State of California

California Environmental Protection Agency

AIR RESOURCES BOARD

Nonattainment Area Designations for the Revised Federal PM2.5 24-Hour Standard

Release Date: December 4, 2007

Public Meeting Date: December 6 - 7, 2007

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO HEAR A REPORT ON STAFF'S NONATTAINMENT AREA RECOMMENDATIONS FOR THE REVISED FEDERAL PM2.5 STANDARD

The Air Resources Board (the Board or ARB) staff will present nonattainment area recommendations for the new federal 35 ug/m^3 24-hour $PM_{2.5}$ standard. ARB will submit these recommendations to the United States Environmental Protection Agency (U.S. EPA) by December 18, 2007.

DATE: December 6 & 7, 2007

TIME: 9:00 a.m.

PLACE: Air Resources Board
Auditorium
9530 Telstar Avenue
El Monte, California 91731

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., December 6, and will continue at 8:30 a.m., December 7, 2007. This item is expected to be considered on December 7, 2007. Please consult the agenda for the meeting, which will be available at least 10 days before December 6, 2007, to determine the day on which this item will be considered.

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.

BACKGROUND

The federal Clean Air Act requires U.S. EPA to set health-based National Ambient Air Quality Standards. On December 18, 2006, the U.S. EPA lowered the 24-hour $PM_{2.5}$ standard from 65 ug/m^3 to 35 ug/m^3. Due to the standard revision, ARB is required to submit nonattainment area recommendations and appropriate boundaries to U.S. EPA for this standard by December 18, 2007. The nonattainment area recommendations are based on 2004-2006 $PM_{2.5}$ air quality monitoring data.

U.S. EPA plans to finalize nonattainment area designations effective April 2009, based on 2005-2007 $PM_{2.5}$ air quality monitoring data. State implementation plans will be due three years after the effective date of designations. Attainment for this new standard will be required by April 2019.

PROPOSED ACTION

ARB staff will recommend that the South Coast Air Quality Management District, the San Joaquin Valley Air Pollution Control District, the Bay Area Air Quality Management District, the Sacramento Air Quality Management District, the combined cities of Yuba City/Marysville, the city of Chico, and the city of Calexico be designated as nonattainment for the new 35 ug/m^3 24-hour $PM_{2.5}$ standard.

AVAILABILITY OF DOCUMENTS

ARB staff will prepare a written Staff Report prior to the meeting. Copies of the Staff Report may be obtained from the Board's Public Information Office, 1001 "I" Street, 1st Floor, Environmental Services Center, Sacramento, California 95814, (916) 322-2990. This notice and Staff Report may also be obtained from ARB's internet site at www.arb.ca.gov/desig/pm25desig/pm25desig.htm.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comment submissions not physically submitted at the meeting must be received **no later than 12:00 noon, December 5, 2007,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require that 30 copies of any written statement be submitted and that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully

consider each comment. Further inquiries regarding this matter should be directed to Ms. Sylvia Zulawnick, Manager of the Particulate Matter Analysis Section, Planning and Technical Support Division, 1001 I Street, Sacramento, California 95814 or by e-mail at szulawni@arb.ca.gov, or Jill Glass, Air Pollution Specialist, Planning and Technical Support Division at (916) 322-6161, 1001 I Street, Sacramento, California 95814 or by e-mail at jglass@arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD

/S/

James N. Goldstene
Executive Officer

Date: November 20, 2007

Background

On December 18, 2006, the U.S. EPA strengthened the federal 24-hour average air quality standard for particulate matter 2.5 microns or less in diameter (PM2.5) from 65 ug/m^3 to 35 ug/m^3. The State of California is required to submit nonattainment area recommendations and appropriate boundaries to U.S. EPA for this standard by December 18, 2007. The purpose of this report is to share with the Board the staff's technical analysis and nonattainment recommendations that will be sent to U.S. EPA. U.S. EPA will make final designations in April 2009.

