Enclosure 3

State of California
Information to Support Recommendations for
Federal PM2.5 Nonattainment Area Boundaries

EXISTING NONATTAINMENT AREAS

South Coast Air Basin

In 2004, the South Coast Air Basin was designated nonattainment of the 24-hour PM2.5 standard of 65ug/m3. Based on 2004 – 2006 monitoring data, the South Coast Air Basin remains in nonattainment of the revised PM2.5 standard with a design value of 57 ug/m3 measured at the Riverside – Rubidoux monitoring site. Consideration of U.S. EPA's nine factors indicates broad regional contribution to elevated PM2.5 levels and supports the use of the air basin boundary. ARB staff recommends that the boundaries remain consistent with the previous PM2.5 nonattainment boundary.

The recommended South Coast Air Basin PM2.5 nonattainment area includes Western Los Angeles (excluding Catalina and San Clemente Islands), Orange, Southwestern San Bernardino, and Western Riverside Counties. This area is under the jurisdiction of the South Coast Air Quality Management District.

San Joaquin Valley Air Basin

In 2004, the San Joaquin Valley Air Basin was designated nonattainment of the 24-hour PM2.5 standard of 65ug/m3. Based on 2004 – 2006 monitoring data, the San Joaquin Valley Air Basin remains in nonattainment of the revised PM2.5 standard with a design value of 64 ug/m3 measured at the Bakersfield – Golden monitoring site. Consideration of U.S. EPA's nine factors indicates broad regional contribution to elevated PM2.5 levels and supports the use of the air basin boundary. ARB staff recommends that the boundaries remain consistent with previous PM2.5 nonattainment boundary.

The recommended San Joaquin Valley PM2.5 nonattainment area consists of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and Western Kern Counties. The area is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District.

NEW NONATTAINMENT AREAS

Sacramento Metropolitan Air Quality Management District

Jurisdictional boundary
The presumptive boundary for the PM2.5 nonattainment area includes all of Sacramento County under the jurisdiction of the Sacramento Metropolitan Air Pollution Control District.

ARB staff believes that a district level nonattainment area boundary is appropriate due to the localized nature of the PM2.5 problem. The two key components of PM 2.5 are ammonium nitrate and organic carbon. While ammonium nitrate is regional, most NOx emissions are from mobile sources which are controlled at a statewide level by ARB. Organic carbon is more localized and most effectively controlled at the district level.

Air Quality
Our initial recommendation for the Sacramento Metropolitan Air Quality Management District is based on ambient PM2.5 concentrations measured from 2004 through 2006. Three monitoring sites throughout Sacramento County monitor for PM2.5, however only two sites – Del Paso Manor and Stockton Boulevard – have complete data to support designations. Our nonattainment recommendation is based on a design value of 49 ug/m3 measured at the Del Paso Manor monitoring site. The Stockton Boulevard monitor is also exceeding the federal standard with a design value of 39 ug/m3.

Areas surrounding Sacramento County include the counties of Yolo, Solano, Placer, El Dorado, Sutter, Yuba, and San Joaquin. Exceedance of the PM2.5 standard in Yuba, Sutter, and San Joaquin County will be included in the recommended nonattainment area for Marysville/Yuba City, and San Joaquin Valley APCD, respectively. Solano County is divided between two air districts, the Bay Area AQMD and Yolo-Solano AQMD. The design value for Solano County is 36 ug/m3 measured at the Vallejo monitoring site, which is under the jurisdiction of the Bay Area AQMD and will therefore be included in the recommended Bay Area nonattainment area. Yolo County is in attainment of the standard with a design value of 30 ug/m3 measured at the Woodland monitoring site. Placer County is in attainment with a design value of 31 ug/m3 measured at the Roseville monitoring site.

The chemical makeup of PM2.5 in Sacramento is dominated by organic carbon and ammonium nitrate. Figure 2 and Figure 3 illustrate the seasonal pattern and chemical composition of PM2.5 at the Del Paso Manor and T Street sites with highest concentrations occurring in the winter time. Organic carbon is the largest component of PM2.5 and increases considerably during the winter months. As shown in Figure 4, organic carbon accounts for roughly 50 percent of the 2004 –

2006 average PM2.5 composition on exceedance days. The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, agricultural and prescribed burning and stationary combustion sources. Concentrations of organic carbon are highest during the winter months, November through February, suggesting that emissions are likely a result of residential wood combustion.

Ammonium nitrate is another significant contributor to the total PM2.5 composition, accounting for about 22 – 27 percent of the average composition on exceedance days. During the fall and winter, the ammonium nitrate fraction of PM2.5 is higher than during the spring and summer, while ammonium sulfate and dust contribute slightly more to ambient PM2.5 during the spring and summer. Cool temperatures, low wind speeds, low inversion layers, and high humidity during the late fall and winter favor the formation of ammonium nitrate, while sunny, warmer conditions during the spring and summer favor the formation of ammonium sulfate, as well as the formation of secondary organic aerosols.

