT controls on smaller sources may be necessary to reach attainment as expeditiously as practicable. PM_{2.5} implementation rule preamble at 20612, 20615

The determination of RACM/RACT is a three-step process: (1) identifying technologically and economically feasible measures and associated emissions reductions, (2) conducting air-quality modeling and related analyses, and (3) selecting RACM/RACT. 72 FR 20586 at 20613. Any measures that are necessary to meet these requirements which are not already either federally promulgated, part of the state's SIP, or otherwise creditable in SIPs must be submitted in enforceable form as part of a state's attainment plan for the area. 72 FR 20586 at 20614.

The first step, identification of potential measures, should be based on an inventory of emissions of direct PM_{2.5} and PM_{2.5} attainment plan precursors from the range of relevant sources and source categories. 72 FR 20586 at 20613. A state is required to evaluate RACM/RACT for direct PM_{2.5} and SO₂. A states is also required to evaluate RACM/RACT for NO_x sources unless it finds that such sources do not significantly contribute to the PM_{2.5} levels in its nonattainment area. 72 FR 20586, at 20613. Significantly contribute in this context means that a significant change in emissions of the precursor from sources in the area would be projected to provide a significant change in PM_{2.5} concentrations in the area. 72 FR 20586 at 20590.

In the preamble to the PM_{2.5} implementation rule, EPA provided a recommended list of the types of source categories and control measures that may be appropriate for evaluation given the local source mix and attainment needs of a specific area 72 FR 20586 at 20621.

Technological feasibility refers to whether there are available measures capable of reducing emissions of PM_{2.5} or PM_{2.5} precursors or both. A number of factors are considered in this analysis, such as process and operating conditions, raw materials, physical plant layout, non-air quality and energy impacts, and the time needed to install and operate controls. 72 FR 20586 at 20618.

Economic feasibility refers to whether the cost of a measure is reasonable for the source or source category. A number of factors are considered in this analysis, such as cost per ton of pollution reduced, capital costs and annualized cost. 72 FR 20586 at 20619.

2. RACM/ACT Analysis in the South Coast 2007 AQMP

The South Coast 2007 AQMP and the revised 2007 State Strategy are the latest in a series of air quality plans that the District and CARB have developed to provide for attainment of the federal air quality standards in the South Coast nonattainment area.⁶³ These planning efforts have resulted in a comprehensive set of rules and programs that address the great majority of emissions in the South Coast nonattainment area. Many of these District and state rules are among the most stringent in the nation.

⁶³ These plans include the 2003 PM₁₀ Plan (approved 70 FR 69081, November 10, 2005), the 2003 AQMP addressing the 1-Hour Ozone Standard (partially approved at 74 FR 10176, March 10, 2009, and the South Coast 2007 AQMP portions that address the 1997 8-hour ozone standard (submitted November 28, 2007).

For the South Coast 2007 AQMP and the revised 2007 State Strategy, the District, CARB and the Southern California Association of Governments (SCAG), the South Coast metropolitan planning organization (MPO) for the area, each undertook a process to identify and evaluate potential RACM that could contribute to expeditious attainment of the PM_{2.5} standards in the South Coast nonattainment area. We describe each agency's efforts below.

a. District RACM/RACT Analysis

The District's RACM/RACT analysis and its results are described in Chapter 6 and Appendix VI of the 2007 AQMP. The analysis focused on the stationary source and area source controls under direct jurisdiction of the District. Since the 1970s, the SCAQMD has adopted stationary source control rules that have resulted in significant improvement in air quality in the South Coast Air Basin. When command and control rules were no longer within the limitations of economic efficiency, the District began using economic incentive approaches with programs such as the Regional Clean Air Incentives Market (RECLAIM) and the Carl Moyer program. While the District still relies on command and control regulations, the District's control strategies are now supplemented by market incentives and compliance flexibility approaches where appropriate. These regulations and strategies have yielded significant emissions reductions from sources under the District's jurisdiction. In developing the South Coast 2007 AQMP, the District conducted a process to identify RACM for the South Coast which involved public meetings to solicit input, evaluation of EPA suggested RACM, and evaluation of other air agencies' regulations. The District conducted a five step process which is described in detail below.

Step 1 - AQMP Summit

In June 2006, the District conducted a 2007 AQMP Summit. Over 125 attendees including experts from a variety of areas and the public provided input on new and innovative concepts to assist the District in attaining the ambient air quality standards for PM_{2.5} by 2015. In total, the District received about 200 control measure suggestions. In general, District staff was advised to 1) promote electrification; 2) focus on technology that improves energy efficiency and protects global warming; 3) influence consumer awareness and choice on low- or zero-VOC products; 4) incentivize low- or zero-emission control technologies; 5) promote the use of remote sensing to detect high polluters, and 6) improve public participation and multi-agency collaboration.

Step 2 - U.S. EPA Suggested List of Control Measures

EPA published a list of suggested potential RACT and RACM for PM_{2.5} in the PM_{2.5} Implementation Rule (see 72 FR 20586, April 25, 2007). As shown in Table 2 of Appendix VI, the District has developed control measures for each PM_{2.5} RACT and RACM provided by EPA in the PM_{2.5} Implementation Rule.

Step 3 - RACT Revised by U.S. EPA in September 2006

As required in CAA section 172(c)(1) the SIP for a nonattainment area must include RACM, which in turn must reflect RACT. EPA defines RACT as:

“the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility”.

Section 182(b)(2) of the Clean Air Act provides that States must revise their SIP to include RACT for VOC sources covered by a Control Techniques Guidelines (CTG) document issued by the U.S. EPA after November 15, 1990 and prior to the area’s date of attainment. The CAA requires the EPA to revise RACT, update existing CTG documents, or develop new documents, on a frequent basis to provide states and local agencies with most current technical information and assist them in determining RACT. In September 2006, EPA updated the CTGs for Offset Lithographic and Letterpress Printing, Flexible Packaging Printing, Industrial Cleaning Solvents, and Flat Wood Paneling Coatings

The District compared the current requirements in its Rule 1104 – Wood Flat Stock Coating Operation (amended 8/13/99), Rule 1171 – Solvent Cleaning Operations (amended 7/14/06), and Rule 1130 – Graphics Arts (amended 10/8/99) with the requirements in the revised CTGs. Rule 1104 and Rule 1171 meet the stringency requirements in the CTGs; however, Rule 1130 does not meet the recommended alcohol content in fountain solution for sheet-fed presses and heat-set web presses. The District committed in the AQMP to make the necessary corrections in forthcoming rulemaking as part of Control Measure MCS-07 – Application of All Feasible Measures as shown in Table 3 of Appendix VI of the AQMP.

Step 4 - Other Districts’ Current Rules and Regulations

The District reviewed all rules and regulations recently adopted or amended, from 2000 to 2006, by San Joaquin Valley, Sacramento, Ventura and San Francisco air districts, and compared the requirements in these rules with those in the South Coast. District staff selected these districts based on the severity of their classifications and near-term attainment dates.

Table 3 in Appendix VI of the AQMP contains a brief description of the 82 source-specific rules that staff analyzed and a summary of other districts’ requirements, only if they were more stringent than the South Coast’s rules. In addition, Table 3 also includes a description of the control measures adopted by other agencies for their own 8-hour Ozone AQMP, and information on advanced technologies or U.S. EPA consent decrees that District staff is aware of that may result in additional emission reductions. In general, the District’s current rules and regulations are equivalent to or more stringent than those developed by other air districts, with a few exceptions shown in Table 3 where improvements are possible. Therefore, the District developed several control measures to address these areas, such as Control Measure MCS-01 – Facility Modernization, MCS-07 – Application of All Feasible Measures, and CMB-02 – Reduction of Emissions in RECLAIM. Table 3 in Appendix VI identifies these control measures. In general, the areas identified for potential improvements are to explore the feasibility of lowering emission limits and increasing level of control in order to promote cleaner technologies, lowering VOC content of coatings/solvents, establishing standards and test methods for generic control equipment,

lowering release or leak thresholds, encouraging continuous wireless monitoring, improving leak detection, repair, inspection and maintenance, and adding best management practices.

With respect to technological and economic feasibility, the District assumed that technologies and measures which are available and cost-effective to implement in other air districts in California, would be available and cost-effective for use in the South Coast Basin in a timely manner. Best Available Retrofit Control Technology (BARCT) is reevaluated every three years. The District refines emission inventory, emission reduction, and cost-effectiveness estimates as well as health benefits on an ongoing basis, especially during the rule development process. In addition, the District commits to monitor rule development in other air districts, and will conduct further study and reevaluate the feasibility of revising the requirements in existing rules if necessary. Instead of amending existing rules, new rules may be adopted to implement the control measures described in the South Coast 2007 AQMP in a more effective manner. Prioritization and schedules for adoption and implementation are discussed in Chapter 7 of the AQMP.

Step 5 - Additional Studies and Analyses

In addition to the above analyses, the District and SCAG have completed the following analyses to meet the RACM requirements of the CAA:

- Evaluating control measures developed by other air districts for their air quality management plans as described in Appendix IV-A.
- Specific costs and cost analyses of each SCAQMD's stationary source and mobile source control measure, if available, are provided in Appendix IV-A and B.
- The schedule for implementing the control measures is discussed in Chapter 7 of the AQMP, which demonstrates that the District will implement the control measures as expeditiously as practicable considering resources and budgets.
- A SCAQMD 8-Hour Ozone RACT SIP Demonstration project was completed and forwarded to EPA in June 2006 for comment. The District concluded that 1) All SCAQMD rules to implement the 1-hour ozone SIP fulfill RACT for the 8-hour ozone SIP; 2) All CTG sources and all major non-CTG sources in the Basin are subject to SIP-approved rules and therefore meet RACT requirements. EPA approved the South Coast RACT SIP for the 1997 8-hour ozone standard on December 18, 2008 at 73 FR 76947.

District's Conclusion Regarding RACM

Following is the summary of the District's findings:

- The District evaluated and analyzed all reasonable control measures that were currently available for inclusion in the South Coast 2007 AQMP.
- The control measures in the South Coast 2007 AQMP included all RACM provided by the

public and experts.

- The control measures in the South Coast 2007 AQMP included all RACT and RACM recommended by EPA in the PM_{2.5} Implementation Rule.
- In general the District's rules and regulations are equivalent to, or more stringent than, other districts' rules and regulations and their proposed control measures in their respective SIPs. In several areas identified in Table 3 of Appendix VI of the AQMP, the existing source-specific rules may be amended to lower the emissions standards, promote cleaner technologies, add additional best management practices, and improve enforceability. District staff will monitor the rule development of other air districts, explore all feasibilities, and conduct further analyses to refine the emission inventory, emission reductions, and cost-effectiveness analysis.
- The District developed 37 stationary source control measures that contained all measures included in other districts' air quality management plans. In addition, the District developed many innovative stationary source control measures, such as MCS-01 – Facility Modernization, CTS-02 - Clean Coating Certification, MCS-07 – Application of All Feasible Measures, and FLX-01 – Economic Incentive Programs, that were not included in other districts' air quality management plans.
- The few available control measures that District staff did not include collectively would not advance the attainment date or contribute to RFP for the South Coast PM_{2.5} nonattainment area because of the insignificant or non-quantifiable amount of emission reductions that they would generate.
- The RACM demonstration for transportation control measures (TCMs) is included in Appendix IV-C, and all mobile source control measures provided by CARB to SCAQMD are deemed RACM.

b. Local Jurisdiction's RACM Analysis

The local jurisdiction's RACM analysis was conducted by SCAG, the MPO for the Los Angeles region. This analysis, which focused on transportation control measures (TCMs), and its results are described in Appendix IV-C of the South Coast 2007 AQMP. TCMs are generally measures designed to reduce emissions from on-road motor vehicles through reductions in vehicle miles traveled (VMT) or traffic congestion.

For the South Coast 2007 AQMP, the RACM demonstration for TCMs is included in Appendix IV-C, The TCMs in the South Coast 2007 AQMP are derived from TCM projects in the 2006 SCAG Regional Transportation Improvement Program (RTIP). This evaluation, described beginning on page 49 of Appendix IV-C of the South Coast 2007 AQMP, resulted in extensive local government commitments to implement programs to reduce auto travel and improve traffic flow. South Coast 2007 AQMP page 6-6 and Appendix IV-C. SCAG also provided reasoned justifications for any measures that it did not adopt. Attachment A to Appendix IV-C contains an extensive list of TCMs in process and newly programmed TCMs.

The enforceable commitment from SCAG and the transportation agencies was to fund and implement projects in the first two years of the 2006 Regional Transportation Improvement Program (RTIP).

c. State's RACM Analysis

CARB describes its proposed strategy to reduce emissions from sources within its jurisdiction – on- and off-road engines and vehicles, fuels, and consumer products- in Chapter 3 of the 2007 State Strategy. CARB has unique authority under the CAA to adopt standards for most categories of on- and off-road engines and vehicles, subject in most instances to a waiver by EPA under CAA section 209.

CARB developed this proposed strategy after an extensive public consultation process to identify potential SIP measures. It included a SIP Symposium in October 2006 and a workshop in November 2006 to discuss development of potential control concepts for meeting the federal 8-hour ozone and PM_{2.5} standards.⁶⁴ CARB made a draft of the 2007 State Strategy available for public review in April 2007 and then conducted a series of public workshops on the draft. On April 26, 2007, CARB staff released a revised draft of the Proposed State Strategy that incorporated changes based on further staff analysis and public comments. CARB Resolution 07-28, p. 3.

From this process, CARB identified and committed to propose 15 new defined measures. 2007 State Strategy, p. 65 and CARB Resolution 07-28, Attachment B, p. 8. These measures focus on cleaning up the in-use (legacy) fleet as well as increasing the stringency of emission standards for a number of engine categories and further reductions from motor vehicle fuels and consumer products. Many if not most of these measures are being proposed and adopted for the first time anywhere in the nation. They build on CARB's already comprehensive program to address emissions of direct PM_{2.5}, NO_x, and VOC from all types of mobile sources through both regulations and incentive programs, as well as from fuels and consumer products. See 2007 State Strategy, p. 38. Table D-1 lists these measures and includes one additional measure each from the California Bureau of Automotive Repair (BAR) and the California Department of Pesticide Regulation (DPR).

⁶⁴ More information on this public process including presentations from the workshops and symposium that preceded the adoption of the 2007 State Strategy can be found at www.arb.ca.gov/planning/sip/2007sip/2007sip.htm.

Table D-1 2007 State Strategy Defined Measures Schedule for Consideration	
Defined State Measure	Expected Adoption Year
Smog Check Improvements	2007-2008
Expanded Vehicle Retirement	2008-2014
Modification to Reformulated Gasoline Program	2007
Cleaner In-use Heavy Duty Trucks	2008
Auxiliary Ship Cold Ironing and Clean Technologies	2007-2008
Cleaner Main Ship Engines and Fuels	Fuels: 2007 Engines: 2009
Port Truck Modernization	2007-2008
Accelerated Introduction of Cleaner Line-Haul Locomotives (enforceable agreement)	2007-2008
Clean Up Existing Harbor Craft	2007
Cleaner In-Use Off-Road Equipment	2007
Cleaner In-Use Agricultural Equipment	2009
New Emissions Standards for Recreational Boats	2009-2010
Expanded Off-Road Recreational Vehicle Emissions Standards	By 2010
Enhanced Vapor Recovery for Above Ground Storage Tanks	2007
Additional Evaporative Emissions Standards	By 2010
Consumer Products Program (I & II)	2007-2008 & 2010-2012
Department of Pesticide Regulation rules	2008

3. EPA's Evaluation and Conclusion

Under the PM_{2.5} implementation rule, RACM/RACT are the set of measures necessary for expeditious attainment in a specific nonattainment area. The measures must address emissions of PM_{2.5} and all PM_{2.5} attainment plan precursors that are necessary for such expeditious attainment. Thus, in order for a PM_{2.5} plan to demonstrate that it provides for RACM/RACT, it must also demonstrate that it provides for expeditious attainment. 72 FR 20586 at 20612-20623.

As discussed further below in section D.5., we are proposing to disapprove the PM_{2.5} attainment demonstration for the South Coast PM_{2.5} nonattainment area because it relies too heavily on commitments to reduce emissions in lieu of fully adopted measures. Absent an approvable attainment demonstration, we are unable to propose to approve and must instead propose to disapprove the South Coast 2007 AQMP's RACM/RACT demonstration.

It appears, however, that the District, State and local jurisdictions have identified and otherwise provided for the implementation of a comprehensive set of measures that are among the most stringent in the nation. Should the State correct the deficiencies in the attainment demonstration, we believe we would be able to approve the RACM/RACT demonstration in the South Coast 2007 AQMP.

As discussed in section I.A.2.b., EPA received a petition for reconsideration of several provisions in the PM_{2.5} implementation rule including three provisions related to RACT. We describe each below and whether the provisions affects our proposed action on the RACM/RACT demonstration in the South Coast 2007 AQMP.

1. The presumption that compliance with the Clean Air Interstate Rule (CAIR) satisfies the NO_x and SO₂ RACT requirements for electric generating units (EGUs). 72 FR 20586, at 20623-28.

The South Coast nonattainment area was not subject to the CAIR, which was intended to control the interstate transport of pollutants in the eastern United States. See 70 FR 26162 (May 12, 2005).⁶⁵

2. The allowance for states to defer establishing emission limits for condensable PM (CPM) until January 1, 2011. 72 FR 20586, at 20652 (codified at 40 CFR § 51.1002(c)).

The District did not explicitly address CPM in its RACT evaluation. EPA will evaluate any rule adopted or revised after January 1, 2011 to assure that it appropriately addresses CPM.

3. The revisions to the criteria for analyzing the economic feasibility of RACT from a presumption that a given source must bear a cost similar to other sources and to a consideration of whether the cost of a measure is reasonable for the regulated entity to bear, in light of benefits. 72 FR 20586 at 20619-20620.

While the South Coast 2007 AQMP includes some discussion of economic feasibility that seem to reflect the revised criteria in the PM_{2.5} implementation rule (see pp. IV-1), we can find no example of where those criteria actually resulted in the rejection of a potential RACT measure.

⁶⁵ EPA has recently proposed a replacement rule for CAIR in response to the remand of the rule by the Court of Appeals for the D.C. Circuit. See 75 FR 45210 (August 2, 2010). For more information, please see <http://www.epa.gov/airquality/transport/index.html>

E. Attainment Date Extension

1. Requirements for Attainment Date Extensions

CAA section 172(a)(2)(A) states that an area's attainment date "shall be the date by which attainment can be achieved as expeditiously as practicable, but no later than 5 years from the date such area was designated nonattainment..., except that the Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period no greater than 10 years from the date of designation as nonattainment considering the severity of nonattainment and the availability and feasibility of pollution control measures."

Since PM_{2.5} designations have an effective date of April 5, 2005, the initial 5-year attainment date for PM_{2.5} areas is no later than April 5, 2010. For any areas that EPA grants the full 5-year attainment date extension under section 172(a), the attainment date is no later than April 5, 2015.

Section 51.1004 of the PM_{2.5} implementation rule addresses the attainment date requirement. Section 51.1004(b) requires a state to submit an attainment demonstration justifying its proposed attainment date and indicates that EPA will approve an attainment date at the same time we approve the attainment demonstration. Thus, the selection of an attainment date is dependent upon an attainment demonstration showing expeditious attainment.

A state that requests an extension of the attainment date under CAA section 172(a)(2)(A) must provide sufficient information to show that attainment by the initial attainment date of April 5, 2010 is impracticable due to the severity of the nonattainment problem in the area and the lack of available control measures. It must also demonstrate that all local control measures that are reasonably available and technologically feasible for the area are being implemented to bring about expeditious attainment of the standard by the alternative attainment date for the area. The state's plan will need to project the emissions reductions expected due to federal and state regulations and local measures such as RACT and RACM, and then conduct modeling to project the level of air quality improvement in accordance with EPA's modeling guidance. EPA will not grant an extension of the attainment date for an area beyond the initial 5 years allowed by section 172(a)(2)(A) if the state has not considered the implementation of all RACM and RACT local control measures for the area. 72 FR 20586, at 20601.

2. Proposed Attainment Date in the South Coast 2007 AQMP

The attainment demonstration and the District's proposed attainment date are found in Chapter 5 of the plan and discussed in more detail in Appendix V. A discussion of the attainment date can be found on page V-2-48 of Appendix V. The Appendix states:

A simulation of 2010 annual average PM_{2.5} was conducted to substantiate the severity of the PM_{2.5} problem in the Basin. The simulation used the projected emissions for 2009 which included all existing and adopted control measures that will be implemented prior to 2010. The resulting 2010 future-year design value (17.9 µg/m³) failed to meet the federal standard.

Based on this analysis for the annual standard, the District and CARB requested an attainment date extension to April 5, 2015 for both the annual and 24-hour PM_{2.5} standards. See SCAQMD Governing Board Resolution adopting the final South Coast 2007 AQMP, June 1, 2007, p. 4 and 5, and CARB Resolution 07-41, page 8, September 27, 2007.

The South Coast 2007 AQMP does not specifically address the most expeditious date for attaining the 24-hour PM_{2.5} standard, although it does state that all monitoring sites in the nonattainment area will meet the 65 ug/m³ PM_{2.5} standard by 2015. South Coast 2007 AQMP, Appendix V, page V-2-48.

3. Evaluation and Conclusions

The South Coast nonattainment area's degree of PM_{2.5} nonattainment can fairly be characterized as severe. The area records some of the highest annual PM_{2.5} levels in the country, with 2007-2009 design values for the annual levels at the Riverside and Mira Loma stations of 17 µg/m³ and 18.8 µg/m³ respectively. See EPA, Air Quality System, Design Value Report, August 26, 2010.

According to the South Coast 2007 AQMP, to attain the 1997 PM_{2.5} standards in the area will require reductions in NO_x emissions of 29 percent from 2005 baseline levels, reductions in VOC emissions of 11 percent from 2005 baseline levels reductions in SO_x emissions of 56 percent from 2005 baseline levels and reductions in direct PM_{2.5} emissions of 15 percent from 2005 baseline levels. The majority of these reductions must come from mobile sources. South Coast 2007 AQMP page ES-9. Reductions from mobile sources accrue mainly from fleet turnover. Although CARB has adopted rules that will accelerate this fleet turnover and both it and the District have well-funded incentive programs to encourage voluntary turnover, this process still takes time to achieve significant reductions.

As discussed in section II.F. below, the District's strategy for attaining the PM_{2.5} standard relies on reductions of direct PM_{2.5} as well as the PM_{2.5} precursor pollutants NO_x, VOC, and SO_x. The South Coast nonattainment area needs significant reductions in PM_{2.5} SO_x, and NO_x to demonstrate attainment. EPA believes that further reductions of these pollutants is challenging, because the State and local air pollution regulations already in place include the most readily available NO_x, SO_x, and PM_{2.5} control measures. Moreover, attainment in the South Coast nonattainment area must also mitigate the emissions increases associated with the projected increases in population and emissions levels in this high-growth area.

The direct PM_{2.5} reductions are achieved primarily from open burning, commercial charbroiling and residential wood combustion measures. These types of control measures present special implementation challenges (e.g., the large number of individuals subject to regulation and the difficulty of applying conventional technological control solutions). NO_x reductions come largely from District rules for fuel combustion sources and from the State's mobile source rules.

Because of the necessity of obtaining additional emissions reductions from these source categories in the South Coast nonattainment area and the need to conduct significant public outreach if applicable control approaches are to be effective, EPA agrees with the District and CARB that the South Coast 2007 reflects expeditious implementation of the programs during the

2008-2014 time frame. EPA also agrees that the implementation schedule for enhanced stationary source controls is expeditious, taking into account the time necessary for purchase and installation of the required control technologies. Finally, we believe that it is not feasible at this time to accelerate the emission reduction schedule for the State and Federal mobile source which must rely on fleet turnover over the years to ultimately deliver the anticipated emission reductions. The District's control strategies are discussed in greater detail in Chapter 4 of the South Coast 2007 AQMP, and in section II.F. below.

In addition, the State has adopted standards for many categories of on-road and off-road vehicles and engines, and gasoline and diesel fuels, and included commitments to develop rules for Smog Check Improvements, Cleaner In-Use Heavy-Duty Trucks, and Cleaner In-Use Off-Road Equipment.

EPA believes that the District and State are implementing these rules and programs as expeditiously as practicable and that it is not feasible to have faster implementation dates nor are there any additional feasible measures which can be implemented. We anticipate that the District and CARB will reevaluate this conclusion after completion of the mid-course review of the PM_{2.5} attainment SIP for this area, due in April 2011. EPA also expects that the District and CARB will continue to investigate opportunities to accelerate progress as new control opportunities arise, and that the agencies will promptly adopt and expeditiously implement any new measures found to be feasible in the future.

As discussed below, however, we are proposing to disapprove the RACM/RACT demonstration in the South Coast 2007 AQMP because we cannot approve the attainment demonstration. As stated in the PM_{2.5} implementation rule preamble at 20601, EPA cannot grant an extension of the attainment date beyond the initial five years provided by section 172(a)(2)(A) if the State has not adequately considered and evaluated the implementation of RACM and RACT in the area. By definition, RACM/RACT are those controls that are necessary to demonstrate attainment as expeditiously as practicable and meet any RFP requirements. 40 CFR § 51.10101(a).

For these reasons, EPA is proposing to not grant California's request for an attainment date extension to April 5, 2015 for the South Coast PM_{2.5} nonattainment area. Given the severity of the PM_{2.5} nonattainment problem in the South Coast nonattainment area, an extension of the attainment date would most likely be appropriate and approvable if it were supported by the necessary analysis and part of an attainment plan that meets the applicable statutory and regulatory requirements including RACM/RACT.

F. Adopted Control Strategy and Enforceable Commitments

1. Requirements for Control Strategies and Enforceable Commitments

CAA section 172(c)(6) requires nonattainment plans to “include enforceable emission limitations, and such other control measures, means or techniques (including economic incentives such as fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such standard in such area by the applicable attainment date....” CAA section 110(a)(2)(A), which applies to all SIPs, contains virtually identical language. The PM_{2.5} implementation rule requires all control measures needed for attainment to be implemented as expeditiously as practicable but no later than the beginning of the year prior to the attainment date. 40 CFR § 51.1007(b).

