

Chapter 1

Air Quality Standards and Requirements

2015 Plan for the 1997 PM_{2.5} Standard
SJVUAPCD

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Chapter 1: Air Quality Standards and Requirements

1.1 WHAT ARE AIR QUALITY STANDARDS?

Pursuant to the federal Clean Air Act (CAA) Section (§)108 and §109, the U.S. Environmental Protection Agency (EPA) periodically reviews and establishes health-based air quality standards (often referred to as National Ambient Air Quality Standards, or NAAQS) for ozone, particulates, and other pollutants. Although the San Joaquin Valley's (Valley) air quality is steadily improving, the Valley experiences unique and significant difficulties in achieving these increasingly stringent standards. For over twenty years, the San Joaquin Valley Air Pollution Control District (District) has implemented several generations of emissions control measures for those stationary and area sources under its regulatory jurisdiction. Similarly, the California Air Resources Board (ARB) has adopted regulations for mobile sources. Together, these efforts represent the nation's toughest air pollution regulations and have greatly contributed to reduced ozone and particulate matter concentrations in the Valley. Despite the significant progress under these regulations, greatly aided by the efforts of Valley businesses and residents, many air quality challenges remain.

1.2 1997 PM2.5 AIR QUALITY STANDARD

EPA adopted the first NAAQS for particulate matter that is 2.5 microns or less in diameter (PM_{2.5}) in July 1997¹ and set the annual PM_{2.5} standard at 15 micrograms per cubic meter (µg/m³) and the 24-hour PM_{2.5} standard at 65 µg/m³. States and air districts addressed this standard under CAA Title 1, Part D, Subpart 1² (Subpart 1) following guidance provided by EPA. As a result of a court ruling in 2013 EPA now requires the 1997 PM_{2.5} Standard be addressed by states and air districts under the requirements of CAA Subpart 1 and CAA Title 1, Part D, Subpart 4 (Subpart 4). This *2015 Plan for the 1997 PM_{2.5} Standard (2015 PM_{2.5} Plan)* addresses the 1997 Standard for PM_{2.5} under Subpart 1 and Subpart 4. Until the exceptional weather conditions experienced due to the recent drought, the District was on track to attain the 1997 annual PM_{2.5} standard before the federally mandated deadline of December 2014.

1.3 DISTRICT'S *2008 PM_{2.5} PLAN* FOR THE 1997 PM_{2.5} STANDARD

Pursuant to Subpart 1 requirements, on January 5, 2005, EPA promulgated air quality designations for all areas for the 1997 PM_{2.5} Standard.³ EPA designated the Valley as a nonattainment area based on ambient air quality data collected in the area from 2001 through 2003. The District adopted an air quality attainment plan (*2008 PM_{2.5} Plan*) to address the 1997 PM_{2.5} standard. At the time of the development of the *2008 PM_{2.5}*

¹ 62 FR 38651-38701

² EPA. Clean Air Act. Retrieved on 11/5/2014 from <http://www.epw.senate.gov/envlaws/cleanair.pdf>.

³ 70 FR 943-1019

Plan, the Valley was already projected to attain the 1997 24-hour standard based on air quality data collected during the period of 2004 through 2006. As such, the focus of the 2008 PM_{2.5} Plan was to address the 15 µg/m³ annual PM_{2.5} standard.

The District's Governing Board adopted the 2008 PM_{2.5} Plan in April 2008⁴ to address EPA's 1997 annual PM_{2.5} standard for PM_{2.5}, and directed staff to forward the adopted 2008 PM_{2.5} Plan to the California Air Resources Board (ARB) for approval and submittal to EPA as a revision to the state implementation plan (SIP). EPA approved the 2008 PM_{2.5} Plan on November 9, 2011, effective January 9, 2012.⁵