Figure 2: Seasonal Pattern of PM2.5 Chemical Components

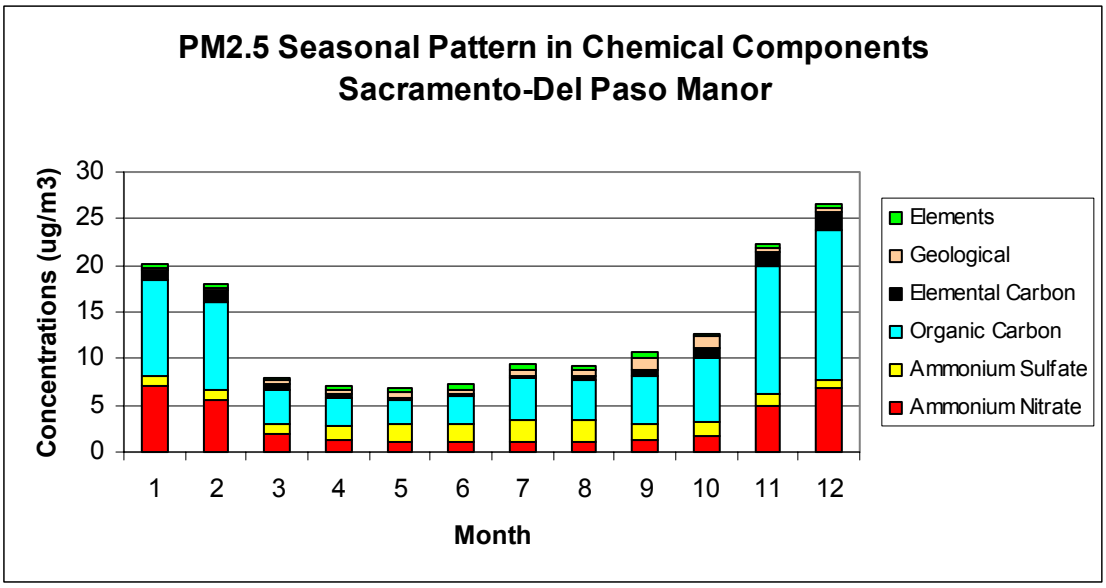


Figure 3: Seasonal Pattern of PM2.5 Chemical Components

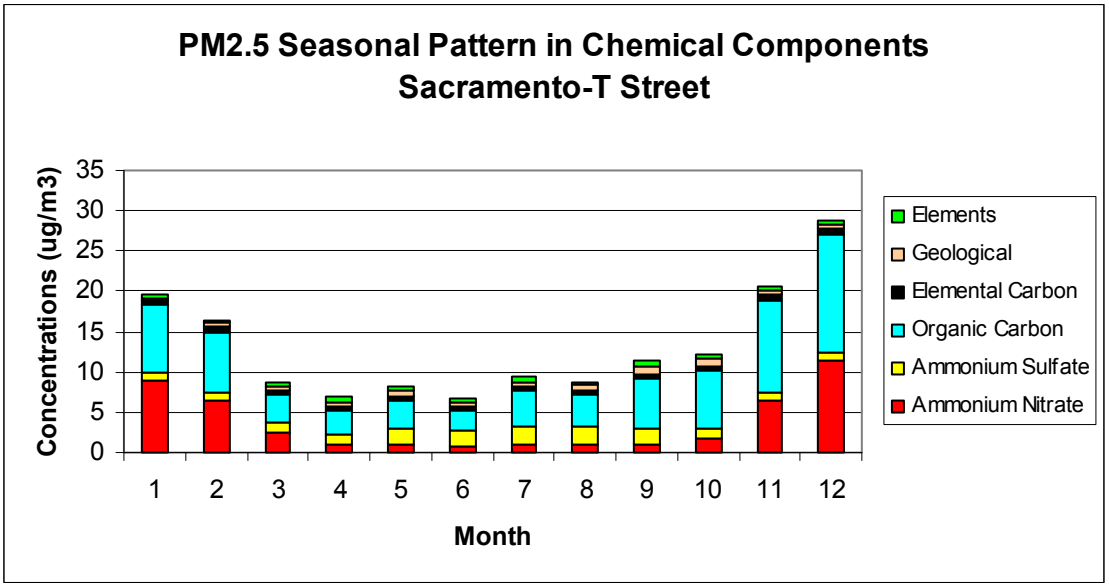
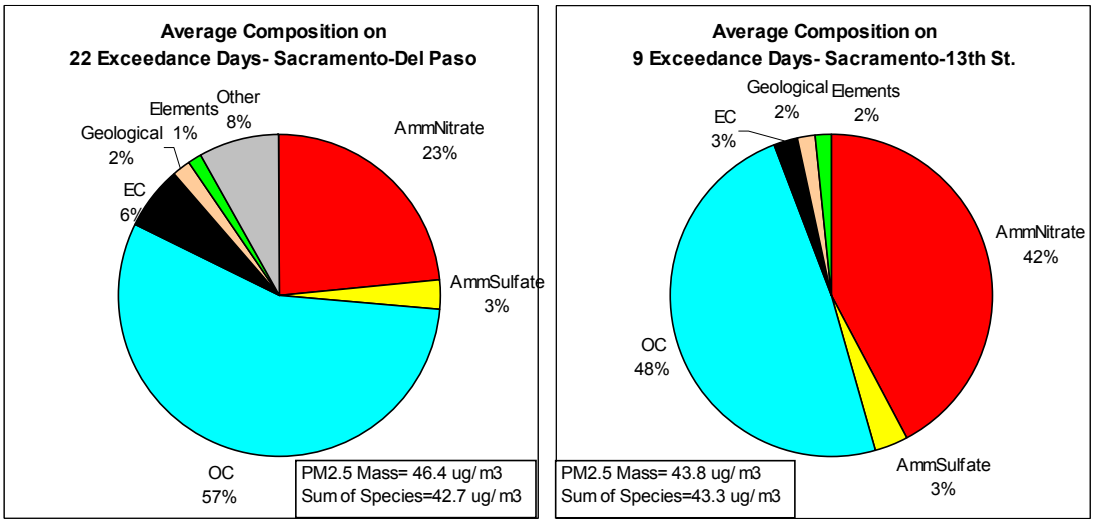


Figure 4:Ave. PM2.5 Composition



Geography/Topography/Meteorology

Sacramento County encompasses approximately 994 square miles in the heart of California's Central Valley. Sacramento County is bounded by the Sierra Nevada foothills to the northeast and the Sacramento-San Joaquin River Delta to the southwest. The lower Sacramento Valley extends through the western and central portions of the county. Elevations range from sea level in the southwest to approximately 400 feet about sea level in the eastern areas of the county.

High PM2.5 concentrations in the Sacramento area appear to be dependant upon calm-to-light winds and not as dependent upon wind direction. This suggests that there is enough activity within the Sacramento area to generate

high PM2.5 concentrations under many conditions, and that high concentrations are not being caused by adjacent areas such as Placer, Sutter or Yolo Counties.

Emissions

The presumptive boundary for the PM2.5 nonattainment area includes all of Sacramento County under the jurisdiction of the Sacramento Metropolitan Air Pollution Control District. All potential emission sources are included within the recommended nonattainment area. Adjacent counties to Sacramento include Yolo, Solano, Sutter, Placer, El Dorado, Amador, San Joaquin, and a small portion of Contra Costa. The nature of the PM2.5 problem in Sacramento County is primarily a result of local emission sources such as smoke; therefore, emissions from neighboring counties would not impact the air quality data for Sacramento County. Emissions generated in Sutter County and San Joaquin County are included in the recommended Marysville/Yuba City and San Joaquin Valley Air District nonattainment areas, respectively. Table 1 provides emissions in tons per day of a primary pollutant contributing to PM2.5 from stationary, area and mobile sources. The majority of NOx emissions are under the mobile source category which is regulated by ARB.

Table 1: NOx Winter Emissions Sacramento and Surrounding Counties

Sacramento County	**2006**	**2010**	**2020**
Stationary Sources	3.9	3.9	4.3
Area Sources	4.0	4.0	4.1
Mobile Sources	75.1	62.5	34.5
Yolo County			
Stationary Sources	3.0	2.9	2.8
Area Sources	0.7	0.7	0.7
Mobile Sources	21.3	17.3	9.9
Solano County			
Stationary Sources	6.3	6.5	7.1
Area Sources	1.6	1.7	1.7
Mobile Sources	42.4	36.0	21.8
Placer County			
Stationary Sources	4.5	4.7	5.1
Area Sources	1.6	1.6	1.6
Mobile Sources	28.2	23.4	13.7
El Dorado County			
Stationary Sources	0.4	0.4	0.4
Area Sources	1.3	1.3	1.4
Mobile Sources	8.8	7.4	4.3
Sutter County			
Stationary Sources	3.6	3.9	3.9
Area Sources	0.9	0.8	0.8
Mobile Sources	14.3	12.9	6.9

Table 1 (cont.)

Amador County	**2006**	**2010**	**2020**
Stationary Sources	2.0	2.1	2.3
Area Sources	0.3	0.3	0.3
Mobile Sources	3.2	2.7	1.7
San Joaquin County			
Stationary Sources	14.8	15.2	17.3
Area Sources	2.7	2.6	2.5
Mobile Sources	88.8	72.9	40.3

Population Density and Degree of Urbanization

According to the U.S Census Bureau, the population of Sacramento County in 2006 is estimated to be 1,374,724 based on 2000 census data. This represents an 11 percent increase in population since 2000, and a 25 percent increase since 1990.

Table 2: Sacramento County Population

	1990	**2000**	**2006**
Population	1,041,219	1,223,499	1,374,724
Population Density	1078 persons/sq mile	1267 persons/sq mile	1423 persons/sq mile

Traffic and Commuting Patterns

The estimates of daily vehicle miles traveled for the years 1990 through 2020 are found in ARB's revised motor vehicle emissions inventory model. In Sacramento County, traffic is expected to increase by 7 percent by 2010 and by 11 percent by 2020. Vehicle miles traveled is projected to increase roughly twice as fast as population, yet NOx emissions from mobile sources are expected to continue along a downward trend. This illustrates the effectiveness of statewide mobile source controls, and supports the need for local control measures to reduce PM2.5 levels.

Table 3: Sacramento County Daily Vehicle Miles Traveled

	1990	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
Ave. Daily VMT/1000	24774	27057	27090	30519	33091	35567	37370

Expected Growth

Sacramento County is expected to grow by 10 percent from 2005 to 2010, and by 28 percent by 2020. Surrounding counties are expected to have similar growth patterns; however, we do not expect surrounding areas to contribute to PM2.5 concentrations in Sacramento County. Ammonium nitrate emissions are controlled on a statewide level and are expected to decrease over time. Organic carbon is a localized source, therefore the most effective control measures focus on a centralized nonattainment area.

Table 4: Sacramento County Projected Growth

	2000	2005	2010	2015	2020
Population	1,233,560	1,392,930	1,555,848	1,751,264	1,946,679

Level of Control of Emissions Sources

Sacramento County has motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California standards; therefore, new vehicles will be controlled through statewide measures. Both cars and heavy trucks are subject to in-use inspection programs. The Sacramento Metropolitan Air District administers a smoke management program for open burning, consistent with ARB's statewide regulation. In addition, the district recently adopted a comprehensive control strategy to reduce emissions from residential wood burning, a key source of localized particulate matter emissions. Areas surrounding Sacramento County have similar level of control regarding smoke management and control of NOx sources.

Bay Area Air Quality Management District

Jurisdictional Boundary

The presumptive boundary for the PM2.5 nonattainment area includes the counties of Sonoma, Napa, Solano, Marin, Contra Costa, San Francisco, Alameda, San Mateo, and Santa Clara under the jurisdiction of the Bay Area Air Quality Management District (AQMD). The two key components of PM2.5 are ammonium nitrate and organic carbon. While ammonium nitrate is regional, most NOx emissions are from mobile sources which are controlled at a statewide level by ARB. Organic carbon is more localized and most effectively controlled at the district level.