In most instances, a nonattainment plan should include the adopted measures it relies on to demonstrate attainment and RFP and/or meet other CAA requirements or should identify the adopted measures it relies on that are already SIP approved, federally promulgated, or otherwise SIP creditable. EPA, however, recognizes that circumstances exist that warrant the initial use of enforceable state commitments in place of these adopted measures. We believe that the CAA allows approval of such enforceable commitments as elements of a CAA control strategy requirement where they are limited in scope.

The language in CAA sections 110(a)(2)(A) and 172(c)(6) cited above is quite broad, allowing a SIP to contain any “means or techniques” that EPA determines are “necessary or appropriate” to meet CAA requirements, such that the area will attain as expeditiously as practicable, but no later than the designated date. Furthermore, the express allowance for “schedules and timetables” demonstrates that Congress understood that all required controls might not have to be in place before a SIP could be fully approved.

Commitments approved by EPA under CAA section 110(k)(3) are enforceable by EPA and citizens under, respectively, CAA sections 113 and 304. In the past, EPA has approved enforceable commitments and courts have enforced actions against states that failed to comply with them: See, e.g., *American Lung Ass'n of N.J. v. Kean*, 670 F. Supp. 1285 (D.N.J. 1987), *aff'd*, 871 F.2d 319 (3rd Cir. 1989); *NRDC, Inc. v. N.Y. State Dept. of Env. Cons.*, 668 F. Supp. 848 (S.D.N.Y. 1987); *Citizens for a Better Env't v. Deukmejian*, 731 F. Supp. 1448, *recon. granted in par*, 746 F. Supp. 976 (N.D. Cal. 1990); *Coalition for Clean Air v. South Coast Air Quality Mgt. Dist.*, No. CV 97-6916-HLH, (C.D. Cal. Aug. 27, 1999). Further, if a state fails to meet its commitments, EPA could make a finding of failure to implement the SIP under CAA section 179(a)(4), which starts an 18-month period for the state to correct the non-implementation before mandatory sanctions are imposed.

Once EPA determines that circumstances warrant the use of an enforceable commitment, EPA considers three factors in determining whether to approve the enforceable commitment: (a) does the commitment address a limited portion of the statutorily-required program; (b) is the

state capable of fulfilling its commitment; and (c) is the commitment for a reasonable and appropriate period of time.⁶⁶

2. Control Strategy in the South Coast 2007 AQMP and Revised 2007 State Strategy

For the purposes of evaluating the South Coast 2007 AQMP and Revised 2007 State Strategy, we have divided the measures relied on in the attainment and RFP demonstrations and to meet the contingency measures requirement into two categories: baseline measures and control strategy measures.

As the term is used here, baseline measures are federal, State, and District rules and regulations adopted prior to October 2006 (i.e., prior to South Coast 2007 AQMP and State Strategy development) that continue to generate emissions reductions through to the attainment year of 2014 and beyond. 2007 State Strategy, Appendix A, p. 1., and South Coast 2007 AQMP, Appendix III, p. III-2-3. Reductions from these measures are incorporated into the baseline inventory and, for the most part, not individually quantified. These measures provide the majority of emissions reductions needed to attain the PM_{2.5} standards in the South Coast nonattainment area. See Table G-1 in this TSD.

Control strategy measures are the new rules, rule revisions, and commitments that provide the additional increment of emission reductions needed beyond the baseline measures to demonstrate RFP and attainment, meet RACM/RACT, and/or provide for contingency measures.

We evaluate the control strategy measures in this section. Baseline measures are listed in Appendices A and B to this TSD.

a. District Control Strategy Measures and Commitments

For the South Coast 2007 AQMP, the District identified and committed to updating and adopting 9 control measures and newly adopting and implementing 28 new control measures to reduce emissions of direct PM_{2.5}, NO_x, SO_x, and/or VOC. In Table F- 1 below, we list the anticipated timing of the expected emissions reductions from these measures; however, we note that the District's commitment is only to aggregate emissions reductions. See South Coast 2007 AQMP, p. 4-2 and 4-73 and SCAQMD Governing Board Resolution, p. 10.

In Table F-2, we give the current SIP submittal and approval status of the measures in the South Coast 2007 AQMP. In Tables F-3, we show the emissions reductions, as given in the South Coast 2007 AQMP and in individual rule submittals, for the measures that have been approved by EPA and for the measures that have been approved by or submitted to EPA, respectively. The reductions listed in Table F-3 are the ones anticipated to be achievable from each rule at the time the South Coast 2007 AQMP was adopted. Actual reductions from each

⁶⁶ The U.S. Court of Appeals for the Fifth Circuit upheld EPA's interpretation of CAA sections 110(a)(2)(A) and 172(c)(6) and the Agency's use and application of the three factor test in approving enforceable commitments in the Houston-Galveston ozone SIP. *BCCA Appeal Group et al. v. EPA et al.*, 355 F.3d 817 (5th Cir. 2003).

rule once adopted may be greater or less than the anticipated reductions. Finally, in Table F-4 we provide the overall control strategy for the South Coast 2007 AQMP.

Table F-1
South Coast Air Quality Management District
Estimated Emissions Reductions for South Coast 2007 AQMP Specific Rule Commitments
(tons per average annual day)

	NOx		VOC		PM2.5		SOx	
	Based on Adoption Date	Based on Implementation Date	Based on Adoption Date	Based on Implementation Date	Based on Adoption Date	Based on Implementation Date	Based on Adoption Date	Based on Implementation Date
2007	0.4	0.4	0.8	0.8	1.0	--	--	--
2008	5.6	--	3.1	--	0.4	1.0	3.0	--
2009	0.8	--	4.5	--	0.4	--	--	--
2010	--	0.5	2.0	3.1	1.2	0.4	--	--
2011	--	--	--	0.8	--	--	--	--
2012	--	--	--	3.7	--	--	--	--
2013	--	--	--	--	--	--	--	--
2014	--	3.5	--	--	--	1.1	--	3.0
2023	--	2.4	--	2.0	----	0.4	--	--
Commitment to Total Reductions	6.8	6.8	10.4	10.4	2.9	2.9	3.0	3.0

Source: South Coast 2007 AQMP, Table 4-10

Table F-2		
Approval and Submittal Status of District Rules in the South Coast 2007 AQMP		
Rule 1144 - Vanishing oils and rust inhibitors	SIP-approved	75 FR 40726, 07/14/10
Rule 1143 - Consumer Paint Thinners and Multi-Purpose Solvents	Not yet submitted – to be adopted December 2010	New rule; no previous version approved into the SIP; District is revising rule.
Rule 1145 – Plastic, Rubber, Leather and Glass Coatings	SIP-approved	75 FR 40726, 07/14/10
Rule 1147 – NOx reductions from miscellaneous sources	SIP-approved	75 FR 46845, 08/04/2010
Rule 2002- Further SOx reductions from RECLAIM	Not yet adopted	Most recent approval of Rule 2002 – August 29, 2006, 71 FR 51120
Rule 1111 - Further NOx reductions from space heaters	SIP-approved	75 FR 46845, 08/04/2010
Rule 1110.2 – Liquid and gaseous fuels – stationary ICEs	SIP-approved	74 FR 18995, 4/27/09
Rule 1146 – NOx from industrial, institutional, commercial boilers, steam gens, and process heaters	Submitted	Most recent approval – April 8, 2002, 67 FR 16640
Rule 1146.1 - NOx from small industrial, institutional, commercial boilers, steam gens, and process heaters	Being acted on	Most recent approval – September 6, 1995 – 60 FR 46220
Rule 1127 - Livestock Waste	Submitted to EPA on 10/05/06	Found complete on October 25, 2006
Refinery Pilot Program	Not yet adopted	N/A
Rule 2301 – Indirect Source Review	Not yet adopted	N/A
Carl Moyer program	No rule associated with this measure	ongoing
AB923 Light and medium duty vehicle high emitter program	No rules associated with these measures	N/A

Table F-3. Status of District Short and Intermediate Term Control Measures Credited in South Coast 2007 AQMP Attainment Demonstration

Control measure	Rule No.	Title	Emissions Reduction Commitment in South Coast 2007 AQMP	Emissions Reductions Achieved^a
CTS-01	1144	Vanishing oils and rust inhibitors	1.9 tpd VOC	2.7 tpd VOC
CTS-03	1143	Consumer Paint Thinners and Multi-Purpose Solvents	2.1 tpd VOC	Not yet submitted
CTS-04	1145	Plastic, Rubber, Leather and Glass Coatings		negligible
CMB-01	1147	NOx reductions from miscellaneous sources	3.5 tpd NOx	6.2 tpd NOx
CMB-02	2002	Further SOx reductions from RECLAIM	3.0 tpd SOx	
FUG – 04	1149	Storage Tank and Pipeline Cleaning and Degassing	none	1.3 tpd VOC
CMB-03	1111	Further NOx reductions from space heaters	0.8 tpd NOx	0.1 tpd NOx
MCS-01	1110.2	Liquid and gaseous fuels – stationary ICEs		0.4 tpd NOx 0.3 tpd VOC
	1146	NOx from industrial, institutional, & commercial boilers, steam generators, and process heaters	1.6 tpd NOx 0.4 tpd PM _{2.5} 2.0 tpd VOC	
	1146.1	NOx from small ind, inst, & comm'l boilers, steam gens, and		

		proc. hrs		
MCS-05	1127	Livestock waste	0.8 tpd VOC	
FLX-02		Refinery pilot program	0.7 tpd VOC, 0.4 tpd PM _{2.5}	
MOB-04 ^b		Carl Moyer funds	7.5 tpd NOx, 0.2 tpd PM _{2.5}	7.5 tpd NOx + 3 tpd NOx 0.2 tpd PM _{2.5}
MOB-05	2251	AB923 LDV high emitter program	0.8 tpd VOC, 0.4 tpd NOx	
MOB-06		AB923 MDV high emitter program	0.5 tpd VOC, 0.5 tpd NOx	
			Total achieved PM _{2.5} reductions	0.2
			Total achieved VOC reductions	4.3
			Total achieved NOx reductions	14.5

^a From District Rule Evaluation Forms.

^b The 2007 State Strategy credits the South Coast Carl Moyer program with an additional 3 tpd of NOx beyond what the District claims for emissions reduction credit for the program. (See 2007 State Strategy, page 17)

Table F-4				
South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
Control Measure		Implementing Agency	Adoption Date	Implementation period
Facility Modernization				
MCS-01	Facility Modernization (NO _x , VOC, PM _{2.5})	SCAQMD	2008-2010	Beginning 2012
Energy Efficiency/Conservation				
MCS-02	Urban Heat Island [All Pollutants]	SCAQMD	On-going	On-going
MCS-03	Energy Efficiency and Conservation [all Pollutants]	SCAQMD	2008-2010	Beginning 2010
Good Management Practices				
FUG-01	Improved Leak Detection and Repair [VOC]	SCAQMD	2008-2009	2009-2010
FUG-02	Emission Reductions from Gasoline Transfer and Dispensing Facilities [VOC]	SCAQMD	2009	2010-2012
FUG-04	Emission Reductions from Pipeline and Storage Tank Degassing [VOC]	SCAQMD	2007	2008-2009
BCM-01	PM Control Devices (Baghouses, Wet Scrubbers, Electrostatic Precipitators, Other Devices)[PM]	SCAQMD	2008-2009	2010-2012
MCS-04	Emissions Reductions from Green Waste Composting [VOC, PM]	SCAQMD	Phase 1: 2008-09 Phase 2: 2010	2012
MCS-06	Improved Start-up, Shut-Down, and Turnaround Procedures [All Pollutants]	SCAQMD	2010	2012
Market Incentives/Compliance Flexibility				
CTS-02	Clean Coating Certification Program [VOC]	SCAQMD	2009-2010	2010
CMB-02	Further SO _x Reductions from RECLAIM (BARCT) [SO _x]	SCAQMD	2008	2011-2014
FLX-01	Economic Incentive Programs [All Pollutants]	SCAQMD	On-going	On-going
FLX-02	Petroleum Refinery Pilot Program [VOC and PM _{2.5}]	SCAQMD	2008	2010
Area Sources				
FUG-03	Emissions Reductions from Cutback	SCAQMD	2008	2010

Table F-4 South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
	Asphalts [VOC]			
CTS-01	Emissions Reductions from Lubricants [VOC]	SCAQMD	2008	2010
CTS-03	Consumer Products Certification and Emissions Reductions from Use of Consumer Products at Institutional and Commercial Facilities [VOC]	SCAQMD	2007-2010	2010-2020
CTS-04	Emission Reductions from the Reduction of VOC Content of Consumer Products not Regulated by the State Board [VOC]	SCAQMD	2008-2010	2010-2020
CMB-01	NOx Reductions from non-RECLAIM Ovens, Dryers, and Furnaces [NOx]	SCAQMD	2008	Beginning 2010
CMB-03	Further NOx Reductions from Space Heaters [NOx]	SCAQMD	2009	Beginning 2012
CMB-04	Natural Gas Fuel Specifications [All Pollutants]	SCAQMD	2008	2009
BCM-02	PM Emission Hot Spots – Localized Control Program [PM2.5]	SCAQMD	On-going	On-going
BCM-03	Emission Reductions from Wood Burning Fireplaces and Wood Stoves [PM2.5]	SCAQMD	2007-2008	2008-2014
BCM-04	Additional PM Emission Reductions from Rule 444 - Open Burning [PM2.5]	SCAQMD	2007	2008-2010
BCM-05	PM Emission Reductions from Underfired Charbroilers [PM2.5]	SCAQMD	2010	2014
MCS-05	Emission Reductions from Livestock Waste [VOC]	SCAQMD	2009	2011
MCS-07	Application of all Feasible Measures [All Pollutants]	SCAQMD	On-going	2010-2020
MCS-08	Clean Air Act Emission Fees for Major Stationary Sources [VOC, Nox]	SCAQMD	2009-2010	2011
Emission Growth Management				
EGM-01	Emission Reductions from New or Redevelopment Projects [NOx, VOC, PM2.5]	SCAQMD	2009	Beginning 2010

Table F-4				
South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
EGM-02	Emission Budget and Mitigation for General Conformity Projects [All Pollutants]	SCAQMD	Beginning 2007	Beginning 2007
EGM-03	Emissions Mitigation and Federally Permitted Projects [All Pollutants]	SCAQMD	Beginning 2007	Beginning 2007
District's Mobile Source Program				
MOB-01	Mitigation Fee Program for all Federal Sources [All Pollutants]	SCAQMD	2007-2010	2010-2020
MOB-02	Expanded Exchange Program [All Pollutants]	SCAQMD	Beginning 2007	2010-2020
MOB-03	Backstop Measure for Indirect Sources of Emissions at Ports and Port-Related Facilities [All Pollutants]	SCAQMD	2007-2010	2010-2020
MOB-04	Emission Reductions from the Carl Moyer Program [NO _x , PM _{2.5}]	SCAQMD	On-going	On-going
MOB-05	AB923 Light Duty Vehicle High Emitter Identification Program [NO _x , VOC]	SCAQMD	On-going	2007-2020
MOB-06	AB923 Medium Duty Vehicle High Emitter Identification Program [NO _x , VOC]	SCAQMD	2008	2010-2020
MOB-07	Concurrent Reductions From Global Warming Strategies [All Pollutants]	SCAQMD	On-going	On-going
Mobile Source and Consumer Product Control Measures Developed by CARB*				
ARB-ONRD-01	Smog Check Enhancements [VOC, NO _x , PM]	BAR	2007-2008	By 2010
ARB-ONRD-02	Expanded Vehicle Retirement [VOC, NO _x , PM]	CARB/BAR	2008-2014	2008-2014
ARB-ONRD-03	Modifications to Reformulated Gasoline Program [VOC]	CARB	2007	Beginning 2010
ARB-ONRD-04	Cleaner In-Use Heavy Duty Trucks [VOC, NO _x , PM]	CARB	2008	2010-2015
ARB-ONRD-05	Port Truck Modernization [NO _x , PM]	CARB/ SCAQMD	2007-2008	2008-2020
ARB-OFRD-	Marine Vessels – Fuel, Auxiliary	U.S.	2007-2009	

Table F-4 South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
01	& Main Engines [VOC, NO _x]	EPA/CARB/SCAQMD		Beginning 2010
ARB-OFRD-02	Accelerate Introduction of Cleaner Line-Haul Locomotives [VOC, NO _x , PM]	CARB/U.S. EPA	2007-2008	Beginning 2012
ARB-OFRD-03	Clean Up Existing Harbor Craft [VOC, NO _x , PM]	CARB	2007	2009-2018
ARB-OFRD-04	Cleaner In-Use Off-Road Equipment [VOC, NO _x , PM]	CARB	2007	Phase in starting 2008
ARB-OFRD-05	New Emission Standards for Recreational Boats [VOC, NO _x]	CARB	2009-2010	2012-2023
ARB-OFRD-06	Expanded Off-Road Recreational Vehicle Emission Standards [VOC]	CARB	By 2010	2012-2023
ARB-CONS-01	Consumer Products [VOC]	CARB	2007-2012	2010-2014
Recommended Mobile Source and Clean Fuel Control Measures*				
SCONRD-01	Accelerated Penetration of Advanced Technology Partial Zero and Zero Emission Vehicles [VOC, NO _x , CO]	CARB	2007-2008	2010-2023
SCONRD-02	Deployment of On-Board Diagnostics (Phase III) in Light and Medium Duty Vehicles [VOC, NO _x , CO, PM]	CARB/BAR	2008	2012-2023
SCONRD-03	Further Emission Reductions From On Road Heavy-Duty Vehicles [NO _x , PM]	CARB/SCAQMD	2008	2010-2014
SCONRD-04	Further Emission Reductions from Heavy-Duty Trucks Providing Freight Drayage	CARB/ Marine Ports/ SCAQMD	2007-2008	2008-2023

Table F-4 South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
	Services [NO _x , PM]			
SCOFFRD-01	Construction/Industrial Equipment Fleet Modernization [VOC, NO _x]	CARB	2007	2009-2023
SCOFFRD-02	Further Emission Reductions from Cargo Handling Equipment [NO _x , PM]	CARB/ Marine Ports	2007-2008	2010-2014
SCOFFRD-03	Further Emission Reductions from Locomotives [NO _x , PM]	U.S.EPA	2007-2008	2012-2014
SCOFFRD-04	Emission Reductions from Airport Ground Support Equipment [NO _x , VOC, PM]	CARB	2007-2008	2010-2014
SCOFFRD-05	Emission Reductions from Transport Refrigeration Units [NO _x]	CARB	2009	2010-2023
SCOFFRD-06	Accelerated Turnover and Catalyst Based Standards for Pleasure Crafts [VOC, NO _x , PM]	CARB	2007-2008	2010-2023
SCFUEL-01	Further Emission Reduction from Gasoline Fuels [NO _x , SO _x]	CARB	2007	2010-2012
SCFUEL-02	Greater Use of Diesel Fuel Alternatives [NO _x , SO _x , PM]	CARB/SCAQMD	2008	2015
Transportation Control Measures				

Table F-4				
South Coast Air Quality Management District 2007 AQMP Control Measures, Implementing Agency, Adoption Date, and Implementation Period				
TCM-A	HOV Improvements	SCAG, CTCs, Local Gov't	2007	2007-2023
TCM-B	Transit & Systems Management	SCAG, CTCs, Local Gov't	2007	2007-2023
TCM-C	Information Based Measures	SCAG, CTCs, Local Gov't	2007	2007-2023
Long-Term Mobile Source and Consumer Product Control Measures				
SCLTM-01A	Further Emission Reductions from On-Road Mobile Sources [NO _x]	CARB	2009-2012	2015-2023
SCLTM-01B	Further Emission Reductions from On-Road Heavy-Duty Vehicles [NO _x]	CARB/BAR	2009-2012	2015-2023
SCLTM-02	Further Emission Reductions from Off-Road Mobile Sources [NO _x]	CARB/ U.S. EPA	2009-2012	2015-2023
SCLTM-03	Further Reductions from Consumer Products [VOC]	CARB	2009-2012	2015-2023

From South Coast 2007 AQMP, Table 7-3, pages 7-5 to 7-9.

* The 2007 South Coast AQMP notes that "The recommended mobile source and clean fuel control measures listed in this table represent a menu of potential control strategies which could be implemented by CARB to achieve the additional 63 tons per day of NO_x reductions needed for PM_{2.5} attainment by 2015. Annual rulemaking schedule to be developed by CARB within adoption date window but at earliest practicable date to achieve the necessary reductions." When CARB adopted the South Coast 2007 AQMP, it did not adopt the measures assigned to CARB by SCAQMD in this table.

b. CARB Measures and Commitments

The 2007 State Strategy provides a list of State measures adopted from 1994 until 2006. See 2007 State Strategy, p. 38. A fuller list can be found in Appendix A of this TSD.

In addition to the State's baseline measures, the 2007 State Strategy includes enforceable commitments for emissions reductions from mobile source categories that are crucial for attainment of the PM_{2.5} NAAQS in the South Coast nonattainment area. For the South Coast nonattainment area, the 2007 State Strategy includes State commitments to achieve 152 tpd of NO_x reductions, 46 tpd of VOC reductions, 9 tpd of direct PM_{2.5} and 20 tpd of SO_x reductions. See 2007 State Strategy, p. 63 and CARB Resolution 07-28 (September 27, 2007), Attachment B, p. 5.

The 2007 State Strategy expects to achieve these emission reductions in the South Coast Air Basin by the attainment year of 2014 from measures such as Smog Check Improvements, Cleaner In-Use Heavy-Duty Trucks, Cleaner In-Use Off-Road Equipment, Cleaner Main Ship Engines and Fuels, Clean up Existing Harbor Craft, Ship Auxiliary Engine Cold Ironing and Clean Technology, and accelerated introduction of cleaner line-haul locomotives. These measures are described in more detail in the 2007 State Strategy (April 26, 2007), Chapter 5.

In the 2007 State Strategy, CARB provides an estimated emissions reduction for each measure to show that, when considered together, these measures can meet the total commitment. CARB states, however, that its enforceable commitment here is achieve the aggregate emissions reductions for each pollutant by specific dates and not for a specific level of reductions from any specific measure. See 2007 State Strategy, p. 58. A summary of the estimates from the proposed measures is provided in Table F-5 below. In this table, we list only those 2007 State Strategy measures for which CARB estimated an emissions reduction in the South Coast.

CARB's commitment is also to propose specific new measures that are identified and defined in the 2007 Strategy State. See 2007 State Strategy, p. 64. Table F-5 below lists these defined measures. As shown on this table, the State adopted many of the measures. Table F-6 lists the emissions reductions the State estimates it will achieve from these measures as adopted. Table F-7 lists the emissions reductions that are currently creditable for SIP purposes.

Table F-5 Expected Emission Reductions from Defined Measures in the 2007 State Strategy for the South Coast Air Basin (Tons Per Day 2014)				
Measure	NO _x	VOC ⁶⁷	PM _{2.5}	SO _x
Smog Check Improvements (BAR)	12.0	10.5	0.2	--
Expanded Vehicle Retirement	2.4	2.8	0.05	--
Modifications to the Reformulated Gasoline Program	--	4.4	--	--
Cleaner In-Use Heavy-Duty Trucks	76.3	5.1	3.0	--
Ship Auxiliary Engine Cold Ironing and Clean Technology	18.5	--	0.3	0.4
Cleaner Main Ship Engines and Fuels	20.0	--	2.4	19.7
Clean up Existing Harborcraft	4.6	--	0.2	
Accelerated Intro. of Cleaner Line-Haul Locomotives	4.3	0.7	0.2	--
Cleaner In-Use Off-Road Equipment (>25hp)	10.5	2.7	2.6	--
New Emissions Standards for Recreational Boats	0.4	4.2	--	--
Expanded Off-Road Rec. Vehicle Emissions Standards	--	2.4	--	--
Consumer Products	--	12.9	--	--
Co-Benefits from Greenhouse Gas Reduction Measures	3.0	NYQ	NYQ	NYQ
Totals:	152	46	9	20

Source: 2009 State Strategy Status Report, p. 17. Only defined measures with NO_x, VOC, PM_{2.5} or SO_x reductions in the South Coast are shown here. NYQ = not yet quantified

⁶⁷ CARB uses the term reactive organic gases (ROG) where we use the term VOC. We will use the term VOC in this document to refer to both ROG and VOC.

Table F-6 2007 State Strategy Defined Measures Schedule for Consideration and Current Status			
State Measures	Primary Area	Expected Adoption Year	Current Status
Defined Measures in 2007 State Strategy			
Smog Check Improvements	Both	2007-2008	Elements approved 75 FR 38023 (July 1, 2010)
Expanded Vehicle Retirement	Both	2008-2014	Adopted by CARB, June 2009; by BAR, September 2010
Modification to Reformulated Gasoline Program	Both	2007	Approved, 75 FR 26653 (May 12, 2010)
Cleaner In-use Heavy Duty Trucks	Both	2008	Adopted December, 2008; pending revisions
Auxiliary Ship Cold Ironing and Other Clean Technologies	SC	2007-2008	Adopted December, 2007
Cleaner Main Ship Engines and Fuels	SC	Fuel: 2007 Engines: 2009	Adopted July 2007
Port Truck Modernization	SC	2007-2008	Adopted December 2007 and December 2008
Accelerated Introduction of Cleaner Locomotives	Both	2007-2008	In progress
Clean Up Existing Harbor Craft	SC	2007	Adopted November 2007, revised June 2010.
Cleaner In-Use Off-Road Engines	Both	2007	Adopted July 2007, pending revisions.
Cleaner In-Use Agricultural Equipment	SJV	2009	Incentive program in progress
New Emissions Standards for Recreational Boats	Both	2009-2010	Partially adopted, July, 2008; additional requirements pending
Expanded Off-Road Recreational Vehicle Emissions Standards	Both	By 2010	Adopted November 2008
Enhanced Vapor Recovery for Above Ground Storage Tanks	Both	2007	Adopted June, 2007
Additional Evaporative Emissions Standards	Both	By 2010	Partial adoption: September, 2008 (outboard marine tanks)
Consumer Products Program (I & II)	Both	2008 & 2010-2012	Phase I – Approved, 74 FR 57074 (November 4, 2009). Additional revision adopted 2009.

