

## ATTACHMENT A

### STAFF REPORT

#### EL DORADO COUNTY AIR QUALITY MANAGEMENT DISTRICT

For Agenda of December 3, 2013

**To:** Board of Directors  
El Dorado County Air Quality Management District

**From:** Dave Johnston  
Air Pollution Control Officer

**Subject:** Adopt a Resolution approving the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request for the Sacramento PM<sub>2.5</sub> Nonattainment Area

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#### Recommendations

1. Determine that the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request for the Sacramento PM<sub>2.5</sub> Nonattainment Area is exempt from the California Environmental Quality Act (CEQA) (Attachment B)
  2. Adopt the attached Resolution (Attachment C) approving the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request with Appendices for the Sacramento PM<sub>2.5</sub> Nonattainment Area (Attachments D & E).
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#### Executive Summary

This PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request for the Sacramento PM<sub>2.5</sub> Nonattainment Area (Plan) provides the information necessary for the United States Environmental Protection Agency (EPA) to redesignate the Sacramento Region to attainment for the 2006 24-hour PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS). Elevated PM<sub>2.5</sub> levels are associated with a variety of health problems including reduced lung function, increased respiratory complications and cardiovascular disease, weakened immune system, and premature death. EPA designated the Sacramento Area as nonattainment for the 2006 24-hour standard, effective on December 14, 2009 (40 CFR 81.305). This designation was based on air quality monitoring data from 2006 through 2008. EPA set nonattainment area boundaries to include all of Sacramento County and portions of Placer, Yolo, Solano, and El Dorado counties. EPA's redesignation to attainment would replace federal nonattainment area permitting requirements with less stringent attainment area requirements.

This Plan provides the information necessary to fulfill the Clean Air Act's five criteria for re-designation to attainment. (CAA Section 107(d)(3)).

1. EPA must determine that the area has met the PM<sub>2.5</sub> NAAQS
2. EPA must fully approve the State's implementation plan
3. EPA must determine that the improvement in air quality is due to permanent and enforceable reductions in emissions
4. EPA must fully approve a maintenance plan for the area that demonstrates Sacramento will continue to attain for 10 years
5. EPA must find that the State has met all applicable requirements under CAA section 110 and part D (Sections 171 et seq.)

Travel activity information was provided by the Sacramento Area Council of Governments (SACOG)<sup>1</sup> and emissions information from the California Air Resources Board (CARB). The Plan uses this information to set motor vehicle emissions budgets (MVEB) that SACOG will have to meet when approving future transportation plans. The MVEB was presented to SACOG's Land Use and Natural Resources Committee and approved by SACOG's Regional Planning Partnership.

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## Attachments

The table below identifies the attachments to this Staff Report (Attachment A):

Item	Attachment
California Environmental Quality Act (CEQA) Notice of Exemption (NOE)	B
Board Resolution	C
PM <sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request for the Sacramento PM <sub>2.5</sub> Nonattainment Area	D
PM <sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request for the Sacramento PM <sub>2.5</sub> Nonattainment Area Appendices	E
Notice of Public Hearing	F

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## Background

Particulate matter (PM) is the term for the mixture of solid and liquid particles in the ambient air. Particles originate from a variety of activities and processes, and the chemical and physical compositions vary. PM can be directly emitted to the air or can be produced by secondary formation in the atmosphere when precursor gaseous pollutants, such as nitrogen oxides and sulfur dioxide, chemically react to form fine aerosol particles. Components of PM include

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<sup>1</sup> The Plan uses data consistent with SACOG's Metropolitan Transportation Plan and Sustainable Communities Strategy 2035 (MTP/SCS 2035).

nitrates, sulfates, elemental carbon, organic carbon compounds, acid aerosols, trace metals, and geologic materials.

Sources of PM are mainly due to human (anthropogenic) activities, and include residential fuel combustion smoke and soot, entrained road dust, and motor vehicle exhaust. PM can also be generated from natural sources such as wildfires.