1.4 TRANSITION FROM SUBPART 1 TO SUBPART 4 OF THE CLEAN AIR ACT

In January 2013, the D.C. Circuit Court found that EPA erred in implementing the federal PM_{2.5} standard pursuant solely to the general implementation provisions of Subpart 1 without also considering the particulate matter-specific provisions of Subpart 4. Specifically, Subpart 4 requires a nonattainment area classification system (i.e., moderate and severe classifications) and contains requirements specific to particulate matter. As a result of the court ruling, on June 2, 2014, EPA classified the Valley (and all other PM_{2.5} nonattainment areas) as a Moderate nonattainment area by order of law under Subpart 4 and required all nonattainment areas to submit additional documentation, as needed, to fulfill all Subpart 4 requirements.⁶

The EPA guidance interpreting the Subpart 4 requirements for particulate matter nonattainment areas in the General Preamble⁷ discusses the relationship of Subpart 1 and Subpart 4 SIP requirements, and notes that SIPs for Moderate nonattainment areas must meet the general provisions in Subpart 1 to the extent that these provisions are not otherwise "subsumed by, or integrally related to, the more specific Subpart 4 requirements." Some Subpart 1 provisions have no Subpart 4 equivalent (e.g., the emissions inventories (CAA section 172(c)(3)) and contingency measures (CAA section 172(c)(9)) and for these provisions, Subpart 1 continues to govern. Other provisions of Subpart 1 are subsumed or superseded by more specific requirements in Subpart 4 (e.g., certain provisions concerning attainment dates). Additionally, EPA guidance provides different requirements for areas of different classifications of nonattainment, as discussed below.

⁴ SJVAPCD. 2008 PM_{2.5} Plan. Retrieved on 11/24/14 from

http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm.

⁵ EPA. Approval and Promulgation of Implementation Plans; California; 2008 San Joaquin Valley PM_{2.5} Plan and 2007 State Strategy; Final Rule. 76 Fed. Reg. 217, pp. 69896 – 69926. (2011, November 9). (to be codified at 40 CFR Part 52). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2011-11-09/pdf/2011-27232.pdf>

⁶ All areas designated nonattainment for PM_{2.5} are classified as Moderate by order of law (CAA §188(a))

⁷ EPA. General Preamble for Title I of the Clean Air Act Amendments of 1990 Appendix. p. 13538. (57 FR 13498, April 16, 1992)

1.5 REQUEST FOR RECLASSIFICATION TO SERIOUS NONATTAINMENT

In accordance with Subpart 4 §188(b), the District submitted an official request to EPA for reclassification from Moderate nonattainment to Serious nonattainment. Included with this request was a demonstration that attainment by the April 5, 2015 deadline under the current Moderate nonattainment classification is impracticable. As discussed in the demonstration of impracticability,⁸ the Valley was on track to attain the 1997 PM_{2.5} standards until the extreme weather conditions over the winter of 2013-2014 overwhelmed emissions controls and led to abnormally high PM_{2.5} levels making attainment of the 1997 annual PM_{2.5} standard based on 2012-2014 data impossible. EPA proposed to reclassify the Valley as a Serious nonattainment area in January 2015.

1.5.1 Demonstration of Impracticability of Attainment as a Moderate Nonattainment Area by April 5, 2015

In its September 25, 2014 letter to EPA, the District provided ambient air quality data demonstrating that the Valley cannot attain the 1997 PM_{2.5} standard by April 5, 2015. Data supporting the request for reclassification and EPA's analysis of said data and conclusions are presented below.

1.5.1.1 1997 Annual PM_{2.5} Standard (15 µg/m³)

The District provided annual average PM_{2.5} concentrations recorded at monitoring sites in the Valley for 2012 and 2013, and then calculated the maximum 2014 annual average PM_{2.5} concentrations for each monitoring site that would result in a 3-year average PM_{2.5} concentration of 15 µg/m³ or less at that site. Through this analysis, the District demonstrated that the maximum 2014 annual average concentration at the Bakersfield-Planz air monitoring site would have to be 7.5 µg/m³ for 2014 in order for the design value to be at or below 15 µg/m³. The average PM_{2.5} concentration measured at the Bakerfield-Planz site in the first quarter of 2014 was 29.7 µg/m³. Thus the average PM_{2.5} concentrations at this monitoring site for the remaining three quarters of 2014 would have to be zero in order to result in a design value at or below 15 µg/m³ for 2014.

