Chapter 1

Introduction

2015 Plan for the 1997 PM2.5 Standard
SJVUAPCD

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Chapter 1: Introduction

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. Over the past couple of decades, 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 jurisdiction. Similarly, the California Air Resources Board (ARB) has adopted regulations for mobile sources. Together, these efforts represent the nation's toughest air pollution emissions controls 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.

EPA adopted the first NAAQS for PM2.5 in July 1997[1] and set the annual PM2.5 standard at 15 micrograms per cubic meter (µg/m^3) and the 24-hour PM2.5 standard at 65 µg/m^3. States and air districts originally addressed the new standards under CAA Title 1, Part D, Subpart 1[2] (Subpart 1) per guidance from EPA. As a result of a court ruling in 2013 EPA now requires the 1997 PM2.5 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 PM2.5 Standard* (*2015 PM2.5* Plan) addresses the 1997 Standard for PM2.5 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 PM2.5 standard before the federally mandated deadline of December 2014.

1.1 THE VALLEY'S UNIQUE CHALLENGES

The Valley's geography and meteorology exacerbate the formation and retention of high levels of air pollution. Surrounding mountains and consistently stagnant weather patterns prevent the dispersal of pollutants that accumulate within the Valley. The Valley has significant naturally occurring biogenic emissions. The California landscape also allows for air pollutant transport within the Valley, as well as between the Valley and other air basins. These natural factors will continue to impact the Valley's progress toward attainment of air quality standards.

The Valley is also one of the fastest growing regions in the state. From 2010 to 2020, the Valley's population is expected to increase by 18% (Table 1-1). In contrast, the total population for the State of California is projected to increase by only 9% over the same time period. Increasing population generally means increases in air pollutant emissions as a result of increased consumer product use and more automobile and truck travel.

[1] 62 FR 38651-38701
[2] EPA. Clean Air Act. Retrieved on 11/5/2014 from http://www.epw.senate.gov/envlaws/cleanair.pdf.

Between 2010 and 2020, the Valley's total vehicle miles traveled (VMT) will increase about 21%,[3] consistent with the Valley's population growth. Also, the Valley is home to the state's major arteries for goods and people movement, which adds to the increases in vehicular traffic.

Table 1-1 Estimated Valley Population by County (2010-2020)[4]

County	Estimated 2010	Projected 2020
Fresno	932,926	1,083,889
Kern*	841,609	1,041,469
Kings	152,996	179,722
Madera	151,136	183,176
Merced	256,345	301,449
San Joaquin	686,651	795,631
Stanislaus	515,229	582,746
Tulare	443,567	536,429
Total	3,980,459	4,704,511

*Kern County is separated into two air districts: San Joaquin Valley and Eastern Kern. This data is the Valley-portion of Kern only.

Although reducing mobile source emissions is critical to the Valley's attainment of air quality standards, the District does not have direct regulatory authority to reduce motor vehicle tailpipe emissions, which are regulated by the EPA and ARB. The District must collaborate with interagency partners and use innovative approaches to reduce mobile source emissions.

