

State of California



Staff Review

of the

Supplemental Document for the San Joaquin 24-Hour PM_{2.5} Standard State Implementation Plan

Release Date: September 22, 2014

Scheduled for Consideration: October 24, 2014

This document has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

Electronic copies from this document are available for download from the Air Resources Board's Internet site at: <http://www.arb.ca.gov/planning/sip/planarea/sanjquvllysip.htm>. In addition, written copies may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, 1st Floor, Visitors and Environmental Services Center, Sacramento, California 95814, (916) 322-2990.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

Supplemental Document for the San Joaquin Valley

24-hour PM_{2.5} Standard State Implementation Plan

This Report documents the Air Resources Board staff's review of the *Supplemental Document: Clean Air Act Subpart 4: The 2012 PM_{2.5} Plan for the 2006 PM_{2.5} Standard and District Rule 2201 (New and Modified Stationary Source Review)* (Supplemental Document) adopted by the San Joaquin Valley Air Pollution Control District (District). The Supplemental Document demonstrates compliance with the requirements under Subpart 4 of the Clean Air Act (Act) for the 24-hour PM_{2.5} standard and provides the information U.S. Environmental Protection Agency (U.S. EPA) needs to approve the San Joaquin Valley 24-hour PM_{2.5} SIP under Subpart 4 of the Act.

I. BACKGROUND

In December 2012, the District adopted a State Implementation Plan (SIP) for the 35 µg/m³ 24-hour PM_{2.5} standard (2012 PM_{2.5} Plan¹). The 2012 PM_{2.5} Plan was developed to meet requirements of the U.S. EPA 2007 *Fine Particle Implementation Rule*² (2007 Implementation Rule) based on Subpart 1 provisions of the Act. In January 2013, the Air Resources Board (ARB or Board) approved³ the 2012 PM_{2.5} Plan.

In the time between the 2012 PM_{2.5} Plan adoption by the District in December 2012 and the ARB hearing in January 2013, the D.C. Circuit Court determined that U.S. EPA erred in solely developing its implementation rule for PM_{2.5} under the Subpart 1 general provisions of the Act without considering the more specific particulate matter provisions in Subpart 4. The Court remanded the rule back to U.S. EPA to address the Subpart 4 provisions. During the January 2013 ARB hearing, the Board determined that it was appropriate to approve the 2012 PM_{2.5} Plan at that time and provide any necessary supplemental information once U.S. EPA provided guidance in response to the D.C. Circuit Court decision.

In accordance with Subpart 4 provisions of the Act, in June 2014, U.S. EPA classified the San Joaquin Valley (SJV) as a moderate nonattainment area⁴ for the 35 µg/m³

¹ SJVUAPCD, 2012 PM_{2.5} Plan. http://www.valleyair.org/Air_Quality_Plans/PM25Plans2012.htm

² U.S. EPA, *Clean Air Fine Particle Implementation Rule; Final Rule*. (20586 – 20667) April 25, 2007. <http://www.epa.gov/fedrgstr/EPA-AIR/2007/April/Day-25/a6347.pdf>

³ ARB, *San Joaquin Valley PM_{2.5} State Implementation Plan, Resolution 13-2* (January 21, 2013) <http://www.arb.ca.gov/planning/sip/sjvpm25/FIN%20RESO%2013-2.pdf>

⁴ U.S. EPA, *Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan Provisions for the 1997 Fine Particle (PM_{2.5}) National Ambient Air Quality Standard (NAAQS) and 2006 PM_{2.5} NAAQS*, 79 FR 105, pp. 31566-31782 (June 2, 2014) <http://www.gpo.gov/fdsys/pkg/FR-2014-06-02/pdf/2014-10395.pdf>

24-hour PM2.5 standard and directed the State to submit a SIP by the end of 2014 that meets the moderate area requirements. U.S. EPA directed states to use existing guidance for PM10 implementation under Subpart 4 and apply the guidance to the PM2.5 standard.

On September 18, 2014, the District adopted the Supplemental Document⁵. The Supplemental Document demonstrates that the existing 2012 PM2.5 Plan satisfies Subpart 4 requirements for a moderate PM2.5 nonattainment area. The Supplemental Document also includes the District's request that the SJV be classified as a serious PM2.5 nonattainment area under Subpart 4 consistent with the attainment demonstration in the 2012 PM2.5 Plan.

II. ADOPTED 2012 PM2.5 PLAN MEETS SUBPART 4 REQUIREMENTS

The Supplemental Document includes a detailed comparison of PM2.5 implementation requirements under Subpart 1 and Subpart 4. These requirements are summarized in Table 1. Focusing on the requirements that differ between Subparts 4 and 1, the Supplemental Document shows how the 2012 PM2.5 Plan adopted by ARB and the District also satisfies the Subpart 4 requirements.

