



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

OFFICE OF THE  
REGIONAL ADMINISTRATOR

August 21, 2008

Marjorie Mejia  
Chairperson  
Lytton Tribal Council  
1300 N. Dutton Avenue, Suite A  
Santa Rosa, CA 95401

Dear Chairperson Mejia:

This letter provides information on the status of fine particle (PM<sub>2.5</sub>) air pollution in the area where your reservation is located. PM<sub>2.5</sub> pollution represents one of the most significant barriers to clean air facing us today. Health studies link these tiny particles – about 1/30<sup>th</sup> the diameter of a human hair – to serious human health problems including aggravated asthma, increased respiratory symptoms such as coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and even premature death in people with heart and lung disease. PM<sub>2.5</sub> pollution can remain suspended in the air for long periods of time and create public health problems far away from emission sources. Reducing levels of PM<sub>2.5</sub> pollution is an important part of our commitment to clean, healthy air.

Your reservation is located in an area that EPA is proposing to designate as nonattainment for the 2006 PM<sub>2.5</sub> air quality standard. Consistent with section 107(d) (1) of the Clean Air Act, this letter is to inform you that EPA intends to designate your reservation as nonattainment for the 2006 PM<sub>2.5</sub> health standard. We also intend to provide copies of this letter to Tribal Environmental Directors along with a copy of our supporting analysis for your reference. This analysis describes EPA's review of the air quality data, emissions data, and other related information for the area surrounding your reservation. If you would like to provide additional information about the PM<sub>2.5</sub> status of your reservation or adjoining areas for our consideration, please send it to us by October 20, 2008.

EPA has taken steps to reduce fine particle pollution across the country, such as implementing the Clean Diesel Program, which has reduced emissions from highway, non-road and stationary diesel engines. In addition, implementation plans developed by the state to attain the 1997 PM<sub>2.5</sub> standards will also help reduce unhealthy levels of fine particle pollution.

We intend to make final designation decisions for the 2006 24-hour PM<sub>2.5</sub> standards by December 18, 2008. If you have any questions, please do not hesitate to have your staff contact Colleen McKaughan at 520-498-0118. We look forward to a continued dialogue with you as we work together to implement the PM<sub>2.5</sub> standards.

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Natri". The signature is fluid and cursive, with a long horizontal stroke at the end.

Wayne Natri  
Regional Administrator

Enclosure

cc: Brent Gudzus, Environmental Director

**Attachment 1**

**CALIFORNIA  
Area Designations For the  
24-Hour Fine Particle National Ambient Air Quality Standard**

The table below identifies the counties in California that EPA intends to designate as not attaining the 2006 24-hour fine particle (PM<sub>2.5</sub>) standard.<sup>1</sup> A county will be designated as nonattainment if it has an air quality monitor that is violating the standard or if the county is determined to be contributing to the violation of the standard.

Area	California Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
Butte County	Butte County - Partial	Butte County
Imperial County	Imperial County - Partial	Imperial County
Sacramento County	Sacramento County	Sacramento County Yolo County Placer County – Partial El Dorado County – Partial Solano County - Partial
San Francisco Bay Area	Sonoma County – Partial Napa County Marin County San Francisco County Contra Costa County Alameda County Santa Clara County San Mateo County Solano County - Partial	Sonoma County – Partial Napa County Marin County San Francisco County Contra Costa County Alameda County Santa Clara County San Mateo County Solano County - Partial
San Joaquin Valley Air Basin	San Joaquin County Stanislaus County Merced County Madera County Fresno County Kings County Tulare County Kern County - Partial	San Joaquin County Stanislaus County Merced County Madera County Fresno County Kings County Tulare County Kern County - Partial
South Coast Air Basin	Los Angeles County – Partial San Bernardino County Partial Riverside County – Partial Orange County	Los Angeles County – Partial San Bernardino County Partial Riverside County – Partial Orange County
Yuba County Sutter County	Yuba County – Partial Sutter County - Partial	Yuba County Sutter County

EPA intends to designate the remaining counties in the state as attainment/unclassifiable.

<sup>1</sup> EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour PM<sub>2.5</sub> standard was revised from 65 micrograms per cubic meter (average of 98<sup>th</sup> percentile values for 3 consecutive years) to 35 micrograms per cubic meter; the level of the annual standard for PM<sub>2.5</sub> remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

## **EPA Technical Analysis for San Francisco Bay Area**

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for the San Francisco Bay Area identifies the counties with monitors that violate the 24-hour PM<sub>2.5</sub> standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Figure 1 is a map of the counties in the area and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the State.



The California Air Resources Board (CARB) sent a letter to EPA, dated December 17, 2008, recommending that southern Sonoma, Napa, Marin, Contra Costa, San Francisco, Alameda, San Mateo, Santa Clara and the western part of Solano Counties be designated as “nonattainment” for the 2006 24-hour PM<sub>2.5</sub> standard based on air quality data from 2004–2006. These data are from Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors located in the state.

Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Composition data was also provided by CARB for the San Jose monitoring site. Analysis of this data indicates that the days with the highest fine particle concentrations occur predominantly in the winter, and the average chemical composition of the highest days is typically characterized by high levels of organic carbon (54%) nitrate (30%), and sulfate (13%).

Based on EPA's 9-factor analysis described below, EPA believes that nine counties in California should be designated nonattainment for the 24-hour PM<sub>2.5</sub> air-quality standard as part of the San Francisco Bay Area nonattainment area, based upon currently available information. These counties are listed in the table below.