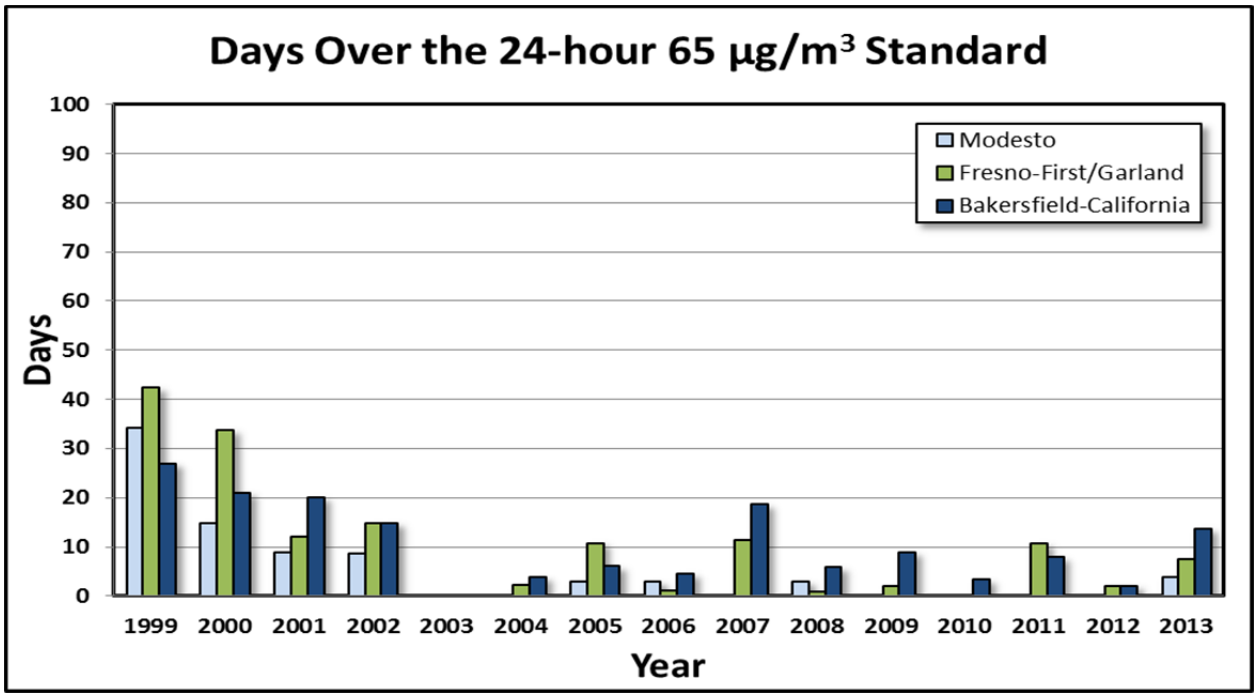
As Chapter 3 of this plan details, the formation and composition of PM2.5 can be complex, with some species impacting health more than others. Long-term trends show that PM2.5 concentrations throughout the Valley have declined since monitoring of this pollutant first began and are projected to continue on that trend. In addition to declining PM2.5 concentrations, most emissions inventories of PM2.5 precursors are also projected to decrease despite future population growth.

The District also assesses long-term trends of PM2.5 concentration by looking at the number of days per year that a monitoring site measures concentrations over the PM2.5 1997 24-hour NAAQS limit of 65 µg/m^3. Figure 1-1 shows the trend in numbers of days that air monitoring sites recorded 24-hour PM2.5 averages over 65 µg/m³ at the Modesto (Stanislaus County), Fresno-First/Garland (Fresno County), and Bakersfield-California (Kern County) air monitoring sites. An overall downward trend is apparent when comparing the early years of 1999 and 2000 to recent years. The current pattern shows generally that the northern Valley has the fewest days over the standard, that the southern Valley has the most days over the standard, and that the central Valley registers somewhere between the two.

[3] California Air Resources Board: 2009 Almanac – Population and Vehicle Trends Tool. Retrieved July 2012 from http://www.arb.ca.gov/app/emsinv/trends/ems_trends.php

[4] California Department of Finance [DOF]: Interim Population Projects for California and its Counties 2010-2050. (May 2012). Retrieved from http://www.dof.ca.gov/research/demographic/reports/projections/interim/view.php

Figure 1-1 Trend in Days over the 24-hour PM2.5 Standard



1.2 DISTRICT'S 2008 PM2.5 PLAN FOR THE 1997 PM2.5 STANDARD

Pursuant to Subpart 1 requirements, on January 5, 2005, EPA promulgated air quality designations for all areas for the 1997 PM2.5 Standard.[5] EPA designated the San Joaquin Valley (Valley) as a nonattainment area based on ambient air quality data collected from 2001 – 2003. During the development of the *2008 PM2.5 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 District focus of the 2008 attainment plan was to address the 15 µg/m^3 annual PM2.5 standard.