#### Health effects

PM is a mixture of very small liquid droplets and solid particles that are suspended in the air. Studies have linked exposure to PM to a variety of significant health problems. While all particle pollution has the ability to create health impacts, PM<sub>2.5</sub> (fine particles) is especially serious because the particles are so small that they can penetrate deep into the lungs. Consequently, exposure to PM<sub>2.5</sub> can cause serious health problems and aggravate existing problems. People with heart or lung diseases, children, and older adults are the most likely to be affected by fine particle pollution. However, even if a person is healthy, they may experience temporary symptoms from exposure to elevated levels of particle pollution (CARB, 2003).

Adverse health effects linked to PM<sub>2.5</sub> include:

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Aggravated asthma;
- Development of chronic bronchitis;
- Irregular heartbeat;
- Nonfatal heart attacks; and
- Premature death in people with heart or lung disease.

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#### Emission Inventory

This PM<sub>2.5</sub> plan contains the required<sup>2</sup> emissions inventory for total directly emitted PM<sub>2.5</sub>, and all precursors of PM<sub>2.5</sub>. Emissions of nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>2</sub>), volatile organic compounds (VOC) and ammonia (NH<sub>3</sub>) are precursors of PM<sub>2.5</sub> because these pollutants can undergo chemical reactions in the atmosphere to form secondary PM<sub>2.5</sub>, such as ammonium nitrate and ammonium sulfate.

The emissions inventory shows that residential combustion from fireplaces and woodstoves is the main contributor to the directly emitted PM<sub>2.5</sub> inventory at 52% (Figure 1a). It also shows that mobile sources dominate the PM<sub>2.5</sub> precursor inventory at 54% (Figure 1b).

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<sup>2</sup> 40 CFR part 51 subpart A, CAA Section 172(c)(3) and 40 CFR 51.1008

Figure 1a: 2011 Directly Emitted PM<sub>2.5</sub> Emissions

26 Tons Per Day (Average Winter Day)

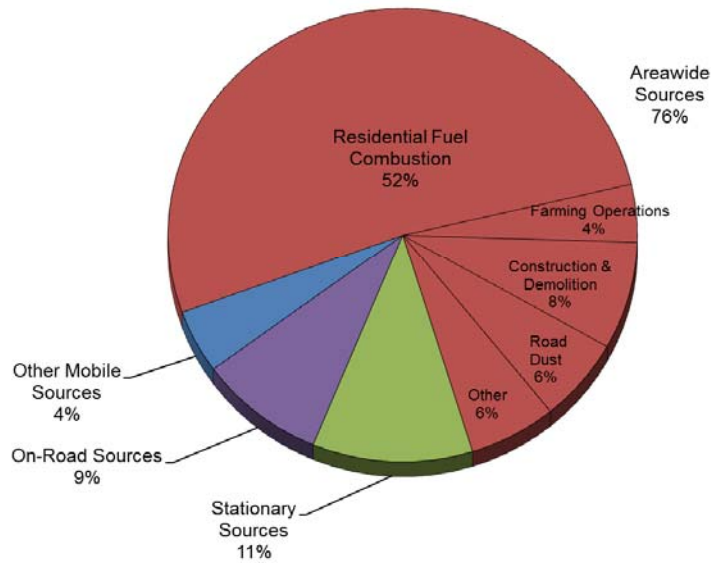
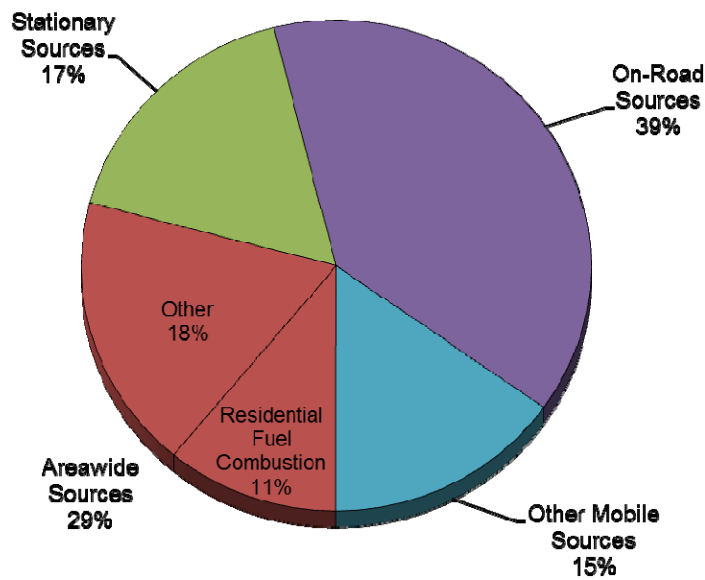