Area	State-Recommended Nonattainment Counties	EPA-Recommended Nonattainment Counties
Bay Area Air Basin	Sonoma (P), Napa, Marin, Contra Costa, San Francisco, Alameda, San Mateo, Santa Clara and Solano (P) Counties	Sonoma (P), Napa, Marin, Contra Costa, San Francisco, Alameda, San Mateo, Santa Clara and Solano (P) Counties

P = partial

In this proposed nonattainment area there are seven full counties and two partial counties. Western Solano County is included in the San Francisco Bay Area, but eastern Solano County is included in the Sacramento nonattainment area. All of Solano County is proposed as nonattainment but the county is split between two separate nonattainment areas. Southern Sonoma County is included in the San Francisco Bay Area nonattainment area, but the northern part of the County is excluded due to topography and its rural nature.

The following is a summary of the nine-factor analysis for the San Francisco Bay Area.

**Factor 1: Emissions data**

For this factor, EPA evaluated county level emission data for the following PM<sub>2.5</sub> components and precursor pollutants: “PM<sub>2.5</sub> emissions total,” “PM<sub>2.5</sub> emissions carbon,” “PM<sub>2.5</sub> emissions other,” “SO<sub>2</sub>,” “NO<sub>x</sub>,” “VOCs,” and “NH<sub>3</sub>.” “PM<sub>2.5</sub> emissions total” represents direct emissions of PM<sub>2.5</sub> and includes: “PM<sub>2.5</sub> emissions carbon,” “PM<sub>2.5</sub> emissions other”, primary sulfate (SO<sub>4</sub>), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO<sub>2</sub> and NO<sub>x</sub>, are part of “PM<sub>2.5</sub> emissions total,” they are not shown on the template or data spreadsheet as separate

items). “PM<sub>2.5</sub> emissions carbon” represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and “PM<sub>2.5</sub> emissions other” represents other inorganic particles (crustal). Emissions of SO<sub>2</sub> and NO<sub>x</sub>, which are precursors of the secondary PM<sub>2.5</sub> components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH<sub>3</sub> (ammonia) are also potential PM<sub>2.5</sub> precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html).

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive way for consideration of data for these factors. A summary of the CES is included in attachment 2, and a more detailed description can be found at [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html#C](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C).

Table 1 shows emissions of PM<sub>2.5</sub> and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the San Francisco Bay Area.

County	State Recommended Nonattainment?	CES	PM <sub>2.5</sub> emissions total	PM <sub>2.5</sub> emissions carbon	PM <sub>2.5</sub> emissions other	SO <sub>2</sub>	NO <sub>x</sub>	VOCs	NH <sub>3</sub>
Sonoma	Yes (P)	5	2,179	1,224	955	2,851	15,064	13,411	2,697
Napa	Yes	7	611	329	282	1,132	4,251	4,199	600
Solano	Yes (P)	66	1,750	834	915	8,335	15,009	12,093	1,579
Marin	Yes	4	833	468	365	973	6,514	7,250	861
Contra Costa	Yes	100	4,061	1,999	2,061	18,115	44,059	27,508	3,149
San Francisco	Yes	16	2,362	1,388	975	1,979	22,711	13,511	570
Alameda	Yes	54	4,640	2,302	2,339	6,932	43,685	32,094	1,705
San Mateo	Yes	10	2,195	1,103	1,092	2,585	20,888	16,141	1,059
Santa Clara	Yes	100	5,284	2,372	2,912	7,008	44,714	36,471	2,234

P =partial. Data given is for entire County

Most of the counties have high levels of PM<sub>2.5</sub> emissions and PM<sub>2.5</sub> precursors, and should be included in the nonattainment area. Sonoma, Napa and Marin County have low CES values, and Napa and Marin County have relatively low total PM<sub>2.5</sub> emissions. Though Sonoma, Napa, and Marin do not have violating monitors, they are part of the same air basin, part of the San Francisco metropolitan area, and part of the Bay Area Air Quality Management District. The State recommended a designation of nonattainment for them, consistent with previous designations of this area.

**Factor 2: Air quality data**

This factor considers the 24-hour PM<sub>2.5</sub> design values micrograms per cubic meter (µg/m<sup>3</sup>) for air quality monitors in counties in the San Francisco Bay Area based on data for the 2005-2007 period. A monitor’s design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM<sub>2.5</sub> standards are met when the 3-year average of a monitor’s 98<sup>th</sup> percentile values are 35µg/m<sup>3</sup> or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM<sub>2.5</sub> design values for counties in the San Francisco Bay Area are shown in Table 2.

Table 2. Air Quality Data			
County	State Recommended Nonattainment?	24-hr PM <sub>2.5</sub> Design Values 2004-06 (µg/m <sup>3</sup> )	24-hr PM <sub>2.5</sub> Design Values 2005-07 (µg/m <sup>3</sup> )
Sonoma	Yes (P)	29	30
Napa	Yes	No data	No data
Solano	Yes (P)	36	36
Marin	Yes	No data	No data
Contra Costa	Yes	35	34
San Francisco	Yes	31	29
Alameda	Yes	34	35
San Mateo	Yes	29	31
Santa Clara	Yes	39	39
P = partial			

In the San Francisco Bay Area, Solano and Santa Clara Counties show a violation of the 24-hour PM<sub>2.5</sub> standard. Therefore, these counties are candidates for inclusion in the San Francisco Bay nonattainment area. However, this factor alone is not sufficient to eliminate the other counties in the San Francisco Bay Area as candidates for nonattainment status. EPA considers each county’s CES values as well as other factors and circumstances when determining which counties to include in the San Francisco Bay Area nonattainment area.

Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM<sub>2.5</sub> NAAQS for designation purposes.