ARB staff has performed an analysis to determine appropriate nonattainment areas throughout the state using criteria outlined in the U.S. EPA's guidance memorandum (*June 8, 2007, Area Designations for the Revised 24-Hour Fine Particle National Ambient Air Quality Standards, Memorandum from Robert J. Meyers, Acting Assistant Administrator, Office of Air and Radiation to Regional Administrators, Regions I-X*). Determination of attainment/nonattainment is based on comparing a three-year average of the 98th percentile 24-hour average concentration to the level of the standard. The nonattainment area recommendations contained in this report are based on 2004-2006 PM2.5 air quality monitoring data.

U.S. EPA guidance recommends that in making boundary recommendations for nonattainment areas, states evaluate each area on a case-by-case basis in consideration of the following nine factors:

- Emissions
- Air quality data
- Population density
- Traffic and commuting patterns
- Expected growth
- Meteorology
- Geography/topography
- Jurisdictional boundaries
- Level of emission control

The Clean Air Act requires that a nonattainment area must include not only the area that is violating the standard, but also nearby areas that contribute to the violation. Accordingly, ARB's recommended nonattainment boundaries are sufficiently large to include both the areas that violate the standard and the areas that contribute to the violations.

The guidance further states that air quality monitoring data affected by exceptional events may be excluded from use in identifying a violation if they meet certain criteria. In 2007, wildfires may have impacted PM2.5

concentrations throughout the State. ARB will submit the required documentation to U.S.EPA in accordance with federal policy.

Air Quality Analysis

ARB maintains a comprehensive PM2.5 monitoring network, including Federal Reference Method (FRM) mass samplers, continuous mass samplers, and chemical speciation samplers. We use FRM monitoring data to determine PM2.5 concentrations in relation to the federal standard, and we use speciation samplers to determine the nature of the PM2.5 pollution. We base our initial recommendations on ambient PM2.5 concentrations measured from 2004 through 2006 by 81 FRM, sited and operated in accordance with federal requirements, located throughout the State. Table 1 provides the 24-hour PM2.5 design value for air districts with monitors violating the standard.