Table F-6 2007 State Strategy Defined Measures Schedule for Consideration and Current Status			
State Measures	Primary Area	Expected Adoption Year	Current Status
Department of Pesticides Pesticide Regulations	SJV	2008	Adopted 2008, amended 2009, additional amendments pending. SIP measures submitted October 2009
Additional Measures Adopted Since 2007			
Light duty Vehicle Catalyst Replacement	Both	N/A	Adopted October 2007
Greenhouse Gas Emissions from Heavy-duty Vehicles	Both	N/A	Adopted December 2008
Large Spark Ignition Engines greater than 1 liter, Rule Amendment	Both	N/A	Adopted November 2008

SC = South Coast Air Basin. Source: 2009 State Strategy Status Report, p. 23 (footnotes in original not included)

Table F-7 Achieved Emission Reductions from Defined Measures in the 2007 State Strategy for the South Coast (Tons Per Day 2014)				
Measure	NO _x	VOC	PM _{2.5}	SO _x
Smog Check Improvements (BAR) [partial]	2.0	4.1	--	--
Modifications to Reformulated Gasoline Program	--	4.4	--	--
Cleaner In-Use Heavy-Duty Trucks	59.7	5	3.5	--
Ship Auxiliary Engine Cold Ironing and Clean Technology	25.4	0.1	0.5	0.3
Cleaner Main Ship Engines and Fuel (fuel portion only)	1.3	--	1.9	17.0
Accelerated Intro. Of Cleaner Line-Haul Locomotives	NYQ	NYQ	NYQ	NYQ
Clean Up Existing Harbor Craft	2.4	0.1	0.1	--
Cleaner In-Use Off-Road Equipment (>25hp)	10.5	2.7	2.6	--
Consumer Products Program [partial]	--	1.8	--	--
Totals:	101.3	18.2	8.6	17.3

Source: 2009 State Strategy Status Report, p. 5. Only defined measures that have been adopted with PM_{2.5}, NO_x, VOC or SO_x reductions in the South Coast are shown here. NYQ = Not yet quantified.

<p align="center">Table F-8 Current Creditable Emission Reductions from Defined Measures in the 2007 State Strategy for the South Coast (Tons Per Day 2014)</p>				
Measure	NOx	VOC	PM _{2.5}	SOx
Modifications to Reformulated Gasoline Program	--	4.4	--	--
Cleaner In-Use Heavy Duty Trucks (not submitted)	0.0	0.0	0.0	0.0
Cleaner In-Use Off-Road Equipment (>25 hp) (not submitted)	0.0	0.0	0.0	0.0
Ship Auxiliary Engine Cold Ironing and Clean Technology	25.4	0.1	0.5	0.3
Clean up Existing Harborcraft	2.4	0.1	0.1	--
Consumer Products program (partial)	--	1.8	--	--
Totals:	27.8	6.4	0.6	0.3

Source: 2009 State Strategy Status Report, p. 5. Only defined measures with PM_{2.5},NOx, VOC, or SOx reductions in the South Coast are shown here. NYQ = Not yet quantified.

3. EPA’s Evaluation and Conclusion

a. Baseline Measures

As shown in Table F-9, the majority of the emission reductions needed to demonstrate attainment come from baseline measures. These reductions come from a combination of District and State measures.⁶⁸

In the past two decades, the District has adopted (and in many case revised each several times) about 80 prohibitory rules that limit emissions of NOx, VOC, particulate matter and/or SOx including most of the rule adoptions/revisions it commitment to as part of the South Coast 2007 AQMP. See Appendix B and Table F-3. These rules include controls for boilers, fugitive dust sources, internal combustion engines, woodburning, and open burning. The great majority of these rules and rule revisions are currently SIP approved and as such their emissions reductions are fully creditable in attainment and RFP demonstrations and for other CAA requirements, such as contingency measures.

⁶⁸ Reductions in the baseline also come from federal measures. These federal measures include EPA’s national emission standards for heavy duty diesel trucks (66 FR 5001 (January 18, 2001)), certain new construction and farm equipment (Tier 2 and 3 non-road engines standards, 63 FR 56968 (October, 23, 1998) and Tier 4 diesel non-road engine standards, 69 FR 38958 (June 29, 2004)), and locomotives (63 FR 18978 (May 16, 1998) and 73 FR 37045 (June 30, 2008)). States are allowed to rely on reductions from federal measures in attainment and RFP demonstrations and for other SIP purposes.

Table F-9 Summary of Reductions Needed for South Coast's PM_{2.5} Attainment Demonstration (tons per average annual day in 2014)					
		NO _x	VOC	PM _{2.5}	SO _x
A	2005 baseline emissions level	972	732	101	63
B	2014 attainment target level	460	474	86	20
C	Total reductions needed from 2005 baseline levels to attain in 2014 (A – B)	512	258	15	43
D	2014 baseline emissions level	654	528	102	43
	Reductions from baseline measures (A-D)	318	204	(-1)	20
	% of reductions needed for attainment from baseline measures	62%	79%	n/a	47%
	Reductions needed from control strategy measures (D - B)	194	54	16	23
	% of reductions needed for attainment from control strategy measures	38%	21%	106%	53%

California has adopted standards for many categories of on- and off-road vehicles and engines, gasoline and diesel fuels, and numerous categories of consumer products. The State's measures fall within two categories: measures for which the State has obtained or has applied to obtain a waiver of federal pre-emption under CAA section 209 (section 209 waiver measures or waiver measures) and those for which the State is not required to obtain a waiver (non-waiver measures). See EPA's proposed approval and final approval of the San Joaquin Valley 1-Hour Ozone Plan at 74 FR 33933, 33938, (July 14, 2009) and 75 FR 10420, 10424 (March 8, 2010).

i. Section 209 Waiver Measures. A waiver under CAA section 209 is, in general, required for most of California's on- and non-road vehicle or engine standards. Examples of State waiver measures are: low emission vehicle program, heavy duty bus standards, and small off-road engines. A list of California's waiver measures can be found in the Appendix A of this TSD.

Historically, EPA has granted credit for the waiver measures without first approving them into the SIP because of special Congressional recognition, in establishing the waiver process in the first place, of the pioneering California motor vehicle control program and because amendments to the CAA (in 1977) expanded the flexibility granted to California in order "to

afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare,” (H.R. Rep. No. 294, 95th Congr., 1st Sess. 301–2 (1977)). In allowing California to take credit for the waiver measures notwithstanding the fact that the underlying rules are not part of the California SIP, EPA treated the waiver measures similarly to the Federal motor vehicle control requirements, which EPA has always allowed states to credit in their SIPs without submitting the program as a SIP revision.

EPA’s historical practice has been to give SIP credit for waiver measures by allowing California to include motor vehicle emissions estimates made by using California’s EMFAC (and its predecessor) motor vehicle emission factor model as part of the baseline emissions inventory. EMFAC was also used to prepare baseline inventory projections into the future, and thus the plans typically showed a decrease in motor vehicle emissions due to the gradual replacement of more polluting vehicles with vehicles manufactured to meet newer, more stringent California vehicle standards. The EMFAC model is based on the motor vehicle emissions standards for which California has received waivers from EPA but also accounts for vehicle deterioration and many other factors. The motor vehicle emissions estimates themselves combine EMFAC results with vehicle activity estimates, among other considerations. *See* the 1982 Bay Area Air Quality Plan, and the related EPA rulemakings approving the plan (see 48 FR 5074 (February 3, 1983) for the proposed rule and 48 FR 57130 (December 28, 1983) for the final rule) as an example of how the waiver measures have been treated historically by EPA in California SIP actions.⁶⁹

California’s motor vehicle emissions control program predates the first federal statute regulating motor vehicle emissions, the Motor Vehicle Air Pollution Control Act of 1965 (which amended the CAA of 1963). In further CAA amendments, referred to as the Air Quality Act of 1967 (Pub. L. 90-148), Congress allowed the State of California, and only California, a waiver of the Air Quality Act’s pre-emption of state emissions standards for new motor vehicles or new motor vehicle engines because of California’s pioneering efforts and unique problems. This was not changed when the statute was amended in 1970. The 1977 amendments to the CAA expanded the flexibility granted to California in order “to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare.” (H.R. Rep. No. 294, 95th Congr., 1st Sess. 301-2 (1977)). So long as California determines that

⁶⁹ EPA’s historical practice in allowing California credit for waiver measures notwithstanding the absence of the underlying rules in the SIP is further documented by reference to EPA’s review and approval of a May 1979 revision to the California SIP entitled, “Chapter 4, California Air Quality Control Strategies.” In our proposed approval of the 1979 revision (44 FR 60758, October 22, 1979), we describe the SIP revision as outlining California’s overall control strategy, which the State had divided into “vehicular sources” and “non-vehicular (stationary source) controls.” As to the former, the SIP revision discusses vehicular control measures as including “technical control measures” and “transportation control measures.” The former refers to the types of measures we refer to herein as waiver measures, as well as fuel content limitations, and a vehicle inspection and maintenance program. The 1979 SIP revision included several appendices, including appendix 4–E, which refers to “ARB vehicle emission controls included in title 13, California Administrative Code, chapter 3 * * *,” including the types of vehicle emission standards we refer to herein as waiver measures; however, California did not submit the related portions of the California Administrative Code (CAC) to EPA as part of the 1979 SIP revision submittal. With respect to the CAC, the 1979 SIP revision states: “The following appendices are portions of the California Administrative Code. Persons interested in these appendices should refer directly to the code.” Thus, the State was clearly signaling its intention to rely on the California motor vehicle control program but not to submit the underlying rules to EPA as part of the SIP. In 1980, we finalized our approval as proposed. *See* 45 FR 63843 (September 28, 1980).

its motor vehicle standards are “in the aggregate” at least as protective of public health and welfare as applicable federal standards, title II of the CAA requires EPA, unless it makes certain findings, to waive the Act’s general prohibition on state adoption and enforcement of standards relating to the control of emissions from new motor vehicles or new motor vehicle engines. See CAA section 209(a) and (b).

In the EPA’s review of the California SIP and its many revisions, EPA has historically allowed emission reduction credit for the motor vehicle emissions standards that are subject to a section 209(b) waiver without requiring California to submit the standards themselves to EPA for approval as part of the California SIP. In this respect, EPA treated these rules similarly to the federal motor vehicle control requirements, which EPA has always allowed states to credit in their SIPs without submitting the program as a SIP revision. CAA section 193, enacted as part of the 1990 Amendments to the CAA, is a general savings clause that provides for, among other things, EPA statutory interpretations that predate those amendments to remain in effect so long as not inconsistent with the Act. At the time it enacted section 193, Congress did not insert any language into the statute rendering EPA’s treatment of California’s motor vehicle standards inconsistent with the Act. Thus, in section 193, Congress effectively ratified EPA’s longstanding pre-1990 practice of allowing emission reduction credit for California standards subject to the waiver process notwithstanding the absence of the standards in the SIP itself.

As part of the 1990 Amendments to the CAA, Congress enacted subsection (e) of section 209. In nearly identical language to subsections (a) and (b) of section 209, subsection (e) sets forth the federal pre-emption of state emissions standards for non-road vehicles or engines but allows the State of California, and only California, a waiver of pre-emption (with certain exceptions) under criteria that mirror the section 209(b) waiver provisions for motor vehicles. Since 1990, EPA has treated such non-road standards in the same manner as California motor vehicle standards, i.e., allowing credit for standards subject to the waiver process without requiring submittal of the standards as part of the SIP. Congress is presumed to be aware of agency interpretations and its subsequent revision of the statute to add subsection (e) without overruling EPA’s interpretation with respect to motor vehicle standards is further compelling evidence that the Agency correctly interpreted Congressional intent with respect to crediting California requirements subject to a section 209 waiver without requiring California to submit the standards themselves to EPA for approval as part of the California SIP.

We believe that section 193 of the CAA, the general savings clause added by Congress in 1990, effectively ratified our long-standing practice of granting credit for the California waiver rules because Congress did not insert any language into the statute rendering EPA’s treatment of California’s motor vehicle standards inconsistent with the Act. Rather, Congress extended the California waiver provisions to most types of non-road vehicles and engines, once again reflecting Congressional intent to provide California with the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare. Requiring the waiver measures to undergo SIP review in addition to the statutory waiver process is not consistent with providing California with the broadest possible discretion as to on-road and non-road vehicle and engine standards, but rather, would add to the regulatory burden California faces in establishing and modifying such standards, and thus would not be consistent with

Congressional intent. In short, we believe that Congress intended California's mobile source rules to undergo only one EPA review process (i.e., the waiver process), not two.

EPA's waiver review and approval process is analogous to the SIP approval process. First, CARB adopts its emissions standards following notice and comment procedures at the State level, and then submits the rules to EPA as part of its waiver request. When EPA receives new waiver requests from CARB, EPA publishes a notice of opportunity for public hearing and comment and then publishes a decision in the Federal Register following the public comment period. Once again, in substance, the process is similar to that for SIP approval and supports the argument that one hurdle (the waiver process) is all Congress intended for California standards, not two (waiver process plus SIP approval process). Moreover, just as SIP revisions are not effective until approved by EPA, changes to CARB's rules (for which a waiver has been granted) are not effective until EPA grants a new waiver, unless the changes are "within the scope" of a prior waiver and no new waiver is needed.

Moreover, to maintain a waiver, CARB's rules can be relaxed only to a level of aggregate equivalence to the Federal Motor Vehicle Control Program (FMVCP) See section 209(b)(1). In this respect, the FMVCP acts as a partial backstop to California's on-road waiver measures (i.e., absent a waiver, the FMVCP would apply in California). Likewise, Federal non-road vehicle and engine standards act as a backstop where there is a corresponding California non-road waiver measure. The constraints of the waiver process thus serve to limit the extent to which CARB can relax the waiver measures for which there are corresponding EPA standards, and thereby serve an anti-backsliding function similar in substance to those established for SIP revisions in CAA sections 110(l) and 193. Meanwhile, the growing convergence between California and EPA mobile source standards diminishes the difference in the emissions reductions reasonably attributed to the two programs and strengthens the role of the Federal program in serving as an effective backstop to the State program. In other words, with the harmonization of EPA mobile source standards with the corresponding State standards, the Federal program is becoming essentially a full backstop to most parts of the California program.

We note that CARB has as long a history of enforcement of vehicle/engine emissions standards as EPA, and CARB's enforcement program is equally as rigorous as the corresponding EPA program. The history and rigor of CARB's enforcement program lends assurance to California SIP revisions that rely on the emissions reductions from CARB's rules in the same manner as EPA's mobile source enforcement program lends assurance to other state's SIPs in their reliance on emissions reductions from the FMVCP.

ii. Non-waiver measures

These measures include improvements to California's inspection and maintenance (I/M) program, SmogCheck, and cleaner burning gasoline and diesel regulations. A list of these non-waiver measures, most of which have been SIP approved, can be found Appendix A.

b. Enforceable Commitments

As stated and shown in Table F-10 below, measures already adopted by the District and State (both prior to and pursuant to the South Coast 2007 AQMP) and approved by EPA provide the majority of emission reductions needed to demonstrate attainment. The balance of the needed reductions is in the form of enforceable commitments by CARB and the District.

We believe that, with respect to the South Coast 2007 AQMP and revised 2007 State Strategy, circumstances warrant the consideration of enforceable commitments as part of the attainment demonstration for the South Coast nonattainment area. As shown in Table F-9 above, the majority of emissions reductions that the State currently estimates are needed to demonstrate attainment and RFP in the South Coast nonattainment area come from the baseline measures. As a result of these State and District efforts, most sources in the South Coast nonattainment area were already subject to stringent rules prior to the State Strategy's and the South Coast 2007 AQMP's development, leaving fewer and more technologically challenging opportunities to reduce emissions in the nonattainment area. In the South Coast 2007 AQMP and the 2007 State Strategy, the District and CARB identified potential control measures that could achieve the additional emission reductions needed for attainment. See South Coast 2007 AQMP, Chapter 4, and 2007 State Strategy, Chapter 5. However, the timeline needed to develop, adopt, and implement these measures went well beyond the April 5, 2008⁷⁰ deadline to submit the PM_{2.5} attainment plan. Given these circumstances, we consider the District's and CARB's reliance in the South Coast 2007 AQMP and 2007 State Strategy on enforceable commitments to be warranted. We now consider the three factors EPA uses to determine whether enforceable commitments in lieu of adopted measures to meet CAA planning requirements is approvable.

⁷⁰ The 2007 State Strategy was developed to address both the 1997 PM_{2.5} NAAQS and the 1997 8-hour ozone NAAQS. The 8-hour ozone SIPs were due in November 2007, and the development and adoption of the State Strategy was timed to coordinate with this submittal date. 2007 State Strategy, p. 1.

Table F-10					
Reductions Needed for Attainment Remaining as Commitments based on Approved Measures using Plan Assumptions Regarding Emissions Reductions (tons per average annual day in 2014)					
		NO _x	VOC	PM _{2.5}	SO _x
A	Total reductions needed from baseline and control strategy measures to attain	512	258	15	43
B	Reductions from baseline measures	318	204	(-1)	20
C	Total reductions needed from new measures and commitments	194	54	16	23
D	Total reductions from approved measures	42.3	10.7	1.8	0.3
	Total reductions remaining as commitments (C-D) ^a	151.7	43.3	14.2	22.7
	% of total reductions needed remaining as commitments ^a	30%	18%	89%	53%
District Commitments					
	Total District commitments ^b	32	10	4	3
	Total reductions from approved District measures	14.5	4.3	1.2	0
	Total reductions remaining as District commitments	17.5	5.7	2.8	3
	% of District's commitments remaining as commitments	55%	57%	70%	100%
CARB Commitments					
	Total CARB commitments	152	46	9	20
	Total reductions from approved/waived measures	27.8	6.4	0.6	0.3
	Total reductions remaining as CARB commitments	124.2	39.6	8.4	19.7
	% of CARB commitments remaining as commitments	80%	86%	93%	99%

^a NO_x reductions include 10 tpd federal assignment.

^b Note: The Proposed 2007 State Strategy had a State commitment of 122 tpd of NO_x. However, Attachment B of the CARB Board Resolution adopting the 2007 State Strategy, CARB commits to an additional 30 tpd of NO_x reductions in the South Coast by 2014. See CARB Board Resolution 07-28, Attachment B, page 4. In addition, the CARB Staff Report on the South Coast 2007 AQMP commits the District to a total of 32 tpd of NO_x. See Staff Report, Proposed 2007 State Implementation Plan for the South Coast Air Basin – PM_{2.5} Annual Average and 8-Hour Ozone National Ambient Air Quality Standards, CARB, September 21, 2007, pages ES-3 and 17.

i. Commitments are a Limited Portion of Required Reductions

For the first factor, we look to see if the commitment addresses a limited portion of a statutory requirement, such as the amount of emissions reductions needed for attainment in a nonattainment area.

As shown in Table F-10, the remaining portion of the enforceable commitments- after accounting for approved or applied for waivers measures, for the South Coast 2007 AQMP and 2007 State Strategy are 151.7 tpd NO_x, 43.3 tpd VOC, 14.2 tpd PM_{2.5}, and 22.7 tpd SO_x. When compared to the total reductions needed by 2014 for PM_{2.5} attainment in the South Coast nonattainment area, the remaining portion of the enforceable commitments represents approximately 30 percent of the needed NO_x, 18 percent of the needed VOC, 89 percent of the needed PM_{2.5} and 53 percent of the needed SO_x. Historically, EPA has approved SIPs with enforceable commitments in the range of 10 percent or less. See our approval of the San Joaquin Valley PM₁₀ Plan at 69 FR 30005, May 26, 2004, the San Joaquin Valley 1-hour ozone plan at 75 FR 10420, March 8, 2010, and the Houston-Galveston 1-hour ozone plan at 66 FR 57160, 57161 (November 14, 2001).

We note that there are significant emissions reductions tied to the Cleaner In-Use Heavy-Duty Trucks measure and Cleaner In-Use Off-Road Engines listed in the 2009 State Strategy Status Report, page 5. EPA understands that the State is working on adopting revisions to these rules and submitting them for EPA approval or waiver under CAA section 209 as necessary. It is possible that the reductions from these measures and several outstanding District rules will reduce the percentage of the remaining portion of the enforceable commitments to below percent. However, until these (or other) measures are adopted, submitted, and EPA approved, as necessary, we believe the percentages of enforceable commitments for direct PM_{2.5}, NO_x, VOC and SO_x relied upon by the South Coast 2007 AQMP and the revised 2007 State Strategy, do not represent a limited portion of the State's current estimate of total emissions reductions needed to meet the statutory requirement for attainment in the South Coast nonattainment area.

ii. The State is Capable of Fulfilling Its Commitment

For the second factor, we consider whether the State and District are capable of fulfilling their commitments.

As discussed above, CARB adopted and submitted a 2009 State Strategy Status Report which updates and revises the 2007 State Strategy. This report shows that CARB has made significant progress in meeting its enforceable commitments for the South Coast and several other nonattainment areas in California. The 2009 State Strategy Status Report shows that during 2007 and 2008, the State has adopted rules for ten measures identified in the 2007 State Strategy and three rules that were not identified in the Strategy that will contribute to the needed PM_{2.5} and PM_{2.5} precursor reductions needed to attain the PM_{2.5} NAAQS in the South Coast nonattainment area. The 2009 State Strategy Status Report includes a table with estimates of the reductions that may fulfill the CARB's full commitment. See 2009 State Strategy Status Report, p. 17.

EPA believes that the District has also made good progress in meeting its enforceable commitments and that its continued efforts in committing to and adopting measures for sources under its jurisdiction will help the District meet its commitments. See Table F-1.

In addition, beyond the rules discussed above, both CARB and the District have well-funded incentive grant programs to reduce emissions from the on- and off-road engine fleets.

While progress has been made by the District and State to achieve their enforceable commitments, there are still significant reductions that must be addressed in order to satisfy the commitments. As discussed above, the remaining portion of the enforceable commitments is 18-89 percent of the relevant pollutants. Given the evidence of the State's and District's efforts to date and their continuing efforts to reduce emissions, we believe that the State and District are capable of meeting their enforceable commitments to achieve total reductions of 151.7 tpd NO_x, 43.3 tpd VOC, 14.2 tpd direct PM_{2.5} and 22.7 tpd SO₂ in the South Coast nonattainment area by 2014.

iii. The Commitment is for a Reasonable and Appropriate Timeframe

Finally, for the third factor, we consider whether the commitment is for a reasonable and appropriate period of time. In order to meet the commitments to achieve reductions of 151.7 tpd NO_x, 43.3 tpd VOC, 14.2 tpd direct PM_{2.5} and 22.7 tpd SO₂ by 2014, the South Coast 2007 AQMP and 2007 State Strategy include an ambitious rule development, adoption, and implementation schedule. EPA considers this schedule to provide sufficient time to achieve the committed reductions by 2014. As we noted before, many of the scheduled measures have been adopted. See Tables F-2 and F-7 above. The State and District are continuing to evaluate their adopted measures and the need for additional reductions from new measures.

While we believe the State and District have provided a reasonable and appropriate schedule for achieving their commitments by 2014, as discussed above, EPA is not proposing to grant the attainment date extension for the South Coast nonattainment area. Thus, we cannot currently conclude that the third factor is satisfied.

G. Attainment Demonstrations

1. Requirement for Attainment Demonstrations

CAA section 172(c) requires states to submit plans that demonstrate attainment of the applicable standard as expeditiously as practicable but no later than the applicable attainment date. Under the PM_{2.5} implementation rule, this demonstration should consist of four parts:

- (1) technical analyses that locate, identify, and quantify sources of emissions that are contributing to violations of the PM_{2.5} NAAQS;
- (2) analyses of future year emissions reductions and air quality improvement resulting from already-adopted national and local programs, and from potential new local measures to meet the RACT, RACM, and RFP requirements in the area;
- (3) adopted emissions reduction measure with schedules for implementation; and
- (4) contingency measures required under section 172(c)(9) of the CAA.

See 72 FR 20586 (April 25, 2007), at 20605.

The requirements for parts 1 and 2 are described in the emissions inventory, air quality modeling, and RACM/RACT sections of this TSD. Requirements for parts 3 and 4 are described in the control strategy and contingency measures sections of this TSD, respectively. In this section, we evaluate how these parts taken together provide or do not provide for attainment of the 1997 PM_{2.5} NAAQS in the South Coast as expeditiously as practicable but no later than the attainment date required by the CAA.

2. Attainment Demonstration in the South Coast 2007 AQMP

The attainment demonstration in the South Coast 2007 AQMP is in Chapter 5, "Future Air Quality." It is summarized in Table G-1 below. Table G-2 shows the contribution by the District and CARB to the control strategy.

<p align="center">Table G-1 Summary of Reductions Needed for South Coast's PM_{2.5} Attainment Demonstration (tons per average annual day in 2014)</p>					
		NO _x	VOC	PM _{2.5}	SO _x
A	2005 baseline emissions level	972	732	101	63
B	2014 attainment target level*	460	474	86	20
C	Total reductions needed from 2005 baseline levels to attain in 2014 (A – B)	512	258	15	43
D	2014 baseline emissions level	654	528	102	43
Reductions from baseline measures (A-D)		318	204	(-1)	20
% of reductions needed for attainment from baseline measures		62%	79%	n/a	47%
Reductions needed from control strategy measures (D - B)		194	59	16	23
% of reductions needed for attainment from control strategy measures		38%	23%	106%	53%

*The South Coast 2007 AQMP and the 2009 State Strategy use slightly different attainment targets. The CARB Staff Report for the South Coast 2007 AQMP presents a slightly different emissions carrying capacity which relies more heavily on reductions of primary PM_{2.5} and less heavily on reductions of precursors to PM_{2.5}. The Staff Report's emission carrying capacity estimates are PM_{2.5} - 86 tons/day, NO_x - 460 tons/day, SO_x - 20 tons/day, and VOC - 474 tons/day (see CARB Staff Report on the South Coast AQMP, page ES-3). Therefore, the percentage reductions needed for attainment in this table may not add up to 100%. In the proposed rule and this TSD, we use the CARB Staff Report carrying capacity numbers.