**Factor 3: Population density and degree of urbanization (including commercial development)**

Table 3. Population			
County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Santa Clara	Yes	1,705,158	1313
Alameda	Yes	1,451,065	1933
Contra Costa	Yes	1,017,644	1341
San Francisco	Yes	741,025	15,700
San Mateo	Yes	701,175	1535
Sonoma	Yes (P)	466,970	294
Solano	Yes (P)	410,786	463
Marin	Yes	247,103	456
Napa	Yes	132,516	167
P = partial. Data given is for entire County			

Figure 2 “San Francisco Bay Area Local Emission Sources and Population Density” shows that population density in all the Bay Area counties is relatively high.

# San Francisco Bay Area Population Density, Truck and Commuting Traffic

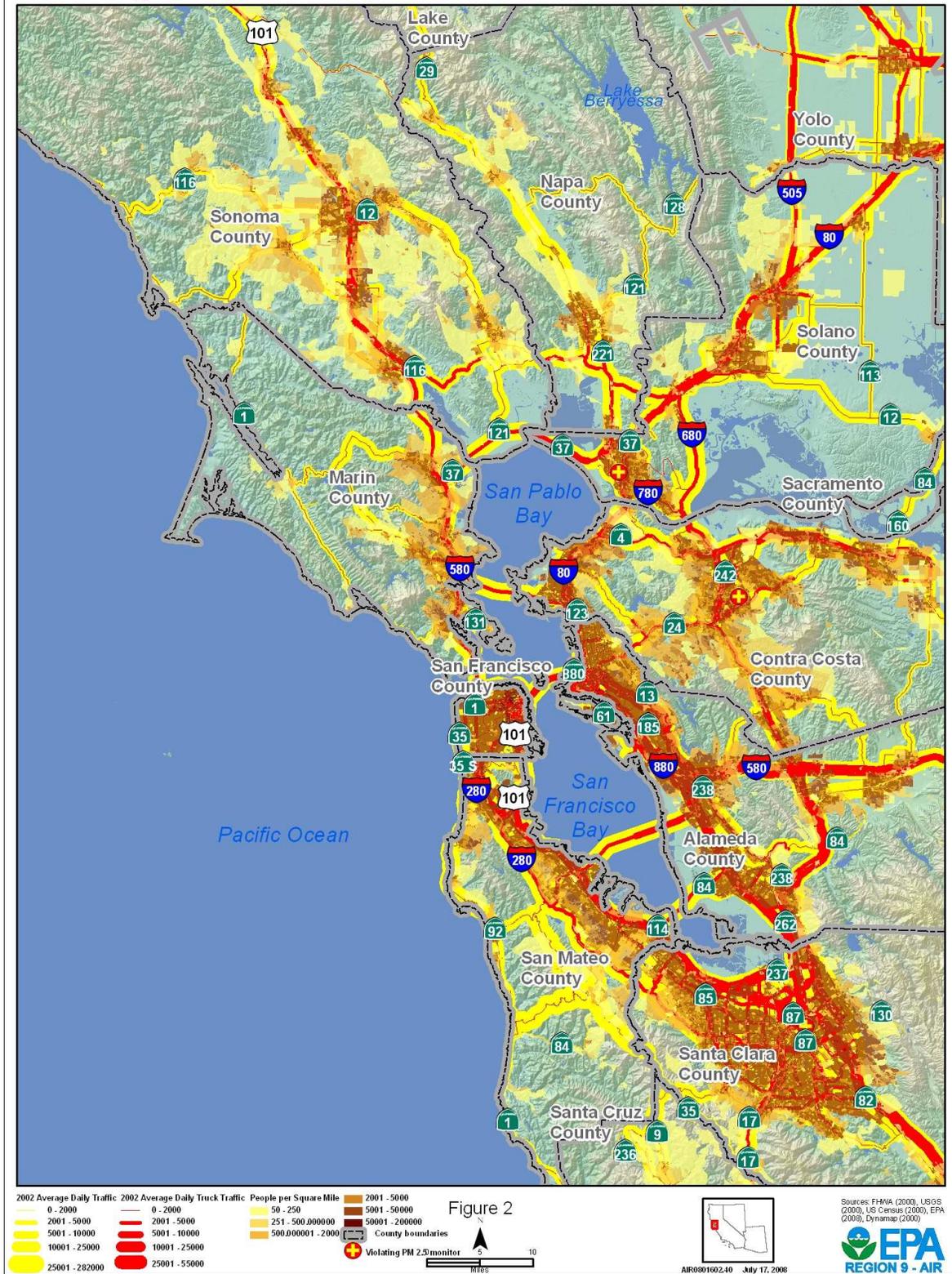


Figure 2

Table 3 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour PM<sub>2.5</sub> standards. The population densities for the Bay Area counties are fairly high so, based on this factor, all the Bay Area counties should be included in the nonattainment area.

**Factor 4: Traffic and commuting patterns**

This factor considers the number of commuters in each county who drive to another county within the San Francisco Bay Area, the percent of total commuters in each county who commute to other counties within the San Francisco Bay Area, as well as the total Vehicle Miles Traveled (VMT) for each county in thousands of miles (see Table 4). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

County	State Recommended Nonattainment?	2005 VMT (1000s mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties
Santa Clara	Yes	15,087	729,340	88 %
Alameda	Yes	9,732	74,150	11 %
San Mateo	Yes	6,820	56,070	16 %
Contra Costa	Yes	8,437	19,680	4%
San Francisco	Yes	3,657	16,630	4%
Sonoma	Yes (P)	4,761	2,770	1%
Marin	Yes	2,272	1,850	1%
Napa	Yes	1,212	4,380	8
Solano	Yes (P)	4,173	105,850	61%

Santa Clara, Solano, Alameda, and San Mateo Counties have the highest number of commuters into the violating areas in the San Francisco Bay Area which are Santa Clara and Solano. All of the Counties in the San Francisco Bay Area have substantial commuting so no Counties are being eliminated on the basis of this factor. It is clear that all the Bay Area counties have substantial commute traffic and should be included in the San Francisco Bay Area nonattainment area based on this factor.