Figure 1b: 2011 PM<sub>2.5</sub> Precursor (NO<sub>x</sub> + VOC + SO<sub>2</sub> + NH<sub>3</sub>) Emissions

235 Tons Per Day (Average Winter Day)



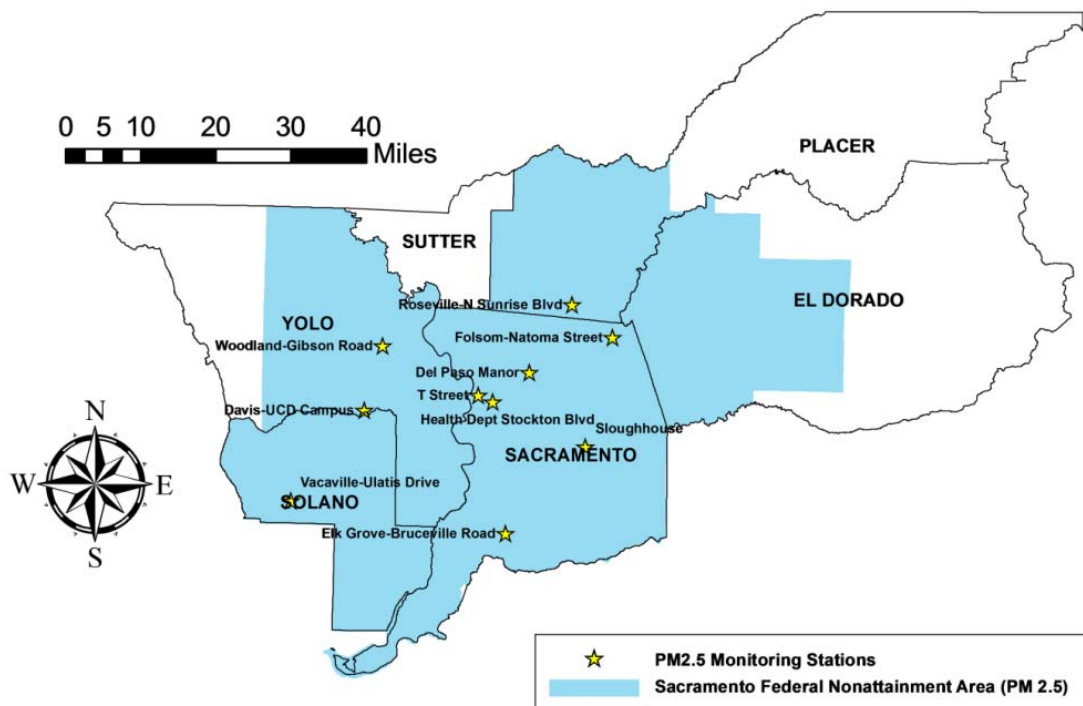
### Attainment - Air Quality Data

PM<sub>2.5</sub> monitoring data show that the Sacramento PM<sub>2.5</sub> Nonattainment Area met the PM<sub>2.5</sub> NAAQS in 2011. On May 9, 2012, CARB submitted a request that EPA find the Sacramento region in attainment. On October 26, 2012, EPA proposed to determine Sacramento attained in 2011. Effective August 14, 2013, EPA made its final “*Determination of Attainment for the Sacramento Nonattainment Area for the 2006 Fine Particle Standard*”<sup>3</sup> after confirming that Sacramento continued to attain in 2012.