Table G-2 Summary of Control Strategy Reductions by Agency (tons per average annual day in 2014)					
		NO _x	VOC	PM _{2.5}	SO _x
	Total reductions needed from baseline and control strategy measures to attain	512	258	15	43
	Total reductions from control strategy measures	194	53	16	23
	District commitments	32	10	4	3
	% of total control strategy reductions from District commitments	16.5%	19%	26.7%	13%
	State commitments*	152	46	9	20
	% of total control strategy reductions from State commitments	78.3%	87%	60%	87%
	Federal assignment**	10 (5.2%)	--	--	--

* The 2007 State Strategy identifies 9 tpd of directly-emitted PM_{2.5} as the aggregate State commitment by the 2015 attainment date (see 2009 State Strategy Status Report, page 20) but the CARB staff report for the South Coast 2007 AQMP indicates a 12 tpd commitment. (see 2007 Staff Report, page ES-3) It is unclear whether the State's commitment is for 9 tpd direct PM_{2.5} or 12 tpd of direct PM_{2.5}.

**The AQMP assigns 10 tpd of NO_x reductions to the federal government. We are proposing to disapprove this assignment.

Since adoption and submittal of the 2007 State Strategy and the South Coast 2007 AQMP, both CARB and the District have adopted most of the measures in their plans, and many have been approved by or submitted to EPA. See Appendix B, Table B-1 in this TSD. Each approved measure reduces the level of the District's and State's commitments. Table G-3 shows the effect of SIP approvals or submittals on the overall level of commitments in the South Coast 2007 AQMP.

<p align="center">Table G-3 Reductions Needed for Attainment Remaining as Commitments based on Approved Measures using Plan Assumptions Regarding Emissions Reductions (tons per average annual day in 2014)</p>						
		NO _x	VOC	PM _{2.5}	SO _x	Combined
A	Total reductions needed from baseline and control strategy measures to attain	512	258	15	43	828
B	Reductions from baseline measures	318	204	(-1)	20	541
C	Total reductions from approved measures (Table F-	42.3	10.7	1.8	0.3	55.1
	Total reductions remaining as commitments (A-B-C)	151.7 ^a	43.3	14.2	22.7	221.9
	% of total reductions needed remaining as commitments	30% ^a	18%	89%	53%	28%
<hr/>						
	Total District commitments	32	10	4	3	49
	Total reductions from approved District measures	14.5	4.3	1.2	0	20
	Total reductions remaining as District commitments	17.5	5.7	2.8	3	29
	% of District's commitments remaining as commitments	55%	57%	70%	100%	59%
<hr/>						
	Total CARB commitments	152	46	9	20	227
	Total reductions from approved/waived measures	27.8	14.1	0.6	0.3	42.8
	Total reductions remaining as CARB commitments	124.2	31.9	8.4	19.7	184.2
	% of CARB commitments remaining as commitments	80%	86%	93%	99%	81%

^a Includes the 10 tpd NO_x federal assignment.

3. EPA's Evaluation and Conclusion

In order to approve a SIP's attainment demonstration, EPA must make several findings and approve the State's requested attainment date.

First, we must find that the demonstration's technical bases -- emissions inventories and air quality modeling -- are adequate. As discussed above in sections II.A. and II.B., we are proposing to approve the emissions inventories and the air quality modeling on which the South Coast 2007 AQMP's attainment demonstration is based.

Second, we must find that the SIP provides for expeditious attainment through the implementation of all RACM and RACT. As discussed above in section II.D., we are proposing to disapprove the RACM/RACT demonstration in the South Coast 2007 AQMP .

Third, EPA must find that the emissions reductions that are relied on for attainment are creditable. As discussed in section II.F., the South Coast 2007 AQMP relies on enforceable commitments for almost 30 percent of the State's current estimate of the combined emissions reductions needed to attain the 1997 PM_{2.5} NAAQS in the South Coast nonattainment area. See Table G-3. While EPA has previously accepted enforceable commitments in lieu of adopted control measures in attainment demonstrations, EPA has done so only when the circumstances warrant it and the commitments meet three criteria. We believe that circumstances here warrant the consideration of enforceable commitments. We also believe that both the State and the District have demonstrated their capability to meet their commitments. However, the commitments do not constitute a limited portion of the required emissions reductions and are not for an appropriate timeframe. The State's and District's unfulfilled commitments currently represent 89 percent of the PM_{2.5} reductions, 28 percent of the NO_x reductions, 18 percent of the VOC reductions and 53 percent of the SO₂ emissions reductions currently estimated to be required for attainment of the 1997 PM_{2.5} NAAQS in the South Coast nonattainment area. These percentages are well above the 10 percent figure generally accepted by EPA to approve an attainment demonstration that relies in part on enforceable commitments.

Finally, for a PM_{2.5} nonattainment area that cannot attain with five years of its designation as nonattainment, EPA must grant an extension of the attainment date in order to approve the attainment demonstration for the area. As discussed above in section II.E., while we believe that an extension of the attainment date would be appropriate if supported by the necessary analysis, we are proposing to not grant the State's request to extend the attainment date in the South Coast nonattainment area to April 5, 2015.

For the foregoing reasons, we are proposing to disapprove the attainment demonstration in the South Coast 2007 AQMP.

H. Reasonable Further Progress Demonstrations

1. Requirements for Reasonable Further Progress Demonstrations

CAA section 172(c)(2) requires that plans for nonattainment areas shall provide for reasonable further progress (RFP). RFP is defined in section 171(1) as “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part [Part D] or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable [NAAQS] by the applicable date.”

The PM_{2.5} implementation rule requires a state to submit an RFP plan at the same time as its attainment demonstration for any area for which the state requests an extension of the attainment date beyond 2010. The RFP plan must provide emission reductions such that emissions in 2009 represent generally linear progress from the baseline year to the attainment year. Where a state requests an extension of the attainment deadline to 2014 or 2015, the state must additionally provide emission reductions such that emissions in 2012 represent generally linear progress from the baseline year to the attainment year. See 40 CFR § 51.1009(c). 72 FR 20586 at 20633

The RFP plan must describe the control measures that provide for meeting the reasonable further progress milestones for the area, the timing of implementation of those measures, and the expected reductions in emissions of direct PM_{2.5} and all PM_{2.5} attainment plan precursors. See 40 CFR § 51.1009(c).

A state is also required to demonstrate in its RFP plan that in each applicable milestone year (that is, 2009 and/or 2012), emissions will be at a level consistent with generally linear progress in reducing emissions between the base year and the attainment year. See 40 CFR § 51.1009(d). A state may demonstrate this generally linear progress by showing that emissions for each milestone year are either 1) roughly equivalent to benchmark emission levels for direct PM_{2.5} emission and each PM_{2.5} attainment plan precursor addressed in the plan or 2) at levels included in an alternative scenario that is projected to result in a generally equivalent improvement in air quality by the milestone year as would be achieved under the first option. See 40 CFR § 51.1009(g). 72 FR 20586 at 20639.

The steps for determining the benchmark emissions levels is given in the PM_{2.5} implementation rule in 40 CFR § 51.1009(f):

(1) For direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy, the full implementation reduction is calculated by subtracting the full implementation inventory from the baseline year inventory. The “full implementation inventory” is the projected RFP emission inventory for the year preceding the attainment date, representing a level of emissions that demonstrates attainment. The “baseline year inventory” is the emissions inventory for the year also used as the base year for the attainment demonstration (see 40 CFR § 51.1000, “Baseline year inventory”).

(2) For direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy, a benchmark emission reduction is calculated by multiplying the full

implementation reduction by the milestone date fraction. The “milestone date fraction” is the ratio of the number of years from the baseline year to the milestone inventory year divided by the number of years from the baseline year to the full implementation year.

(3) The benchmark emission level in the milestone year is calculated for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor by subtracting the benchmark emission reduction from the baseline year emission level. The benchmark RFP plan is defined as a plan that achieves benchmark emission levels for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy for the area.

In comparing inventories between baseline and future years for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor, the inventories must be derived from the same geographic area. The plan must include emissions estimates for all types of emitting sources and activities in the geographic area from which the emission inventories for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the plan are derived. See 40 CFR § 51.1009(f)(5).

The equivalence of an alternative scenario to the corresponding benchmark plan must be determined by comparing the expected air quality changes of the two scenarios at the design value monitor location. This comparison must use the information developed for the attainment plan to assess the relationship between emissions reductions of the direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy and the ambient air quality improvement for the associated ambient species. See 40 CFR § 51.1009(h). The preamble to the proposed PM_{2.5} implementation rule provides an example of an alternative scenario. See 70 FR 65984, at 66012-66013 (November 1, 2005).

2. RFP Demonstration in the South Coast 2007 AQMP

The RFP demonstration is in Chapter 6 of the South Coast 2007 AQMP. The demonstration addresses NO_x, VOC, direct PM_{2.5}, and SO_x and uses the 2002 annual average day inventory as the baseline year inventory and 2014 as the attainment year. The 2014 attainment year is 12 years from the 2002 baseline year making the 2009 milestone date fraction 7/12 and the 2012 milestone date fraction 10/12.

Table H-1 RFP Calculations (tons per average annual day)					
		NO _x	VOC	PM _{2.5}	SO _x
1	2002 baseline inventory (tpd)	1093	844	99	53
2	Annual percentage change needed to show linear progress (%)	4.87	3.7	1.01	5.35
3	2009 target needed to show linear progress (tpd)	720	625	92	33
4	2009 remaining emissions with plan (tpd)	813	578	99	28
5	Projected shortfall (tpd)	93	0	7	0
6	2012 target needed to show linear progress (tpd)	561	532	89	25
7	2012 remaining emissions with plan (tpd)	565	505	92	21
8	Projected shortfall (tpd)	4	0	3	0
9	2014 remaining emissions with plan (tpd)	459	464	87	19

Source: Table 6-3A of the South Coast 2007 AQMP.

Table H-2 Reductions Needed from Contingency Measures to Equal One Year's Worth of RFP (tons per average annual day)					
		NO _x	VOC	PM _{2.5}	SO _x
A	2002 baseline	1093	844	99	53
B	2014 attainment	460	474	86	20
C	Emissions reductions needed for attainment (A-B)	633	370	13	33
D	One year's RFP (C/12)	52.8	30.8	1.08	2.75
E	One year's RFP as percent of 2002 baseline	4.8%	3.6%	5.2%	1.9%

Source: Table 6-3A of South Coast 2007 AQMP and EPA staff calculations.

Based on the information in the above table, the District concludes that the South Coast 2007 AQMP meets the RFP requirement with generally linear progress towards attainment and by providing reductions in direct PM_{2.5} and precursor emissions as quickly as possible.

3. EPA's Evaluation and Conclusion

Because California has requested an attainment date of 2015 for the South Coast, the Plan has addressed RFP for both 2009 and 2012 as required by 40 CFR § 51.1009(c).

The South Coast 2007 AQMP describes in Chapter 4 (Tables 4-1, 4-2 and 4-10) and Chapter 7 (Table 7-3) the non-baseline control measures that are relied on to meet the reasonable further progress milestones for the area, the timing of implementation of those measures, and the expected reductions in emissions of direct PM_{2.5} and PM_{2.5} attainment plan precursors as required by 40 CFR § 51.1009(c).

The inventories used for comparing the baseline and future years are derived from the same geographic area and include emissions estimates for all types of emitting sources and activities in the geographic area from which the emission inventories for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the Plan are derived as required 40 CFR § 51.1009(c).

Under the PM_{2.5} implementation rule, States may demonstrate generally linear progress by one of two methods: 1) showing emissions levels in the area will be roughly equivalent to benchmark emission levels for direct PM_{2.5} emission and each PM_{2.5} attainment plan precursor addressed in the plan or 2) at levels included in an alternative scenario that is projected to result in a generally equivalent improvement in air quality by the milestone year as would be achieved under the first option. See 40 CFR § 51.1009(g). The District uses the first method in its RFP demonstration.

In preparing calculating its RFP demonstration, the District followed the procedures in by 40 CFR § 51.1009(f) and correctly calculated its benchmark emissions levels.

While we believe the District has demonstrated generally linear progress towards attainment by 2015, we are not proposing to approve the attainment date extension to 2015. We believe, however, that if the deficiencies identified with the attainment demonstration are addressed, we may then be able to approve the attainment date extension and RFP demonstration. See 40 CFR § 51.1009

I. Contingency Measures

1. Requirement for Contingency Measures

Section 51.1012 of the PM_{2.5} implementation rule implements the subpart 1 requirement that all PM_{2.5} nonattainment areas must include in their SIPs contingency measures consistent with section 172(c)(9). Contingency measures are additional control measures to be implemented in the event that an area fails to meet RFP or fails to attain the standards by its attainment date. These contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date. The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP. 72 FR 20586 (April 25, 2007), at 20642

The key requirements associated with contingency measures are:

- Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date.
- The SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without further action by the State or by EPA.
- The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP.
- The measures should provide for emission reductions equivalent to about 1 year of reductions needed for RFP, based on the overall level of reductions needed to demonstrate attainment divided by the number of years from the base year to the attainment year.

See 72 FR 20586 (April 25, 2007), at 20643.

The April 16, 1992 General Preamble (57 FR 13498, 13512) provided the following guidance on contingency measures which continues to be applicable:

States must show that their contingency measures can be implemented without further action on their part and with no additional rulemaking actions such as public hearings or legislative review. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the State of its failure.”

Contingency measures can include Federal measures and local measures already scheduled for implementation, as explained below. EPA has approved numerous SIPs under this interpretation—i.e., that use as contingency measures one or more Federal or local measures that are in place and provide reductions that are in excess of the reductions required by the attainment

demonstration or RFP plan. (62 FR 15844, April 3, 1997; 62 FR 66279, December 18, 1997; 66 FR 30811, June 8, 2001; 66 FR 586 and 66 FR 634, January 3, 2001.) 72 FR 20586 (April 25, 2007), at 20642.

The key to this approach is that the statute requires that contingency measures provide for additional emission reductions that are not relied on for RFP or attainment and that are not included in these demonstrations. The purpose is to provide a cushion while the plan is being revised to meet the missed milestone. In other words, contingency measures are intended to achieve reductions over and beyond those relied on in the attainment and RFP demonstrations. Nothing in the statute precludes a State from implementing such measures before they are triggered. In fact, a court ruling upheld contingency measures that were previously required and implemented where they were in excess of the attainment demonstration and RFP SIP. *See LEAN v. EPA*, 382 F.3d 575, 5th Circuit, 2004. 72 FR 20586 (April 25, 2007), at 20642

2. Contingency Measures in the South Coast 2007 AQMP

The attainment plan for the South Coast includes contingency measures to be implemented if the area fails to attain by its attainment date or fails to meet RFP requirements. The South Coast contingency measures are described in Chapter 9 of the South Coast 2007 AQMP and discussed in more detail in Appendix IV-A, section 2 of the AQMP. They are described below.

CARB discusses the contingency measure provision in Appendix D of the 2007 State Strategy. This discussion addresses the contingency measure provisions for California's 8-hour ozone plans and not the PM_{2.5} plans.

The South Coast 2007 AQMP describes the contingency measures in the following way, "Although implementation of these measures is expected to reduce emissions, there are issues that limit the viability of these measures as AQMP control measures at this time. Issues surrounding these measures include, but are not limited to availability of District resources to implement and enforce the measures, cost-effectiveness of the measure, potential adverse environmental impacts, potential economic impacts, effectiveness of emissions reductions, and availability of methods to quantify emissions reductions." South Coast 2007 AQMP, page 9-1. The contingency measures do not meet the requirements of the CAA, namely the requirements for these contingency measures to be fully adopted or otherwise ready for quick implementation, for trigger mechanisms and an implementation schedule, and the AQMP does not provide for quantification of emissions reductions demonstrating the equivalent of one year of RFP for any of the suggested contingency measures.

CTY-01 - Offsetting potential emissions increase due to change in natural gas specifications

This proposed contingency measure requires RECLAIM facilities that use natural gas of a quality that creates more emissions to offset these emissions for all pollutants. The measure is listed as a "Remaining 2003 AQMP Revision Control Measure" and thus was relied on in the 2003 AQMP for attainment. In addition, the reductions are not quantified, and may be zero, since the proposed measure may only reduce future emissions increases rather than provide net reductions. There is no trigger mechanism, and the AQMP does not quantify the reductions

associated with this measure. For these reasons, this proposed measure does not meet CAA requirements for contingency measures.

CTY – 02 – Clean Air Act Emission Fees for Major Stationary Sources – This proposed contingency measure would use fees generated from the District’s Rule 317, Clean Air Act Nonattainment Fees, to achieve emissions reductions. The implementation of Rule 317 is triggered by a failure of the South Coast to attain the 1-hour standard by its applicable attainment date (which can occur no earlier than November 15, 2010) and not by any failure to make RFP or to attain the PM_{2.5} NAAQS, a minimum requirement for contingency measures for PM_{2.5} SIPs. There is no implementation schedule provided, and the AQMP does not quantify the reductions associated with this measure. For these reasons, this proposed measure does not meet CAA requirements for contingency measures.

CTY-03 - Banning pre-Tier 3 off road diesel engines on High Pollution Advisory (HPA) days – This proposed contingency measure would complement a CARB rule which proposed to establish declining fleet average emissions levels for off-road equipment over 25 horsepower (hp). The District proposed a complementary measure, SC-OFFRD-1, which would ban the use of pre-Tier 3 off-road diesel engines after 2023 on HPA days should the South Coast Air Basin fail to meet the 8-hour ozone standard. This proposed contingency measure would require additional rulemaking at the District level, as it is not currently adopted. It also would be implemented too late in time to provide for RFP or contingency reductions for PM_{2.5} RFP or attainment. In addition, the AQMP does not quantify the reductions associated with this measure. For these reasons, this proposed measure does not meet CAA requirements for contingency measures.

CTY-04 - Accelerated implementation of CARB’s mobile source measures – This proposed contingency measure, which could function as both an RFP and an attainment contingency measure, requires the District’s Board to request that CARB accelerate the adoption and/or implementation of the remaining control measures that have not been adopted or fully implemented by one year. South Coast 2007 AQMP, page 9-3. Under CAA section 172(c)(9) and EPA’s long-standing policies interpreting this section, contingency measures must require minimal additional rulemaking by the State and take effect within a few months of a failure to make RFP or to attain. This proposed contingency measure would require additional rulemaking at the District level and potentially substantial and lengthy additional rulemaking at the State level to be implemented. There is no trigger mechanism or implementation schedule provided, and the AQMP does not quantify the reductions associated with this measure. For these reasons, this proposed measure does not meet CAA requirements for contingency measures.

Post-Attainment-Year Emissions Reductions. We note that we are not proposing to approve the attainment date extension. However, even if it were approved, excess reductions in 2015/2016 from CARB mobile source measures do not fully address the contingency measure requirement for the PM_{2.5} attainment year. There is no calculation of the emissions reductions equivalent of one year’s work of RFP in the South Coast 2007 AQMP. However, from information in the Plan, we calculate one year’s worth of RFP to be 1.08 tpd PM_{2.5}, 52.8 tpd NO_x, 30.8 tpd of VOC, and 2.75 tpd SO₂. See TSD, section II.H, and CARB Staff Report on the 2007 South Coast AQMP, Appendix A. However, CARB’s mobile source measures do not provide sufficient NO_x

reductions to meet one year's worth of RFP; therefore, post-attainment-year emissions reductions cannot be used to meet the CAA contingency measure requirement.

3. Proposed Action on the Contingency Measures

The South Coast 2007 AQMP includes suggestions for several measures that do not meet the CAA's minimum requirements (e.g., no additional rulemaking, surplus to attainment and RFP needs). The AQMP, however, indicates that the measures proposed by the District are not adopted, and does not quantify the expected emissions reductions so we can gauge if they provide reductions equivalent to one year's worth of RFP. For the reasons stated above, we are proposing to disapprove the District's contingency measures in the South Coast 2007 AQMP for PM_{2.5}. The approvability issues related to the South Coast 2007 AQMP's contingency measures are listed in Table J-1.

Table J-1. Summary of Approvability of Contingency Measures from the South Coast 2007 AQMP							
Measure	RFP or Attainment Contingency Measure?	Approvable as a Contingency Measure?	Comment	Quantified Reductions (Tons per Average Annual Day)			
				NO _x	VOC	PM _{2.5}	SO _x
Offsetting potential emissions increase due to change in natural gas specifications	Attainment	No	Not triggered by failure to make RFP or attain; reductions associated with this measure may only offset potential increases and not provide net reductions; reductions not quantified; control measure in 2003 AQMP.	Not quantified			
Ozone Nonattainment Area Fee	2012 RFP milestone/ Attainment	No	Not triggered by failure to make RFP or attain for the PM _{2.5} standard; reductions not quantified;.	Not quantified			
Banning pre-Tier 3 off road diesel engines on High Pollution Advisory (HPA) days	Attainment	No	Does not trigger until 2023; would require additional rulemaking; reductions not quantified;.	Not quantified			
Request CARB to expedite implementation of mobile source controls	Both	No	Would require additional rulemaking at District and State level; reductions not quantified;.	Not quantified			
Post-Attainment year emissions reductions*	RFP	No	Insufficient excess reductions in RFP demonstration to meet 1 year of required NO _x reductions; reductions not quantified;	Not quantified in plan			

*Calculated by EPA staff as the difference in total emissions in the on-road mobile and other mobile sources categories between 2014 and 2015 on page 72 (NO_x) of 2007 State Strategy, Appendix A. See also Table H-2 of this TSD, where one year of RFP reductions is calculated.

J. Adequacy of the Motor Vehicle Emissions Budgets in the South Coast 2007 AQMP

1. Requirements for Motor Vehicle Emissions Budgets

CAA section 176(c) requires Federal actions in nonattainment and maintenance areas to conform to the SIP's goals of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of the standards. Conformity to the SIP's goals means that such actions will not: (1) cause or contribute to violations of a NAAQS, (2) worsen the severity of an existing violation, or (3) delay timely attainment of any NAAQS or any interim milestone.

Actions involving Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) funding or approval are subject to the EPA's transportation conformity rule, codified at 40 CFR part 93, subpart A. Under this rule, metropolitan planning organizations (MPOs) in nonattainment and maintenance areas coordinate with state and local air quality and transportation agencies, EPA, FHWA, and FTA to demonstrate that an area's regional transportation plans (RTP) and regional transportation improvement programs (RTIP) conform to the applicable SIP. This demonstration is typically done by showing that estimated emissions from existing and planned highway and transit systems are less than or equal to the motor vehicle emissions budgets (budgets) contained in the SIP. An attainment, maintenance, or RFP SIP should include budgets for the attainment year, each required RFP year or the last year of the maintenance plan, as appropriate. Budgets are generally established for specific years and specific pollutants or precursors.

PM_{2.5} attainment and RFP plans should identify budgets for direct PM_{2.5} and all PM_{2.5} attainment plan precursors. All direct PM_{2.5} SIP budgets should include direct PM_{2.5} motor vehicle emissions from tailpipe emissions, brake wear, and tire wear. A state must also consider whether re-entrained paved and unpaved road dust or highway and transit construction dust are significant contributors and should be included in the direct PM_{2.5} budget. See 40 CFR § 93.102(b) and § 93.122(f) and the conformity rule preamble at 69 FR, 40004, 40031–40036 (July 1, 2004). In determining whether the on-road mobile source emissions of a PM_{2.5} attainment plan precursor are significant, state and local agencies should use the criteria for insignificance findings provided in 40 CFR § 93.109(k). See also 70 FR 24280, 24282–24287 (May 6, 2005).

Before an MPO may use budgets in a submitted SIP, EPA must first determine that the budgets are adequate. In order for us to find the budgets adequate and eventually approvable, the submittal must meet the conformity adequacy requirements of 40 CFR § 93.118(e)(4) and be approvable under all pertinent SIP requirements. The budgets must reflect all of the motor vehicle control measures contained in the attainment and RFP demonstrations. See 40 CFR § 93.118(e)(4)(v).

2. Motor Vehicle Emissions Budgets in the South Coast 2007 AQMP

As submitted on November 28, 2007, the 2007 South Coast AQMP included a set of PM_{2.5} budgets for RFP years 2009 and 2012, the attainment year 2014, and analysis years 2023 and 2030 for directly emitted PM_{2.5}, VOC, and NO_x. See CARB Resolution 07-05, which revised the budgets in the 2007 South Coast AQMP as adopted by the SCAQMD, and which was included in the November 28, 2007 submittal. We refer to these budgets as the “original” budgets.

3. May 6, 2008 Adequacy/Inadequacy Finding

On April 30, 2008, CARB submitted a SIP revision that replaces the original set of PM_{2.5} budgets with two new sets of budgets (“replacement” budgets). One set of the replacement budgets is referred to as “SIP-based” budgets, and the other set is referred to as “baseline” budgets. In its April 30, 2008 submittal, CARB requests that EPA give primary consideration to the “SIP-based” budgets and only find the “baseline” budgets to be adequate if EPA cannot find the “SIP-based” budgets adequate in their entirety.

The replacement budgets submitted on April 30, 2008 differ from the original budgets in that they reflect the EPA-approved EMFAC2007 motor vehicle emissions factor model (see 73 FR 3464, January 18, 2008) rather than the District’s CEPA emission factor model, which had been used for the original budgets. The “SIP-based” budgets reflect emissions reductions from rules adopted by October 2006 and also from control measures CARB expects to adopt in regulatory form in the future. The “baseline” budgets differ from the “SIP-based” budgets by excluding emission reductions from control measures in the 2007 State Strategy that had not been adopted in regulatory form by October 2006.⁷¹ Moreover, the “baseline” budgets are only established for RFP years 2009 and 2012 whereas the “SIP-based” budgets are established for the RFP years, the attainment year, and analysis years 2023 and 2030. The two sets of PM_{2.5} budgets (i.e., the replacement budgets) are shown in Tables J-1 and J-2, below.