In EPA's evaluation of the request for reclassification, EPA independently evaluated preliminary 2014 air quality data available in EPA's Air Quality System (AQS) as of August 2014 to assess the District's representations.⁹ Preliminary 2014 AQS data for four monitoring locations in the Valley demonstrate that the 3-year average PM_{2.5} concentration for 2012-2014 will likely be well above 15 µg/m³. Because a determination of attainment requires that each eligible monitoring site in the area show a design value at or below the level of the PM_{2.5} Standard, a 2014 design value above

⁸ SJVAPCD. *Item Number 9: Review and Approve Actions to Address Air Quality Impacts Resulting from the Exceptional Weather Conditions Caused by the Recent Drought*. (2014, August 21) Retrieved on 12/02/2014 from http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2014/August/final/09.pdf

⁹ Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp. 1482-1491. (2015, January 12). (to be codified 40 CFR Part 81) <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

this level at one eligible monitor would render attainment by April 5, 2015 impossible. EPA's analysis is summarized in the following table.

Table 1-1 Preliminary Recorded Annual Average PM_{2.5} Concentrations (in $\mu\text{g}/\text{m}^3$) for Selected Sites in the Valley and Comparison to Lowest Recorded¹⁰

Monitor	Average Recorded 2014	EPA estimate for Max 2014 Annual Average Allowed to Attain	Lowest Recorded Annual Average (year)	Percent Difference Between Max 2014 and Lowest Recorded Annual Average
Bakersfield – Planz	29.7	7.7	14.5 (2011)	47
Visalia	27.9	11.4	13.6 (2010)	16
Corcoran	22.9	13.0	15.6 (2013)	18
Hanford	18.7	12.1	14.8 (2012)	18

1.5.1.2 1997 24-hour PM_{2.5} Standard (65 $\mu\text{g}/\text{m}^3$)

EPA also reviewed ambient air quality data in the AQS to determine whether the Valley can practicably attain the 24-hour standard by April 5, 2015. The 24-hour PM_{2.5} design value is determined by taking the 98th percentile value for each year over a consecutive three year period and averaging the three 98th percentile values. The resulting value is then rounded to the nearest 1.0 $\mu\text{g}/\text{m}^3$ and compared to the standard. The 98th percentile 24-hour average PM_{2.5} concentrations recorded in 2012 and 2013 at selected monitoring sites were analyzed for this purpose. The 98th percentile 24-hour concentrations in 2013 were higher than in 2012, and in some cases the 2013 value was significantly higher than the 2012 value. Based on these observed 98th percentile values in 2012 and 2013, EPA calculated for each of these monitoring sites the maximum 98th percentile 24-hour concentration in 2014 that would enable the site to show a 2014 24-hour PM_{2.5} Standard design value at or below 65 $\mu\text{g}/\text{m}^3$.

EPA also calculated a low estimate of the 98th percentile 24-hour concentration for 2014 at each of these sites, based on preliminary data reported to AQS for the first quarter of 2014 and a conservative assumption that 24-hour PM_{2.5} concentrations remain below these levels for the remainder of the year at each monitoring site. EPA's low estimates for the 98th percentile concentrations for 2014 at the two monitoring sites in Bakersfield (Planz and California Avenue) already exceed the maximum 2014 values that would enable these two sites to show a 24-hour PM_{2.5} standard design value for 2014 at or below 65 $\mu\text{g}/\text{m}^3$. These two sites in Bakersfield cannot practicably show a 24-hour PM_{2.5} standard design value at or below 65 $\mu\text{g}/\text{m}^3$ by April 5, 2015 as summarized in the following table.