- **Attainment Date:** Under Subpart 1, a non-attainment area has an attainment date of five years from the nonattainment designation, which is 2014, and up to 2019 if earlier attainment is not practicable. In contrast, per the area classification requirements of Subpart 4, the moderate area attainment date is six years after designation or 2015, and the serious attainment date is four years later or 2019.

The photochemical modeling and other technical analyses in the 2012 PM2.5 Plan demonstrated that 2019 is the most expeditious date for reaching attainment throughout the SJV. This modeling was conducted consistent with U.S EPA guidance. The 2012 PM2.5 Plan attainment strategy includes emission reductions, to occur each year through 2019, from implementing a combination of ARB and District programs including reductions from the State mobile source program. The District actions include further strengthening of its wood burning curtailment program and additional requirements on commercial cooking operations, to bring the entire SJV into attainment by 2019.

⁵ SJVAPCD, *Supplemental Document: Clean Air Act Subpart 4: The 2012 PM2.5 Plan for the 2006 PM2.5 Standard and District Rule 2201 (New and Modified Stationary Source Review)*. September 18, 2014 http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2014/September/final/06.pdf

Table 1. Subpart 1 and Subpart 4 Comparison of 35 ug/m3 24-hour PM2.5 Standard Implementation

SIP Component	Subpart 1	Subpart 4
Classifications	None	Moderate Area Serious Area
Attainment Dates	<ul style="list-style-type: none"> Five years from designation date (December 2014) May be extended to up to ten years from designation date (December 2019) 	Moderate Area: <ul style="list-style-type: none"> By the end of the sixth year after designation (December 2015) Serious Area: <ul style="list-style-type: none"> By the end of the tenth year after designation (December 2019) May extend up to five years (December 2024)
SIP Submission Deadlines	Three years after designation (December 2012)	Moderate Area: <ul style="list-style-type: none"> 18 months after designation (December 31, 2014) Serious Area: <ul style="list-style-type: none"> 18 months after reclassification
Precursor Requirements	<ul style="list-style-type: none"> Must address sources of directly emitted PM2.5, SOx, and NOx. Address ammonia or VOC if they significantly contribute to PM2.5 levels in the area. 	Must address sources of all PM2.5 and PM2.5 precursors.
Level of Emission Controls	Reasonably Available Control Measures (RACM)	<ul style="list-style-type: none"> Moderate Area: RACM Serious Area: Best Available Control Measures
Reasonable Further Progress	Linear progress towards attainment	Quantitative milestones to be achieved every 3 years
Permitting Program	Major Sources not required to control ammonia or VOC, unless demonstrated that they contribute significantly to PM2.5 concentrations in the area. Major source is over 100 tons per year (tpy).	Major Sources must control all precursors of PM2.5, unless demonstrated that such precursors do not contribute to levels which exceed the standard. Moderate Area: Major source is over 100 tpy. Serious Area: Major source is over 70 tpy.

U.S. EPA can reclassify SJV from moderate to serious if it determines that SJV cannot practicably attain by 2015 based on the attainment analysis in the 2012 PM2.5 Plan. Classifying SJV as a serious area will maintain the current attainment date as implementation of the 2012 PM2.5 Plan moves from Subpart 1 to Subpart 4.

- **Precursors Requirements:** Under Subpart 1, only directly emitted PM2.5, sulfur oxides (SOx), and nitrogen oxides (NOx) were presumed significant plan precursors. Under Subpart 4, states must address all precursors including ammonia and volatile organic compounds (VOC). However, states may make a demonstration that a precursor is not significant if a significant reduction in emissions does not result in a significant decrease in PM2.5 concentrations.

The role of ammonia and VOC in SJV PM2.5 concentrations is discussed in the 2012 PM2.5 Plan and summarized in the Supplemental Document. Based on the large body of published scientific evidence from research conducted through the extensive California Regional Particulate Matter Air Quality Study (CRPAQS) and subsequent data analysis and modeling studies, as well as photochemical modeling conducted in support of the 2012 PM2.5 Plan, reductions in either ammonia or VOC would not significantly advance PM2.5 attainment in the Valley.

In developing the 2012 PM2.5 Plan, a number of studies and analyses based on CRPAQS were evaluated to understand the role of ammonia in the SJV. Measurements of chemically speciated PM2.5 show that ammonium nitrate (formed in the air from reactions of ammonia and NOx emissions) is a major component of PM2.5. Ambient measurements of ammonia, nitric acid, and particulate ammonium nitrate demonstrate, however that due to the excess of ammonia relative to nitric acid (formed from NOx emissions) throughout the SJV, the amount of NOx emissions limit the formation of ammonium nitrate.

The 2012 PM2.5 Plan also evaluated studies to understand the role of VOC in secondary organic aerosol and ammonium nitrate formation, including a number of photochemical modeling exercises using CRPAQS data. These studies show secondary organic aerosols derived from anthropogenic VOC emissions account for a very small portion of PM2.5 and indicate that in the SJV, NOx, rather than VOC, is the limiting precursor for nitric acid, and subsequent ammonium nitrate formation.