Table J-1. “SIP-based” PM_{2.5} Motor Vehicle Emissions Budgets (annual average tons per day)

Budget Year	VOC	NO_x	PM_{2.5}
2009	196	413	38
2012	139	276	37
2014	122	201	33
2023	89	131	37
2030	75	121	39

⁷¹ With respect to the “SIP-based” budget for RFP year 2009, however, CARB did exclude the emissions reductions from measures not adopted by October 2006. Thus, the “SIP-based” PM_{2.5} budget for 2009 is the same as the “baseline” PM_{2.5} budget for that year.

Table J-2. “Baseline” PM_{2.5} Motor Vehicle Emissions Budgets (annual average tons per day)

Budget Year	VOC	NO_x	PM_{2.5}
2009	196	413	38
2012	163	337	38

On May 6, 2008, we notified CARB that we had found the “SIP-based” PM_{2.5} budgets for the 2007 South Coast AQMP, as submitted on April 30, 2008, did not meet certain adequacy requirements under 40 CFR 93.118(e)(4) and (5) and concluded that they were inadequate for transportation conformity purposes. See letter and enclosures, dated May 6, 2008 from Deborah Jordan, Director, Air Division, EPA Region IX, to James Goldstene, Executive Officer, CARB, a copy of which has been placed in the docket for this rulemaking. However, in our May 2008 adequacy determination, we found the “baseline” PM_{2.5} budgets for the RFP years 2009 and 2012 to be adequate. Generally, we found the “SIP-based” budgets to be inadequate because they reflected control measures not yet adopted in regulatory form and thus not adequately quantified or supported by the plan. In contrast, we found the “baseline” PM_{2.5} budgets to be consistent with the plan’s RFP demonstration and to be based on adopted mobile source regulations that have already been implemented. Our notice of adequacy/inadequacy was published on May 15, 2008 at 73 FR 28110 (corrected on June 18, 2008 at 73 FR 34837) and was effective on May 30, 2008. The finding is available on EPA’s transportation conformity website at <http://www.epa.gov/otaq/stateresources/transconf/pastsips.htm>.

4. EPA’s Proposed Action on the Motor Vehicle Emissions Budgets

As explained in the May 15, 2008 Federal Register notice, an adequacy review is separate from EPA’s completeness and full plan review, and should not be used to prejudge EPA’s ultimate approval action for the SIP. Even if we find a budget adequate, the SIP and the associated budget could later be disapproved.

Now that we have completed a thorough review of the entire South Coast 2007 AQMP for CAA and EPA regulations for PM_{2.5} nonattainment area SIPs, which is described above in this technical support document and in our proposed action, we have concluded that the “SIP-based” budgets are not precisely quantified because the new emission reductions do not result from adequately specified control measures, and that the plan as a whole will not ensure RFP and attainment of the PM_{2.5} NAAQS and does not show a clear relationship between the “SIP-based” budgets and the emissions inventory and control measures. We have also determined that we must propose disapprove the RFP demonstration in the South Coast 2007 AQMP, and therefore cannot propose to approve the RFP budgets. Specifically the budgets, when considered together with all other emissions sources, are inconsistent with the applicable requirements for reasonable further progress and attainment.

Thus, we propose to disapprove both the “baseline” and the “SIP-based” PM_{2.5} budgets (shown in Table J-1 and J-2 above) for transportation conformity purposes. SCAG and the U.S.

Department of Transportation are not currently using the “SIP-based” budgets in transportation conformity determinations due the inadequacy finding made in 2008. If the proposed disapproval of the budgets is finalized, then neither the “baseline” or “SIP-based” budgets could be used in transportation conformity determinations after the effective date of the disapproval.⁷²

In summary, for the reasons discussed above, we are now proposing disapproval of the “SIP-based” PM_{2.5} budgets that we previously had determined to be inadequate. Because we are proposing to disapprove the RFP demonstration, we are proposing to disapprove the “baseline” PM_{2.5} budgets for RFP years 2009 and 2012 that we previously determined to be adequate as well.

⁷² Note that the RFP budgets that EPA found adequate on May 6, 2008 remain adequate for transportation conformity purposes unless and until a final action disapproving them becomes effective.

K. Mid-Course Review

1. Requirement for Mid-Course Review Submittal

Under 40 CFR § 51.1011 of the PM_{2.5} implementation rule, each area with an approved attainment date in 2014 or 2015 is required to submit a mid-course review by April 2011. The midcourse review is to include an updated attainment demonstration as well as a review of the implementation status of measures included in the April 2008 submittal and a review of recent air quality data, as well as new or revised control measures necessary to ensure attainment by the applicable attainment date. The midcourse review is in lieu of RFP milestone reviews or any other form of tracking to ensure reasonable progress in reducing emissions is occurring. See 72 FR 20586, 20641.

The specific elements that must be included in MCR are given in § 51.1011(b). These elements are:

- (1) A review of emissions reductions and progress made in implementing control measures to reduce emissions of direct PM_{2.5} and PM_{2.5} attainment plan precursors contributing to PM_{2.5} concentrations in the area;
- (2) An analysis of changes in ambient air quality data for the area;
- (3) Revised air quality modeling analysis to demonstrate attainment; and
- (4) Any new or revised control measures adopted by the State, as necessary to ensure attainment by the attainment date in the approved SIP of the nonattainment area.

Neither the CAA nor EPA regulations require States to address the midcourse review requirement in their attainment and RFP plans due in 2008.

2. MCR Requirement in the South Coast 2007 AQMP

We anticipate receiving a mid-course review from the State in April 2011.

3. EPA's Analysis and Conclusion

SCAQMD is already taking the initial steps in preparing its PM_{2.5} MCR. EPA will work closely with the District, ARB, and other interested parties to assure that the MCR address the required elements as well as any other elements that may be needed to address deficiencies identified with the South Coast 2007 AQMP or the revised 2007 State Strategy as it affects the PM_{2.5} attainment plan for the South Coast Air Basin.

Appendix A – CARB Rules and Measures

A. Complete List of State Measures

Appendix Table A-1 is a list of all measures adopted by CARB from 1990 until the end of 2006. This period covers the 18 years prior to the development of the 2007 State Strategy and the South Coast 2007 AQMP. The table should include any substantive rules that would still be generating emissions reductions in the South Coast nonattainment area during the 2005-2014 period covered by the South Coast 2007 AQMP and thus reflected in the baseline for the South Coast 2007 AQMP.

This list does not include the limits on pesticide emissions adopted by the California Department of Pesticide Regulation nor the State's inspection and maintenance program adopted by the California Bureau of Automotive Repair.

Measures that are categorized as "Not Applicable" are either solely administrative (e.g., permit fees, state ambient air quality standards), do not address particulate matter or a PM_{2.5} attainment plan precursors in the South Coast nonattainment area (e.g., asbestos toxic control measure), or otherwise do not affect emissions in the South Coast nonattainment area (e.g., test methods).

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Antiperspirant/Deodorants. T 17, CCR, 94500-94506	11/09/89	Consumer products
Transported Pollutants (Ozone). T 17, CCR, 70500	12/04/89	Not applicable
Emission Control System Warranty. T 13, CCR, 2035-2041, 1977	12/14/89	On-road
Non-vehicular Test Methods. T 17, CCR, 94002, 94003 17, &26, 94146-94149, 94132, 94135, 94139, 94140	01/11/90	Not applicable
Certification Procedure for Aftermarket Parts. VC 27156 & 38391	02/08/90	On-road
Airborne Toxic Control Measure for Asbestos in Surfacing Applications. T 17, & 26, CCR, 93106	04/12/90	Not applicable
Test Method for Asbestos in Serpentine Aggregate. T 17, & 26, CCR, 94147, Method 435	04/12/90	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90704, 93300-93347	05/10/90	Not applicable
Airborne Air Toxic Measure for Ethylene Oxide from Sterilizers & Aerators. T 17, CCR, 93108	05/10/90	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.1, 90800, 90802-90803	05/10/90	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/14/90	Not applicable
Consumer Products Regulations for the BAAQMD. T 17, CCR, 94520-94526	06/14/90	Consumer products
Criteria for Area Designations for the State Ambient Air Quality Standard. T 17, CCR, 70303 & 70304	06/14/90	Not applicable
Emission Standards for Medium Duty Vehicles. T 13, CCR, 1900, 1956.8, 1960.1, 1968.1, 2061, 2112, 2139	06/14/90	On-road
Wintertime Limits for Sulfur in Diesel Fuel. T 13, CCR, 2255	06/21/90	Fuels
Dioxins Airborne Toxic Control Measure for Medical Waste Incinerators. T 17, CCR, 93104	07/12/90	Not applicable
Emission Reduction Accounting Procedures for California Clean Air Act. T 17, CCR, 70700-70704	07/12/90	Not applicable
Identification of Inorganic Arsenic as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/12/90	Not applicable
Evaporative Emission Standards. T 13, CCR, 1976	08/09/90	On-road
Transport Mitigation Regulations. T 17, CCR, 70600-70601	08/09/90	Not applicable
Air Toxic Fee Schedule & Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 90700-90704, 93300-93347	09/13/90	Not applicable
California Reformulated Gasoline (CaRFG), Phase I. T 13, CCR, 2251.5	09/27/90	Fuels
Low Emission Vehicles and Clean Fuels. T 13, CCR, 1900, 1904, 1956.8, 1960.1, 1960.1.5, 1960.5 and 2111, 2112, 2125, and 2139, 2061.	09/28/90	On-road
Identification of Trichloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/11/90	Not applicable
Phase I - Consumer Products. T 17, CCR, 94507-94517	10/11/90	Consumer products
Controls for Abrasive Blasting. T 17, CCR, 92000, 92200, 92400, 98500, 98510, 92520, 92530	11/08/90	Not applicable
Heavy Duty Diesel Smoke Emission Testing. T 13, CCR, 2180-2187	11/08/90	On-road
Revision to Designation Criteria. T 17, CCR, 60200-60204, 60208	11/08/90	Not applicable

Appendix Table A-1		
Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Identification of Vinyl Chloride as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	11/13/90	Not applicable
Conflict of Interest Code. T 17, CCR, 95001, et. seq.	12/13/90	Not applicable
Emission Standards for Utility and Lawn and Garden Engines. T 17, CCR, 2400 et. seq.	12/13/90	Off-road
Identification of Chloroform as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	12/13/90	Not applicable
Limit on Aromatic Content of Diesel Fuel. T 13, CCR, 2256	12/13/90	Fuels
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.2, 90801, 90803	02/24/91	Not applicable
Acid Deposition Fee Regulations. T 17, CCR, 90621.2, 90620, 90622	04/11/91	Not applicable
Non -Vehicular Test Methods. T 17, CCR, 94131, 94132, 94142	04/11/91	Not applicable
Administrative Hearing Procedures. T 17, CCR, 60075.1, 60075.47	05/09/91	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700 - 90705	06/13/91	Not applicable
Agricultural Burning Guidelines. T 17, 80130, 80150, 80250, 80260, 80290	07/11/91	Not applicable
Identification of Metallic & Inorganic Nickel Compounds as a Toxic Air Contaminant. T 17, & 26, 93000	08/08/91	Not applicable
Onboard Diagnostics for Light-Duty Trucks and Light & Medium-Duty Motor Vehicles. T 13, CCR, 1977, 1968.1	09/12/91	On-road
Identification of Perchloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/10/91	Not applicable
State Ambient Air Quality Standard for SO ₂ . T 17, CCR, 70100, 70200, 70201	10/10/91	Not applicable
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1, 1977	11/12/91	On-road
Area Designations. T 17, CCR, 60200, 60209	11/14/91	Not applicable
Low Emission Vehicles amendments revising reactivity adjustment factor (RAF) provisions and adopting a RAF for M85 transitional low emission vehicles. T 13, CCR, 1960.1	11/14/91	On-road
California Reformulated Gasoline, Phase II. T 13, CCR, 2250, 2255.1, 2252, 2260 - 2272, 2295	11/21/91	Fuels
Wintertime Gasoline Program. T 13, CCR, 2258, 2298, 2251.5, 2296	11/21/91	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Specifications for Alternative Motor Vehicle Fuel. T 13, & 26, CCR, 2290, 2291, 2292.1, 2292.2, 2292.3, 2292.5, 2292.6, 2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	12/12/91	Fuels
Heavy Duty Diesel Cycle Engines. T 13, CCR, 2420-2427	01/09/92	Off-road
Phase II - Consumer Products. T 17, CCR, 94501, 94502, 94505, 94514, 94503.5, 94506, 94507 - 94513, 94515	01/09/92	Consumer products
Identification of Formaldehyde as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	03/12/92	Not applicable
Specifications for Alternative Motor Vehicle Fuels. T 13, & 26, CCR, 2290-2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	03/12/92	On-road
Atmospheric Acidity Protection Fees. T 17, CCR, 90621.3	04/09/92	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.3, 90803	04/09/92	Not applicable
Criteria for Area Designations. T 17, CCR, 70303, 70304	05/14/92	Not applicable
Standards and Test Procedures for Alternative Fuel Retrofit Systems. T 13, CCR, 2030, 2031	05/14/92	On-road
Transported Air Pollutants. T 17, CCR, 70500	05/28/92	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90701, 90704, 90705	07/09/92	Not applicable
Identification of 1,3 Butadiene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/09/92	Not applicable
Phase 2 RFG certification fuel specifications. T 13, CCR, 1960.1, 1956.8(d)	08/13/92	On-road
CFC Refrigerants in Air Conditioning Systems. T 13, CCR, 2500	09/10/92	Not applicable
Substitute Fuel or Clean Fuel Incorporated Test Procedures. T 13, CCR, 1960.1(k), 2317	11/12/92	On-road
Notice of General Public Interest for Consumer Products. T 17, CCR, 94507 - 94517	11/30/92	Consumer products
Airborne Toxic Control Measure for Emission of Toxic Metals from Non-Ferrous Metal Melting. T 17, & 26, CCR, 93107	12/10/92	Not applicable
Criteria for Area Designations. T 17, CCR, 70303.5, 60200-60203, 60205, 70303	12/10/92	Not applicable
Smoke Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	12/10/92	On-road

Appendix Table A-1		
Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Certification Requirements for Low Emission Passenger Cars, Light-Duty Trucks & Medium Duty Vehicles. T 13, CCR, 1960.1, 1976, 2061, 1900	01/14/93	On-road
Transport Mitigation Regulations. T 17, CCR, 70600, 70601	03/11/93	Not applicable
1-year Implementation Delay in Emission Standards for Utility Engines. T 13, CCR, 2400, 2403-2407	04/08/93	Off-road
Acid Deposition Fee Regulations. T 17, CCR, 90622, 90621.4	04/08/93	Not applicable
Identification of Federal Hazardous Air Pollutants as Toxic Air Contaminants. T 17, & 26, CCR, 93001, 39665, 39666	04/08/93	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.4, 90803	04/08/93	Not applicable
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/10/93	Not applicable
Urban Transit Buses. T 13, CCR, 1956.8, 1965, 2112	06/10/93	On-road
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/08/93	Not applicable
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1	07/09/93	On-road
Mitigation Transport Pollutants. T 17, CCR, 70500, 70600	08/12/93	Not applicable
Wintertime Oxygenate Program. T 13, CCR, 2258, 2251.5, 2263(b), 2267, 2298, 2259, 2283, 2293.5	09/09/93	Fuels
Airborne Toxic Control Measure for Perchloroethylene Dry Cleaning. T 17, & 26, CCR, 93109, 93110	10/14/93	Not applicable
Diesel Fuel Regulations - Emergency. T 13, CCR, 2281(h), 2282(1)	10/15/93	Fuels
Conflict of Interest. T 17, CCR, 90500	11/18/93	Not applicable
Criteria for Area Designations. T 17, CCR, 60200-60202, 60204, 60206, 60208, 70300-70306	11/18/93	Not applicable
Off-Highway Recreational Vehicles. T 13, CCR, 2410-2414, 2111-2140	01/03/94	Off-road
Evaporative Emission Standards and Test Procedures. T 13, CCR, 1976	02/10/94	On-road
SCAQMD's Reclaim Consideration	03/10/94	Not applicable

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Measures Adopted by the California Air Resource Board
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Measure	Hearing Date	Category
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.5, 90803	04/14/94	Not applicable
Predictive Model for Phase II CaRFG. T 13, CCR, 2261, 2262-2270	06/09/94	Fuels
Small Refiner Diesel. T 13, CCR, 2282(e)(1)	07/24/94	Fuels
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/28/94	Not applicable
Utility and Lawn and Garden Equipment Engines. T 13, CCR, 2403(c), 11(a)(1)(I)(ii), 4(a)(1)(I)(ii)	07/28/94	Off-road
Alternative Control Plan for Consumer Products. T 17, CCR, 94540-94555	09/22/94	Consumer products
Diesel Fuel Certification. T 13, CCR, 1956.8(b)&(d), 1960.1(k), 2292.6	09/22/94	Fuels
Area Designations. T 17, CCR, 60201, 60204	11/09/94	Not applicable
Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	11/09/94	On-road
Onboard Diagnostics, Phase II. T 13, CCR, 1963.1, & Certification Procedures	12/08/94	On-road
Periodic Smoke Inspection Program. T 13, CCR, 2190	12/08/94	On-road
Specification for Alternative Motor Vehicle Fuels (M100). T 13 CCR, 2292.1	12/08/94	Fuels
Aerosol Coating Products and Alternative Control Plan. T 17, CCR, 94520-94528, 94540-94543, 94547...	03/23/95	Consumer products
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.6, 90803	04/27/95	Not applicable
Employee-Based Trip Reductions Emission Formula. T 13, CCR, 2330, 2331, 2332	06/29/95	Not applicable
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015, 94150-94160, 94000-94004, 94007.	06/29/95	Vapor Recovery
Heavy Duty Vehicle Exhaust Emission Standards. T 13, CCR, 1956.8 and incorporate test procedures.	06/29/95	On-road
Onboard Refueling Vapor Recovery Standards. T 13, CCR, 1976, 1978 and incorporate test procedures	06/29/95	On-road
Test Method for Oxygen in Gasoline. T 13, CCR, 2251.5(c), 2258(c), 2263(b)	06/29/95	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Retrofit Emission Standards. T 13, CCR, 1956.9, 2030, 2031, and incorporate test procedures	07/27/95	On-road
Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products. T 17, CCR, 94500-94506, 94508, 94521	09/28/95	Consumer products
Low Emission Vehicle Standards 3 (LEV 3). T 13, CCR, 1956.8, 1960.1, 1965, 2101, 2061, 2062, and incorporate test procedures	09/28/95	On-road
Test Methods for CaRFG 13, CCR, 2263(b)	10/26/95	Fuels
Required Additives in Gasoline (Deposit Control Additives). T 13, CCR, 2257 and incorporates testing procedures.	11/16/95	Fuels
CaRFG Housekeeping & CARBOB. T 13, CCR, 2263.7, 2266.5, 2260, 226 _{2.5} , 2264, 2265, 2272	12/14/95	Fuels
Exemption of Military Tactical Vehicles. T 13, CCR, 1905, 2400, 2420	12/14/95	On Road/Off Road
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705 and Appendix A	01/25/96	Not applicable
CaRFG Variance Requirements. T 13, CCR, 2271 (Emergency)	01/25/96	Fuels
Relaxation of Carbon Monoxide Emission Standards for Utility Engines. T 13, CCR, 2403 and incorporating test procedures	01/25/96	Off-road
Postpone Zero Emission Vehicle Requirements. T 13, CCR, 1900, 1960.1, 1976	03/28/96	On-road
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90803, 90800.7	04/25/96	Not applicable
Basin Boundaries for Agricultural Burning (Mojave Desert, South Coast & Salton Sea). T 17, CCR, 60104, 60109, 60114, 80280, 80311	05/30/96	Not applicable
Regulation Improvement and Repeal. T 17, CCR, 93301-93355, Appendix A-E (emissions inventory)	05/30/96	Not applicable
Regulation Improvements and Repeals (fuel additives). T 13, CCR, 2201, 2202	05/30/96	Fuels
Emissions Inventory Criteria & Guideline Report. T 17, CCR, 93300.5	07/25/96	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90701-90705 Appendix A to §§ 90700-90705	09/26/96	Not applicable
Stationary Source Test Methods. T 17, CCR, 94105, 94107, 94114, 94135, 94141, 94143, 94161	09/26/96	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Wintertime Requirements for Utility Engines & Off-Highway Vehicles. T 13, CCR, 2403	09/26/96	Off-road
Diesel Fuel Certification Test Methods . T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Fuels
Diesel Fuel Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Fuels
Antiperspirants and Deodorants, Consumer Products, Aerosol Coating Products (ARB Test Method 310). T 17, CCR, 94506(a), 94515(a), 94526	11/21/96	Consumer products
Area Designations. T 17, CCR, 60201-60209	11/21/96	Not applicable
Consumer Products and Aerosol Coating Products Amendments. T 17, CCR, 94508-94515, 99517, 94321	11/21/96	Consumer products
Transport Pollutants. T 17, CCR, 70500, 70600	11/21/96	Not applicable
Onboard Diagnostics, Phase II, Technical Status. T 13, CCR, 1968.1, 2030, 2031	12/12/96	On-road
Consumer Products (Hair Spray) Amendments. T 17, CCR, 94509, 94513, 94514	03/27/97	Consumer products
Liquefied Petroleum Gas Propane Limit Specification Delay. T 13, CCR, 2292.6	03/27/97	Fuels
Portable Equipment Registration Program. T 13, CCR, 2450-2465	03/27/97	Off-road
Identification of Inorganic Lead as Toxic Air Contaminant (TAC). T 17, CCR, 93000	04/24/97	Not applicable
Interchangeable Emission Reduction Credits. T 17, CCR, 91500	05/22/97	Not applicable
Postpone Enhanced Evaporative Emission Requirements for Ultra-Small Volume Vehicle Manufacturers. T 13, CCR, 1976 and incorporate test procedures	05/22/97	On-road
Consumer Products (Mid-Term Measures) Amendments. T 17, CCR, 94508, 94509, 94513	07/24/97	Consumer products
Off-Cycle Emissions Supplemental Federal Test Procedures (SFTPs). T 13, CCR, 1960.1, 2101 and incorporate test procedures	07/24/97	On-road
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR 90701-90705 and Appendix A	11/13/97	Not applicable
Area Designations. T 17, CCR, 60201 & 60205	11/13/97	Not applicable

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Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Consumer Products (Hairspray Credit Program). T 17, CCR, 94502, 94509, 94522, & 94548	11/13/97	Consumer products
Heavy Duty Vehicle Smoke Inspection Program/Periodic Smoke Inspection Program. T 13, CCR, 2180-2188 and 2190-2194	12/11/97	On-road
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR 90800....	01/29/98	Not applicable
Small Off-Road Engines (SORE). T 13, CCR, 2400, 2410-2414	03/26/98	Off-road
Classifying Minor Violations. T 17, CCR, 60090-60095	04/23/98	Not applicable
Heavy Duty Vehicle Regulations: 2004 Standards. T 13, CCR, 1956.8, 1965, 2036, 2112 and test procedures	04/23/98	On-road
Airborne Toxic Control Measure for Chrome Plating. T 17, CCR, 93102	05/21/98	Not applicable
Cleaner Burning Gasoline Model Flexibility. T 13, CCR, Sections 2260, 2262.1, 2262.3, 2262.4, 226 _{2.5} , 2262.6, 2262.7 and 2265	08/27/98	Fuels
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015 and 94150, 94156, 94157, 94158, 94159, 94160, 94162	08/27/98	Vapor Recovery
Identification of Diesel Exhaust as a Toxic Air Contaminant. T 17, CCR, 93000	08/27/98	Not applicable
Gasoline Deposit Control Additive Regulation. T 13, CCR, 2257, and incorporating test procedures	09/24/98	Fuels
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90701-90705 and Appendix A	10/22/98	Not applicable
Area Designations and Criteria for the National and State Ambient Air Quality Standards for Ozone. T 17, CCR, 60301, 60202, 60205, 60206, 70300-70306, 70303.1	10/22/98	Not applicable
Large Off-Road Spark-Ignition Engine Regulations. T 13, CCR, 2430 et seq., and 2411-2414	10/22/98	Off-road
Stationary Source Test Methods. T 17, CCR, 94101 - 94104, 94106, 94108 - 94113, 941T 17 - 94124, 94137 and revision of Method 12.	10/22/98	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Low Emission Vehicles Standards (LEV 2) and Compliance Assurance Program (CAP 2000). T 13, CCR, 1961 & 1962 (both new); 1900, 1960.1, 1965, 1968.1, 1976, 1978, 2037, 2038, 2062, 2101, 2106, 2107, 2110, 2112, 2114, 2119, 2130, 2137-2140, 2143-2148	11/05/98	On-road
Aftermarket Parts for Off-Road Engines. T 13, CCR, 2470-2476	11/19/98	Off-road
Consumer Products - LVP-VOC Definitions And Test Methods. T 17, CCR, 94506, 94506.5, 94508(a)(78), 94515 and 94526, and the amendment of ARB Method 310	11/19/98	Consumer products
Consumer Products, Aerosol Coatings & Antiperspirants and Deodorants. T 17, CCR, 94501, 94508, 94521, 94522, and 94524	11/19/98	Consumer products
1997 & Later Model Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2410-2414, 2415	12/10/98	Off-road
Emission Standards and Test Procedures for 2001 Marine Engines. T 13, CCR, 2440 et seq	12/10/98	Off-road
Exhaust Standards for (On-Road) Motorcycles. T 13, CCR, 1958	12/10/98	On-road
Revisions to Statewide Portable Equipment Registration Program. T 13, CCR, 2450-2463	12/10/98	Off-road
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2600-2610	12/10/98	On-road
Cleaner Burning Gasoline (Increasing the Oxygen Content). T 13, CCR, sections 226 _{2.5} (b) and 2265(a)(2)	12/11/98	Fuels
Specifications for Liquid Petroleum Gas Used as a Motor Vehicle Fuel. T 13, CCR, 2292.6	12/11/98	Fuels
Cleaner Burning Gasoline, Oxygen Requirement for Wintertime In Lake Tahoe Area/Gas Pump Labeling for MTBE. T 13, CCR, 226 _{2.5} , and 2273	06/24/99	Fuels
Gasoline Vapor Recovery Systems. T 17, CCR, 94011, 94153, 94155, and incorporated test procedures, CP-201, TP- 201.4, and TP-201.6	06/24/99	Vapor Recovery
Clean Fuels Regulation Requirements. T 13, CCR, sections 2300-2317, and 2303.5, 2311.5	07/22/99	On-road
Portable Container Spillage Control Measure. T 13, CCR, 2470-2478	09/23/99	Off-road
Administrative Hearing Procedures. T 17, CCR, 60040 and 60075.1-60075.45	10/22/99	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
California Consumer Products Regulation Mid-Term Measures II. T 17, CCR, 94508, 94509, and 94513	10/28/99	Consumer products
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201	11/18/99	Not applicable
CaRFG Phase 3 Amendments (Phase out of MTBE, standards, predictive model). T 13, CCR, 2260, 2261, 2262.1, 226 _{2.5} , 2263, 2264, 2264.2, 2265, 2266 etc...	12/09/99	Fuels
Off-Road Compression Ignition Engines. T 13, CCR, 2111, 2112, 2137, 2139, 2140, 2141, 2144, 2400, 2401, 2403, 2420, 2421, 2423-2427, & appendix A to article 2.1.	01/27/00	Off-road
Transit Bus Standards. T 13, CCR, 1956.1, 1956.2, 1956.3, 1956.4, 1956.8, 1965	02/24/00	On-road
Agricultural Burning Guidelines. T 17 Amendments 80145, 80T 179, 80100-80102, 80110, 80120, 80130, 80140, 80150, 80155, 80160, 80T 170, 80180, 80200, 80210, 80230, 80240, 80250, 80260, 80270, 80280, 80290, 80300, 80310, 80311, 80320, 80330	03/23/00	Not applicable
Enhanced Gasoline Vapor Recovery Systems (Emergency Filing CP-201, section 18). T 17, CCR, 94011	03/23/00	Vapor Recovery
Enhanced Gasoline Vapor Recovery Systems (In Station Diagnostics and Onboard Refueling Vapor Recovery). T 17, CCR, 94011	03/23/00	Vapor Recovery
Air Toxic Control Measure for Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Facilities. T 17, CCR, 93111	04/27/00	Other
Consumer Products Aerosol Adhesives Control Measure. T 17, CCR, 94508, 94509, 94512, 94513	05/25/00	Consumer products
Aerosol (Paint) Coatings Products. T 17, CCR, 94700, 94701, 94521-94524, 94526	06/22/00	Consumer products
Air Toxic Control Measure for Asbestos Containing Serpentine. T 17, CCR, 93106	07/20/00	Not applicable
Conflict of Interest Code. T 17, CCR, 95001, 95002, 95005, and subchapter 9	09/28/00	Not applicable
Rice Straw Conditional Burn Permit Program. T 17, CCR, 80101, 80156-80158	09/28/00	Not applicable
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90705 tables 1, 2, 3a, 3b, 3c, and 4	10/26/00	Not applicable