EPA’s action suspends certain planning requirements including attainment and reasonable further progress demonstrations, reasonably available control measures (RACM), and attainment plan contingency measures as long as the area continues to meet the standard.

There are currently six PM<sub>2.5</sub> monitoring sites within Sacramento County, ten in the Sacramento Region as shown in Figure 2. Historically, the highest PM<sub>2.5</sub> concentrations are in Sacramento County during late November and December. Three factors contribute to PM<sub>2.5</sub>: (i) wintertime weather conditions (e.g., low wind speed, limited dispersion of pollutants, and colder temperatures), (ii) increased residential wood combustion activities, and (iii) increased formation of PM<sub>2.5</sub> from secondary pollutants. Figure 3 shows the air quality improvements.

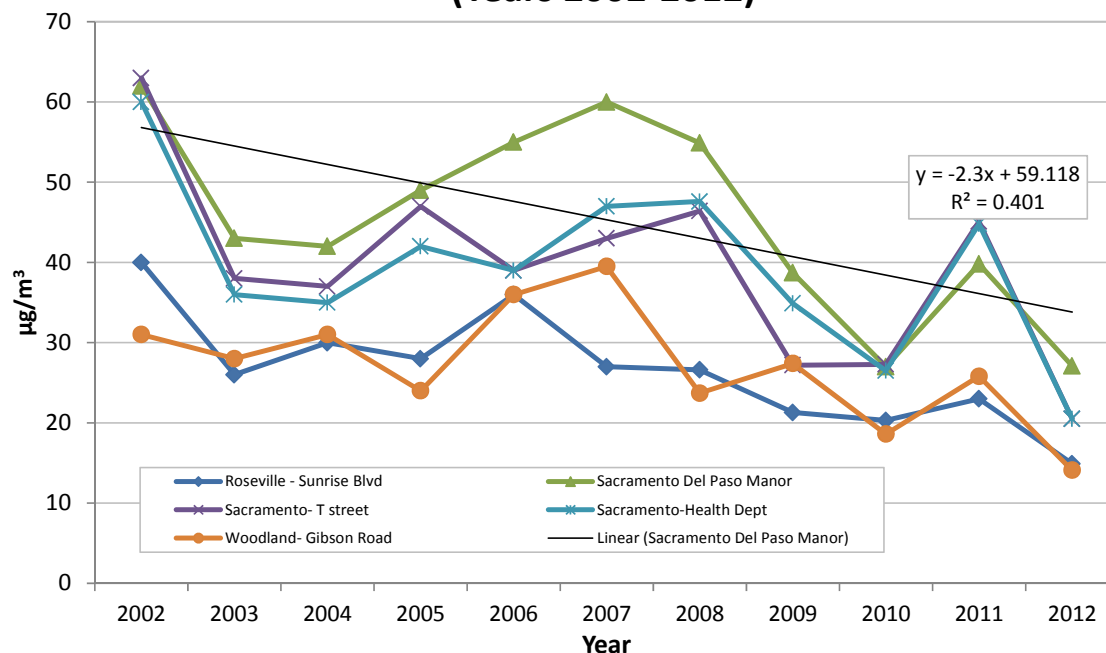
Figure 2: Air Monitoring Stations in the Sacramento Nonattainment Area



Information can be referenced at the California Air Resources Board (CARB) GIS website: <http://www.arb.ca.gov/ei/gislib/gislib.htm>

<sup>3</sup> Federal Register, Vol. 78, No. 135, p. 42018, 07-15-2013.