¹⁰ Table 3 from Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp. 1482-1491. (2015, January 12). (to be codified 40 CFR Part 81) <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

Table 1-2 Preliminary Recorded 2014 24-hour PM_{2.5} Concentrations (in µg/m³) for Selected Sites in the Valley and Calculation of 98th Percentile Values¹¹

Monitoring Site	98 th Percentile in 2012	98 th Percentile in 2013	Low Estimate of 98 th Percentile in 2014	Max 98 th Percentile allowed in 2014 to attain
Bakersfield-Planz	40.6	96.7	64.4	58.9
Bakersfield – CA Ave	56.4	71.8	72.6	68.0
Hanford	48.3	67.6	76.7	80.3
Fresno-Pacific	51.3	71.6	61.8	73.3
Fresno-Garland	52.6	63.8	65.5	79.8

1.5.2 EPA Action on Impracticability

EPA analysis of air quality data from 2012 through 2014 resulted in the determination that attainment by April 5, 2015 as a Moderate nonattainment area is impracticable. EPA proposed to reclassify the Valley as a Serious Nonattainment area under CAA Subpart 4. EPA published this proposed action in the federal register on January 12, 2015 and received comments on the proposal through February 11, 2015.¹²

1.6 FEDERAL REQUIREMENTS FOR A SERIOUS NONATTAINMENT AREA

In their proposal to reclassify the Valley from a Moderate nonattainment area to a Serious nonattainment area for the 1997 PM_{2.5} Standard, EPA identified specific statutory requirements applicable to Serious nonattainment areas that upon reclassification as a Serious nonattainment area for the 1997 PM_{2.5} Standard, California is required to submit.¹³ These additional SIP revisions will satisfy the statutory requirements that apply to Serious nonattainment areas, including the requirements of Subpart 4. The Serious area SIP elements that California will be required to submit are summarized in Table 1-2.

On March 10, 2015 EPA issued proposed requirements for implementing the NAAQS for PM_{2.5} in areas that are designated nonattainment for these standards.¹⁴ The proposed requirements would apply to state, local and tribal air agencies developing plans that outline how nonattainment areas will meet and maintain fine particle standards. This guidance has not yet been published in the Federal Register for official

¹¹ Table 4 from Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp. 1482-1491. (2015, January 12). (to be codified 40 CFR Part 81) <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

¹² Designation of Areas for AQ Planning Purposes; Ca; SJV; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp.1482-1491. (2015, January 12). <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

¹³ Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp. 1482-1491. (2015, January 12). (to be codified 40 CFR Part 81) <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

¹⁴ Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements <http://www.epa.gov/airquality/particulatepollution/pdfs/20150311proposal.pdf>

public review and comment. The District looks forward to reviewing this proposed implementation rule and will follow it as it goes through the public review and comment process. Once published in the Federal Register as a final rule the District will use this guidance in development of future attainment plans to address PM2.5 standards.