Air Quality

Our initial recommendation for the Bay Area AQMD is based on ambient PM2.5 concentrations measured from 2004 through 2006. Our nonattainment recommendation is based on a design value of 39 ug/m3 measured at the San Jose – Jackson Street monitoring site in Santa Clara county, and a design value of 36 ug/m3 measured at the Vallejo monitoring site in Solano county.

Areas surrounding the Bay Area AQMD include the counties of Mendocino, Lake, Yolo, Sacramento, San Joaquin, Stanislaus, Merced, San Benito, and Monterey. Exceedances of the PM2.5 standard in Sacramento will be included in the recommended Sacramento Metropolitan AQMD nonattainment area. Exceedances of the standard in San Joaquin, Stanislaus, and Merced counties will be included in the recommended San Joaquin Valley APCD nonattainment area. Mendocino, Lake, Yolo, San Benito, and Monterey counties are all in attainment of the standard.

The chemical makeup of PM2.5 in the Bay Area is dominated by organic carbon and ammonium nitrate. Figure 5 illustrates the seasonal pattern and chemical composition of PM2.5 at the San Jose monitoring site, with highest concentrations occurring in the winter time. As shown in Figure 6, organic carbon accounts for roughly 44 percent of the 2004 – 2006 average PM2.5 composition on exceedance days. The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, agricultural and prescribed burning, and stationary combustion sources. Concentrations of organic carbon are highest during the winter months, November through February, suggesting that emissions are likely a result of residential wood combustion.

Ammonium nitrate is another significant contributor to the total PM2.5 composition, accounting for about 32 percent of the average composition on exceedance days. During the fall and winter, the ammonium nitrate fraction of PM2.5 is higher than during the spring and summer, while ammonium sulfate and dust contribute slightly more to ambient PM2.5 during the spring and summer.

Figure 5: Seasonal Patten of PM2.5 Chemical Components

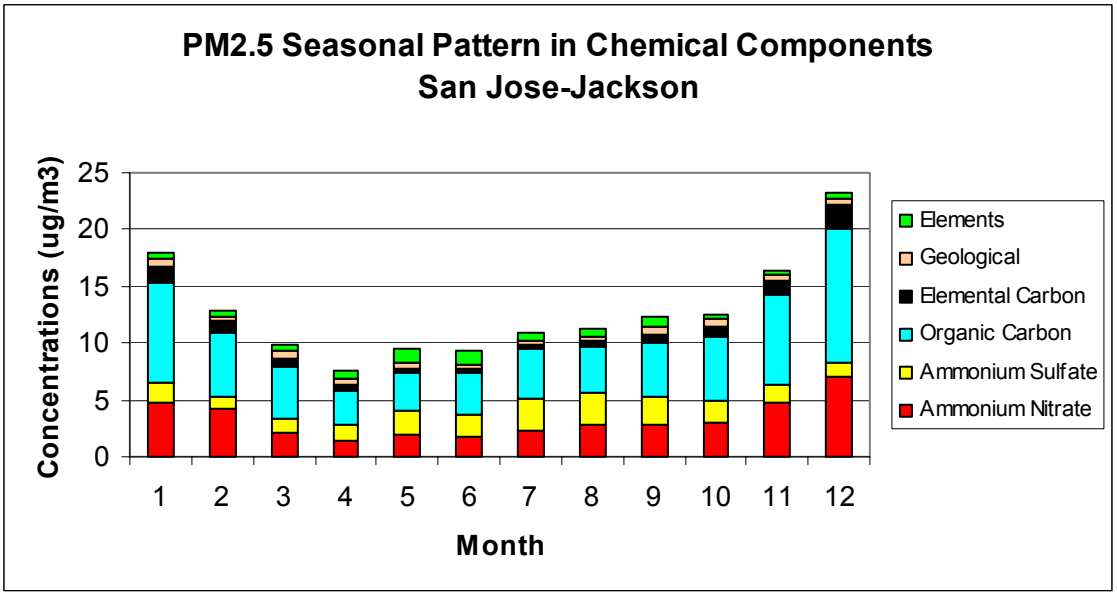
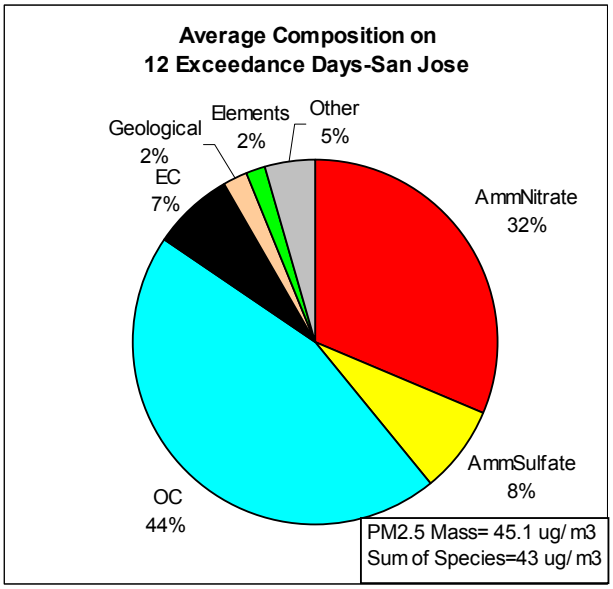


Figure 6: Ave PM2.5 Composition



Geography/ Topography/Meteorology

The San Francisco Air Basin encompasses approximately 5,430 square miles and consists of all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern half of Sonoma County and the southwestern portion of Solano County. The region is characterized by complex terrain, consisting of coastal mountain ranges, rugged hillsides, and inland valleys and bays. Elevations can range from sea level to 1500 feet. The coastal zones tend to be more windy and cooler in the summer that the hotter, drier interior regions with a reversal in the winter months. Precipitation is more typical of a Mediterranean climate with dry summers and wet winters.

The summer climate is dominated by a high pressure center over the Pacific Ocean. Storms rarely affect the coast during the summer, thus the conditions that persist during the summer are a northwest air flow and negligible precipitation. A thermal low pressure area from the Sonoran – Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer. Air flow over cool Pacific Ocean temperatures produces condensation – a high incidence of fog and stratus clouds are common along the coast in summer.

In winter, the Pacific High weakens and shifts southward, winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate and air pollution potential is very low. During winter periods when the Pacific High becomes dominant, inversions become strong, winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog.

Emissions

The presumptive boundary for the PM2.5 nonattainment area includes the counties of Sonoma, Napa, Solano, Marin, Contra Costa, San Francisco, Alameda, San Mateo, and Santa Clara under the jurisdiction of the Bay Area AQMD. All potential emission sources are included within the recommended nonattainment area. Adjacent counties to the Bay Area AQMD include Mendocino, Lake, Yolo, San Joaquin, Stanislaus, Merced, San Benito, and Monterey. The nature of the PM2.5 problem in the Bay Area is primarily a result of local emission sources such as smoke; therefore, emissions from neighboring counties would not impact the air quality data for the Bay Area. Emissions generated in San Joaquin, Stanislaus, and Merced counties are included in the recommended San Joaquin Valley APCD nonattainment area. Table 5 provides emissions in tons per day of a primary pollutant contributing to PM2.5 from stationary, area, and mobile sources. The majority of NOx emissions are under the mobile source category which is regulated by ARB.

Table 5: NOx Winter Emissions Bay Area and Surrounding Counties

Solano County	**2006**	**2010**	**2020**
Stationary Sources	6.3	6.5	7.1
Area Sources	1.6	1.7	1.7
Mobile Sources	42.4	36.0	21.8
Santa Clara County			
Stationary Sources	11.8	12.2	13.2
Area Sources	6.9	7.1	7.5
Mobile Sources	87.8	71.5	41.0
Sonoma County			
Stationary Sources	0.8	0.8	0.8
Area Sources	1.9	1.9	2.0
Mobile Sources	23.4	18.7	9.8
Napa County			
Stationary Sources	0.5	0.6	0.6
Area Sources	0.6	0.6	0.7
Mobile Sources	10.5	8.4	4.5
Marin County			
Stationary Sources	0.4	0.4	0.4
Area Sources	1.6	1.6	1.7
Mobile Sources	16.4	14.6	12.5

Table 5 (cont.)