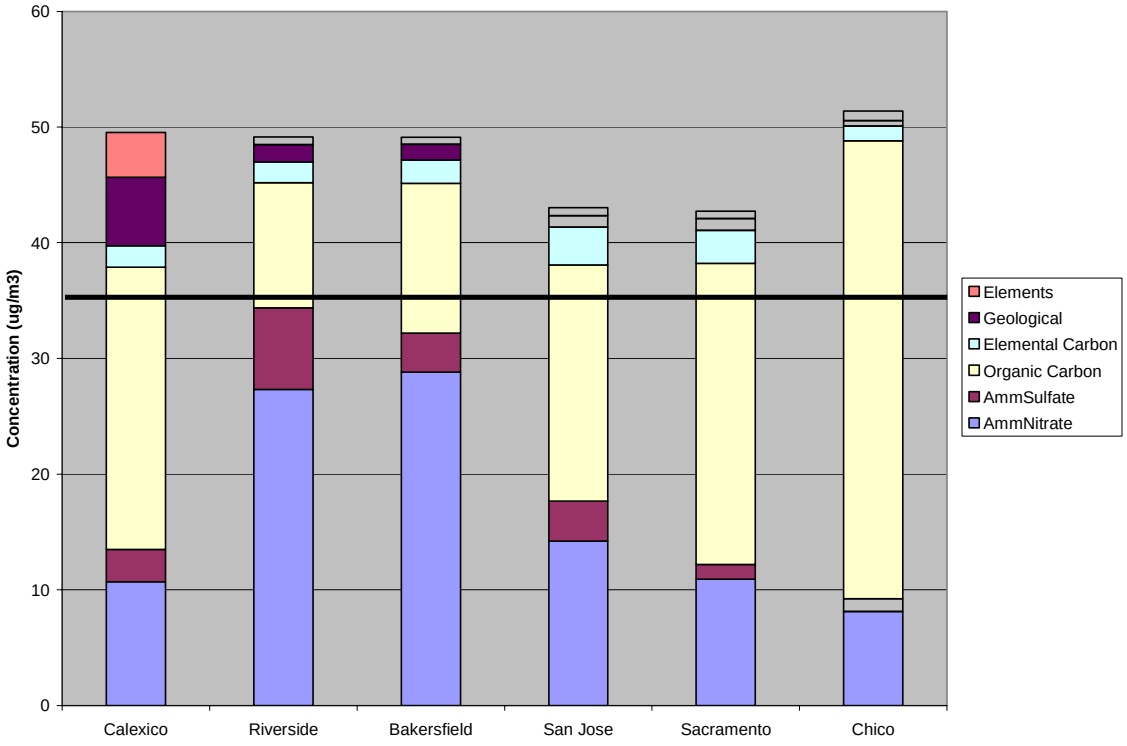
Table 1: Violating Area Design Values

Violating Area	24-hour Design Value	Air District
Riverside – Rubidoux, Riverside County	57 ug/m3	South Coast Air District
Bakersfield, Kern County	64 ug/m3	San Joaquin Valley Air District
Chico, Butte County	56 ug/m3	Butte County Air District
Calexico – Ethel St., Imperial County	40 ug/m3	Imperial County Air District
Sacramento – Del Paso Manor, Sacramento County	49 ug/m3	Sacramento Metropolitan Air District
San Jose – Jackson, Santa Clara County	39 ug/m3	Bay Area Air District
Vallejo, Solano County	36 ug/m3	Bay Area Air District
Yuba City, Sutter County	40 ug/m3	Feather River Air District

Figure 1 displays the average chemical composition on days with PM2.5 concentrations greater than the 35 ug/m3 standard in these areas. As shown, ammonium nitrate and organic carbon are the two greatest contributors to the total PM2.5 concentration. Ammonium nitrate is a secondary pollutant, formed from reactions of NOx and ammonia. Recent studies conducted during the California Regional Particulate Matter Air Quality Study (CRPAQS), have demonstrated that ammonium nitrate is regionally distributed, with similar concentrations in both urban and rural areas (Chow 2005, Turkiewicz 2006). The majority of the emissions that cause high ammonium nitrate are dominated by mobile sources. ARB's statewide mobile source strategy is currently, and will continue to reduce emissions leading to ammonium nitrate formation.

In contrast, organic carbon is a localized pollutant and typically is not transported beyond a small source region. In northern California, concentrations of organic carbon are highest during the winter months, November through February, suggesting that residential wood combustion is a key source, along with other combustion emissions from vehicles, agricultural and prescribed burning, and stationary sources. Conditions during the winter months are cold and stagnant, with light winds (Chow 2006, Turkiewicz 2006). CRPAQS research indicates that organic and elemental carbon is low at rural sites, consistent with a weak source of primary emissions in rural areas (Chow 2006). In addition transport does not play a large role in patterns of wintertime organic carbon. MacDonald 2006 found that "Particulate OM [organic matter] concentrations were high at the urban core sites and low at most rural sites. At distances >50 km from the urban areas, OM concentrations typically declined by a factor of 3-7. Overall, these spatial patterns of OM suggest the impact of urban emissions was largely confined to the urban areas..." Finally, analysis conducted by the Desert Research Institute during CRPAQS on the spatial zone of influence of different source types found that residential wood burning, a large contributor to wintertime carbon concentrations, typically had a zone of influence of only 4 to 5 miles (Chow 2005).