The 2005 VMT data used for Table 4 and 5 of the 9-factor analysis has been derived using methodology similar to that described in “Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: [atftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002\\_mobile\\_nei\\_version\\_3\\_report\\_092807.pdf](http://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf). The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

### Factor 5: Growth rates and patterns

This factor considers population growth from 2000-2005 and growth in vehicle miles traveled (VMT) for 1996 -2005 for counties in the San Francisco Bay Area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the San Francisco Bay area.

County	Population (2005)	Population Density	2005 VMT (millions mi)	VMT % change (1996 to 2005)
Sonoma (P)	466,970	294	4,761	26%
Napa	132,516	167	1,212	46%
Solano (P)	410,786	463		19%
Marin	247,103	456	2,272	14%
Contra Costa	1,017,644	1341	8,437	32%
San Francisco	1,705,158	15,700	3,657	(38%)
Alameda	1,451,065	1933	9,732	(9%)
San Mateo	701,175	1535	6,820	27%
Santa Clara	1,705,644	1313	15,087	10%

P = partial. Data are for entire counties.

Napa, San Francisco and San Mateo Counties had a decrease in population from 2000 to 2005. While San Francisco had a corresponding decrease in VMT growth from 1996 – 2005, San Mateo County had a significant (27%) increase in VMT, as did Napa County (46%). The increase in VMT growth in suburban counties, coupled with the decrease in VMT for San Francisco and Alameda, indicate there has been a shift from the major population centers to the suburbs.

Based on these statistics, it would appear that, although there are shifting populations among the counties in the San Francisco Bay Area, both the population and VMT numbers are significant indicating that a large amount of the population is exposed to the high emissions levels represented by the violating monitors in Solano and Santa Clara monitors and therefore none of these candidates can be dropped from consideration of a PM<sub>2.5</sub> nonattainment designation.

### Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments in the area. Wind direction and wind speed data for 2004-2006 were analyzed, with an emphasis on “high PM<sub>2.5</sub> days” for each of two seasons (an October-April “cold” season and a May-September

“warm” season). These high days are defined as days where any FRM or FEM air quality monitors had 24-hour PM<sub>2.5</sub> concentrations above 95% on a frequency distribution curve of PM<sub>2.5</sub> 24-hour values, or were 24-hr values exceeded 35.1 µg/m<sup>3</sup>.

For each air quality monitoring site, EPA developed a “pollution rose” to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour PM<sub>2.5</sub> values by color; days exceeding 35 µg/m<sup>3</sup> are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for Santa Clara County, site 060850005, shown in Figure 3, indicates that elevated levels of particulate matter occur during the cool season during time periods when the winds are light, consistent with the analysis submitted by California, below. The additional pollution roses for the San Francisco Bay Area, included in Attachment 3, show similar results.

The State letter from the California Air Resources Board (CARB) to EPA discusses conditions lead to high PM<sub>2.5</sub>. The coastal zones tend to be more windy and cooler in the summer than the hotter drier interior regions with a reversal in the winter months. Precipitation is characterized with dry summers and wet winters. In winter, the Pacific High weakens and shifts southward, and winter storms become frequent. 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.

The meteorology data support the analysis submitted by California and support inclusion of all the Bay Area counties into the nonattainment area.

The meteorology factor is also considered in each county’s Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high PM<sub>2.5</sub> days.

#### **Factor 7: Geography/topography (mountain ranges or other air basin boundaries)**

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of PM<sub>2.5</sub> over the San Francisco Bay Area.

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 western 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. However, the commuting patterns and the truck traffic among the San Francisco Bay area

counties, indicates that topography does not constitute an impediment to the transport of PM<sub>2.5</sub> emissions in the San Francisco Bay Area. Therefore on that basis, none of the counties in the San Francisco Bay Area can be dropped from consideration for a PM<sub>2.5</sub> nonattainment designation. The exception is the northern half of Sonoma County which is distinguished from the southern part of the county by its topography and rural nature.