Contra Costa County	**2006**	**2010**	**2020**
Stationary Sources	24.3	25.2	28.0
Area Sources	4.5	4.6	4.8
Mobile Sources	62.2	50.9	30.4
San Francisco County			
Stationary Sources	1.6	1.6	1.6
Area Sources	3.5	3.6	3.8
Mobile Sources	46.6	42.3	37.0
Alameda County			
Stationary Sources	5.9	6.1	6.7
Area Sources	5.9	6.1	6.4
Mobile Sources	128.5	106.3	67.1
San Mateo County			
Stationary Sources	1.7	1.7	1.8
Area Sources	3.4	3.5	3.7
Mobile Sources	46.6	42.3	37.0
San Joaquin County			
Stationary Sources	14.8	15.2	17.3
Area Sources	2.7	2.6	2.5
Mobile Sources	88.8	72.9	40.3
Stanislaus County			
Stationary Sources	9.3	9.4	10.2
Area Sources	2.7	2.6	2.5
Mobile Sources	47.7	38.0	19.4
Merced County			
Stationary Sources	6.0	5.9	5.8
Area Sources	1.6	1.6	1.5
Mobile Sources	53.7	41.5	20.5
Mendocino County			
Stationary Sources	0.9	0.9	1.0
Area Sources	0.8	0.9	0.9
Mobile Sources	24.1	23.1	24.2
Lake County			
Stationary Sources	0.3	0.4	0.4
Area Sources	0.6	0.6	0.6
Mobile Sources	5.7	5.0	3.1
San Benito County			
Stationary Sources	0.7	0.7	0.7
Area Sources	0.2	0.2	0.2
Mobile Sources	12.9	9.8	4.2

Table 5 (cont.)

Monterey County	**2006**	**2010**	**2020**
Stationary Sources	11.6	12.0	13.0
Area Sources	1.5	1.4	1.4
Mobile Sources	48.9	44.4	41.1
Yolo County			
Stationary Sources	3.0	2.9	2.8
Area Sources	0.7	0.7	0.7
Mobile Sources	21.3	17.3	9.9

Population Density and Degree of Urbanization

The Bay Area Air Basin has an estimated population of 6,953,438 as of 2005, based on data derived from reports developed by the California Department of Finance, Demographic Research Unit. This represents approximately a 4 percent increase in population since 2000, and a 15 percent increase since 1990.

Table 6: San Francisco Bay Area Air Basin Population

	1990	**2000**	**2005**
Population	5,874,353	6,646,727	6,953,438
Population Density	1100 persons/sq mile	1245 persons/sq mile	1302 persons/sq mile

Traffic and Commuting Patterns

The estimates of daily vehicle miles traveled for the years 1990 through 2020 are found in ARB's revised motor vehicle emissions inventory model. In the Bay Area Air Basin traffic is expected to increase by 11 percent by 2010 and by 20 percent by 2020. Vehicle miles traveled is projected to increase faster than the population, yet NOx emissions from mobile sources are expected to continue along a downward trend. This illustrates the effectiveness of statewide mobile source controls, and supports the need for local control measures to reduce PM2.5 levels.

Table 7: Bay Area Air Basin Vehicle Miles Traveled

	1990	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
Ave. Daily VMT/1000	133,990	144,854	159,271	172,581	193,300	202,212	213,900

Expected Growth

The Bay Area AQMD is expected to grow by 5 percent from 2005 to 2010 and by 15 percent by 2020. Surrounding counties are expected to have similar growth patterns; however, we do not expect surrounding areas to contribute to PM2.5 concentrations in the Bay Area. Ammonium nitrate emissions are controlled on a statewide level and are expected to decrease over time. Organic carbon is a localized source, therefore the most effective control measures focus on a centralized nonattainment area.

Table 8: Bay Area Air Basin Projected Growth

	2000	2005	2010	2015	2020
Population	6,646,727	6,953,438	7,337,485	7,736,635	8,135,781

Level of Control of Emissions Sources
The Bay Area has motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California standards; therefore, new vehicles will be controlled through statewide measures. Both cars and heavy trucks are subject to in-use inspection programs. The Bay Area AQMD administers a smoke management program for open burning. Areas surrounding the Bay Area AQMD have similar levels of control regarding smoke management and control of NOx sources.

The Combined Cities of Marysville and Yuba City within the Feather River Air Quality Management District

Jurisdictional Boundary
The presumptive boundary for the PM2.5 nonattainment area includes the cities of Marysville and Yuba City under the jurisdiction of the Feather River Air Quality Management District (AQMD).

ARB staff believes that a city level PM2.5 nonattainment area boundary is appropriate due to the localized nature of the PM2.5 problem. The cities of Marysville and Yuba City together form one urban area separated only by the county line along the Feather River. The two key components of PM2.5 are ammonium nitrate and organic carbon. While ammonium nitrate is regional, most NOx emissions are from mobile sources which are controlled at a statewide level by ARB. Organic carbon is more localized and most effectively controlled at the district level.

Air Quality
Our initial recommendation for Marysville/Yuba City is based on ambient PM2.5 concentrations measured from 2004 through 2006. The Feather River AQMD has only one monitor to measure PM2.5, located in Yuba City in Sutter County. Our nonattainment recommendation is based on a design value of 40 ug/m3 measured at the Yuba City monitoring site. Due to the close proximity of the city of Marysville in Yuba County, we recommend the Marysville/Yuba City urbanized region be included in the nonattainment area.

Areas surrounding Feather River AQMD include the counties of Butte, Glenn, Colusa, Yolo, Sacramento, Placer, Nevada, and Sierra. Exceedance of the PM2.5 standard in Sacramento County will be included in the recommended nonattainment area for the Sacramento Metropolitan AQMD. Exceedance of the standard in Butte County will be included in the recommended nonattainment area for the City of Chico. Yolo County is in attainment of the standard with a

design value of 30 ug/m3 measured at the Woodland monitoring site. Placer County is in attainment with a design value of 31 ug/m3 measured at the Roseville monitoring site. Likewise, Glenn, Colusa, Nevada and Sierra counties all are in attainment of the standard.

Speciation data for the Yuba City monitor is not available; however, we believe the speciation data from Sacramento and Chico to be representative of the chemical makeup of PM2.5 in the Maryville/Yuba City urbanized area. The chemical composition of PM2.5 in Sacramento is dominated by organic carbon and ammonium nitrate. Figure 7 and Figure 8 illustrate the seasonal pattern and chemical composition of PM2.5 at the Del Paso Manor site in Sacramento County, and the Chico site in Butte County, with the highest concentrations occurring in the winter time. As shown in Figure 9, organic carbon accounts for roughly 57 percent and 75 percent of the average PM2.5 composition on exceedance days at the Del Paso Manor and Chico monitoring sites, respectively. The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, agricultural and prescribed burning and stationary combustion sources. Concentrations of organic carbon are highest during the winter months, November through February, suggesting that emissions are likely a result of residential wood combustion.

Ammonium nitrate is another significant contributor to the total PM2.5 composition, accounting for about 16 to 23 percent of the 2004 – 2006 average at Sacramento and Chico. During the fall and winter the ammonium nitrate fraction of PM2.5 is higher than during the spring and summer, while ammonium sulfate and dust contribute slightly more to ambient PM2.5 during the spring and summer. Cool temperatures, low wind speeds, low inversion layers, and high humidity during the late fall and winter favor the formation of ammonium nitrate, while sunny, warmer conditions during the spring and summer favor the formation of ammonium sulfate, as well as the formation of secondary organic aerosols.