Table 1-3 Statutory Requirements Applicable to Serious Nonattainment Areas

Requirement	Federal CAA	Description	2015 PM2.5 Plan
BACM and BACT	Subpart 4 §189(b)(1)(B)	Provisions to assure that the best available control measures (BACM), including best available control technology (BACT) for stationary sources, for the control of direct PM2.5 and PM2.5 precursors shall be implemented no later than four years after the area is reclassified.	Chapter 5, Appendix C
Attainment Demonstration	Subpart 4 §188(c)(2) and §189(b)(1)(A)	A demonstration that the plan provides for attainment as expeditiously as practicable but no later than December 31, 2015, or where the State is seeking an extension of the attainment date under Section 188(e), a demonstration that attainment by December 31, 2015 is impracticable and that the plan provides for attainment by the most expeditious alternative date practicable.	Chapter 1, Chapter 4, Appendix A
Reasonable Further Progress	Subpart 1 §172(c)(2)	Plan provisions that require reasonable further progress (RFP).	Chapter 6
Quantitative Milestones	Subpart 4 §189(c)	Quantitative milestones which are to be achieved every three years until the area is redesignated attainment and which demonstrate RFP toward attainment by the applicable date.	Chapter 6
PM2.5 Precursors	Subpart 4 §189(e)	Provisions to assure that control requirements applicable to major stationary sources of PM2.5 also apply to major sources of PM2.5 precursors, except where the State demonstrates to EPA's satisfaction that such sources do not contribute significantly to PM2.5 levels that exceed the standard in the area.	Appendix A
Emission Inventory	Subpart 1 §172(c)(3)	A comprehensive, accurate, current inventory of actual emissions from all sources of PM2.5 and PM2.5 precursors in the area.	Appendix B
Contingency Measures	Subpart 1 §172(c)(9)	Contingency measures to be implemented if the area fails to meet RFP or to attain by the applicable attainment date.	Chapter 6
New Source Review Program Major Source Thresholds	Subpart 4 §189(b)(3)	A revision to the nonattainment new source review (NSR) program to lower the applicable "major stationary source" thresholds from 100 tons per year (tpy) to 70 tpy.	Chapter 6

1.7 1997 PM_{2.5} STANDARD TIMELINE

The timeline below illustrates actions related to the 1997 PM_{2.5} standard, District Actions, EPA actions, and Valley events affecting attainment.

Figure 1-1 1997 PM_{2.5} Standard Timeline

- 1997
 - EPA sets first standard for PM_{2.5}^{15,16,17}
 - 24-hr: 65 µg/m³ (based on 3-year average of 98th percentile 24-hr PM_{2.5} concentrations)
 - Annual: 15 µg/m³ (based on 3-year average annual mean PM_{2.5} concentrations)
- 2005
 - EPA finalizes attainment designations¹⁸; designates Valley as “nonattainment”
- 2007
 - EPA issues *Clean Air Fine Particle Implementation Rule*¹⁹; directs states to adopt attainment plans under Subpart 1 requirements
- 2008
 - District adopts *2008 PM_{2.5} Plan* per EPA guidance²⁰ to address annual standard (Valley already in attainment of 24-hr standard)
- 2011
 - EPA approves District’s *2008 Plan*²¹ except for the contingency measures, which EPA disapproved.
 - EPA grants California’s request for an extension of the attainment date for the Valley to April 5, 2015
- 2013
 - A revised PM_{2.5} contingency measure plan for the Valley is submitted to EPA
 - U.S. Court of Appeals for the D.C. Circuit rules that EPA erred by not using Subpart 4 in addition to Subpart 1 in establishing its PM_{2.5} implementation rule
 - The District is on track to attain the 1997 annual PM_{2.5} standard
 - (Winter 2013-2014) The Valley experiences extreme drought and exceptional weather conditions.
- 2014
 - EPA approves the revised PM_{2.5} contingency plan for the Valley

¹⁵ NAAQS for Particulate Matter, 52 Fed. Reg. 119, pp. 24634-24669. (1987, July 1).

<http://www.regulations.gov/#!documentDetail;D=EPA-R08-OAR-2012-0446-0004>

¹⁶ NAAQS for Particulate Matter, 62 Fed. Reg. 138, pp. 38702-38752. (1997, July 18). <http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18577b.htm>

¹⁷ NAAQS for Particulate Matter, 62 Fed. Reg. 138, pp. 38753-38760. (1997, July 18). <http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18577c.htm>

¹⁸ Air Quality Designations and Classifications for the Fine Particles (PM_{2.5}) NAAQS, 70 Fed. Reg. 3, pp. 944-1019. (2005, January 5). <http://www.epa.gov/fedrgstr/EPA-AIR/2005/January/Day-05/a001.pdf>