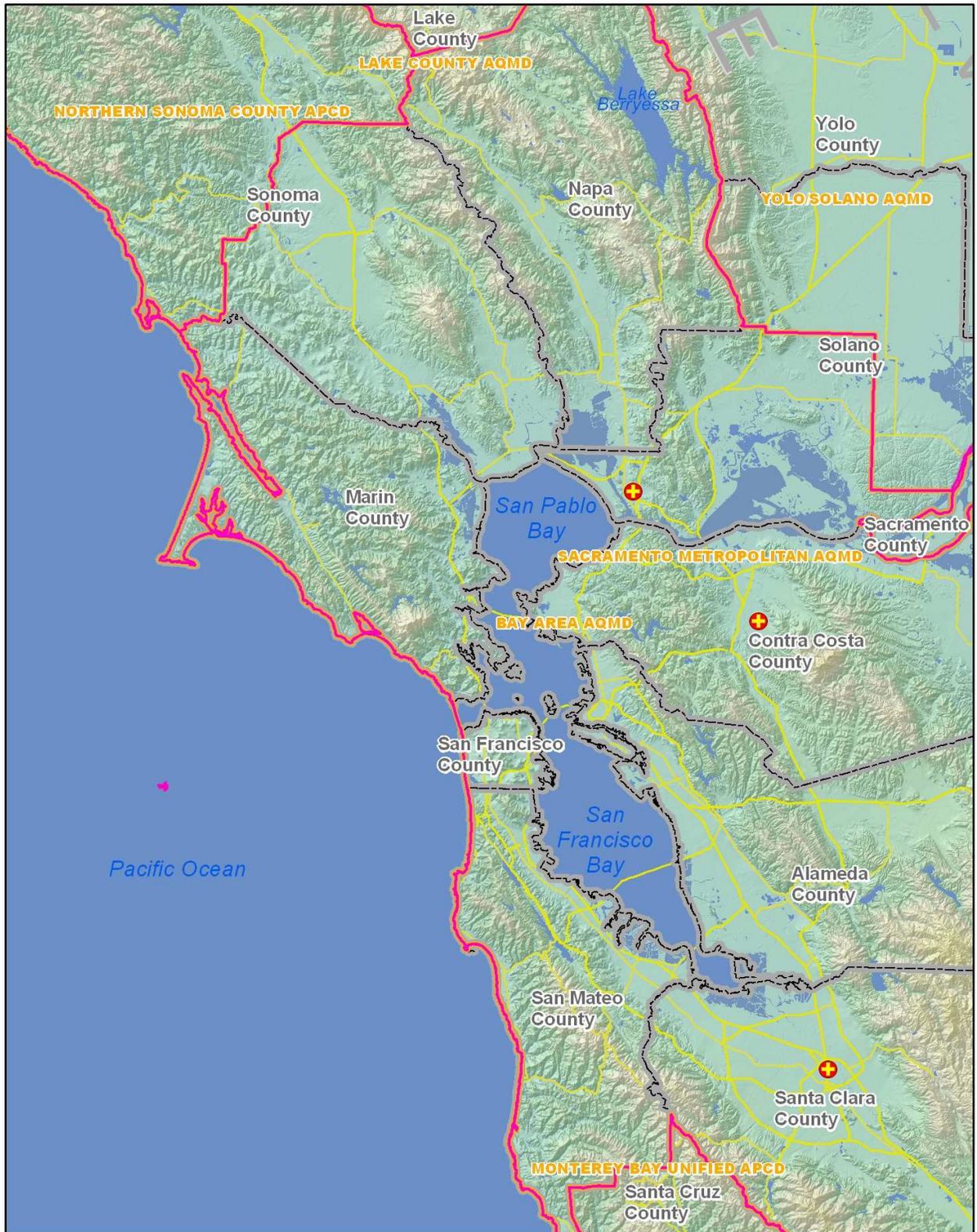
**Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)**

In evaluating the jurisdictional boundary factor, consideration should be given to existing boundaries and organizations that may facilitate air quality planning and the implementation of control measures to attain the standard. Areas designated as nonattainment (e.g for PM<sub>2.5</sub> or 8-hour ozone standard) represent important boundaries for state air quality planning.

The analysis of jurisdictional boundaries considered the planning and organizational structure of the San Francisco Bay Area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner.

See Figure 4: “San Francisco Bay Area – Air Districts, Air Basins, ozone Nonattainment Areas.”

# San Francisco Bay Area - Air Districts, Air Basins



- California Air Basins
- California Air Districts
- County boundaries
- + Violating PM 2.5 monitor

Figure 4



Sources: FHWA (2000), USGS (2000), US Census (2000), EPA (2008), Dynamap (2000)



The major jurisdictional boundary in the San Francisco Bay Area is the area encompassed by the Bay Area Air Quality Management District (BAAQMD) whose boundaries include the San Francisco metropolitan area. The boundaries of the proposed PM<sub>2.5</sub> nonattainment area would be consistent with the existing 8-hour ozone nonattainment area including parts of Sonoma and Solano Counties. All of the nine counties (including parts of Sonoma and Solano Counties) in the San Francisco Bay Area are within the existing 8-hour ozone nonattainment area. The BAAQMD is the air quality agency responsible for preparing the PM<sub>2.5</sub> State Implementation Plan. Additionally, the eastern part of Solano County is included in the Yolo-Solano District which EPA is also proposing be designated nonattainment for PM<sub>2.5</sub>.

**Factor 9: Level of control of emission sources**

This factor considers emission controls currently implemented for major sources in the San Francisco Bay Area.

The emission estimates on Table 1 (under Factor 1) include any control strategies implemented by the states in the San Francisco Bay area before 2005 that may influence emissions of any component of PM<sub>2.5</sub> emissions (i.e., total carbon, SO<sub>2</sub>, NO<sub>x</sub>, and crustal PM<sub>2.5</sub>).

## Attachment 2

### Description of the Contributing Emissions Score

The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Using this methodology, scores were developed for each county in and around the relevant metro area. The county with the highest contribution potential was assigned a score of 100, and other county scores were adjusted in relation to the highest county. The CES represents the relative maximum influence that emissions in that county have on a violating county. The CES, which reflects consideration of multiple factors, should be considered in evaluating the weight of evidence supporting designation decisions for each area.

The CES for each county was derived by incorporating the following significant information and variables that impact PM<sub>2.5</sub> transport:

- Major PM<sub>2.5</sub> components: total carbon (organic carbon (OC) and elemental carbon (EC)), SO<sub>2</sub>, NO<sub>x</sub>, and inorganic particles (crustal).
- PM<sub>2.5</sub> emissions for the highest (generally top 5%) PM<sub>2.5</sub> emission days (herein called “high days”) for each of two seasons, cold (Oct-Apr) and warm (May-Sept)
- Meteorology on high days using the NOAA HYSPLIT model for determining trajectories of air masses for specified days
- The “urban increment” of a violating monitor, which is the urban PM<sub>2.5</sub> concentration that is in addition to a regional background PM<sub>2.5</sub> concentration, determined for each PM<sub>2.5</sub> component
- Distance from each potentially contributing county to a violating county or counties

A more detailed description of the CES can be found at [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html#C](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C).