Figure 7: Seasonal Pattern of PM2.5 Chemical Components

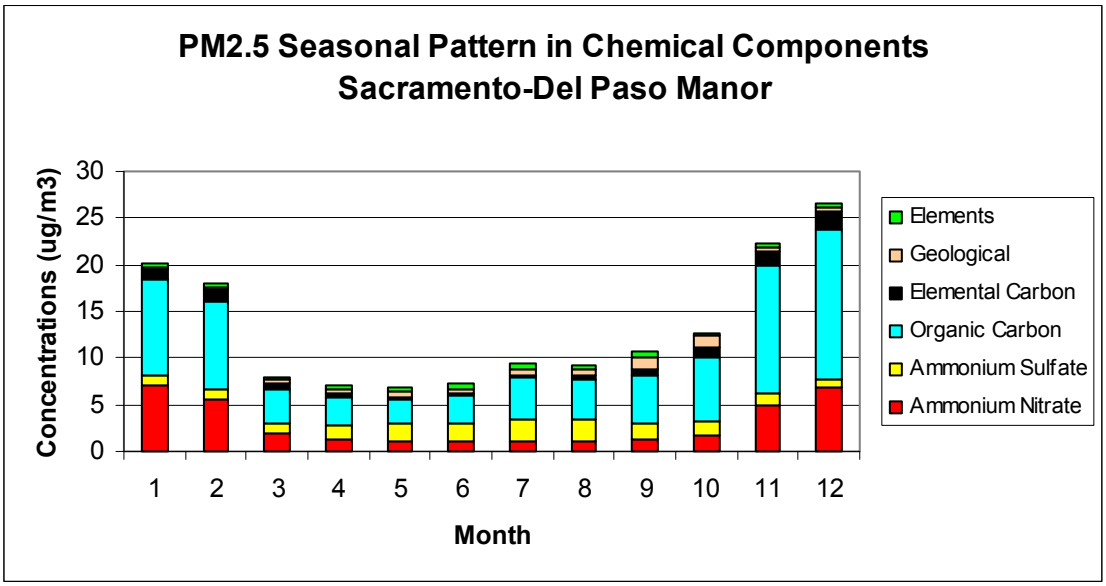


Figure 8: Seasonal Pattern of PM2.5 Chemical Components

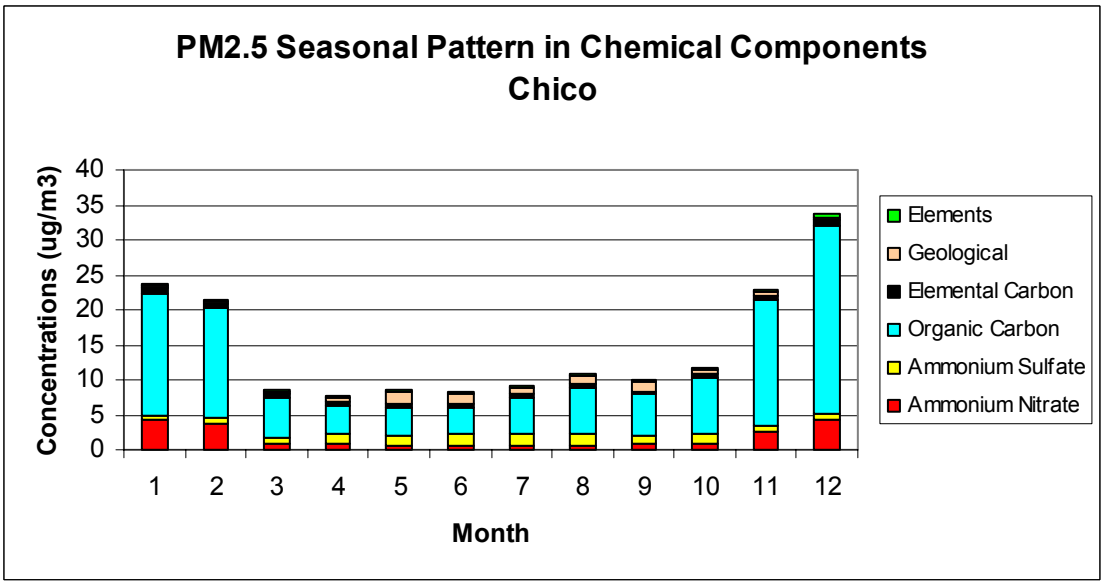
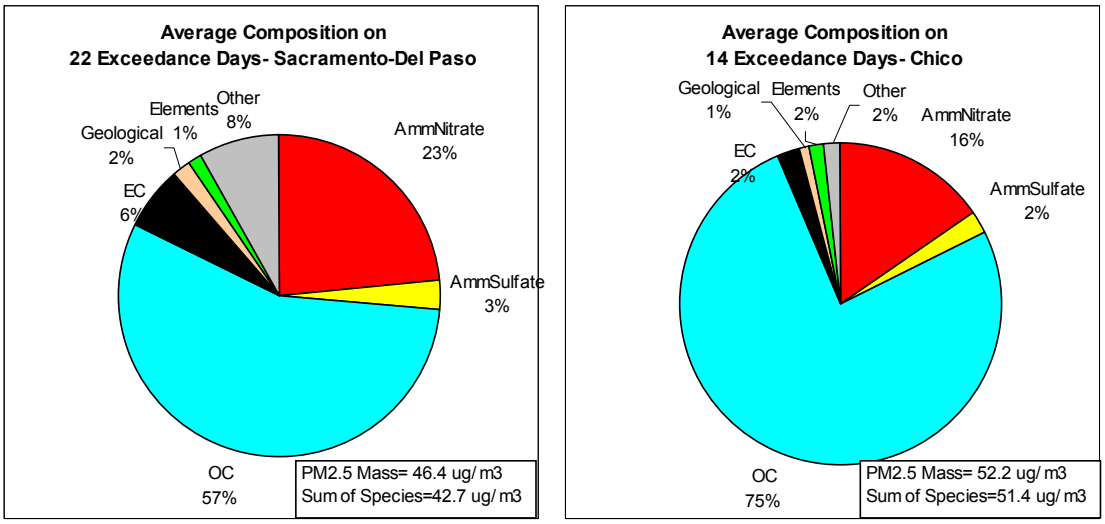


Figure 9: Ave. PM2.5 Composition



Geography/Topography/Meteorology

The city of Marysville is in Yuba County, while Yuba City is in Sutter County. Marysville and Yuba City are considered one metropolitan area, separated only by the Feather River. Yuba and Sutter counties form the Feather River AQMD. Together, the two counties encompass 1,234 square miles. The Feather River AQMD is part of the larger Northern Sacramento Valley Air Basin (NSVAB), and includes the counties of Butte, Colusa, Glenn, Shasta, and Tehama. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6000 feet with peaks rising much higher. This provides a substantial physical barrier to locally created pollution. Although a significant area of the NSVAB is above 1000 feet sea level, the majority of the Feather River AQMD is located in the Valley floor and foothill regions. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

Emissions

The presumptive boundary for the PM2.5 nonattainment area includes the cities of Marysville and Yuba City under the jurisdiction of the Feather River AQMD. All potential emission sources are included within the recommended nonattainment area. Adjacent counties to Feather River AQMD include Butte, Glenn, Colusa, Yolo, Sacramento, Placer, Nevada, and Sierra. The nature of the PM2.5 problem in Marysville/Yuba City is primarily a result of local emission sources such as smoke; therefore, emissions from neighboring counties would not impact the air quality data for Feather River AQMD. Table 9 provides NOx emissions in tons per day from stationary, area, and mobile sources. The majority of NOx emissions are under the mobile source category which is regulated by ARB.

Table 9: NOx Winter Emissions Feather River AQMD and Surrounding Counties

Yuba County	**2006**	**2010**	**2020**
Stationary Sources	0.7	0.7	0.7
Area Sources	0.5	0.5	0.5
Mobile Sources	6.2	6.6	4.9
Sutter County			
Stationary Sources	3.6	3.9	3.9
Area Sources	0.9	0.8	0.8
Mobile Sources	14.3	12.9	6.9
Sacramento County			
Stationary Sources	3.9	3.9	4.3
Area Sources	4.0	4.0	4.1
Mobile Sources	75.1	62.5	34.5
Yolo County			
Stationary Sources	3.0	2.9	2.8
Area Sources	0.7	0.7	0.7
Mobile Sources	21.3	17.3	9.9
Butte County			
Stationary Sources	1.4	1.4	1.4
Area Sources	1.7	1.7	1.6
Mobile Sources	23.3	19.9	11.3
Glenn County			
Stationary Sources	3.5	3.6	3.6
Area Sources	0.1	0.1	0.1
Mobile Sources	7.6	6.2	3.7
Colusa County			
Stationary Sources	5.1	5.1	5.0
Area Sources	0.9	0.9	0.9
Mobile Sources	8.4	6.7	4.0
Placer County			
Stationary Sources	4.5	4.7	5.1
Area Sources	1.6	1.6	1.6
Mobile Sources	28.2	23.4	13.7
Nevada County			
Stationary Sources	0.2	0.2	0.3
Area Sources	1.6	1.6	1.6
Mobile Sources	12.8	10.1	5.5
Sierra County			
Stationary Sources	0.5	0.5	0.5
Area Sources	0.1	0.5	0.5
Mobile Sources	0.6	0.6	0.5

Population Density and Degree of Urbanization
According to the US Census Bureau, the population of Yuba County in 2006 is estimated to be 70,396 based on 2000 census data. This represents a 15 percent increase in population since 2000, and a 17 percent increase since 1990. The 2006 population of Sutter County is estimated to be 91,410 based on 2000 census data. This represents a 14 percent increase in population since 2000, and a 30 percent increase since 1990.

