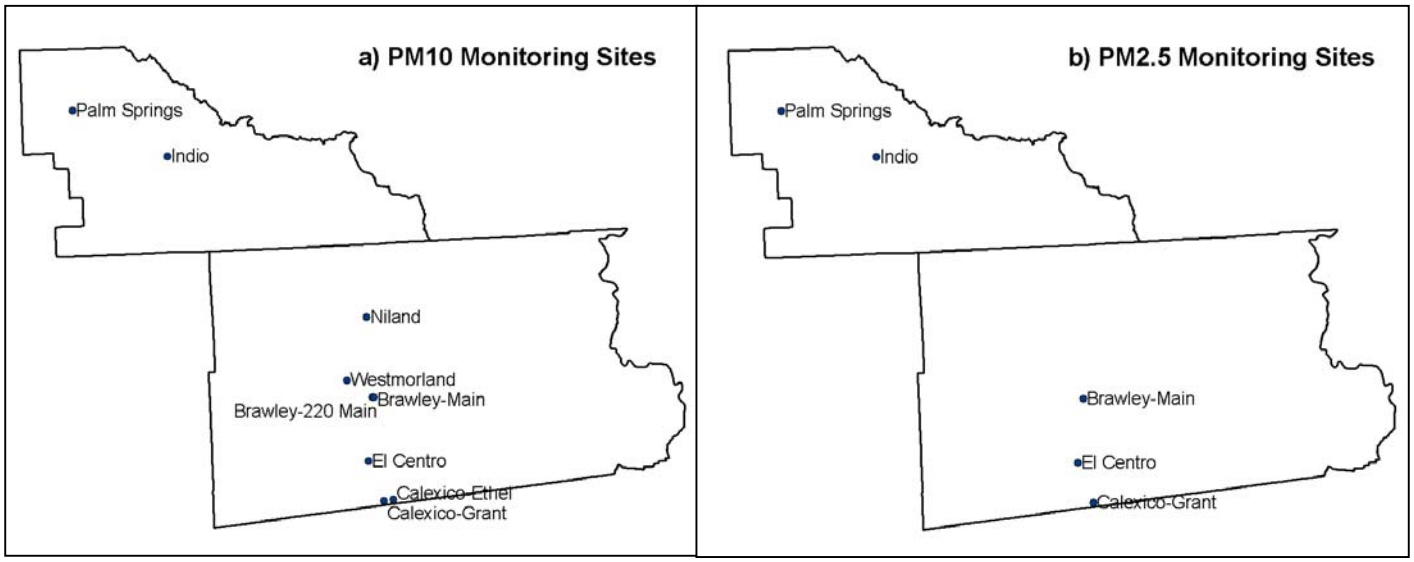
J. Salton Sea Air Basin

The Salton Sea Air Basin is comprised of a portion of the South Coast AQMD, which consists of the central portion of Riverside County (the Coachella Valley) and the Imperial County APCD, which consists of Imperial County. The Basin currently exceeds both the 24-hour and the annual State PM10 standards. The city of Calexico in the Imperial County APCD is also designated nonattainment for the State annual PM2.5 standard, with the rest of the air basin designated as unclassified - available data are insufficient to support designation as attainment or nonattainment. The Coachella Valley and the western portion of Imperial County are also designated as nonattainment for the national PM10 standards.

Figure J-1 shows the location of the PM10 (a) and PM2.5 (b) monitoring sites throughout the Salton Sea Air Basin.

Figure J-1. PM10 and PM2.5 Monitoring Sites throughout the Air Basin.



South Coast AQMD (Coachella Valley)

Table J-1 provides information on the yearly variations in the highest PM10 and PM2.5 concentrations recorded across the South Coast AQMD portion of the air basin in 2001 through 2003. We estimate that during this period, particulate levels exceeded the State 24-hour PM10 standard of 50 $\mu g/m^3$ five-hundred and one times, and consistently exceeded the State annual standard of 20 $\mu g/m^3$. PM10 levels also exceeded both of the national PM10 standards, the 24-hour standard of 150 $\mu g/m^3$ and the annual standard of 50 $\mu g/m^3$. During windy conditions, dust can produce very high episodic PM10 concentrations. High concentrations on windy days can also result in high annual average concentrations. PM2.5 levels did not exceed the State annual PM2.5 standard of 12 $\mu g/m^3$ in 2002 or 2003, but data were insufficient to determine if this was also the case in 2001.

Table J-1. PM10 and PM2.5 Air Quality in the South Coast AQMD.

Year	PM10 (ug/m^3)			PM2.5 (ug/m^3)	
	Calculated Days over State Std.	Max 24-hour (Std.=50)	Max Annual Average (Std.=20)	Max 24-hour*	Max Annual Average (Std.=12)
2001	171	604**	59	45	Incomplete Data
2002	169	276	54	42	12
2003	161	309	56	27	11

* The maximum 24-hour PM2.5 values are provided for information only.
**This value was excluded for determining attainment status. See text.