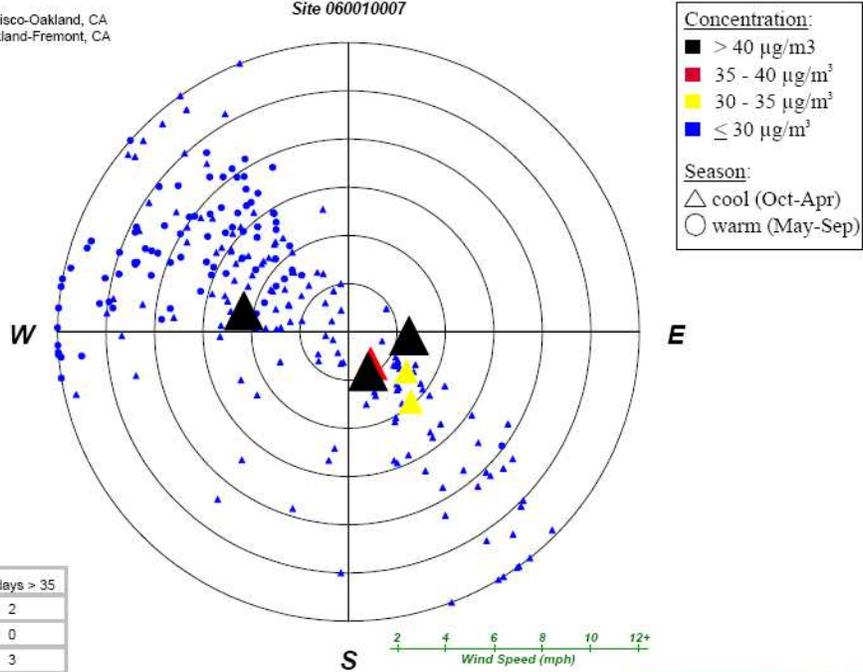
# ATTACHMENT 3

## POLLUTION ROSES FOR SAN FRANCISCO BAY AREA

Alameda County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: San Francisco-Oakland-Fremont, CA

Site 060010007



Year	98th %-ile	# days > 35
2004	35.3	2
2005	28.7	0
2006	36.6	3
Design Value	34-A	

1 exceedance(s) not plotted  
(due to missing or variable wind data)

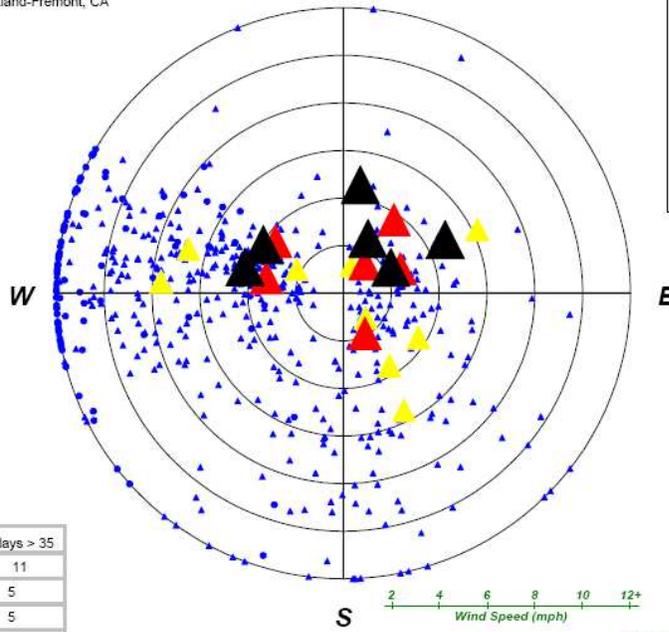
Meteorological data from 32.7 miles away  
STOCKTON\_METROPOLITAN\_ARPT (ID=23237)

located in/near: San Francisco Bay Area, CA

Contra Costa County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: San Francisco-Oakland-Fremont, CA

Site 060130002



**Concentration:**

- > 40  $\mu\text{g}/\text{m}^3$
- 35 - 40  $\mu\text{g}/\text{m}^3$
- 30 - 35  $\mu\text{g}/\text{m}^3$
- $\leq 30 \mu\text{g}/\text{m}^3$

**Season:**

- △ cool (Oct-Apr)
- warm (May-Sep)

Year	98th %-ile	# days > 35
2004	38.1	11
2005	33.4	5
2006	33.6	5
Design Value	35-A	

9 exceedance(s) not plotted  
(due to missing or variable wind data)