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Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Antiperspirant and Deodorant Regulations. T 17, CCR, 94502, 94504	10/26/00	Consumer products
Area Designations for the State Ambient Air Quality Standard for Ozone. T 17, CCR, 60201	11/16/00	Not applicable
CaRFG Phase 3 Follow-up Amendments. T 13, CCR, sections 2260, 2261, 2262.3, 226 _{2.5} , 2263, 2264, 2265, 2266, 2266.5, 2270, 2272, 2273, 2282, 2296, 2297, 2262.9 and incorporated test procedures	11/16/00	Fuels
CaRFG Phase 3 Test Methods. T 13, CCR, sections 2263(b)	11/16/00	Fuels
Heavy Duty Diesel Engines "Not-to-Exceed (NTE)" Test Procedures. T 13 CCR, 1956.8, 2065	12/07/00	On-road
Light-and Medium Duty Low Emission Vehicle Alignment with Federal Standards. Exhaust Emission Standards for Heavy Duty Gas Engines. T 13, CCR, 1956.8 &1961	12/07/00	On-road
Zero Emission Vehicle Regulation Update. T 13, CCR, 1900, 1960.1(k), 1961, 1962 & incorporated Test Procedure	01/25/01	On-road
Ozone Transport Assessment. T 17, CCR, 70500 & 70600	04/26/01	Not applicable
Zero Emission Vehicle Infrastructure and Standardization of Electric Vehicle Charging Equipment. T 13, CCR, 1900(b), 1962(b) 1962.1	06/28/01	On-road
Airborne Toxic Control Measure for Asbestos from Construction, Grading, Quarrying, and Surface Mining. T 17, CCR, 93105	07/26/01	Not applicable
Marine Inboard Engines. T 13, CCR, 2111, 2112, 2139, 2140, 2147, 2440-2442, 2443.1-2443.3, 2444, 2445.1, 2445.2, 2446, 2444.2 and incorporation of documents by reference	07/26/01	Off-road
Air Toxic Control Measures for Auto and Mobile Equip Refinishing Coatings containing Hexavalent Chromium and Cadmium Compounds. T 17, CCR, 93112	09/20/01	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705	10/25/01	Not applicable
Gasoline Vapor Recovery Systems Test Methods and Compliance Procedures. T 17, CCR, 94010, 94011, 94153, 94155, 94163, 94164, 94165 & incorporated procedures	10/25/01	Vapor Recovery

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Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Heavy Duty Diesel Engine Standards for 2007 and Later. T 13, CCR, 1956.8 and incorporated test procedures	10/25/01	On-road
Distributed Generation Guidelines and Regulations. T 17, CCR, 94200-94214	11/15/01	Other
Gasoline Vapor Recovery Systems Defects. T 17, CCR, 94006 and incorporated document.	11/15/01	Vapor Recovery
Low Emission Vehicle Regulations. T 13, CCR, 1960.1,1960.5, 1961, 1962 and incorporate test procedures and guidelines	11/15/01	On-road
California Motor Vehicle Service Information Rule. T 13&17, CCR, 1969 & 60060.1 - 60060.7	12/13/01	On-road
Airborne Toxic Control Measure for Outdoor Residential Waste Burning. T 17, CCR, 93113	02/21/02	Other
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2601-2605, 2606 & appendices C & D, and 2607-2610	02/21/02	On-road
On-Board Diagnostic II Review Amendments. T 13, CCR, 1968.1, 1968.2, 1968.5	04/25/02	On-road
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements. T 13, CCR, 2700-2710	05/16/02	On-road
Review of California Ambient Air Quality Standards for Particulate Matter and Sulfates. T 17, CCR, 70100,70200, and 70100.1	06/20/02	Not applicable
CaRFG Phase 3 Amendments. T 13, CCR, 2261, 2262, 2262.4, 2262.5, 2262.6, 2262.9, 2266.5, 2269, 2271, 2272, 2265, and 2296	07/25/02	Fuels
Revision to Transit Bus Regulations Amendments. T 13, CCR, 1956.1, 1956.2, 1956.4,1956.8, and 2112, & documents incorporated by reference	10/24/02	On-road
Administrative Civil Penalties Program. T 17, CCR, 60065.1 - 60065.45 and 60075.1 - 60075.45	12/12/02	Not applicable
Airborne Toxic Control Measure for Diesel Particulate from School Bus Idling. T13, CCR, 2480	12/12/02	On-road
CaRFG Phase 3 Amendments (specifications for De Minimus Levels of Oxygenates and MTBE Phase Out Issues). T 13, CCR, 2261, 2262.6, 2263, 2266.5, 2272, 2273, 2260, 2273.5	12/12/02	Fuels

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Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Gasoline Vapor Recovery Systems Test Procedures. T 17, CCR, 94010, 94011, 94163, 94164, and 94165 and procedures incorporated by reference, and 94166, 94167, and incorporation by reference.	12/12/02	Vapor Recovery
Low Emission Vehicles II. Align Heavy Duty Gas Engine Standards with Federal Standards; minor administrative changes. T 13, CCR, 1961, 1965, 1956.8, 1956.1, 1978, 2065 and documents incorporated by reference	12/12/02	On-road
Zero Emission Vehicle Amendments for 2003. T 13, CCR, 1960.1(k), 1961(a) and (d), 1900, 1962, and documents incorporated by reference	03/25/03	On-road
Ozone Transport Mitigation Regulations. T 17, CCR, 70600 and 70601	05/22/03	Not applicable
Off-Highway Recreation Vehicles. T13, CCR, 2415	07/24/03	Off-road
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.75, 90800.9, 90804, 90800.8, 90801, 90802, and 90803	07/24/03	Not applicable
Specifications for Motor Vehicle Diesel Fuel. T 13 & T 17, CCR, 1961, 2281, 2282, 2701, 2284, 2285, 93114, and incorporated test procedure	07/24/03	Fuels
Solid Waste Collection Vehicles. T 13, CCR, 2020, 2021, 2021.1, 2021.2	09/24/03	On-road
Small Off-Road Engines (SORE). T 13, CCR, 2400-2409, 2405.1, 2405.2, 2405.3, 2750-2754, 2754.1, 2754.2, 2755-2767, 2767.1, 2768-2773 and the documents incorporated by reference	09/25/03	Off-road
Revised Tables of Maximum Incremental Reactivity Values. T 1, CCR, 94700.	12/03/03	Consumer products
Airborne Toxic Control Measure for Diesel Particulate for Transport Refrigeration Units. T 13, CCR, 2022 & 2477	12/11/03	On-road
Airborne Toxic Control Measure for Stationary Compression Ignition Engines. T 17, CCR 93115 & documents incorporate by reference	12/11/03	Other
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements (Amendments). T 13, CCR, 2701-2707 & 2709	12/11/03	On-road
Area Designation Criteria and Area Designations for State PM _{2.5} and Ozone Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, 60210	01/22/04	Not applicable

Appendix Table A-1		
Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
CA Motor Vehicle Service Information Rule. T 13, CCR, 1969	01/22/04	On-road
Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 17, CCR,93116, 93116.1, 93116.2, 93116.3, 93116.4, and 93116.5	02/26/04	Off-road
Modifications to the Statewide Portable Equipment Registration Program (PERP) Regulations . T 13, CCR Amendments to 2450-2465, and repeal of 2466	02/26/04	Off-road
Heavy Duty Diesel Engine-Chip Reflash. T 13, CCR, 2011, 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194	03/27/04	On-road
Engine Manufacturer Diagnostic System Requirements for 2007 and Subsequent Model Heavy Duty Engines. T 13, CCR, 1971	05/20/04	On-road
Consumer Products & Methods 310/ATCM for Para-Dicholorobenzene. T 17, CCR, 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, and ARB Method 310, which is incorporated by reference	06/24/04	Consumer products
Urban Bus Engines/Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, 1956.3, and 1956.4,	06/24/04	On-road
Airborne Toxic Control Measure for Diesel Particulate from Diesel Fueled Commercial Vehicle Idling. T 13, CCR, 2485	07/22/04	On-road
Gasoline Vapor Recovery Systems at Dispensing Facilities. Emergency Filing. T 17, CCR, 94011	07/22/04	Vapor Recovery
Unihose Gasoline Vapor Recovery Systems. T17, CCR, 94011	07/22/04	Vapor Recovery
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006(b) & incorporated document	08/24/04	Vapor Recovery
Greenhouse Gas. T 13, CCR, 1961.1, 1900, 1961 and Incorporated Test Procedures	09/23/04	On-road
California Reformulated Gasoline, Phase 3. T 13, CCR, 2260, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2263, 2265 (and the incorporated "California Procedures"), and 2266.5	11/18/04	Fuels
Diesel Fuel Standards for Harborcraft & Locomotives. T 13, CCR, 2299, 2281, 2282, and 2284, and T 17, CCR, 93117	11/18/04	Fuels

Appendix Table A-1		
Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Enhanced Gasoline Vapor Recovery Systems Extension. T 17, CCR, 94011 and certification procedure	11/18/04	Vapor Recovery
Permit Fee Regulations for Non-vehicular Sources. T17, CCR 90805 and 90806; and 90800.8 and 90803	11/18/04	Not applicable
Emergency Regulation for Temporary Delay of Diesel Fuel Lubricity Standard. T 13, CCR, 2284	11/24/04	Fuels
Airborne Toxic Control Measure for Hexavalent Chromium and Nickel from Thermal Spraying. T 17, CCR, 9310 _{2,5}	12/09/04	Not applicable
Off-Road Compression Ignition Engines. T 13, CCR, 2420, 2421, 2423, 2424, 2425, 2427	12/09/04	Off-road
Area Designations. T 17, CCR, 60201, 60202, 60205, 60210	01/20/05	Not applicable
Transit Fleet Rule. T 13, CCR, 2023, 2023.1, 2023.2, 2023.3, 2023.4, 1956.1, 2020, 2021, repeal 1956.2, 1956.3, 1956.4	02/24/05	On-road
State Ambient Air Quality Standard for Ozone. T 17, CCR, 70100, 70100.1, and 70200	04/28/05	Not applicable
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments). T 17, CCR, 93115	05/26/05	Other
Definition of Large Confined Animal Facility. T 17, CCR 86500 and 86501	06/23/05	Not applicable
On-Board Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines (HD OBD). T 13, CCR, 1971.1	07/21/05	On-road
Reid Vapor Pressure Limit. Emergency Rule. T 13, CCR, 2262 and 2262.4	08/08/05	Fuels
2007-2009 Model-Year Heavy Duty Urban Bus Engines and the Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, and 1956.8	09/15/05	On-road
Portable Fuel Containers (PFC) [Part 2 of 2]. T 13, CCR 2467.2, 2467.3, 2467.4, 2467.5, 2467.6, 2467.7; repeal of 2467.8, and adoption of new 2467.8 and 2467.9.	09/15/05	Off road
Portable Fuel Containers (PFC) [Part 1 of 2]. T 13, CCR, 2467 and 2467.1	09/15/05	Off road
Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008. T 13, CCR section 1956.8 and the incorporated document	10/20/05	On-road

Appendix Table A-1
Measures Adopted by the California Air Resource Board
1990 to 2006

Measure	Hearing Date	Category
Airborne Toxic Control Measure for Cruise Ships Onboard Incineration. T 17, CCR, 93119	11/17/05	Off road
Marine Inboard Sterndrive Engines. T 13 CCR 2111, 2112, 2441, 2442, 2444.2, 2445.1, 2446, 2447, and incorporated document	11/17/05	Off-road
Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline. T 13, CCR, 2299.1 and T 17, CCR, 93118	12/08/05	Off-road
Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities. T 13, CCR, 2022 and 2022.1	12/08/05	On-road
Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. T 13, CCR, 2479	12/08/05	Off-road
AB1009 Heavy-Duty Vehicle Smoke Inspection Program. T 13, CCR, 2180, 2180.1, 2181, 2182, 2183, 2184, 2185, 2186, 2187, and 2188, 2189	01/26/06	On-road
Identification of Tobacco Smoke as a Toxic Air Contaminant. T 17, CCR, 93000	01/26/06	Not applicable
Diesel Verification Procedure, Warranty & In-Use. T 13, CCR, 2702, 2703, 2704, 2706, 2707, and 2709.	03/23/06	On-road
Technical Amendments to Evaporative Exhaust and Evaporative Emissions Test Procedures. T 13, CCR, 1961,1976 and 1978.	05/25/06	On-road
Fork Lifts and Other Industrial Equipment. (Large Off-Road Spark Ignition Engines > 1 liter) T 13, CCR 2430, 2433, 2434. Adopt 2775, 2775.1, 2775.2, 2780, 2781, 2783, 2784, 2785, 2786, 2787, 2788, and 2789.	05/26/06	Off-road
California Motor Vehicle Service Information Rule. T 13, CCR, 1969 and incorporated documents	06/22/06	On-road
Gasoline Vapor Recovery Systems. T 17 CCR 94011 and incorporated certification	06/22/06	Vapor Recovery
Portable Equipment Registration Program. T 13, CCR, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, and 2465	06/22/06	Off-road
Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2411-2413, 2415 & documents incorporated by reference	07/20/06	Off-road

Appendix Table A-1		
Measures Adopted by the California Air Resource Board		
1990 to 2006		
Measure	Hearing Date	Category
Heavy-Duty In-Use Compliance Regulation. T 13, CCR, 1956.1, 1956.8, and documents incorporated by reference	09/28/06	On-road
On-Board Diagnostic II. T 13, CCR, 1968.2, 1968.5, 2035, 2037 and 2038	09/28/06	On-road
Distributed Generation Guidelines and Regulations. T 17, CCR, 94201, 94201.1, 94203, 94204, & 94207-942142	10/19/06	Other
Zero Emission Bus Regulation. T13, CCR, 2023.1, 2023.3, & 2023.4	10/19/06	On-road
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, CCR, 93300.5 and document incorporated by reference	11/16/06	Not applicable
Airborne Toxic Control Measure for Cruise Ships and Ocean-Going Ships Onboard Incineration (amendments). T 17, CCR, 93119	11/16/06	Off-road
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments, Agricultural Eng. Exemption removal). T 17, CCR, 93115.1-93115.15.t.	11/16/06	Other
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, & 60210	11/16/06	Not applicable
Consumer Products. T 17, CCR, 94508, 94509, 94510, 94513 & 94523	11/17/06	Consumer products
Emergency Regulation for Portable Equipment Registration Program, Airborne Toxic Control Measures and Portable and Stationary diesel-Fueled Engines. T 13, CCR, 2452, 2455, 2456, 2461; T17 CCR 93115, 93116.2, 93116.3	12/06/06	Off-road
Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations. T 17, CCR, 93102.1-93102.16	12/07/06	Not applicable
Voluntary Accelerated Retirement Regulation. T 13, CCR, 2601-2610 and appendices A-D	12/07/06	On-road

B. State Rules that Do Not Address direct PM_{2.5} or PM_{2.5} Attainment Plan Precursor in the San Joaquin Valley

A substantial number of the measures adopted by ARB since 1990 do not affect direct PM_{2.5} or a PM_{2.5} attainment plan precursor emissions in the San Joaquin Valley. These types of measures include fee rules, identification of toxic air contaminants, area boundary designations, and controls for pollutants other than direct PM_{2.5} (or PM), NO_x, VOC, or SO₂. Appendix Table A-2 provides a list of these measures.

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Transported Pollutants (Ozone). T 17, CCR, 70500	12/04/89	Not an emissions reduction measure
Non-vehicular Test Methods. T 17, CCR, 94002, 94003 17, &26, 94146-94149, 94132, 94135, 94139, 94140	01/11/90	Not an emissions reduction measure
Test Method for Asbestos in Serpentine Aggregate. T 17, & 26, CCR, 94147, Method 435	04/12/90	Not an emissions reduction measure
Airborne Toxic Control Measure for Asbestos in Surfacing Applications. T 17, & 26, CCR, 93106	04/12/90	Not a PM emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.1, 90800, 90802-90803	05/10/90	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90704, 93300-93347	05/10/90	Not an emissions reduction measure
Dioxins Airborne Toxic Control Measure for Medical Waste Incinerators. T 17, CCR, 93104	07/12/90	Not a PM emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/14/90	Not an emissions reduction measure
Criteria for Area Designations for the State Ambient Air Quality Standard. T 17, CCR, 70303 & 70304	06/14/90	Not an emissions reduction measure
Emission Reduction Accounting Procedures for California Clean Air Act. T 17, CCR, 70700-70704	07/12/90	Not an emissions reduction measure
Identification of Inorganic Arsenic as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/12/90	Not an emissions reduction measure
Transport Mitigation Regulations. T 17, CCR, 70600-70601	08/09/90	Not an emissions reduction measure
Air Toxic Fee Schedule & Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 90700-90704, 93300-93347	09/13/90	Not an emissions reduction measure
Identification of Trichloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/11/90	Not an emissions reduction measure
Revision to Designation Criteria. T 17, CCR, 60200-60204, 60208	11/08/90	Not an emissions reduction measure

Appendix Table A-2
Measures Adopted by the California Air Resources Board
That Do Not Address PM_{2.5} in the San Joaquin Valley
1990 to 2006

Measure	Hearing Date	Comments
Identification of Vinyl Chloride as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	11/13/90	Not an emissions reduction measure
Identification of Chloroform as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	12/13/90	Not an emissions reduction measure
Conflict of Interest Code. T 17, CCR, 95001, et. seq.	12/13/90	Not an emissions reduction measure
Permit Fee Regulations for Non -Vehicular Sources. T 17, CCR, 90800.2, 90801, 90803	02/24/91	Not an emissions reduction measure
Non - Vehicular Test Methods. T 17, CCR, 94131, 94132, 94142	04/11/91	Not an emissions reduction measure.
Acid Deposition Fee Regulations. T 17, CCR, 90621.2, 90620, 90622	04/11/91	Not an emissions reduction measure. Obsolete.
Administrative Hearing Procedures. T 17, CCR, 60075.1, 60075.47	05/09/91	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700 - 90705	06/13/91	Not an emissions reduction measure
Agricultural Burning Guidelines. T 17, 80130, 80150, 80250, 80260, 80290	07/11/91	Not an emissions reduction measure
Identification of Metallic & Inorganic Nickel Compounds as a Toxic Air Contaminant. T 17, & 26, 93000	08/08/91	Not an emissions reduction measure
State Ambient Air Quality Standard for SO ₂ . T 17, CCR, 70100, 70200, 70201	10/10/91	Not an emissions reduction measure
Identification of Perchloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/10/91	Not an emissions reduction measure
Area Designations. T 17, CCR, 60200, 60209	11/14/91	Not an emissions reduction measure
Identification of Formaldehyde as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	03/12/92	Not an emissions reduction measure
Atmospheric Acidity Protection Fees. T 17, CCR, 90621.3	04/09/92	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.3, 90803	04/09/92	Not an emissions reduction measure
Criteria for Area Designations. T 17, CCR, 70303, 70304	05/14/92	Not an emissions reduction measure
Transported Air Pollutants. T 17, CCR, 70500	05/28/92	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90701, 90704, 90705	07/09/92	Not an emissions reduction measure
Identification of 1.3 Butadiene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/09/92	Not an emissions reduction measure
CFC Refrigerants in Air Conditioning Systems. T 13, CCR, 2500	09/10/92	Not a PM emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Criteria for Area Designations. T 17, CCR, 70303.5, 60200-60203, 60205, 70303	12/10/92	Not an emissions reduction measure
Transport Mitigation Regulations. T 17, CCR, 70600, 70601	03/11/93	Not an emissions reduction measure
Identification of Federal Hazardous Air Pollutants as Toxic Air Contaminants. T 17, & 26, CCR, 93001, 39665, 39666	04/08/93	Not an emissions reduction measure
Acid Deposition Fee Regulations. T 17, CCR, 90622, 90621.4	04/08/93	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.4, 90803	04/08/93	Not an emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/10/93	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/08/93	Not an emissions reduction measure
Mitigation Transport Pollutants. T 17, CCR, 70500, 70600	08/12/93	Not an emissions reduction measure
Airborne Toxic Control Measure for Perchloroethylene Dry Cleaning. T 17, & 26, CCR, 93109, 93110	10/14/93	Not a PM or ozone control measure (perc is not a VOC)
Conflict of Interest. T 17, CCR, 90500	11/18/93	Not an emissions reduction measure
Criteria for Area Designations. T 17, CCR, 60200-60202, 60204, 60206, 60208, 70300-70306	11/18/93	Not an emissions reduction measure
SCAQMD's Reclaim Consideration	03/10/94	Not a SJV control measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.5, 90803	04/14/94	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/28/94	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201, 60204	11/09/94	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.6, 90803	04/27/95	Not an emissions reduction measure
Employee-Based Trip Reductions Emission Formula. T 13, CCR, 2330, 2331, 2332	06/29/95	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705 and Appendix A	01/25/96	Not an emissions reduction measure
Relaxation of Carbon Monoxide Emission Standards for Utility Engines. T 13, CCR, 2403 and incorporating test procedures	01/25/96	Carbon monoxide requirement
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90803, 90800.7	04/25/96	Not an emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Basin Boundaries for Agricultural Burning (Mojave Desert, South Coast & Salton Sea). T 17, CCR, 60104, 60109, 60114, 80280, 80311	05/30/96	Not applicable to SJV
Regulation Improvement and Repeal. T 17, CCR, 93301-93355, Appendix A-E (emissions inventory)	05/30/96	Not an emissions reduction measure
Emissions Inventory Criteria & Guideline Report. T 17, CCR, 93300.5	07/25/96	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90701-90705 Appendix A to §§ 90700-90705	09/26/96	Not an emissions reduction measure
Stationary Source Test Methods. T 17, CCR, 94105, 94107, 94114, 94135, 94141, 94143, 94161	09/26/96	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201-60209	11/21/96	Not an emissions reduction measure
Transport Pollutants. T 17, CCR, 70500, 70600	11/21/96	Not an emissions reduction measure
Identification of Inorganic Lead as Toxic Air Contaminant (TAC). T 17, CCR, 93000	04/24/97	Not an emissions reduction measure
Interchangeable Emission Reduction Credits. T 17, CCR, 91500	05/22/97	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR 90701-90705 and Appendix A §§ 90700-90705	11/13/97	Not an emissions reduction measure
Area Designations '97 . T 17, CCR, §§ 60201 & 60205	11/13/97	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR 90800....	01/29/98	Not an emissions reduction measure
Classifying Minor Violations. T 17, CCR, 60090-60095	04/23/98	Not an emissions reduction measure
Airborne Toxic Control Measure for Chrome Plating. T 17, CCR, 93102	05/21/98	Not an emissions reduction measure
Identification of Diesel Exhaust as a Toxic Air Contaminant. T 17, CCR, 93000	08/27/98	Not an emissions reduction measure
Stationary Source Test Methods. T 17, CCR, 94101 - 94104, 94106, 94108 - 94113, 941T 17 - 94124, 94137 and revision of Method 12.	10/22/98	Not an emissions reduction measure
Administrative Hearing Procedures. T 17, CCR, 60040 and 60075.1-60075.45	10/22/99	Not an emissions reduction measure
Area Designations and Criteria for the National and State Ambient Air Quality Standards for Ozone. T 17, CCR, 60301, 60202, 60205, 60206, 70300-70306, 70303.1	10/22/98	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90701-90705 and Appendix A	10/22/98	Not an emissions reduction measure

Appendix Table A-2		
Measures Adopted by the California Air Resources Board		
That Do Not Address PM_{2.5} in the San Joaquin Valley		
1990 to 2006		
Measure	Hearing Date	Comments
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201	11/18/99	Not an emissions reduction measure
Agricultural Burning Guidelines. T 17 Amendments 80145, 80T 179, 80100-80102, 80110, 80120, 80130, 80140, 80150, 80155, 80160, 80T 170, 80180, 80200, 80210, 80230, 80240, 80250, 80260, 80270, 80280, 80290, 80300, 80310, 80311, 80320, 80330	03/23/00	Not an emissions reduction measure
Air Toxic Control Measure for Asbestos Containing Serpentine. T 17, CCR, 93106	07/20/00	Not a PM emissions reduction measure
Conflict of Interest Code. T 17, CCR, 95001, 95002, 95005, and subchapter 9	09/28/00	Not an emissions reduction measure
Rice Straw Conditional Burn Permit Program. T 17, CCR, 80101, 80156-80158	09/28/00	Not a SJV control measure (Sacramento Valley air basin only)
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90705 tables 1, 2, 3a, 3b, 3c, and 4	10/26/00	Not an emissions reduction measure
Area Designations for the State Ambient Air Quality Standard for Ozone. T 17, CCR, 60201	11/16/00	Not an emissions reduction measure
Ozone Transport Assessment. T 17, CCR, 70500 & 70600	04/26/01	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705	10/25/01	Not an emissions reduction measure
Review of California Ambient Air Quality Standards for Particulate Matter and Sulfates. T 17, CCR, 70100, 70200, and 70100.1	06/20/02	Not an emissions reduction measure
Administrative Civil Penalties Program. T 17, CCR, 60065.1 - 60065.45 and 60075.1 - 60075.45	12/12/02	Not an emissions reduction measure
Ozone Transport Mitigation Regulations. T 17, CCR, 70600 and 70601	05/22/03	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.75, 90800.9, 90804, 90800.8, 90801, 90802, and 90803	07/24/03	Not an emissions reduction measure
Area Designation Criteria and Area Designations for State PM _{2.5} and Ozone Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, 60210	01/22/04	Not an emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Permit Fee Regulations for Non-vehicular Sources. T17, CCR 90805 and 90806; and 90800.8 and 90803	11/18/04	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201, 60202, 60205, 60210	01/20/05	Not an emissions reduction measure
State Ambient Air Quality Standard for Ozone. T 17, CCR, 70100, 70100.1, and 70200	04/28/05	Not an emissions reduction measure
Definition of Large Confined Animal Facility. T 17, CCR 86500 and 86501	06/23/05	Not an emissions reduction measure
Identification of Tobacco Smoke as a Toxic Air Contaminant. T 17, CCR, 93000	01/26/06	Not an emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, CCR, 93300.5 and document incorporated by reference	11/16/06	Not an emissions reduction measure
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, & 60210	11/16/06	Not an emissions reduction measure

C. State Fuel Measures

ARB has adopted a number of revisions to its reformulated gasoline program and clean diesel program since 1990, as well as measures addressing other motor vehicle fuels and fuel standards for off-road sources. Appendix Table A-3 is a list of these revisions.