Figure 3: Air Quality Data (2002 – 2012)  
**Annual 98th Percentile Concentrations**  
**(Years 2002-2012)**



**Control measures**

Another redesignation criteria<sup>4</sup> is to show that attainment resulted from permanent and enforceable control measures. The Sacramento region’s control measures include a combination of actions taken by the four air districts, CARB, and EPA to reduce PM<sub>2.5</sub> and PM<sub>2.5</sub> precursor emissions. The Sacramento region continued to attain in 2012. One of the most important control measures contributing to attainment is our Rule 421 that prohibits wood burning when poor air quality is forecast. Because the SFNA has already attained the 2006 NAAQS, new measures are not required<sup>5</sup>. The maintenance demonstration discussed below showed that no new control measures are required to continue to attain the PM<sub>2.5</sub> NAAQS.

Clean Air Act<sup>6</sup> requires SIPs to include emission limitations and other measures necessary to prevent significant deterioration of air quality in an attainment or unclassified area and require permits for the construction and operation of new or modified major stationary sources anywhere in the nonattainment area. In nonattainment areas, the permit program is referred to as the New Source Review (NSR) program.

NSR requirements apply to any major stationary source that directly emits, or has the potential to emit, PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors. EPA determined that nonattainment NSR requirements are replaced by Prevention of Significant Deterioration (PSD) after re-designation to attainment. PSD requirements affect certain new or modified major stationary sources that emit, or have the

<sup>4</sup> CAA Section 107(d)(3)(E)(iii)  
<sup>5</sup> 40 CFR 51.1004(c)  
<sup>6</sup> CAA Section 161, 172(c)(5) and 173

potential to emit, 100 tons per year or of any regulated pollutant in an attainment area; the threshold is 250 tons per year for all other sources<sup>7</sup>. PSD requirements include: installation of Best Available Control Technology (BACT), air quality monitoring and modeling analyses to ensure a project will not cause or contribute to a violation of any air quality standard, and additional public involvement (including opportunity for public comment). Nonattainment area requirements to offset significant emissions increases at major stationary sources will not apply after re-designation. All four air districts meet PSD requirements.

#### Maintenance Demonstration

The maintenance plan must include a demonstration showing that the area will continue to meet the National Ambient Air Quality Standard (NAAQS) for at least 10 years. (Clean Air Act Section 107(d)(3)(E)(iv)). This Plan uses 2024 as the end of the 10 year period because we anticipate EPA's plan approval action to occur in 2014. EPA guidance also requires the area to demonstrate that attainment was not due to unusually favorable weather conditions or temporary emissions reductions from adverse economic conditions. The Plan includes meteorological analysis and economic indicators to make those showings.

EPA's guidance documents include two maintenance demonstration options for showing that the future emissions are less than the emissions in the attainment year. This Plan used the first of the two options. The test results are summarized in Table 1. The analysis shows that the combined total future emissions of directly emitted PM<sub>2.5</sub> and its precursors remain below attainment year emission levels.

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<sup>7</sup> Sources belonging to the list of source categories in 40 CFR 51.166(b)(1)(i)(a) are subject to the 100 tons per year threshold. All other sources must emit, or have the potential to emit, of 250 tons per year or more of a regulated NSR pollutant, to trigger the threshold.

**Table 1: Comparison of 2011 and 2024 PM<sub>2.5</sub> and Its Precursors Emissions<sup>1</sup>**

	SFNA-PM <sub>2.5</sub> Emissions (Tons/Day)		Net Change From Attainment Year (Tons/Day)
	2011	2024	(2024-2011)
<b>Total Emissions (PM<sub>2.5</sub> &amp; Precursors)</b>	<b>261</b>	<b>215</b>	<b>-46</b>
Directly Emitted PM <sub>2.5</sub> <sup>2</sup>	26	28	2
Total Precursors	235	187	-48
NO <sub>x</sub> <sup>1</sup>	100	63	-37
SO <sub>2</sub>	2	2	0
VOC	106	94	-12
NH <sub>3</sub>	27	28	1