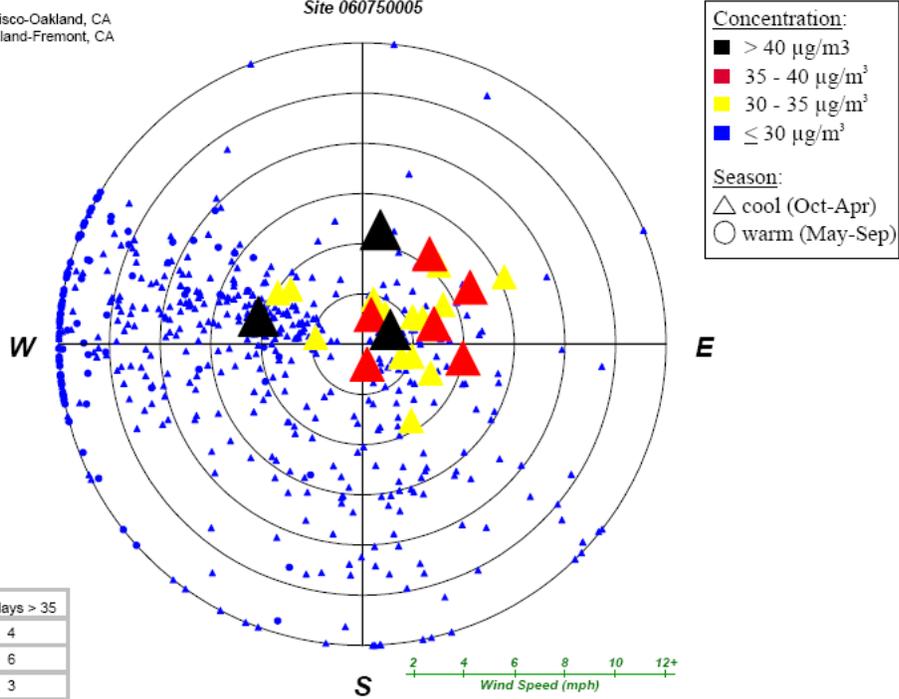
Meteorological data from 29.5 miles away  
SAN FRANCISCO\_INTL\_AP (ID=23234)

located in/near San Francisco Bay Area, CA

San Francisco County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: San Francisco-Oakland-Fremont, CA

Site 060750005



Year	98th %-ile	# days > 35
2004	32.2	4
2005	32.6	6
2006	27.8	3
Design Value	31-A	

4 exceedance(s) not plotted  
(due to missing or variable wind data)

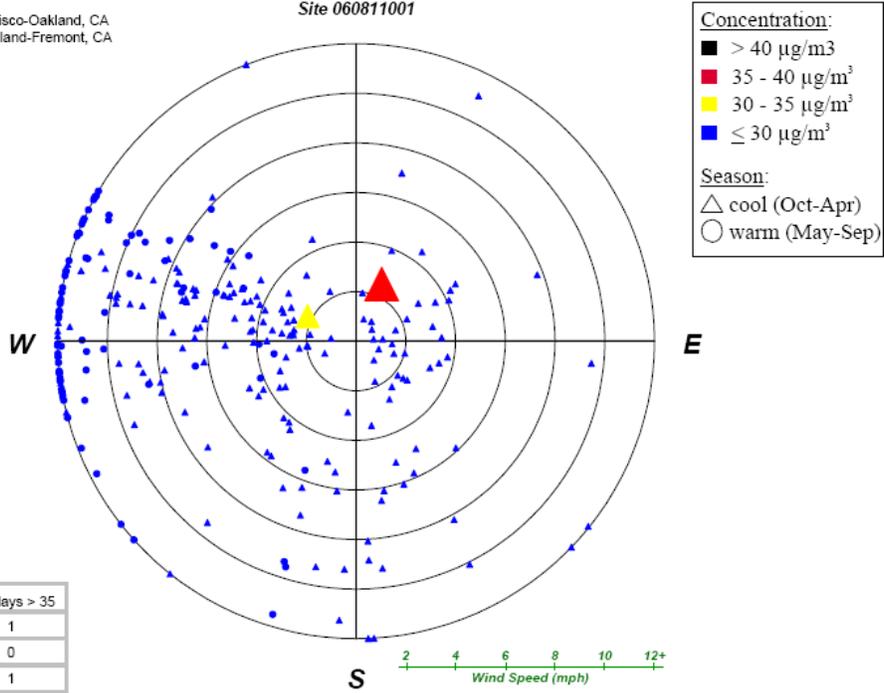
Meteorological data from 10.4 miles away  
SAN\_FRANCISCO\_INTL\_AP (ID=23234)

located in/near San Francisco Bay Area, CA

San Mateo County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: San Francisco-Oakland-Fremont, CA

Site 060811001



Year	98th %-ile	# days > 35
2004	27.9	1
2005	29.4	0
2006	30.9	1
Design Value	29-A	

1 exceedance(s) not plotted  
(due to missing or variable wind data)

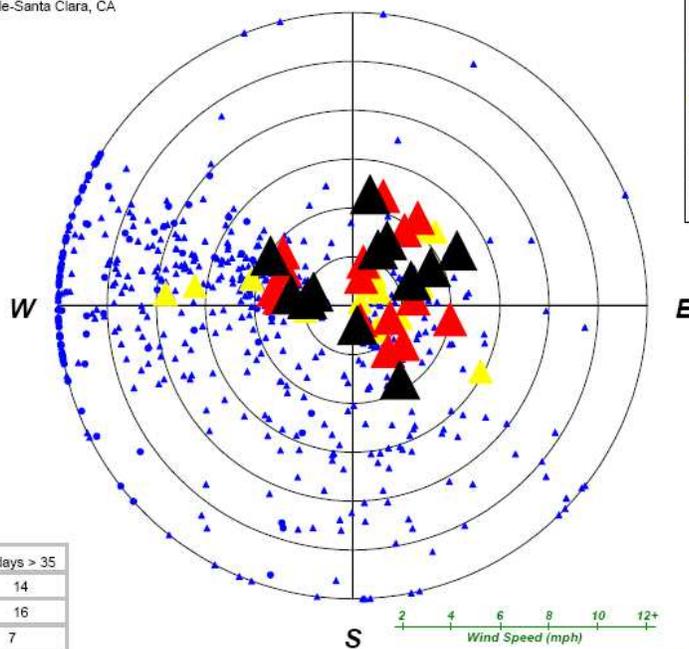
Meteorological data from 13.5 miles away  
SAN\_FRANCISCO\_INTL\_AP (ID=23234)

located in/linear San Francisco Bay Area, CA

Santa Clara County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: San Jose-Sunnyvale-Santa Clara, CA