Appendix Table A-3 Fuel Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Wintertime Limits for Sulfur in Diesel Fuel. T 13, CCR, 2255	06/21/90	Renumbered to section 2281. Approved 60 FR 43379 (8/21/95)
Limit on Aromatic Content of Diesel Fuel. T 13, CCR, 2256	12/13/90	Renumbered to section 2282. Approved 60 FR 43379 (8/21/95) (listed as 4/15/01 adoption in FR)
Diesel Fuel Regulations - Emergency. T 13, CCR, 2281(h), 2282(1)	10/15/93	Approved 60 FR 43379 (8/21/95)
Small Refiner Diesel. T 13, CCR, 2282(e)(1)	07/24/94	Approved 60 FR 43379 (8/21/95)
Diesel Fuel Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Approved 75 FR 26653 (5/12/10)
Specifications for Motor Vehicle Diesel Fuel. T 13 & T 17, CCR, 1961, 2281, 2282, 2701, 2284, 2285, 93114, and incorporated test procedure	07/24/03	Approved 75 FR 26653 (5/12/10)
Emergency Regulation for Temporary Delay of Diesel Fuel Lubricity Standard. T 13, CCR, 2284	11/24/04	Temporary delay of standard. Expired
Diesel Fuel Standards for Harborcraft & Locomotives. T 13, CCR, 2299, 2281, 2282, and 2284, and T 17, CCR, 93117	11/18/04	NO _x reductions estimated at 0.1 tpd for SJV, more for South Coast. See CARB 6/29/09 Letter
California Reformulated Gasoline (CaRFG), Phase I. T 13, CCR, 2251.5	09/27/90	RVP standard for period between 1992 and 1996. Obsolete.
California Reformulated Gasoline, Phase II. T 13, CCR, 2250, 2255.1, 2252, 2260 - 2272, 2295	11/21/91	Approved 60 FR 43379 (8/21/95)
Wintertime Gasoline Program. T 13, CCR, 2258, 2298, 2251.5, 2296	11/21/91	Approved 60 FR 43379 (8/21/95)
Predictive Model for Phase II CaRFG. T 13, CCR, 2261, 2262-2270	06/09/94	Superseded by 11/18/04 & 6/14/07 rules
Test Method for Oxygen in Gasoline. T 13, CCR, 2251.5(c), 2258(c), 2263(b)	06/29/95	Section 2251.5 - obsolete; section 2258 wintertime; section 2263, superseded
Wintertime Oxygenate Program. T 13, CCR, 2258, 2251.5, 2263(b), 2267, 2298, 2259, 2283, 2293.5	09/09/93	Carbon monoxide control measure

Appendix Table A-3		
Fuel Measures Adopted by the California Air Resources Board		
1990 to 2006		
Measure	Hearing Date	Comments
Test Methods for CaRFG 13, CCR, 2263(b)	10/26/95	Superseded by 11/18/04 & 6/14/07 rules
Required Additives in Gasoline (Deposit Control Additives). T 13, CCR, 2257 and incorporates testing procedures.	11/16/95	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Housekeeping & CARBOB. T 13, CCR, 2263.7, 2266.5, 2260, 226 _{2.5} , 2264, 2265, 2272	12/14/95	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Variance Requirements. T 13, CCR, 2271 (Emergency)	01/25/96	Superseded by 11/18/04 & 6/14/07 rules
Regulation Improvements and Repeals (fuel additives). T 13, CCR, 2201, 2202	05/30/96	Repealed sections
Cleaner Burning Gasoline Model Flexibility. T 13, CCR, Sections 2260, 2262.1, 2262.3, 2262.4, 226 _{2.5} , 2262.6, 2262.7 and 2265	08/27/98	Superseded by 11/18/04 & 6/14/07 rules
Gasoline Deposit Control Additive Regulation. T 13, CCR, 2257, and incorporating test procedures	09/24/98	Superseded by 11/18/04 & 6/14/07 rules
Cleaner Burning Gasoline (Increasing the Oxygen Content). T 13, CCR, sections 226 _{2.5} (b) and 2265(a)(2)	12/11/98	Wintertime gasoline for South Coast and Imperial County
Cleaner Burning Gasoline, Oxygen Requirement for Wintertime In Lake Tahoe Area/Gas Pump Labeling for MTBE. T 13, CCR, 226 _{2.5} , and 2273	06/24/99	Not applicable to the SJV/SC area/Obsolete
CaRFG Phase 3 Amendments (Phase out of MTBE, standards, predictive model). T 13, CCR, 2260, 2261, 2262.1, 226 _{2.5} , 2263, 2264, 2264.2, 2265, 2266 etc...	12/09/99	2262.1 renumber to 2262.4; 2264 (designation of alternative limits) not approved; otherwise superseded by 11/18/04 and 6/14/07 rules
CaRFG Phase 3 Test Methods. T 13, CCR, sections 2263(b)	11/16/00	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Follow-up Amendments. T 13, CCR, sections 2260, 2261, 2262.3, 226 _{2.5} , 2263, 2264, 2265, 2266, 2266.5, 2270, 2272, 2273, 2282, 2296, 2297, 2262.9 and incorporated test procedures	11/16/00	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Amendments. T 13, CCR, 2261, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2266.5, 2269, 2271, 2272, 2265, and 2296	07/25/02	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Amendments (specifications for De Minimus Levels of Oxygenates and MTBE Phase Out Issues). T 13, CCR, 2261, 2262.6, 2263, 2266.5, 2272, 2273, 2260, 2273.5	12/12/02	Superseded by 11/18/04 & 6/14/07 rule. Approved 75 FR 26653 (5/12/10) (except for section 2272 (CARFG3 standards for small refineries) and 2273.5 (requirement to

Appendix Table A-3		
Fuel Measures Adopted by the California Air Resources Board		
1990 to 2006		
Measure	Hearing Date	Comments
		identify gasoline containing ethanol when delivered to retail station))
California Reformulated Gasoline, Phase 3. T 13, CCR, 2260, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2263, 2265 (and the incorporated "California Procedures"), and 2266.5	11/18/04	Approved 75 FR 26653 (5/12/10)
Reid Vapor Pressure Limit. Emergency Rule. T 13, CCR, 2262 and 2262.4	08/08/05	Operative for September and October 2005 only. Obsolete.
Specifications for Liquid Petroleum Gas Used as a Motor Vehicle Fuel. T 13, CCR, 2292.6	12/11/98	No identifiable emission reductions
Liquefied Petroleum Gas Propane Limit Specification Delay. T 13, CCR, 2292.6	03/27/97	Expired

D. State On-Road Mobile Sources Measures

Appendix Tables A-4 and A-5 list measures for on-road and off-road sources adopted by CARB since 1990.

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Certification Procedure for Aftermarket Parts. VC 27156 & 38391	02/08/90	Compliance provisions.
Emission Standards for Medium Duty Vehicles. T 13, CCR, 1900, 1956.8, 1960.1, 1968.1, 2061, 2112, 2139	06/14/90	Waiver granted September 16, 1994 (59 FR 48625 (9/22/94))
Evaporative Emission Standards. T 13, CCR, 1976	08/09/90	Waiver granted August 25, 1994 (59 FR 46979 (9/13/94))
Low Emission Vehicles and Clean Fuels. T 13, CCR, 1900, 1904, 1956.8, 1960.1, 1960.1.5, 1960.5 and 2111, 2112, 2125, and 2139, 2061.	09/28/90	Waivers granted January 7, 1993 & April 6, 1998 (58 FR 4166 (1/13/93) & 63 FR 18403 (4/15/98))
Heavy Duty Diesel Smoke Emission Testing. T 13, CCR, 2180-2187	11/08/90	
Onboard Diagnostics for Light-Duty Trucks and Light & Medium-Duty Motor Vehicles. T 13, CCR, 1977, 1968.1	09/12/91	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1, 1977	11/12/91	
Low Emission Vehicles amendments revising reactivity adjustment factor (RAF) provisions and adopting a RAF for M85 transitional low emission vehicles. T 13, CCR, 1960.1	11/14/91	Confirm within the scope finding requested February 18, 1993
Alternative Motor Vehicle Fuel Certification Fuel Specification. T 13 & 26, CCR, 2290-2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	3/12/92	Confirm within the scope finding requested February 17, 1994
Standards and Test Procedures for Alternative Fuel Retrofit Systems. T 13, CCR, 2030, 2031	05/14/92	Compliance provisions
Phase 2 RFG certification fuel specifications. T 13, CCR, 1960.1, 1956.8(d)	08/13/92	Confirm within the scope finding requested February 17, 1994
Substitute Fuel or Clean Fuel Incorporated Test Procedures. T 13, CCR, 1960.1(k), 2317	11/12/92	Confirm within the scope finding requested February 17, 1994
Smoke Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	12/10/92	

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Certification Requirements for Low Emission Passenger Cars, Light-Duty Trucks & Medium Duty Vehicles. T 13, CCR, 1960.1, 1976, 2061, 1900	01/14/93	Confirm within the scope finding requested February 21, 1994
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1	07/09/93	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Urban Transit Buses. T 13, CCR, 1956.8, 1965, 2112	06/10/93	Found within the scope September 28, 2004 (69 FR 59920 (October 6, 2004))
Evaporative Emission Standards and Test Procedures. T 13, CCR, 1976	02/10/94	Waiver granted July 28, 1999 (64 FR 42689 (8/5/99))
Diesel Fuel Certification. T 13, CCR, 1956.8(b)&(d), 1960.1(k), 2292.6	09/22/94	Confirm within the scope finding requested September 14, 1995
Self Inspection Program for Heavy Duty Diesel Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	11/09/94	
Onboard Diagnostics, Phase II. T 13, CCR, 1963.1, & Certification Procedures	12/08/94	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Periodic Smoke Inspection Program. T 13, CCR, 2190	12/08/94	
Heavy Duty Vehicle Exhaust Emission Standards. T 13, CCR, 1956.8 and incorporate test procedures.	06/29/95	Found within the scope September 28, 2004 (69 FR 59920 (10/6/04))
Onboard Refueling Vapor Recovery Standards. T 13, CCR, 1976, 1978 and incorporate test procedures	06/29/95	Waiver granted August 13, 2002 (67 FR 54180 (8/21/02))
Retrofit Emission Standards. T 13, CCR, 1956.9, 2030, 2031, and incorporate test procedures	07/27/95	Compliance provision
Low Emission Vehicle Standards 3 (LEV 3). T 13, CCR, 1956.8, 1960.1, 1965, 2101, 2061, 2062, and incorporate test procedures	09/28/95	Confirm within the scope finding requested October 8, 1996.
Postpone Zero Emission Vehicle Requirements. T 13, CCR, 1900, 1960.1, 1976	03/28/96	Found within the scope January 18, 2001 (66 FR 7751 (1/25/01))
Diesel Fuel Certification Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Confirm within the scope finding requested November 24, 1997
Onboard Diagnostics, Phase II, Technical Status. T 13, CCR, 1968.1, 2030, 2031	12/12/96	Initial notice 69 FR 5542 (February 5, 2004)

<p align="center">Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006</p>		
Measure	Hearing Date	Comments
Postpone Enhanced Evaporative Emission Requirements for Ultra-Small Volume Vehicle Manufacturers. T 13, CCR, 1976 and incorporate test procedures	05/22/97	Found within the scope July 28, 1999 (64 FR 42689 (8/5/99))
Off-Cycle Emissions Supplemental Federal Test Procedures (SFTPs). T 13, CCR, 1960.1, 2101 and incorporate test procedures	07/24/97	Waiver granted September 30, 2004 (69 FR 60996 (10/14/04))
Heavy Duty Vehicle Smoke Inspection Program/Periodic Smoke Inspection Program. T 13, CCR, 2180-2188 and 2190-2194	12/11/97	
Heavy Duty Vehicle Regulations: 2004 Standards. T 13, CCR, 1956.8, 1965, 2036, 2112 and test procedures	04/23/98	Confirm within the scope finding requested December 26, 2001
Low Emission Vehicles Standards (LEV 2) and Compliance Assurance Program (CAP 2000). T 13, CCR, 1961 & 1962 (both new); 1900, 1960.1, 1965, 1968.1, 1976, 1978, 2037, 2038, 2062, 2101, 2106, 2107, 2110, 2112, 2114, 2119, 2130, 2137-2140, 2143-2148	11/05/98	Waiver granted April 11, 2003 (68 FR 19811 (4/22/03))/found within the scope (1999 ZEV amendments) December 21, 2006 (71 FR 78190 (12/28/06))
Exhaust Standards for (On-Road) Motorcycles. T 13, CCR, 1958	12/10/98	Waiver granted July 27, 2006 (71 FR 44027 (8/3/06))
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2600-2610	12/10/98	Establishes standards for a voluntary accelerated retirement program. Revised 2/21/06 and 12/7/06
Clean Fuels Regulation Requirements. T 13, CCR, sections 2300-2317, and 2303.5, 2311.5	07/22/99	Removal of obsolete provisions, streamlining and other minor changes to 9/1990 rule.
Transit Bus Standards. T 13, CCR, 1956.1, 1956.2, 1956.3, 1956.4, 1956.8, 1965	02/24/00	Combination of fleet requirements, emission standards, and zero-emission bus standards. Fleet requirements achieve approximately 2 tpd NO _x reductions statewide, so minimal effect in SC. Federal & state emission standards are the same for 2010 MY buses.
Light-and Medium Duty Low Emission Vehicle Alignment with Federal Standards. Exhaust Emission Standards for Heavy Duty Gas Engines. T 13, CCR, 1956.8 & 1961	12/07/00	Waiver granted for LDV & HDV April 11, 2003 (68 FR 19811 (4/22/03)) Initial notice on within-the-scope finding request for HDGE: 72 FR 27114 (May 14, 2007).
Heavy Duty Diesel Engines "Not-to-Exceed (NTE)" Test Procedures. T 13 CCR, 1956.8, 2065	12/07/00	Confirm within the scope finding requested December 26, 2001.

<p align="center">Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006</p>		
Measure	Hearing Date	Comments
Zero Emission Vehicle Regulation Update. T 13, CCR, 1900, 1960.1(k), 1961, 1962 & incorporated Test Procedure	01/25/01	Found within the scope December 21, 2006 (71 FR 78190 (12/28/06))
Zero Emission Vehicle Infrastructure and Standardization of Electric Vehicle Charging Equipment. T 13, CCR, 1900(b), 1962(b) 1962.1	06/28/01	Found within the scope December 21, 2006 (71 FR 78190 (12/28/06))
Heavy Duty Diesel Engine Standards for 2007 and Later. T 13, CCR, 1956.8 and incorporate test procedures	10/25/01	Waiver granted August 19, 2005 (70 FR 50322 (8/26/05))
Low Emission Vehicle Regulations. T 13, CCR, 1960.1,1960.5, 1961, 1962 and incorporate test procedures and guidelines	11/15/01	Found within the scope April 21, 2005 (70 FR 22034 (4/28/05))
California Motor Vehicle Service Information Rule. T 13&17, CCR, 1969 & 60060.1 - 60060.7	12/13/01	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2601-2605, 2606 & appendices C & D, and 2607-2610	02/21/02	Establishes standards for a voluntary accelerated retirement program. Revised 12/7/06.
On-Board Diagnostic II Review Amendments. T 13, CCR, 1968.1, 1968.2, 1968.5	04/25/02	Initial notice 69 FR 5542 (2/5/04)
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements. T 13, CCR, 2700-2710	05/16/02	Procedures to verify diesel retrofit technology.
Revision to Transit Bus Regulations Amendments. T 13, CCR, 1956.1, 1956.2, 1956.4,1956.8, and 2112, & documents incorporated by reference	10/24/02	Slight relaxation in requirements over 2000 rule.
Low Emission Vehicles II. Align Heavy Duty Gas Engine Standards with Federal Standards; minor administrative changes. T 13, CCR, 1961, 1965, 1956.8, 1956.1, 1978, 2065 and documents incorporated by reference	12/12/02	Waiver granted August 19, 2005 (70 FR 50322 (8/26/05)) for all but HDGE. HDGE standards adopted to harmonize with EPA's. Initial notice on within-the-scope finding request for HDGE: 72 FR 27114 (5/14/07).
Airborne Toxic Control Measure for Diesel Particulate from School Bus Idling. T13, CCR, 2480	12/12/02	No emission reductions claimed.
Zero Emission Vehicle Amendments for 2003. T 13, CCR, 1960.1(k), 1961(a) and (d), 1900, 1962, and documents incorporated by reference	03/25/03	Found within the scope December 21, 2005 (71 FR 78190 (12/28/06))
Solid Waste Collection Vehicles. T 13, CCR, 2020, 2021, 2021.1, 2021.2	09/24/03	
Airborne Toxic Control Measure for Diesel Particulate from Transport Refrigeration Units. T 13, CCR, 2022 and 2477	12/11/03	Waiver granted (non-road) January 9, 2009 (74 FR 3030 (1/16/2009))

Appendix Table A-4		
On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements (Amendments). T 13, CCR, 2701-2707 & 2709	12/11/03	Procedures to verify diesel retrofit technology.
CA Motor Vehicle Service Information Rule. T 13, CCR, 1969	01/22/04	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
Heavy Duty Diesel Engine-Chip Reflash. T 13, CCR, 2011, 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194	03/27/04	Compliance provision.
Engine Manufacturer Diagnostic System Requirements for 2007 and Subsequent Model Heavy Duty Engines. T 13, CCR, 1971	05/20/04	Waiver granted December 22, 2005 (71 FR 335 (1/4/06))
Urban Bus Engines/Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, 1956.3, and 1956.4,	06/24/04	Various modifications to urban/transit bus standards.
Airborne Toxic Control Measure for Diesel Particulate from Diesel Fueled Commercial Vehicle Idling. T 13, CCR, 2485	07/22/04	
Greenhouse Gas Standards. T 13, CCR, 1961.1, 1900, 1961 and Incorporated Test Procedures	09/23/04	Waiver granted June 30, 2009 (74 FR 32744 (July 8, 2009))
Transit Fleet Rule. T 13, CCR, 2023, 2023.1, 2023.2, 2023.3, 2023.4, 1956.1, 2020, 2021, repeal 1956.2, 1956.3, 1956.4	02/24/05	
On-Board Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines (HD OBD). T 13, CCR, 1971.1	07/21/05	Waiver granted August 13, 2008 (73 FR 52042 (9/8/08))
2007-2009 Model-Year Heavy Duty Urban Bus Engines and the Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, and 1956.8	09/15/05 & 10/20/05	Aligns State emission standards with federal emission standards.
Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008. T 13, CCR section 1956.8 and the incorporated document	10/20/05	Confirm not pre-empted or within the scope finding requested. Initial notice 75 FR 43975 (7/27/2010)
Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities. T 13, CCR, 2022 and 2022.1	12/08/05	
AB1009 Heavy-Duty Vehicle Smoke Inspection Program. T 13, CCR, 2180, 2180.1, 2181, 2182, 2183, 2184, 2185, 2186, 2187, and 2188, 2189	01/26/06	Requires trucks to have emission control labels.

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Diesel Verification Procedure, Warranty & In-Use. T 13, CCR, 2702, 2703, 2704, 2706, 2707, and 2709.	03/23/06	Procedures to verify diesel retrofit technology, supporting rule for in-use control measures.
Technical Amendments to Evaporative Exhaust and Evaporative Emissions Test Procedures. T 13, CCR, 1961, 1976 and 1978.	05/25/06	Within the scope finding July 22, 2010 (75 FR 44948 (July 27, 2010)).
California Motor Vehicle Service Information Rule. T 13, CCR, 1969 and incorporated documents	06/22/06	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
On-Board Diagnostic II. T 13, CCR, 1968.2, 1968.5, 2035, 2037 and 2038	09/28/06	Within the scope finding requested
Heavy-Duty In-Use Compliance Regulation. T 13, CCR, 1956.1, 1956.8, and documents incorporated by reference	09/28/06	Compliance provision. Compliance program "essentially identical to EPA's." See Updated Information Digest for the Rule.
Zero Emission Bus Regulation. T13, CCR, 2023.1, 2023.3, & 2023.4	10/19/06	Delays ZEB requirements due to high bus costs and unproven durability, reliability and ability to produce the number of buses required by the regulation. See Updated Information Digest.
Voluntary Accelerated Retirement Regulation. T 13, CCR, 2601-2610 and appendices A-D	12/07/06	Establishes standards for a voluntary accelerated retirement program.