Table 10: Yuba County and Sutter County Population

	1990	2000	2006
Yuba County			
Population	58,228	60,219	70,396
Population Density	92 persons/sq mile	96 persons/sq mile	112 persons/sq mile
Sutter County			
Population	64,415	78,930	91,410
Population Density	107 persons/sq mile	131 persons/sq mile	152 persons/sq mile

Traffic and Commuting Patterns
The estimates of daily vehicle miles traveled for the years 1990 through 2020 are found in ARB's revised motor vehicle emissions inventory model. Traffic is expected to increase by 18 percent from 2005 to 2010, and by 39 percent by 2020 in Yuba County. Sutter County is expected to experience a 20 percent increase in traffic from 2005 to 2010, and a 44 percent increase by 2020. Vehicle miles traveled in Feather River AQMD is projected to increase roughly twice as fast as population, yet NOx emissions from mobile sources is expected to continue along a downward trend. This illustrates the effectiveness of statewide mobile source controls, and supports the need for local control measures to reduce PM 2.5 levels.

Table 11: Yuba County and Sutter County Vehicle Miles Traveled

	1990	2000	2005	2010	2015	2020
Yuba County						
Ave. Daily VMT/1000	1137	1278	1510	1842	2157	2485
Sutter County						
Ave. Daily VMT/1000	1616	1921	2333	2922	3534	4196

Expected Growth
Feather River is expected to grow by 6 percent from 2005 to 2010, and by 21 percent by 2020. Surrounding counties are expected to have similar growth patterns; however, we do not expect surrounding areas to contribute to PM2.5 concentrations in Feather River AQMD. Ammonium nitrate emissions are controlled on a statewide level and are expected to decrease over time. Organic

carbon is a localized source, therefore the most effective control measures focus on a centralized nonattainment area.

Table 12: Yuba County and Sutter County Projected Growth

	2000	2005	2010	2015	2020
Yuba County					
Population	60,411	67,102	71,506	78,161	84,816
Sutter County					
Population	79,526	88,905	95,757	103,807	111,856

Level of Control of Emissions Sources
Yuba and Sutter Counties have motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California Standards; therefore new vehicles will be controlled through statewide measures. Both cars and heavy trucks are subject to in-use inspection programs. The Sacramento Valley Basinwide Air Pollution Control Council, which includes the Feather River AQMD, administers a smoke management program for open burning, consistent with the ARB's statewide regulation. Areas surrounding Yuba and Sutter Counties have similar level of control regarding smoke management and control of NOx sources.

City of Chico within the Butte County Air Quality Management District

Jurisdictional Boundary
The presumptive boundary for the PM2.5 nonattainment area includes the city of Chico under the jurisdiction of the Butte County Air Quality Management District (AQMD). Chico is located within the Sacramento Valley Air Basin.

ARB staff believes that the Chico city level nonattainment boundary is appropriate due to the localized nature of the PM2.5 problem. The city of Chico is the largest urbanized area in Butte County and is located on the Sacramento Valley floor. Several small communities throughout the Sacramento Valley meet the standard, so ARB staff does not believe it is a broad regional problem. Due to the localized nature of the PM2.5 problem in the urbanized area, we believe the violating area to be restricted to this small geographic region and not extending into the rural and mountainous regions of Butte County. The two key components of PM2.5 are ammonium nitrate and organic carbon. While ammonium nitrate is regional, most NOx emissions are from mobile sources which are controlled at a statewide level by ARB. Organic carbon is more localized and most effectively controlled at the district level.

Air Quality

Our initial recommendation for the city of Chico is based on ambient PM2.5 concentrations measured from 2004 through 2006. Our nonattainment recommendation is based on a design value of 56 ug/m3 measured at the Chico monitoring site. Butte County has two monitors measuring PM2.5, located in Chico and Gridley, however, only Chico can be used for federal purposes.

Areas surrounding the city of Chico include the counties of Plumas, Tehama, Glenn, Colusa, Sutter and Yuba. Exceedance of the PM2.5 standard in Sutter and Yuba counties will be included in the recommended nonattainment area for the cities of Marysville/Yuba City. Glenn, Colusa, Tehama, and Plumas counties all are in attainment of the standard.

The chemical makeup of PM2.5 in the city of Chico is dominated by organic carbon and ammonium nitrate. Figure 10 illustrates the seasonal pattern and chemical composition of PM2.5 at the Chico monitoring site with highest concentrations occurring in the winter time. As shown if Figure 11, organic carbon accounts for roughly 75 percent of the PM2.5 composition on exceedance days. The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, agricultural and prescribed burning and stationary combustion sources. Concentrations of organic carbon are highest during the winter months, November through February, suggesting that emissions are likely a result of residential wood combustion.

Ammonium nitrate is another significant contributor to the total PM2.5 composition, accounting for about 16 percent on exceedance days. During the fall and winter the ammonium nitrate fraction of PM2.5 is higher than during the spring and summer, while ammonium sulfate and dust contribute slightly more to ambient PM2.5 during the spring and summer. Cool temperatures, low wind speeds, low inversion layers, and high humidity during the late fall and winter favor the formation of ammonium nitrate, while sunny, warmer conditions during the spring and summer favor the formation of ammonium sulfate, as well as the formation of secondary organic aerosols.

Figure 10: PM2.5 Chemical Composition in Chico

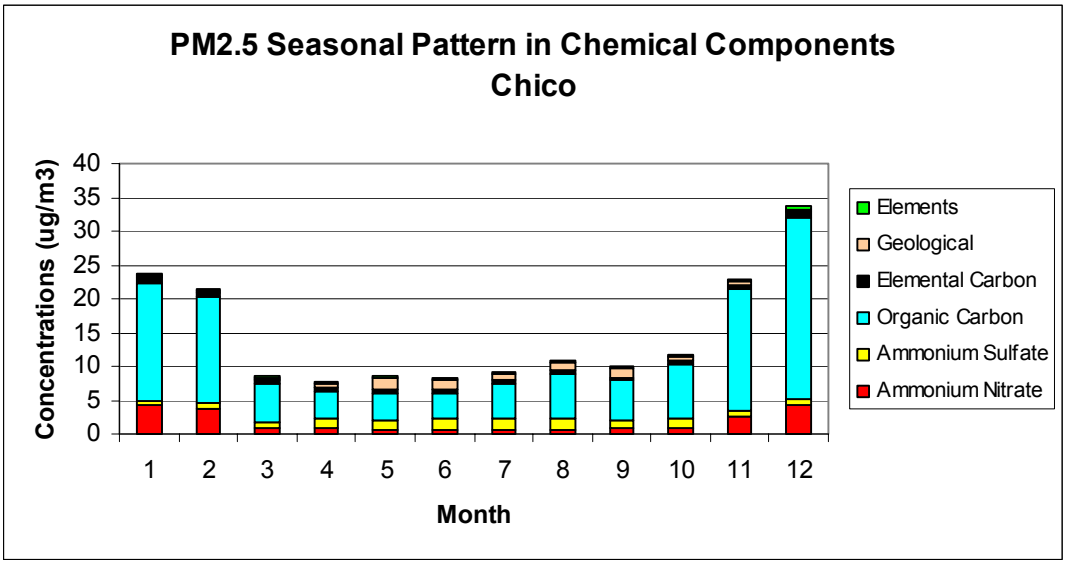
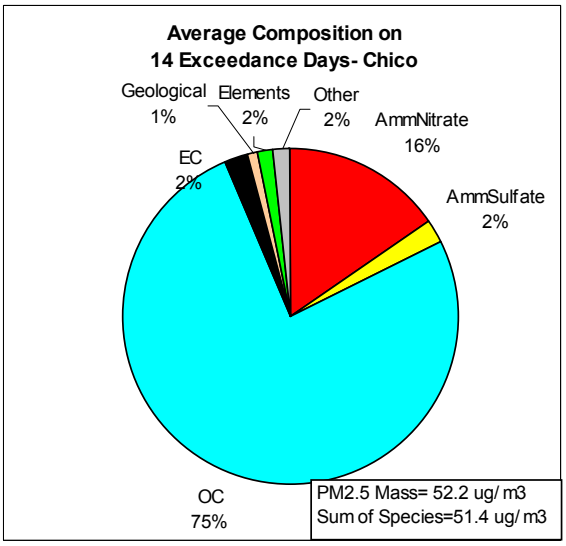


Figure 11: Average Chemical Composition



Geography/Topography/Meteorology

The city of Chico is located at the northeast edge of the Sacramento Valley. The Sierra Nevada Mountains lie to the east, and the Sacramento River lies to the west. Chico sits primarily on the valley floor and is on the whole very flat, but several miles of the eastern city limits venture into the increasingly hilly terrain of the Sierra Nevada foothills. The city limits encompass an area of 30 square miles. Butte County encompasses an area of 1,639 square miles.