The projected future emissions of directly emitted PM<sub>2.5</sub> and NH<sub>3</sub> show slight increases compared to attainment year levels. Consequently, Chemical Mass Balance modeling was applied to confirm that the small future emission increases would not cause a violation. The modeling results show that the future ambient concentrations and design values are lower than the attainment year levels. Specifically, the design values are forecast to decrease from 2011 levels, from 35 µg/m<sup>3</sup> to 31 µg/m<sup>3</sup> in 2024 at DPM and from 33 µg/m<sup>3</sup> to 29 µg/m<sup>3</sup> at T St. The largest reduction comes from the forecasted change in NO<sub>x</sub> emissions and the corresponding change in ambient ammonium nitrate concentrations (-37%).

The Sacramento Region will continue to operate an appropriate air quality monitoring network and review the assumptions and data for the PM<sub>2.5</sub> maintenance demonstration to verify the region continues to attain the standards. The Clean Air Act requires the maintenance plan to contain contingency provisions to promptly correct any violation of the standard that occurs after re-designation of the area as an attainment area. If a NAAQS violation occurs at any monitoring site, and is not due to a natural or exceptional event, then the Plan requires the districts to evaluate potential controls to correct the violation within 24 months of certification of the violation.

Transportation Conformity

Transportation conformity is the federal regulatory procedure for linking and coordinating the transportation and air quality planning processes to ensure that transportation activities do not interfere with air quality progress. Motor vehicle emissions budgets (MVEBs) are established in air quality plans using motor vehicle related emissions information from the California Air Resources Board (CARB) and transportation activity data provided by the metropolitan



transportation organization (MPO). The MPOs with jurisdiction over the Sacramento PM<sub>2.5</sub> nonattainment area are the Sacramento Area Council of Governments (SACOG) and the Bay Area Metropolitan Transportation Commission (MTC).

Currently, the Sacramento Region has no federally approved budget for PM<sub>2.5</sub>. In the interim, federal regulations allow MPOs to use a “build vs. no build” test to determine transportation conformity for the region’s transportation plans and programs for PM<sub>2.5</sub> (40 CFR 93.119). If the proposed MVEBs are determined to be adequate by the United States Environmental Protection Agency (EPA), future transportation plans will need to conform to these MVEBs in any future transportation plan amendment and updates. The MPOs must ensure that the aggregate transportation emissions in the Sacramento Region do not exceed these levels when approving new metropolitan transportation plans and transportation improvement programs, even if the mix of projects changes or growth increases. Following EPA action, these new NO<sub>x</sub> and PM<sub>2.5</sub> MVEBs will remain in effect until other budgets are proposed and approved by EPA.

The Transportation Conformity Regulation (40 CFR Part 93, §93.124) allows an area to increase the MVEB in its implementation or maintenance plan provided the area can demonstrate compliance with applicable milestone, attainment, or maintenance requirements with the higher motor vehicle emissions budget. The plan must explicitly state that this additional amount is available to the MPO (i.e. SACOG) and Department of Transportation (DOT) in the emissions budget for conformity purposes. The MVEB incorporate a “safety margin,” which includes an additional 1.88 tons per day of NO<sub>x</sub> and 0.09 tons per day of direct PM<sub>2.5</sub> in 2017 and 2.10 tons per day of NO<sub>x</sub> and 0.36 tons per day of direct PM<sub>2.5</sub> in 2024.

Table 2 shows the proposed MVEB for PM<sub>2.5</sub> and NO<sub>x</sub> for the Sacramento PM<sub>2.5</sub> Nonattainment Area for an interim year (2017) and the maintenance year (2024). Future transportation plans must show that regional motor vehicle emissions will be less than the budgets shown in order to demonstrate conformity.