Figure 1: PM2.5 Chemical Composition at Six Nonattainment Areas



Boundary Analysis

In California, the primary considerations for air quality planning are air basin and air district boundaries if the pollution problem is regional in nature. Under State law, air basins are based on a rigorous scientific assessment of geography and meteorology, with consideration of political jurisdictions. Basin boundaries are formally adopted by ARB in regulation. Air districts were established by State statute. ARB typically uses a combination of air basin and air district lines to set boundaries for areas that violate California air quality standards, with exceptions when a single city or community has a unique air pollution problem distinct from the region.

ARB staff recommends retaining the existing nonattainment area boundaries for South Coast and San Joaquin Valley. Ammonium nitrate is the dominant constituent in both the South Coast and the San Joaquin Valley, indicating a region-wide pollution problem. In addition, monitors distributed throughout these two areas record violations of the standard. We recommend the nonattainment areas include the entire air basin for South Coast and San Joaquin Valley to reflect the regional nature of PM2.5 pollution in these areas.

Because organic carbon is primarily an urban scale problem, we are focusing the nonattainment area boundaries for those areas dominated by organic carbon on the urbanized region of each air district. Violations of the PM2.5 standard in San Jose and Vallejo are representative of the broad, urbanized Bay Area. The Bay Area Air Quality Management District is made up of several highly urbanized counties. In addition, speciation data for the Bay Area exhibits a larger contribution from ammonium nitrate and sulfate, reflecting a regional aspect. For these reasons we recommend designating the entire District nonattainment of the PM2.5 standard. Likewise, Sacramento County is predominantly one continuous urbanized area, with multiple monitors violating the standard. While there are urbanized areas on the periphery of Sacramento County, monitors in these areas do not violate the standard. Therefore, ARB staff recommends the Sacramento Metropolitan Air Quality Management District be designated nonattainment of the PM2.5 standard.

In contrast, the Feather River and Butte Air Districts have large rural portions, therefore, we are proposing designating only the primary urbanized area within each district where the population density is sufficient to contribute to localized wood smoke problems. Other small communities in the Sacramento Valley with PM2.5 monitoring show concentrations below the standard, suggesting that the problem is limited to the identified urban areas. ARB staff recommends a focused nonattainment area for the cities of Chico, and Yuba City/Marysville to reflect the localized nature of the PM2.5 problem in these regions.

In the case of Calexico, we believe that the City of Calexico would attain the PM2.5 air quality standard but for emissions emanating from outside of the

United States. Calexico is on the U.S. – Mexico border, at the southern end of Imperial County. Based on the available information, we believe that violations of the PM2.5 standard are localized in Calexico and the much larger adjacent city of Mexicali, Mexico. ARB plans to use the provisions in the Clean Air Act for dealing with plans along international border areas.

Designation Recommendations

After careful evaluation of nine factors, ARB recommends that the U.S. EPA designate seven areas as nonattainment for the PM2.5 standard:

- South Coast Air Basin
- San Joaquin Valley Air Basin
- Bay Area Air Quality Management District
- Sacramento Metropolitan Air Quality Management District
- The combined cities of Yuba City/Marysville within the Feather River Air Quality Management District
- The City of Chico within the Butte County Air Quality Management District
- The City if Calexico within the Imperial County Air Pollution Control District

References

MacDonald, C.P. et al, 2006, "Transport and Dispersion During Wintertime Particulate Matter Episodes in the San Joaquin Valley, California", *J. A&WMA*. 56:961-976.

Chow. J.C. et al, 2006, "PM2.5 Chemical Composition and Spatiotemporal Variability During the California Regional PM10/PM2.5 Air Quality Study", *J. Geo. Res.* DOI:10.1029.

Turkiewicz, K. et al, 2006, "Comparison of Two Winter Air Quality Episodes During the California Regional Particulate Air Quality Study", *J. A&WMA*, 56:467-473.

Chow, J.C. et al, 2005, "California Regional PM10/PM2.5 Air Quality Study Initial Data Analysis of Field Program Measurements", prepared for the San Joaquin Valleywide Air Pollution Study Agency.