Chico is part of the larger Northern Sacramento Valley Air Basin (NSVAB), which includes the counties of Butte, Colusa, Glenn, Shasta, and Tehama. The NSVAB is bounded on the north and west by the Coastal Mountain Range and

on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6000 feet with peaks rising much higher. This provides a substantial physical barrier to locally created pollution. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

Emissions

The presumptive boundary for the PM2.5 nonattainment area includes the city of Chico under the jurisdiction of the Butte County AQMD. All potential emission sources are included within the recommended nonattainment area. Adjacent counties include Plumas, Tehama, Glenn, Colusa, Sutter and Yuba. The nature of the PM2.5 problem in Chico is primarily a result of local emission sources such as smoke; therefore, emissions from neighboring counties would not impact the air quality data for Butte County. Emissions generated in Sutter and Yuba Counties are included in the recommended Marysville/Yuba City nonattainment area. Table 13 provides emissions in tons per day of the primary pollutant contributing to PM2.5 from stationary, area and mobile sources. The majority of NOx emissions are under the mobile source category which is regulated by ARB.

Table 13: NOx Winter Emissions Butte County AQMD and Surrounding Counties

Butte County	**2006**	**2010**	**2020**
Stationary Sources	1.4	1.4	1.4
Area Sources	1.7	1.7	1.6
Mobile Sources	23.3	19.9	11.3
Sutter County			
Stationary Sources	3.6	3.9	3.9
Area Sources	0.9	0.8	0.8
Mobile Sources	14.3	12.9	6.9
Yuba County			
Stationary Sources	0.7	0.7	0.7
Area Sources	0.5	0.5	0.5
Mobile Sources	6.2	6.6	4.9
Glenn County			
Stationary Sources	3.5	3.6	3.6
Area Sources	0.1	0.1	0.1
Mobile Sources	7.6	6.2	3.7
Colusa County			
Stationary Sources	5.1	5.1	5.0
Area Sources	0.9	0.9	0.9
Mobile Sources	8.4	6.7	4.0

Table 13 (cont.)

Plumas County	**2006**	**2010**	**2020**
Stationary Sources	1.8	1.8	1.8
Area Sources	0.4	0.4	0.4
Mobile Sources	4.8	4.3	3.7
Tehama County			
Stationary Sources	1.8	1.8	1.8
Area Sources	0.5	0.5	0.5
Mobile Sources	17.6	13.6	7.5

Population Density and Degree of Urbanization

According to the U.S. Census Bureau, the city of Chico has a 2006 population of 73,316. The population of Butte County in 2006 is approximately 215,881 based on 2000 Census data. This represents a 6 percent increase in population since 2000, and a 16 percent increase since 1990.

Table 14: Population Butte County and City of Chico

Butte County	**1990**	**2000**	**2006**
Population	182,120	203,171	215,881
Population density	111 persons/sq mile	124 persons/sq mile	132 persons/sq mile
City of Chico			
Population	40,079	59,954	73,316
Population density	1,336 persons/sq mile	1,998 persons/sq mile	2,444 persons/sq mile

Traffic and Commuting Patterns

The estimates of daily vehicle miles traveled for the years 1990 through 2020 are found in ARB's revised motor vehicle emissions inventory model. Traffic is expected to increase by 13 percent from 2005 to 2010, and by 30 percent by 2020 in Butte County. Vehicle miles traveled in Butte County is projected to increase roughly twice as fast as population, yet NOx emissions from mobile sources is expected to continue along a downward trend. This illustrates the effectiveness of statewide mobile source controls, and supports the need for local control measures to reduce PM2.5 levels.

Table 15: Average Daily Vehicle Miles Traveled Butte County

	1990	**2000**	**2005**	**2010**	**2015**	**2020**
Ave. Daily VMT/1000	4320	4496	4996	5762	6456	7138

Expected Growth

Butte County is expected to grow by 5 percent from 2005 to 2010, and by 12 percent by 2020. Population growth in surrounding areas is not expected to contribute to PM2.5 concentrations in Chico. Ammonium nitrate emissions are controlled on a statewide level and are expected to decrease over time. Organic

carbon is a localized source, therefore the most effective control measures focus on a centralized nonattainment area.

Table 16: Projected Future Population Butte County

	2000	2005	2010	2015	2020
Population	203,855	215,558	228,020	244,375	260,730

Level of Control of Emissions Sources
The city of Chico has motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California standards; therefore, new vehicles will be controlled through statewide measures. Both cars and heavy trucks are subject to in-use inspection programs. The Sacramento Valley Basinwide Air Pollution Control Council, which includes Butte County AQMD, administers a smoke management program for open burning consistent with ARB's statewide regulation. Areas surrounding Butte County have similar level of control regarding smoke management and control of NOx sources.

City of Calexico within the Imperial County Air Pollution Control District

Jurisdictional Boundary
The presumptive boundary for the PM2.5 nonattainment area includes the City of Calexico, under the jurisdiction of the Imperial County Air Pollution Control District, and within the Salton Sea Air Basin.

ARB staff believes that the Calexico city level nonattainment boundary is appropriate due to the unique international pollutant transport problem between Calexico and Mexicali, Mexico. The two key components of PM2.5 are ammonium nitrate and organic carbon. Ammonium nitrate is a regional pollutant primarily derived from reactions with NOx emissions from mobile sources. ARB regulates sources of NOx emissions at a statewide level. Organic carbon is more localized and can be effectively controlled at the district level. However, we have no jurisdiction over these pollutant emission sources in Mexico.

Air Quality
Our initial recommendation for the city of Calexico is based on ambient PM2.5 concentrations measured from 2004 through 2006. Four monitoring sites throughout Imperial County monitor for PM2.5, however only two sites – Calexico-Ethel Street and El Centro-9th Street – have sufficient data to support designations. Our nonattainment recommendation is based on a design value of 40 ug/m3 measured at the Calexico-Ethel Street monitoring site. The El Centro monitoring site is well below the federal standard with a design value of 25 ug/m3.

Areas surrounding Imperial County include San Diego County to the west, Riverside County to the north, Arizona to the east, and Mexico to the south.

Exceedances of the PM2.5 standard in Riverside are included in the nonattainment area for the South Coast Air Pollution Control District. San Diego County is in attainment of the standard with a design value of 28 ug/m3 measured at the Chula Vista monitoring site.

The chemical makeup of PM2.5 in Calexico is dominated by organic carbon and ammonium nitrate. Figure 12 illustrates the seasonal pattern and chemical composition of PM2.5 at the Calexico-Ethel Street site with highest concentrations occurring in the winter time. Organic carbon is the largest component of PM2.5 and increases considerably during the winter months, however, it is significant throughout the year. Waste burning is prevalent throughout Mexicali and contributes to the year-round organic carbon concentrations. As shown in Figure 13, organic carbon accounts for roughly 48 percent of the 2004 – 2006 average PM2.5 composition on exceedance days. The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, agricultural and prescribed burning and stationary combustion sources. Concentrations of organic carbon are highest during the winter months, November through February, suggesting that emissions are likely a result of wood combustion.

Ammonium nitrate is another significant contributor to the total PM2.5 composition, accounting for about 22 percent of the average composition on exceedance days. The primary source of ammonium nitrate is motor vehicles, which are regulated statewide by ARB. The motor vehicle fleets in Calexico and Mexicali differ substantially. Calexico vehicle fleets are equipped with state of the art emission control technologies. In contrast, Mexicali has a large number of late model vehicles lacking emission controls. The Calexico/Mexicali border is a major corridor for vehicle traffic resulting in a significant amount of motor vehicle emissions.