The District's Governing Board adopted the *2008 PM2.5 Plan* in April 2008[6] to address EPA's 1997 annual PM2.5 standard for PM2.5, and directed staff to forward the adopted *2008 PM2.5 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 PM2.5 Plan* effective January 9, 2012.[7]

[5] 70 FR 943-1019
[6] SJVAPCD. *2008 PM2.5 Plan.* Retrieved on 11/24/14 from http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm.
[7] EPA. Approval and Promulgation of Implementation Plans; California; 2008 San Joaquin Valley PM2.5 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

1.3 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 federal PM2.5 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). As a result of the court ruling, on June 2, 2014, EPA classified the Valley (and all other PM2.5 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.[8]

A timeline summary of the 1997 PM2.5 standard, related EPA actions, and related District actions is presented in Figure 1-2. Refer to Chapter 2 for more details on the attainment demonstration, impracticability of attainment by 2015, request for extension of the attainment deadline under the serious nonattainment classification, and the attainment outlook for the Valley.

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[8] All areas designated nonattainment for PM2.5 are classified as Moderate by order of law (CAA §188(a))

Figure 1-2 1997 PM2.5 Standard Timeline

1997
- EPA sets first standard for PM2.5[9,10,11]
  - 24-hr: 65 µg/m^3 (based on 3-year average of 98th percentile 24-hr PM2.5 concentrations)
  - Annual: 15 µg/m^3 (based on 3-year average annual mean PM2.5 concentrations)

2005
- EPA finalizes attainment designations[12]; designates Valley as "nonattainment"

2007
- EPA issues *Clean Air Fine Particle Implementation Rule*[13]; directs states to adopt attainment plans under Subpart 1 requirements

2008
- District adopts *2008 PM2.5 Plan* per EPA guidance[14] to address annual standard (Valley already in attainment of 24-hr standard)

2011
- EPA approves District's *2008 Plan*[15] except for the contingency measures, which EPA disapproved. EPA also granted California's request for an extension of the attainment date for the Valley to April 5, 2015

2013
- State submitted a revised PM2.5 contingency measure plan for the Valley
- 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 PM2.5 implementation rule
- Until the exceptional weather conditions experienced due to the recent drought, the District was on track to attain the 1997 annual PM2.5 standard before the federally mandated deadline of December 2014

2014
- EPA approves the contingency plan for the Valley
- EPA classifies Valley as a Moderate nonattainment area under Subpart 4 with an attainment date of April 5, 2015
- District submits formal request for reclassification of Valley as a Serious nonattainment area with a demonstration that the Valley cannot practicably attain the 1997 annual PM2.5 standard by the April 5, 2015 attainment date.

2015
- EPA proposes to reclassify the Valley as a Serious nonattainment area[16]
- District to submit an attainment plan to EPA satisfying Subpart 1 and Subpart 4 requirements with a demonstration that attainment by 2015 is impracticable, and a request for an attainment deadline extension to no later than 2020
- Attainment date for a Serious nonattainment area: December 31, 2015

2020
- Attainment date (after extension) December 31, 2020

[9] 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
[10] 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
[11] 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
[12] Air Quality Designations and Classifications for the Fine Particles (PM2.5) NAAQS, 70 Fed. Reg. 3, pp. 944-1019. (2005, January 5). http://www.epa.gov/fedrgstr/EPA-AIR/2005/January/Day-05/a001.pdf
[13] 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
[14] San Joaquin Valley Air Pollution Control District [SJVAPCD]. (2008, April 30). 2008 PM2.5 Plan. Fresno, CA. http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Adopted_PM25_2008.htm
[15] Approval and Promulgation of Implementation Plans; California; 2008 San Joaquin Valley PM2.5 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
[16] Designation of Areas for AQ Planning Purposes; Ca; SJV; Reclassification as Serious Nonattainment for the 1997 PM2.5 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

The EPA guidance interpreting the Subpart 4 requirements for particulate matter nonattainment areas in the General Preamble[17] 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).

In their proposal to reclassify the Valley from a Moderate nonattainment area to a Serious nonattainment area for the 1997 PM2.5 Standard, EPA identified specific statutory requirements applicable to Serious nonattainment areas that upon reclassification as a Serious nonattainment area for the 1997 PM2.5 Standard, California is required to submit.[18] These additional SIP revisions will satisfy the statutory requirements that apply to Serious 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.