In addition to these studies, photochemical modeling sensitivity analysis was also conducted as part of the 2012 PM2.5 Plan to determine the relative effectiveness of emission reductions in PM2.5, NOx, SOx, ammonia, and VOCs. This modeling demonstrated in the Bakersfield area, which measures the highest PM2.5 levels in

the SJV, NO_x and PM_{2.5} reductions are 10 and 40 times more effective than ammonia reductions on a per ton basis. The modeling also indicates that VOC reductions have no benefit and may in some case cause a very slight increase in PM_{2.5} concentrations.

Accordingly, the 2012 PM_{2.5} Plan appropriately includes directly emitted PM_{2.5}, SO_x and NO_x as the significant PM_{2.5} precursors to control consistent with Subpart 4 requirements.

- **Reasonably Available Control Measures (RACM):** Under Subpart 1 and Subpart 4 for moderate areas, RACM is the required minimum control level. Per Subpart 4, RACM must be in place within four years of an area's nonattainment designation. The 2012 PM_{2.5} Plan includes a thorough analysis focused on PM_{2.5}, NO_x, and SO_x of reasonably available measures adopted by the District and ARB over emission sources operating in the SJV. ARB has adopted the most stringent control measures in the nation for on-road and off-road mobile sources and the fuels that power them. The 2012 PM_{2.5} Plan RACM analysis compares District rules for all stationary and area source with other rules in the country for those sources. The RACM analysis shows that the District is implementing RACM for stationary and area sources, and many of the adopted rules go beyond RACM. If U.S. EPA classifies the SJV as a serious nonattainment area, the required control level will become best available control measures (BACM) and a subsequent BACM analysis and SIP submittal will be needed.
- **Reasonable Further Progress (RFP):** Under Subpart 1, the Plan must demonstrate generally linear progress to meet RFP requirements. Under Subpart 4, the Plan must include quantitative milestones to be achieved every three years until the area is redesignated to attainment and which demonstrate RFP. The 2012 PM_{2.5} Plan identifies RFP emission level milestones for 2014 and 2017 that show generally linear progress in emission reductions towards attainment in 2019. These milestones in the 2012 PM_{2.5} Plan meet the requirements for quantitative milestones required under Subpart 4.
- **Contingency Requirements:** Per Subpart 1, contingency measures provide additional emission reductions in the event a nonattainment area fails to achieve either RFP targets or attain the PM_{2.5} standard by its attainment date. These contingency measures are to take effect without any further ARB or District regulatory action. The Supplemental Document demonstrates that a larger amount of emission reductions from ARB and District regulations are being achieved than those needed to meet RFP. This difference in emission reductions is enough to

meet the contingency requirements. The 2012 PM2.5 Plan does not include contingency for 2015, the moderate area attainment date, because 2015 was not a milestone year in a plan that shows attainment in 2019. The 2012 PM2.5 Plan does already include the contingency reductions for 2019 which will be required under Subpart 4 if U.S. EPA classifies the region as a serious nonattainment area.

- **New Source Review (NSR) Program:** U.S. EPA also set a deadline of December 31, 2014 for the District to demonstrate their PM2.5 permitting program complies with Subpart 4 requirements. To meet the deadline, the Supplemental Document describes how the District NSR Rule 2201 satisfies these requirements.

Subpart 4 requires the control of PM2.5 precursors at major stationary sources except when they do not contribute significantly to PM2.5 levels. The *2012 PM2.5 Plan* addresses NOx and SOx as PM2.5 precursors and demonstrates ammonia and VOC do not contribute significantly to PM2.5 levels. Consistent with this assessment, Rule 2201 treats NOx and SOx as PM2.5 precursors for permitting requirements.

In addition, under Subpart 4 requirements for moderate areas, major sources of PM2.5 are defined as those sources with the potential to emit 100 tons per year (tpy) or more. Rule 2201 already includes this threshold for PM2.5, plus appropriate thresholds for NOx and SOx.

III. STAFF RECOMMENDATION

The District *Supplemental Document: Clean Air Act Subpart 4: The 2012 PM2.5 Plan for the 2006 PM2.5 Standard and District Rule 2201 (New and Modified Stationary Source Review)* demonstrates that the San Joaquin Valley 2012 PM2.5 Plan satisfies requirements for a moderate PM2.5 nonattainment area under Subpart 4 of the Act. The Supplemental Document also discusses that a serious area classification aligned with the attainment date in the 2012 PM2.5 Plan is appropriate. Once submitted to U.S. EPA, this Supplemental Document should enable U.S. EPA to approve the 2012 PM2.5 Plan as meeting the Subpart 4 moderate area requirements.

Staff recommends that the Board approve the District *Supplemental Document: Clean Air Act Subpart 4: The 2012 PM2.5 Plan for the 2006 PM2.5 Standard and District Rule 2201 (New and Modified Stationary Source Review)* along with the District request to classify the SJV as a serious nonattainment area and submit to U.S. EPA as a revision to the California SIP.