Figure 12: Seasonal Pattern of PM2.5 Chemical Components

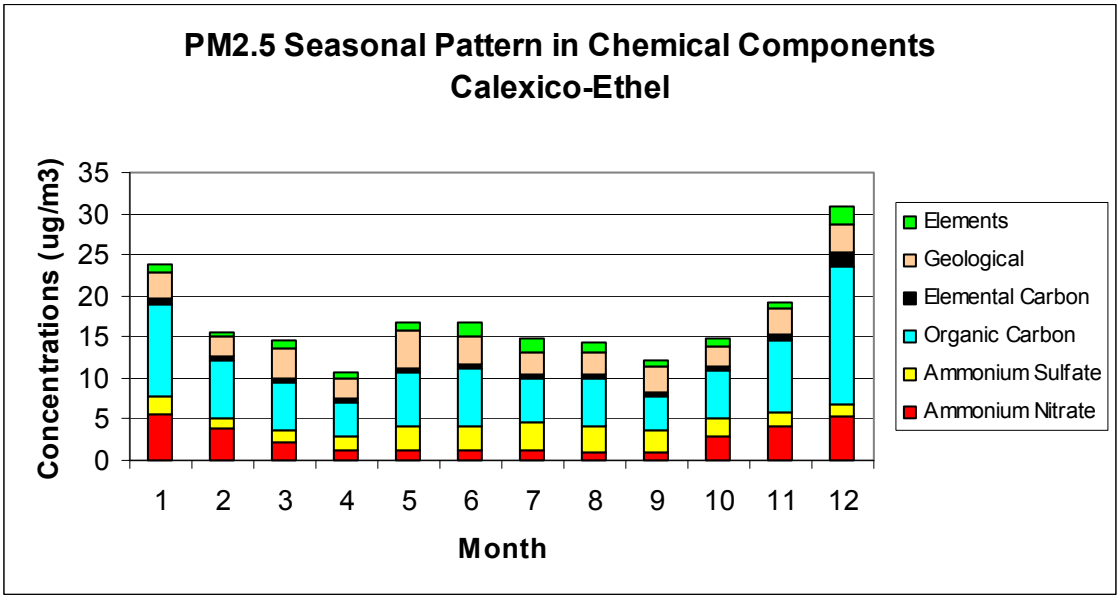
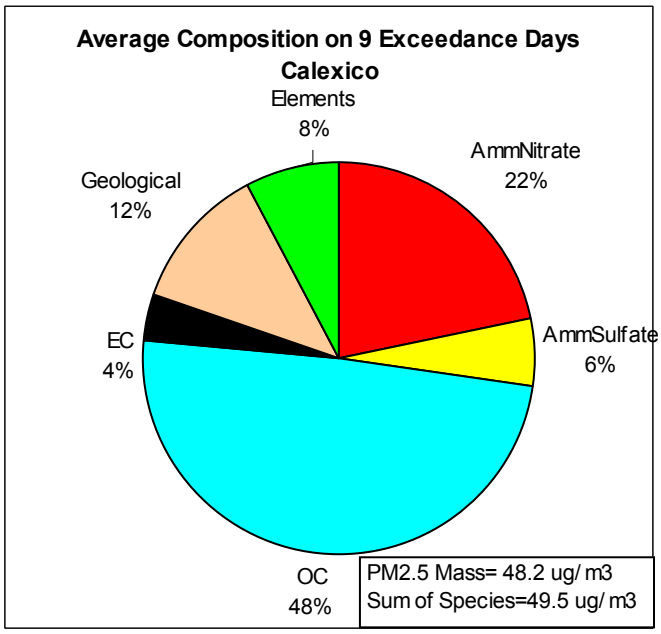


Figure 13: Ave. PM2.5 Composition



Geography/Topography/Meteorology

Imperial County is located within the Salton Sea Air Basin along with the desert portion of Riverside County. Imperial County consists of 4,175 square miles, bordering Mexico to the south, Riverside County to the north, San Diego County to the west, and the State of Arizona on the east.

The Imperial Valley is a part of the larger Salton Trough. Also included in the Salton Trough is the western half of the Mexicali Valley and the Colorado River delta in Mexico. This trough is a very flat basin surrounded by mountains: the Peninsular Ranges to the west, the Chocolate, Orocopia and Cargo Muchacho Mountains to the east. Most of the trough is below seas level and is predominantly desert with agricultural land.

Climatic conditions in the Salton Sea Air Basin are governed by the large-scale sinking and warming air in the subtropical high-pressure center of the Pacific Ocean. The high-pressure ridge blocks most mid-latitude storms except in the winter when the high-pressure ridge is weakest and farthest south. Similarly, the coastal mountains prevent the intrusion of any cool damp marine air from the coast. Because of the weakened storms and the mountainous barrier, the Salton Sea Air Basin has hot summers, mild winters, and little rainfall. The flat terrain of the valley and the strong temperature differentials, created by intense solar heating produces moderate winds and deep thermal convection.

Emissions

The presumptive boundary for the PM2.5 nonattainment area includes the City of Calexico in Imperial County under the jurisdiction of the Imperial County Air Pollution Control District. Calexico (and Mexicali) are distinct from the rest of Imperial County based on the distribution and nature of emission sources. Imperial County is largely rural with widespread agricultural activity. ARB staff believes that violation of the PM2.5 standard in Calexico results from emissions in the densely populated international Calexico/Mexicali border region. The level of urban activity and PM2.5 pollution in the Calexico/Mexicali area are distinct and not representative of the rest of Imperial County.

Table 17: NOx Winter Emissions Imperial and Surrounding Counties

Imperial County	**2006**	**2010**	**2020**
Stationary Sources	5.5	5.7	6.1
Area Sources	1.0	0.9	0.9
Mobile Sources	33.3	26.5	18.8
Riverside County			
Stationary Sources	11.6	12.1	14.2
Area Sources	3.5	3.4	3.9
Mobile Sources	180.7	134.6	76.2
San Diego County			
Stationary Sources	8.8	10.8	12.0
Area Sources	3.7	3.7	3.7
Mobile Sources	205.4	172.7	132.9

Population Density and Degree of Urbanization

From an air quality perspective, Calexico and Mexicali, Mexico form one urbanized region divided by an international border. According to 2000 U.S.

Census data, Calexico's population in 2000 was approximately 27,000. The official Mexican Census placed Mexicali's population in 2000 at 760,000, with 3 percent annual growth expected. In 2000, the entire Imperial County population was approximately 143,000. Considering the geographic size of the two areas as well, the Mexicali population density is two and a half times the density for all of Imperial County.

Table 18: Imperial County Population

	1990	**2000**	**2005**
Population	110100	143595	162599
Population Density	26 persons/sq mile	34 persons/sq mile	39 persons/sq mile

Table 19: City of Calexico Population

	1990	**2000**	**2006**
Population	18633	27102	37243

Table 20: Mexicali, Mexico Population

	2000	**2004**	**2006**
Population	764602	866277	922077

Traffic and Commuting Patterns

Calexico/Mexicali is home to a busy U.S. – Mexico border crossing. In 1996, the border crossing handled almost 7 million vehicles. Mexicali has over three times as many motor vehicles as all of Imperial County.

Expected Growth

Imperial County is expected to grow by about 9 percent from 2005 to 2010, and by about 24 percent by 2020. The city of Calexico has experienced a rapid population growth from 1990 to 2000, growing by approximately 40 percent during that time period. An even more dramatic growth of 50 percent is projected for the 2000 – 2010 period. Nonetheless, this rapid growth in Calexico and Imperial County is overwhelmed by the population and projected growth of Mexicali. According to the State Government of Baja Mexico, the 2006 population based on a 2000 census is 922,077. Assuming a constant rate of growth from 2000, the 2010 population is estimated to be approximately 1,045,000, and the 2020 estimated population is approximately 1,433,000.

Table 21: Imperial County Projected Growth

	2000	**2005**	**2010**	**2015**	**2020**
Population	143,595	162,599	178,201	196,294	214,386

Table 22: Mexicali, Mexico Projected Growth

	2000	**2006**	**2010**	**2020**
Population	764,602	922,077	1,045,842	1,432,892

Level of Control of Emissions Sources

Imperial County has motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California standards; therefore, new vehicles will be controlled through statewide measures. Both cars and heavy trucks are subject to in-use inspection programs. The Imperial County District administers a smoke management program for open burning consistent with ARB's statewide regulation. Vehicles in Mexicali are typically older than California vehicles and there is no in-use inspection program. Finally, Mexicali open burning is widespread and uncontrolled. This is particularly significant given the large organic fraction found in Calexico PM2.5.

Based on all of these factors, ARB staff has concluded that Calexico exceedances of the federal PM2.5 standards are the result of urban activity associated with the densely populated international Calexico/Mexicali border region. Within Imperial County, the level of urban activity is unique to the area and is not representative of the air quality of the rest of Imperial County or the Salton Sea Air Basin.