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

[18] Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 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 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, Chapter 6, 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

1.4 REQUEST RECLASSIFICATION TO SERIOUS NONATTAINMENT

Pursuant to §188(b) of Subpart 4, 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,[19] the extreme weather conditions over the winter of 2013-2014 overwhelmed emissions controls and led to abnormally high PM2.5 levels making attainment of the 1997 annual PM2.5 standard based on 2012-2014 data impossible. Based on the demonstrations and analyses discussed below, EPA proposed to reclassify the Valley as a Serious nonattainment area in January 2015.

1.5 1997 ANNUAL PM2.5 STANDARD (15 µ/M3)

In its September 25, 2014 letter to EPA, the District provided ambient air quality data demonstrating that the Valley cannot attain the 1997 PM2.5 standard by April 5, 2015. Specifically, the District provided annual average PM2.5 concentrations recorded at monitoring sites in the Valley for 2012 and 2013, and then calculated the maximum 2014 annual average PM2.5 concentrations for each monitoring site that would result in a 3-year average PM2.5 concentration of 15 µg/m^3 or less at that site. The District demonstrated that the maximum 2014 annual average concentration at the Bakersfield-Planz air monitoring site would have to be 7.5 µg/m^3 for 2014 in order for the design value to be at or below 15 µg/m^3. The average PM2.5 concentration measured at the Bakerfield-Planz site in the first quarter of 2014 was 29.7 µg/m^3. Thus the average PM2.5 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/m^3 for 2014.

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.[20] Preliminary 2014 AQS data for four monitoring locations in the Valley demonstrate that the 3-year average PM2.5 concentration for 2012-2014 will likely be well above 15 µg/m^3. 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 PM2.5 Standard, a 2014 design value above this level at one eligible monitor would render attainment by April 5, 2015 impossible. EPA's analysis is summarized in Table 1-3.

[19] 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

[20] Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 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 1-3 Preliminary Recorded Annual Average PM2.5 Concentrations (in µg/m^3) for Selected Sites in the Valley and Comparison to Lowest Recorded[21]

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 1997 24-hour PM2.5 Standard (65 µg/m^3)

EPA reviewed ambient air quality data in the Air Quality System (AQS) to determine whether the Valley can practicably attain the 24-hour standard by this date. The 24-hour PM2.5 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 µg/m³ and compared to the standard The 98th percentile 24-hour average PM2.5 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 PM2.5 Standard design value at or below 65 µg/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 PM2.5 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 PM2.5 Standard design value for 2014 at or below 65 µg/m^3. These two sites in Bakersfield cannot practicably show a 24-hour PM2.5 Standard design value at or below 65 µg/m^3 by April 5, 2015 as summarized in the following table.

For the San Joaquin Valley to attain the 1997 NAAQS for the years 2013-2015, the monitoring data for this period would need to satisfy both the 24-hour average and annual average attainment tests, which are based on 98th percentile values and calendar year averages, respectively. Since the PM2.5 monitoring data during this period was heavily influenced by the extreme drought conditions, long periods of stagnation, and strong inversions experienced during the winter of 2013-2014, as

[21] Table 3 from Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 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

described in more detail below, the Valley cannot demonstrate attainment of either component of the 1997 NAAQS by December 2015.

Table 1-4 Preliminary Recorded 2014 24-hour PM2.5 Concentrations (in µg/m^3) for Selected Sites in the Valley and Calculation of 98th Percentile Values[22]

Monitoring Site	98th Percentile in 2012	98th Percentile in 2013	Low Estimate of 98th Percentile in 2014	Max 98th 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

EPA proposed to reclassify the Valley as a Serious Nonattainment area under CAA Subpart 4 based on the results of the analyses discussed above. EPA published this proposed action in the federal register on January 12, 2015 and received comments on the proposal through February 11, 2015.[23]

1.1 PUBLIC PROCESS FOR PLAN DEVELOPMENT

To ensure the public has opportunities to provide comments on this plan, the District is using the following tentative timeline for the public process.

Table 1-5 *2015 PM2.5 Plan* Development and Public Workshop Tentative 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	Make 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	Make the 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.

[22] Table 4 from Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 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

[23] Designation of Areas for AQ Planning Purposes; Ca; SJV; Reclassification as Serious Nonattainment for the 1997 PM2.5 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