¹⁹ Clean Air Fine Particle Implementation Rule, 72 Fed. Reg. 79, pp. 20586-20667. (2007, April 25). <http://www.epa.gov/fedrgstr/EPA-AIR/2007/April/Day-25/a6347.pdf>

²⁰ San Joaquin Valley Air Pollution Control District [SJVAPCD]. (2008, April 30). 2008 PM_{2.5} Plan. Fresno, CA.

http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm

²¹ Approval and Promulgation of Implementation Plans; California; 2008 San Joaquin Valley PM_{2.5} Plan and 2007 State Strategy, 76 Fed. Reg. 217, pp. 69896-69926. (2011, November 9). <http://www.gpo.gov/fdsys/pkg/FR-2011-11-09/pdf/2011-27232.pdf>

- EPA classifies Valley as a Moderate nonattainment area (by order of law) under Subpart 4 with an attainment date of April 5, 2015
- District submits formal request for reclassification of Valley to a Serious nonattainment area with a demonstration that the Valley cannot practicably attain the 1997 annual PM_{2.5} standard by the April 5, 2015 attainment date due to extreme weather during the winter of 2013-2014
- 2015 ▪ EPA proposes to reclassify the Valley as a Serious nonattainment area thus extending the attainment date to no later than December 31, 2015²²
- District to submit an attainment plan to EPA satisfying Subpart 1 and Subpart 4 requirements with attainment as expeditious as practicable but no later than December 31, 2015. (Plan submittal to include a demonstration that attainment by December 2015 is impracticable and a request for an attainment deadline extension to no later than 2020)
- 2020 ▪ Attainment date (after extension): as expeditiously as practicable but no later than December 31, 2020

1.8 IMPRACTICABILITY OF ATTAINMENT BY DECEMBER 31, 2020 AND REQUEST FOR EXTENSION OF ATTAINMENT DATE FOR A SERIOUS NONATTAINMENT AREA

Until the exceptional weather conditions experienced due to the recent drought, the Valley was on the verge of attaining the 1997 federal PM_{2.5} national ambient air quality standard (15 µg/m³ for annual, 65 µg/m³ for 24-hour) with an average annual concentration of 14.7 µg/m³ and average 24-hour concentration of 56.4 µg/m³ at the Valley's historic peak PM_{2.5} sites in Bakersfield in 2012. Due to the extreme drought, stagnation, strong inversions, and historically dry conditions experienced over the winter of 2013-2014, analysis showed that the Valley could not reach attainment even if the Valley experienced zero PM_{2.5} pollution for the last three quarters of 2014. In this plan, the District requests a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual standard to 2020. Refer to Chapter 4 of this *2015 PM_{2.5} Plan* for a full explanation of the Subpart 4 section that allows for a one time extension of the attainment date, supporting analysis behind the request, and requirements and demonstration of said requirements.

²² Designation of Areas for AQ Planning Purposes; Ca; SJV; Reclassification as Serious Nonattainment for the 1997 PM_{2.5} Standards. 80 Fed. Reg. 7, pp.1482-1491. (2015, January 12). <http://www.gpo.gov/fdsys/pkg/FR-2015-01-12/pdf/2015-00309.pdf>

1.9 PUBLIC PROCESS FOR PLAN DEVELOPMENT

The District used the following public process timeline for the development of this plan.

Table 1-4 2015 PM_{2.5} Plan Development and Public Workshop Timeline

August 2014 – ongoing	Monthly updates on the progress and development of the plan at public meetings such as the District’s Governing Board meetings, Citizen Advisory Committee meetings, and Environmental Justice Advisory Group meetings.
February 2015	Draft plan documents available for public review and comment.
March 4, 2015	Public workshop to present and receive comments on the draft plan documents with an associated comment period.
March 17, 2015	Proposed Plan available for public review and comment 30-days prior to the Governing Board public hearing.
April 16, 2015	District Governing Board public hearing to hear and potentially adopt the proposed plan.

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