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Emission Standards for Utility and Lawn and Garden Engines. T 17, CCR, 2400 et. seq.	12/13/90	Waiver granted July 5, 1995 (60 FR 37440 (7/20/95))
1-year Implementation Delay in Emission Standards for Utility Engines. T 13, CCR, 2400, 2403-2407	04/08/93	
Utility and Lawn and Garden Equipment Engines. T 13, CCR, 2403(c), 11(a)(1)(I)(ii), 4(a)(1)(I)(ii)	07/28/94	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
Utility and Lawn and Garden Equipment Engines. CO Standards	1/25/96	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Small Off-Road Engines (SORE). T 13, CCR, 2400, 2410-2414	03/26/98	Within the scope finding November 9, 2000 (65 FR 69767 (11/20/00)), waiver granted (durability requirements), November 10, 2003 (65 FR 65702 (11/21/03)).
Small Off-Road Engines (SORE). T 13, CCR, 2400-2409, 2405.1, 2405.2, 2405.3, 2750-2754, 2754.1, 2754.2, 2755-2767, 2767.1, 2768-2773 and the documents incorporated by reference	09/25/03	Waiver granted, December 11, 2006 (71 FR 75536 (12/15/2006))
Off-Highway Recreational Vehicles. T 13, CCR, 2410-2414, 2111-2140	01/03/94	Waiver granted December 23, 1996 (61 FR 69093 (12/31/1996))
Wintertime Requirements for Utility Engines & Off-Highway Vehicles. T 13, CCR, 2403	09/26/96	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
1997 & Later Model Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2410-2414, 2415	12/10/98	Within the scope finding request March 4, 2000
Off-Highway Recreation Vehicles. T13, CCR, 2415	07/24/03	Addition to March 4, 2000 request November 19, 2004. Made changes to riding season restrictions.
Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2411-2413, 2415 & documents incorporated by reference	07/20/06	Adopted evaporative emission standards identical to EPA's.
Heavy Duty Diesel Cycle Engines. T 13, CCR, 2420-2427	01/09/92	Waiver granted May 15, 1995 (60 FR 48981 (9/21/1995))
Exemption of Military Tactical Vehicles. T 13, CCR, 1905, 2400, 2420	12/14/95	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
Off-Road Compression Ignition Engines. T 13, CCR, 2111, 2112, 2137, 2139, 2140, 2141, 2144, 2400, 2401, 2403, 2420, 2421, 2423-2427, & appendix A to article 2.1.	01/27/00	Waiver granted, February 5, 2010 (75 FR 8056 (2/23/2010))
Off-Road Compression Ignition Engines. T 13, CCR, 2420, 2421, 2423, 2424, 2425, 2427	12/09/04	Waiver granted February 5, 2010 (75 FR 8056 (2/23/2010))

Appendix Table A-5		
Off-Road Mobile Source Measures Adopted		
by the California Air Resources Board		
1990 to 2006		
Measure	Hearing Date	Comments
In-Use Off-Road Diesel Vehicles. T 13, CCR, 2449	07/26/07	Notice of opportunity for public hearing and comment (on waiver), 73 FR 58585 (10/7/2008).
Large Off-Road Spark-Ignition Engine Regulations. T 13, CCR, 2430 et seq., and 2411-2414	10/22/98	Waiver granted May 15, 2006 (71 FR 29623 (5/23/2006))
Fork Lifts and Other Industrial Equipment. (Large Off-Road Spark Ignition Engines > 1 liter) T 13, CCR 2430, 2433, 2434. Adopt 2775, 2775.1, 2775.2, 2780, 2781, 2783, 2784, 2785, 2786, 2787, 2788, and 2789.	05/26/06	Adopts EPA's Standards for 2007; adopts more stringent standards for 2010.
Emission Standards and Test Procedures for 2001 Marine Engines. T 13, CCR, 2440 <i>et seq</i>	12/10/98	Waiver granted March 22, 2007 (59 FR 14546 (March 28, 2007))
Marine Inboard Engines. T 13, CCR, 2111, 2112, 2139, 2140, 2147, 2440-2442, 2443.1-2443.3, 2444, 2445.1, 2445.2, 2446, 2444.2 and incorporation of documents by reference	07/26/01	Waiver granted in part March 22, 2007 (59 FR 14546 (March 28, 2007)) 2007 standards not waived.
Marine Inboard Sterndrive Engines. T 13 CCR 2111, 2112, 2441, 2442, 2444.2, 2445.1, 2446, 2447, and incorporated document	11/17/05	Revision to year 2007 standards in 7/26/2001 marine inboard engine standards. Waiver requested February 7, 2008.
Portable Equipment Registration Program. T 13, CCR, 2450-2465	03/27/97	
Revisions to Statewide Portable Equipment Registration Program. T 13, CCR, 2450-2463	12/10/98	
Modifications to the Statewide Portable Equipment Registration Program (PERP) Regulations. T 13, CCR Amendments to 2450-2465, and repeal of 2466	02/26/04	
Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 17, CCR, 93116, 93116.1, 93116.2, 93116.3, 93116.4, and 93116.5	02/26/04	Within-the-scope finding/waiver requested March 28, 2005.
Portable Equipment Registration Program. T 13, CCR, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, and 2465	06/22/06	Within-the-scope finding/waiver requested December 5, 2008.

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Emergency Regulation for Portable Equipment Registration Program Airborne Toxic Control Measures and Portable and Stationary diesel-Fueled Engines. T 13, CCR, 2452, 2455, 2456, 2461; T17 CCR 93115, 93116.2, 93116.3	12/06/06	Within-the-scope finding/waiver requested December 5, 2008.
Portable Equipment Registration Program and Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 13, CCR, 2451, 2452, 2456, 2458, 2459, 2460, 2461, and 2462, T 17, CCR, 93116.1, 93116.2, 93116.3, 93116.3.1	03/22/07	Within-the-scope finding/waiver requested December 5, 2008.
Aftermarket Parts for Off-Road Engines. T 13, CCR, 2470-2476	11/19/98	Compliance measure
Portable Container Spillage Control Measure. T 13, CCR, 2470-2478	09/23/99	Similar federal regulation. 40 CFR part 59, subpart F.
Portable Fuel Containers (PFC) [Part 1 of 2]. T 13, CCR, 2467 and 2467.1	09/15/05	Similar federal regulation. 40 CFR part 59, subpart F.
Portable Fuel Containers (PFC) [Part 2 of 2]. T 13, CCR 2467.2, 2467.3, 2467.4, 2467.5, 2467.6, 2467.7; repeal of 2467.8, and adoption of new 2467.8 and 2467.9.	09/15/05	Similar federal regulation. 40 CFR part 59, subpart F.
Airborne Toxic Control Measure for Diesel Particulate for Transport Refrigeration Units. T 13, CCR, 2022 & 2477	12/11/03	Waiver granted (non-road) January 9, 2009 (74 FR 3030 (1/16/2009))
Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. T 13, CCR, 2479	12/08/05	Within-the-scope finding and waiver request January 29, 2007
Airborne Toxic Control Measure for Cruise Ships Onboard Incineration. T 17, CCR, 93119	11/17/05	No emission reductions
Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline. T 13, CCR, 2299.1 and T 17, CCR, 93118	12/08/05	
Airborne Toxic Control Measure for Cruise Ships and Ocean-Going Ships Onboard Incineration (amendments). T 17, CCR, 93119	11/16/06	
Ocean-Going Vessels At Berth (Shore Power). T 13, CCR, 2299.3 and T 17, CCR, 93118.3 and documents incorporated by reference	12/06/07	No emission reductions claimed

Appendix Table A-5
Off-Road Mobile Source Measures Adopted
by the California Air Resources Board
1990 to 2006

Measure	Hearing Date	Comments
Commercial Harbor Craft. T 13, CCR, 2222 and incorporated "California Evaluation Procedures for New Aftermarket Catalytic Converters"	11/15/07	No emission reductions claimed
Cleaner Fuels in Ocean-Going Vessel Main Engines and Auxiliary Boilers. T 13, CCR, 2299.2 and T 17, CCR, section 93118.2	07/24/08	

E. State Consumer Product Measures

California has been regulating the VOC content of consumer products for 20 years and continues to tighten standards and regulate more products. Appendix Table A-6 is a list of CARB's rulemaking actions on consumer products since 1990.

Appendix Table A-6 Consumer Products Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Antiperspirant/Deodorants. T 17, CCR, 94500-94506	11/09/89	Approved 8/21/95 (60 FR 43379)
Consumer Products BAAQMD. T 17, CCR, 94520-94526	06/14/90	Not applicable to the SJV area
Phase I - Consumer Products. T 17, CCR, 94507-94517	10/11/90	Approved 8/21/95 (60 FR 43379)
Phase II - Consumer Products. T 17, CCR, 94501, 94502, 94505, 94514, 94503.5, 94506, 94507 - 94513, 94515	01/09/92	Approved 8/21/95 (60 FR 43379)
Notice of General Public Interest for Consumer Products. T 17, CCR, 94507 - 94517	11/30/92	Not a control measure
Alternative Control Plan for Consumer Products. T 17, CCR, 94540-94555	09/22/94	Voluntary compliance option. No action.
Aerosol Coating Products and Alternative Control Plan. T 17, CCR, 94520-94528, 94540-94543, 94547.	03/23/95	Superseded by 6/22/00 rule.
Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products. T 17, CCR, 94500-94506, 94508, 94521	09/28/95	Superseded by 6/24/04 rule for antiperspirants and deodorants; superseded by 11/17/06 rule for consumer products; superseded by 11/17/06 rule for aerosol coating products.
Antiperspirants and Deodorants, Consumer Products, Aerosol Coating Products (ARB Test Method 310). T 17, CCR, 94506(a), 94515(a), 94526	11/21/96	Superseded by 6/24/04 rule for antiperspirants and deodorants; superseded by 11/17/06 rule for consumer products; superseded by 11/17/06 rule for aerosol coating products.
Consumer Products and Aerosol Coating Products Amendments. T 17, CCR, 94508-94515, 99517, 94321	11/21/96	Superseded by 11/17/06 rule
Consumer Products (Hair Spray) Amendments. T 17, CCR, 94509, 94513, 94514	03/27/97	Voluntary compliance option. No action.

Appendix Table A-6 Consumer Products Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Consumer Products (Mid-Term Measures) Amendments. T 17, CCR, 94508, 94509, 94513	07/24/97	Superseded by 11/17/06 rule
Consumer Products (Hairspray Credit Program). T 17, CCR, 94502, 94509, 94522, & 94548	11/13/97	Voluntary compliance option. No action.
Consumer Products, Aerosol Coatings & Antiperspirants and Deodorants. T 17, CCR, 94501, 94508, 94521, 94522, and 94524	11/19/98	Superseded by 11/17/06 rule
Consumer Products - LVP-VOC Definitions And Test Methods. T 17, CCR, 94506, 94506.5, 94508(a)(78), 94515 and 94526, and the amendment of ARB Method 310	11/19/98	Superseded by 6/24/04 rule for test method 310 and 11/17/06 rule for rest.
California Consumer Products Regulation Mid-Term Measures II. T 17, CCR, 94508, 94509, and 94513	10/28/99	Superseded by 11/17/06 rule
Consumer Products Aerosol Adhesives Control Measure. T 17, CCR, 94508, 94509, 94512, 94513	05/25/00	Superseded by 11/17/06 rule
Aerosol (Paint) Coatings Products. T 17, CCR, 94700, 94701, 94521-94524, 94526	06/22/00	Approved 9/13/05 70 FR 53920; superseded by 11/17/06 rule
Antiperspirant and Deodorant Regulations. T 17, CCR, 94502, 94504	10/26/00	Superseded by 6/24/04 rule
Revised Tables of Maximum Incremental Reactivity Values. T 1, CCR, 94700.	12/03/03	Approved 9/13/05 70 FR 53920; superseded by 11/17/06 rule
Consumer Products & Methods 310/ATCM for Para-Dicholorobenzene. T 17, CCR, 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, and ARB Method 310, which is incorporated by reference	06/24/04	Approved November 4, 2009 (74 FR 57074) (EO order date of 5/6/05)
Consumer Products. T 17, CCR, 94508, 94509, 94510, 94513 & 94523	11/17/06	Approved November 4, 2009 (74 FR 57074) (EO order date 9/16/07)

F. State Vapor Recovery Measures

Under California State law (Health and Safety Code Sections 41954), CARB is required to adopt procedures and performance standards for controlling gasoline emissions from gasoline marketing operations, including transfer and storage operations. State law also authorizes CARB, in cooperation with the Districts, to certify vapor recovery systems, identify defective equipment, and develop test methods. Appendix Table A-7 is a list of rulemaking actions taken by CARB since 1990 that address vapor recovery equipment certification, defects, and/or test methods.

Appendix Table A-7 Gasoline Vapor Recovery Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015, 94150-94160, 94000-94004, 94007.	06/29/95	CARB sets requirements for and certifies vapor recovery equipment. District rules establish requirements for the installation of CARB-certified equipment. See SJVAPCD Rules 4621 & 4622
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015 and 94150, 94156, 94157, 94158, 94159, 94160, 94162	08/27/98	
Gasoline Vapor Recovery Systems. T 17, CCR, 94011, 94153, 94155, and incorporated test procedures, CP-201, TP- 201.4, and TP-201.6	06/24/99	
Enhanced Gasoline Vapor Recovery Systems (In Station Diagnostics and Onboard Refueling Vapor Recovery). T 17, CCR, 94011	03/23/00	
Enhanced Gasoline Vapor Recovery Systems (Emergency Filing CP-201, section 18). T 17, CCR, 94011	03/23/00	
Gasoline Vapor Recovery Systems Test Methods and Compliance Procedures. T 17, CCR, 94010, 94011, 94153, 94155, 94163, 94164, 94165 & incorporated procedures	10/25/01	
Gasoline Vapor Recovery Systems Defects. T 17, CCR, 94006 and incorporated document.	11/15/01	
Gasoline Vapor Recovery Systems Test Procedures. T 17, CCR, 94010, 94011, 94163, 94164, and 94165 and procedures incorporated by reference, and 94166, 94167, and incorporation by reference.	12/12/02	
Unihose Gasoline Vapor Recovery Systems. T17, CCR, 94011	07/22/04	

Appendix Table A-7 Gasoline Vapor Recovery Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Gasoline Vapor Recovery Systems at Dispensing Facilities. Emergency Filing. T 17, CCR, 94011	07/22/04	
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006(b) & incorporated document	08/24/04	
Enhanced Gasoline Vapor Recovery Systems Extension. T 17, CCR, 94011 and certification procedure	11/18/04	
Gasoline Vapor Recovery Systems. T 17 CCR 94011 and incorporated certification	06/22/06	
Vapor Recovery Aboveground Storage Tanks (AST). T 17, CCR, 94010, 94011, 94016 and 94168 and incorporated documents	06/21/07	
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006	N/A	

G. Other State Measures

A number of CARB measures do not fall into one of the categories of measures listed in Appendix Tables A-2 through A-7. These measures are listed below in Appendix Table A-8.

Appendix Table A-8 Other Not Previously Listed Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Airborne Air Toxic Measure for Ethylene Oxide from Sterilizers & Aerators. T 17, CCR, 93108	05/10/90	
Controls for Abrasive Blasting. T 17, CCR, 92000, 92200, 92400, 98500, 98510, 92520, 92530	11/08/90	
Airborne Toxic Control Measure for Emission of Toxic Metals from Non-Ferrous Metal Melting. T 17 & 26, CCR, 93107	12/10/92	
Air Toxic Control Measure for Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Facilities. T 17, CCR, 93111	04/27/00	Mainly addresses non-VOC
Airborne Toxic Control Measure for Asbestos from Construction, Grading, Quarrying, and Surface Mining. T 17, CCR, 93105	07/26/01	
Air Toxic Control Measures for Auto and Mobile Equipment Refinishing Coatings Containing Hexavalent Chromium and Cadmium Compounds. T 17, CCR, 93112	09/20/01	Air toxic control measures prohibits additives with hexavalent chromium. Total emissions CA are less than 300 lb per year. ISOR, p. V-2.
Distributed Generation Guidelines and Regulations. T 17, CCR, 94200-94214	11/15/01	Minimal impact, few units certified. See ISOR for 9/28/06 rule amendment
Airborne Toxic Control Measure for Outdoor Residential Waste Burning. T 17, CCR, 93113	02/21/02	
Airborne Toxic Control Measure for Stationary Compression Ignition Engines. T 17, CCR 93115 & documents incorporate by reference	2/26/04	PM control measure.

<p align="center">Appendix Table A-8 Other Not Previously Listed Measures Adopted by the California Air Resources Board 1990 to 2006</p>		
Measure	Hearing Date	Comments
Airborne Toxic Control Measure for Hexavalent Chromium and Nickel from Thermal Spraying. T 17, CCR, 93102.5	12/09/04	Air toxic control measures. Total emissions (chromium & nickel in CA are less than 200 lb per year. ISOR, p. IV-6 to 8.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments). T 17, CCR, 93115	05/26/05 3/17/05	Revisions to 2/26/04 rule. PM control measure.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments, In-Use Agricultural Eng. Exemption removal). T 17, CCR, 93115.1-93115.15.t.	11/16/06	PM control measure.
Distributed Generation Guidelines and Regulations. T 17, CCR, 94201, 94201.1, 94203, 94204, & 94207-942142	10/19/06	Addition of 2013 standards NO _x and VOC standards for DG units which burn waste gas.
Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations. T 17, CCR, 93102.1-93102.16	12/07/06	Air toxic control measures. Total emissions in CA are 14.4 lb per year. ISOR, p. 49.

Appendix B – SCAQMD Rules

Table Appendix B -1
Status of South Coast Air Quality Management District Rules
for NO_x, VOC, PM, and SO_x

Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
223	Large Confined Animal Feeding Operations	6/2/06	3/17/09	n/a	n/a	Baseline measure
401	Visible Emissions	11/09/01	7/10/84	1/29/85	50 FR 3907	Baseline measure
403	Fugitive Dust	6/3/05	10/20/05	03/10/08	73 FR 12639	Baseline measure
431.2.	Sulfur Content Of Liquid Fuels	9/15/00	12/31/90	06/08/99	64 FR 30396	Baseline measure
442	Usage Of Solvents	12/15/00	05/08/01	05/23/02	67 FR 36105	Baseline measure
444	Open Burning	11/7/08	1/22/02	4/8/02	67 FR 16644	Baseline and control strategy measure
445	Wood Burning Devices	03/07/08	07/18/08	6/11/2009	74 FR 27716	Control Strategy measure
461	Gasoline Transfer and Dispensing	03/07/08	10/20/05	4/11/06	71 FR 18216	Baseline and control strategy measure
462	Organic Liquid Loading	05/14/99	06/03/99	07/21/99	64 FR 39037	Baseline measure
463	Organic Liquid Storage	05/6/05	10/20/05	01/04/07	72 FR 267	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1102	Petroleum Solvent Dry Cleaners	11/7/2000	5/08/01	7/17/02	67 FR 46876	Baseline measure
1103	Pharmaceuticals and Cosmetics Manufacturing	3/12/99	5/13/99	7/21/99	64 FR 39037	Baseline measure
1104	Wood Flat Stock Coating Operation	8/13/99	10/29/99	3/22/00	65 FR 15240	Baseline measure
1105	Fluid Catalytic Cracking Units - SO _x	9/1/84	2/6/85	7/12/90	55 FR 28624	Baseline measure
1105.1	Reduction of PM and NH ₃ emissions from Fluid Catalytic Cracking Units	11/7/03	6/3/04	1/4/06	71 FR 241	Baseline measure
1106	Marine Coating Operations	1/13/95	2/24/95	7/14/95	60 FR 36225	Baseline measure
1106.1	Pleasure Craft Coating Operations	2/12/99	6/3/99	8/31/99	64 FR 47390	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1107	Coating of Metal Parts and Products	1/6/06	5/8/07	11/24/08	73 FR 70883	Baseline and control strategy measure
1108	Cutback Asphalt	2/1/85	4/12/85	7/12/90	55 FR 28624	Baseline measure
1108.1	Emulsified Asphalt	11/4/83	10/25/84	1/24/85	50 FR 3338	baseline measure
1109	NO _x Emissions from Boilers and Process Heaters – Petroleum Refineries	8/5/88	3/26/90	1/13/00	65 FR 2052	Baseline measure
1110.2	Emissions from Gaseous and Liquid Fueled Engines	2/1/08	5/20/08	4/17/09	74 FR 18995	Control strategy measure
1111	NO _x emissions from Natural-Gas-Fired, Fan type Central Furnaces	11/6/09	5/17/10	8/4/10	75 FR 46845	Control strategy measure
1112	NO _x from Cement Kilns	6/6/86	10/10/86	6/25/90	55 FR 25832	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1112.1	PM from Cement Kilns	12/4/09	7/20/10	09/2/98	63 FR 46659	Baseline and control strategy measure
1113	Architectural coatings	7/13/07	3/07/08	10/5/10 proposal	75 FR 61367	Baseline and control strategy measure
1115	Motor Vehicle Assembly Line Coating Operations	5/12/95	6/16/95	7/14/95	60 FR 36225	Baseline measure
1117	NO _x emissions from Glass Melting Furnaces	1/6/84	2/6/85	7/12/90	55 FR 28624	Baseline measure
1118	Refinery flares	11/4/05	10/5/06	8/28/07	72 FR 49196	Baseline measure
1121	Control of NO _x from Residential type natural-gas-fired water heaters	9/3/04	7/18/08	5/6/09	74 FR 20880	Baseline and control strategy measure
1122	Solvent Degreasers	10/1/04	1/13/05	2/8/06	71 FR 6350	Baseline measure
1123	Refinery Process Turnarounds	12/7/90	5/13/91	8/11/92	57 FR 35758	Baseline measure
1124	Aerospace Assembly and Component Manufacturing Operations	9/21/01	1/22/02	8/13/02	67 FR 52611	Baseline measure
1125	Metal Container, Closure, and Coil Coating Operations	03/7/08	4/6/09	12/21/09	74 FR 67844	Baseline and control strategy measure
1126	Magnet Wire Coating Operations	1/13/95	2/24/95	6/13/95	60 FR 31081	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1127	Emissions Reductions from Livestock Waste	8/6/04	10/5/06	n/a	n/a	Baseline measure
1128	Paper, Fabric, and Film Coating Operations	3/8/96	7/23/96	5/4/99	64 FR 23774	Baseline measure
1130	Graphic Arts	10/8/99	1/21/00	9/13/00	65 FR 55201	Baseline measure
1130.1	Screen Printing Operations	12/13/96	3/3/97	8/21/98	63 FR 44792	Baseline measure
1131	Food Product Manufacturing and Processing Operations	6/6/03	8/11/03	1/22/04	69 FR 3018	Baseline measure
1132	Further Control of VOC from High Emitting Spray Booths	5/5/06	1/10/10	4/26/04	69 FR 22445	Baseline measure
1133, 1133.1, 1133.2	Composting and Related Operations	1/10/03	6/5/03	7/21/04	69 FR 43518	Baseline measure
1134	NO _x from Stationary Gas Turbines	8/8/97	3/10/98	8/1/00	65 FR 46873	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1135	NO _x from Electric Power Generating Systems	7/9/91	1/28/92	8/11/98	63 FR 42721	Baseline measure
1136	Wood Products Coatings	6/14/96	8/28/96	8/18/98	63 FR 44132	Baseline measure
1137	PM ₁₀ Reduction from Woodworking Operations	2/1/02	11/9/02	1/22/04	69 FR 3018	Baseline measure
1138	Control of Emissions from Restaurant Operations	11/14/97	3/10/98	7/11/01	66 FR 36170	Baseline measure
1140	Abrasive Blasting	8/2/85	11/12/85	09/28/81	46 FR 47451	Baseline measure
1141	Control of VOC Emissions from Resin Manufacturing	11/17/00	3/14/01	8/13/02	67 FR 52611	Baseline measure
1141.1	Coatings and Ink Manufacturing	11/17/00	3/14/01	2/12/02	67 FR 6410	Baseline measure
1141.2	Surfactant Manufacturing	1/11/02	5/21/02	8/26/03	68 FR 51181	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1142	Marine Tank Vessel Operations	7/19/91	01/28/92	12/13/94	59 FR 64132	Baseline measure
1143	Consumer paint thinners and multipurpose solvents	7/9/10	n/a	n/a	n/a	Control strategy measure; New rule; not yet submitted
1144	Metalworking fluids and direct contact lubricants	7/9/10	5/17/10	7/14/10	75 FR 40726	Control strategy measure
1145	Plastic, Rubber, Leather and Glass Coatings	12/3/09	5/17/10	7/14/10	75 FR 40726	Control strategy measure
1146	NO _x from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters	9/5/08	7/20/10	4/8/02	67 FR 16640	Control strategy measure
1146.1	NO _x from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters	9/5/08	7/20/10	9/6/95	60 FR 46220	Control strategy measure
1146.2	NO _x from Large Water Heaters and Small Boilers	5/5/06	3/7/08	12/5/08	73 FR 74027	Baseline measure
1147	NO _x Reductions from Miscellaneous Sources	12/5/08	5/17/10	8/4/10	75 FR 46845	Control strategy measure
1148	Thermally Enhanced Oil Recovery Wells	11/5/82	2/3/83	10/19/84	49 FR 41028	Baseline measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1148.1	Oil and gas production wells	03/05/04	01/10/10	n/a	n/a	Baseline measure; first time this rule has been submitted to EPA
1149	Storage Tank Degassing	05/02/08	04/06/09	12/21/09	74 FR 67821	Control strategy measure
1150.1	Control of Gaseous Emissions from Active Landfills	03/17/00	07/26/00	07/01/02	67 FR 44062	Baseline measure
1151	Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations	12/02/05	06/04/09	12/29/09	74 FR 68759	Baseline measure
1153	Commercial Bakery Ovens	01/13/95	02/24/95	08/08/95	60 FR 40285	Baseline measure
1156	PM10 Emissions Reductions from Cement Manufacturing	3/6/09	4/29/09	3/10/08	73 FR 12639	Control strategy measure
1157	PM10 Emissions Reductions from Aggregate and Related Operations	9/8/06	5/17/10	n/a	n/a	Control strategy measure; first time this rule has been submitted to EPA
1158	Storage, Handling and Transport of Petroleum Coke	7/11/08	12/23/08	11/10/09	74 FR 57907	Control strategy measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1159	Nitric Acid Units - NO _x -	12/6/85	2/10/86	7/12/90	55 FR 28622	Baseline measure
1162	Polyester Resin Operations	7/8/05	4/6/09	2/12/02	67 FR 6410	Baseline measure
1164	Semiconductor Manufacturing	1/13/95	2/24/95	2/1/96	61 FR 3579	Baseline measure
1166	VOC Emissions from Decontaminated Soil	7/14/95	10/13/95	8/17/98	63 FR 43884	Baseline measure
1168	Adhesive and Sealant Applications	1/7/05	4/29/09	12/12/03	68 FR 69320	Baseline measure
1171	Solvent Cleaning Operations	7/14/06	5/17/10	7/27/04	69 FR 44599	Baseline and control strategy measure
1173	Fugitive VOC Emissions	2/6/09	1/10/10	5/5/10	75 FR 24406	Baseline and control strategy measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
1174	Control of VOC Emissions from the Ignition of Barbecue Charcoal	10/5/90	5/13/91	10/4/94	59 FR 50498	Baseline measure
1175	Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products	9/7/07	3/7/08	5/5/10	75 FR 24406	Baseline measure and control strategy measure
1176	Sumps and Wastewater Separators	9/3/96	11/26/96	10/7/02	67 FR 62376	Baseline measure
1178	Further Reductions of VOC Emissions From Storage Tanks at Petroleum Facilities	12/21/01	5/21/02	8/26/03	68 FR 51181	Baseline measure
1179	Publicly Owned Treatment Works Operations	3/6/92	9/14/92	10/4/94	58 FR 50498	Baseline measure
1186	PM10 Emissions from Paved and Unpaved Roads and Livestock Operations	7/11/08	12/23/08	11/14/05	70 FR 69081	Baseline and control strategy measure.
1189	Emission from Hydrogen Plant Process Vents	1/21/00	7/26/00	6/8/01	66 FR 30815	Baseline measure
2000-2015	RECLAIM	5/6/05	10/20/05	8/29/06	71 FR 51120	Baseline and control strategy measure