**Table 2: Proposed Motor Vehicle Emissions Budgets for Maintenance of PM<sub>2.5</sub> NAAQS**

Sacramento PM <sub>2.5</sub> Nonattainment Area (tons per day)	2017		2024	
	NO <sub>x</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	PM <sub>2.5</sub>
Baseline On-Road emission from EMFAC2011	37.62	1.78	23.32	1.82
Adjustment to Baseline	-0.55	-0.05	-1.21	-0.16
Net Inventory	37.07	1.73	22.11	1.66
Safety Margin	1.88	0.09	2.10	0.36
Total	38.95	1.82	24.21	2.02
<b>Conformity Budget*</b>	<b>39</b>	<b>2</b>	<b>25</b>	<b>3</b>

\* Budgets established by rounding emissions to the next highest integer.

### **Public Review Process**

A notice of the public hearings for this PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-Designation Request was published in each air district in the SFNA. The Sacramento Metropolitan AQMD notice was published on September 23, 2013. The notice was also e-mailed to all persons who have requested rule or plan notices. Each air district in the Sacramento Federal Ozone Nonattainment Area, which includes the El Dorado County Air Quality Management District, Yolo-Solano Air Quality Management District, the Placer County Air Pollution Control District, will hold a public hearing. The hearings are scheduled for:

Sacramento Metropolitan AQMD:	October 24, 2013
Yolo-Solano AQMD:	November 13, 2013
El Dorado County AQMD:	December 3, 2013
Placer County APCD:	February 13, 2014

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### **Environmental Review and Compliance**

The California Environmental Quality Act (CEQA) requires an environmental evaluation to consider and analyze potentially significant environmental impacts associated with the proposed PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request for the Sacramento Region. This plan is to assure the maintenance, restoration, enhancement, or protection of the environment and proposes no new measures. Therefore, it is exempt from CEQA<sup>8</sup> because it is an action by a regulatory agency for protection of the environment and because it can be seen with certainty that there is no possibility that the activity in question may have a significant adverse effect on the environment.

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### **Conclusions**

The Plan meets the CAA requirements to redesignate the Sacramento region to attainment for the 2006 PM<sub>2.5</sub> NAAQS. Local, state, and federal control measures provided permanent and enforceable emissions reductions that successfully led the Sacramento region to attainment of the 2006 24-hour PM<sub>2.5</sub> NAAQS in 2011. The Sacramento region continued to attain in 2012. One of the most important control measures contributing to attainment is our Rule 421 that prohibits wood burning when poor air quality is forecast. This Plan contains a Maintenance Plan that demonstrates that the region will continue to attain for the 10-year maintenance period, 2014-2024. No additional control measures are needed. Federal nonattainment area NSR permitting requirements will be replaced by the less stringent PSD requirements after EPA redesignates the area to attainment. The Plan establishes MVEBs that SACOG must use to show that future transportation plans will not interfere with continued attainment, once those MVEBs are approved by EPA. The Plan contains other information that shows the Sacramento region has a fully approvable SIP. The Sacramento Federal PM<sub>2.5</sub> nonattainment area will

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<sup>8</sup> Class 8 Categorical Exemption, Section 15308 and Section 15061(b)(3) of the State CEQA Guidelines

submit this Plan as a revision to the State Implementation Plan and request that EPA re-designate the region 'attainment' for the 2006 24 hour PM<sub>2.5</sub> NAAQS.

The CEQA evaluation concludes that no adverse environmental impacts would be expected and a Notice of Exemption will be filed.

Therefore, after considering public comments, staff recommends that the Board:

1. Determine that the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request for the Sacramento Region is exempt from the California Environmental Quality Act (CEQA)(Attachment B)
2. Adopt the Resolution (Attachment C) approving the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request with Appendices for the Sacramento Region (Attachments D & E);
3. Direct staff to submit the PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request for the Sacramento Region and necessary supporting documentation to CARB for submittal to EPA as a revision to the State Implementation Plan.