Site 060850005



**Concentration:**

- > 40  $\mu\text{g}/\text{m}^3$
- 35 - 40  $\mu\text{g}/\text{m}^3$
- 30 - 35  $\mu\text{g}/\text{m}^3$
- $\leq 30 \mu\text{g}/\text{m}^3$

**Season:**

- △ cool (Oct-Apr)
- warm (May-Sep)

Year	98th %-ile	# days > 35
2004	39.8	14
2005	39.8	16
2006	36.0	7
Design Value	39-NA	

10 exceedance(s) not plotted  
(due to missing or variable wind data)

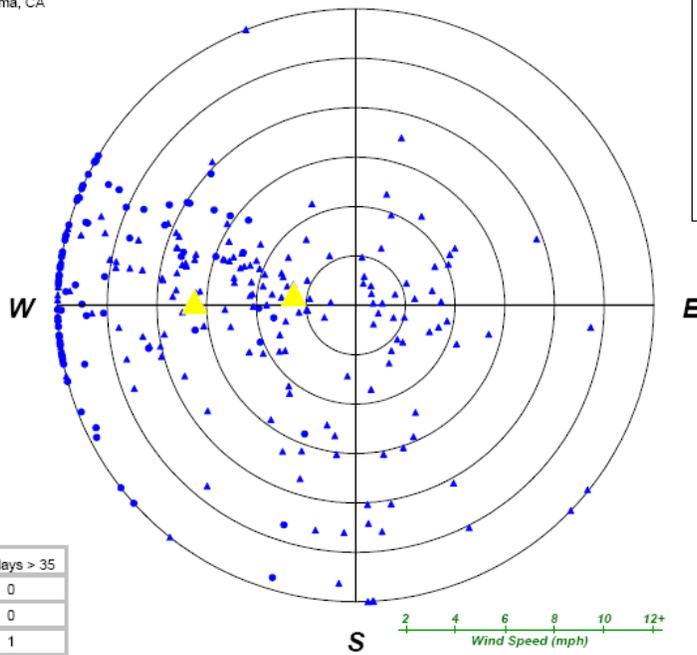
Meteorological data from 32.6 miles away  
SAN\_FRANCISCO\_INTL\_AP (ID=23234)

located in near San Francisco Bay Area, CA

**Sonoma County, CA  
Pollution Rose, 2004-2006**

Not in an existing NAA  
 CSA: San Jose-San Francisco-Oakland, CA  
 CBSA: Santa Rosa-Petaluma, CA

Site 060970003



**Concentration:**  
 ■ > 40 µg/m<sup>3</sup>  
 ■ 35 - 40 µg/m<sup>3</sup>  
 ■ 30 - 35 µg/m<sup>3</sup>  
 ■ ≤ 30 µg/m<sup>3</sup>

**Season:**  
 △ cool (Oct-Apr)  
 ○ warm (May-Sep)

Year	98th %-ile	# days > 35
2004	25.2	0
2005	29.7	0
2006	31.2	1
Design Value	29-A	

1 exceedance(s) not plotted  
 (due to missing or variable wind data)

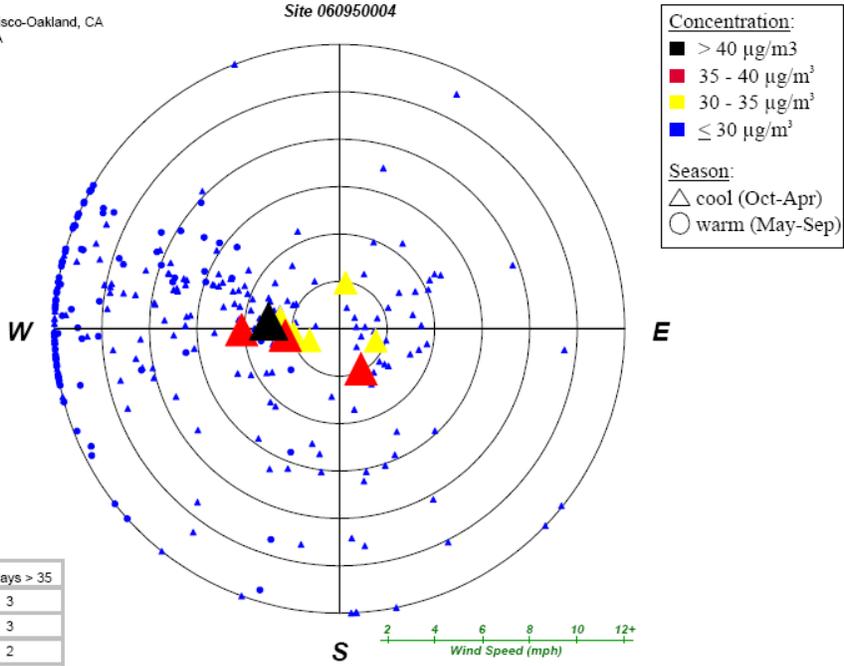
Meteorological data from 59.9 miles away  
 SAN\_FRANCISCO\_INTL\_AP (ID=23234)

located in/near San Francisco Bay Area, CA

Solano County, CA  
Pollution Rose, 2004-2006

Not in an existing NAA  
CSA: San Jose-San Francisco-Oakland, CA  
CBSA: Vallejo-Fairfield, CA

Site 060950004



Year	98th %-ile	# days > 35
2004	36.9	3
2005	35.6	3
2006	34.3	2
Design Value	36-NA	

4 exceedance(s) not plotted  
(due to missing or variable wind data)

Meteorological data from 34.5 miles away  
SAN FRANCISCO\_INTL\_AP (ID=23234)

located in near San Joaquin Valley, CA