Table J-2 provides the 24-hour and annual designation values for the State standards for the 2001-2003 period. Designation values represent the highest 24-hour PM10 concentration measured during the three year period, after concentrations measured during highly irregular and infrequent events have been excluded, and the highest estimated PM10 and PM2.5 annual average in the same period. For example, the high 24-hour PM10 concentration in 2001 shown in Table J-1 was identified as an extreme concentration event and was therefore excluded in determining the designation values shown in Table J-2. The designation values are determined for each site, and the highest site is used for determining an area's designation. Based on these data, the South Coast AQMD portion of the air basin currently is nonattainment for both the State 24-hour and annual average PM10 standards. The District is designated as unclassified for the State annual PM2.5 standard – available data are insufficient to support designation as attainment or nonattainment for the State annual PM2.5 standard.

Table J-2. Air District Level Designation Values* for the State PM10 and PM2.5 Standards (2001-2003 Period).

	PM10 (ug/m^3)		PM2.5 (ug/m^3)
	24-Hour (Std.=50)	Annual Average (Std.=20)	Annual Average (Std.=12)
Designation Value	309	59	Incomplete Data

* Designation value is the value used for determining attainment status. It is the highest measured value over three years after excluding highly irregular or infrequent events.

Table J-3 provides designation values for each monitoring site in the air district to provide further information on the geographic distribution of concentrations. The data show that both the Indio and Palm Springs PM10 monitors exceeded the State 24-hour and annual PM10 standards. Although the data are not complete for the full three year period needed for determining designation status, PM2.5 concentrations were below the level of the State annual PM2.5 standard for the two years with complete data.

Table J-3. Monitoring Site Level Designation Values* for the State PM10 and PM2.5 Standards (2001-2003 Period).

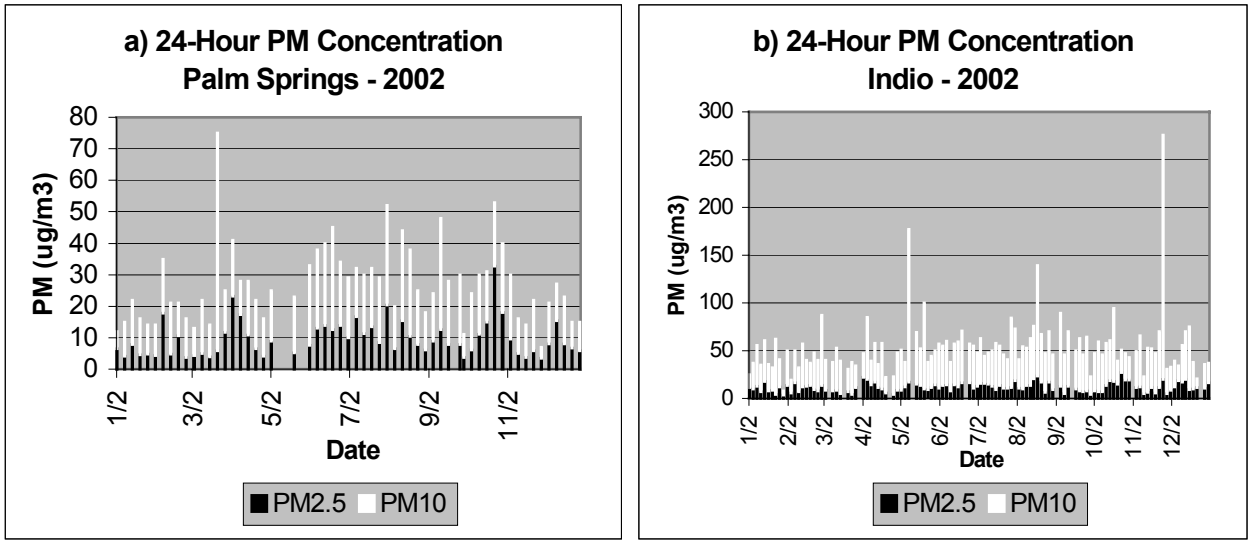
Site	PM10 (ug/m^3)		PM2.5 (ug/m^3)
	24-Hour (Std.=50)	Annual Average (Std.=20)	Annual Average (Std.=12)
Indio	309	59	12
Palm Springs	108	27	10

* Designation value is the value used for determining attainment status. It is the highest measured value over three years after excluding highly irregular or infrequent events.

Figure J-2 illustrates the variation in PM10 and PM2.5 levels throughout 2002 at Palm Springs (a) and Indio (b). The total height of the bars represents PM10 concentrations, while the height of the black portion of the bars represents the PM2.5 fraction. At Palm Springs, high PM10 concentrations occurred during the spring through early fall, and were mostly driven by the coarse fraction (particles between PM2.5 and PM10 in size). At Indio, high PM10 concentrations, also driven by the coarse fraction, occurred at any time of the year. The coarse fraction is primarily due to activities that resuspend dust, such as emissions from paved and unpaved roads and construction, as well as windblown dust.

On an annual average, based on 2000-2003 monitoring data, we estimate that PM2.5 comprises approximately 28 percent of the PM10 ambient levels. Although chemical composition data are not available, based on similarities with the Imperial County APCD portion of the air basin, we estimate that the fraction of PM2.5 comprised of secondary ammonium nitrate and sulfate is approximately 25 percent.

Figure J-2. Seasonal Variation in PM10 and PM2.5 Concentrations.



Imperial County APCD

Table J-4 provides information on the yearly variations in the highest PM10 and PM2.5 concentrations recorded across the Imperial County APCD in 2001 through 2003. We estimate that during this period, particulate levels exceeded the State 24-hour PM10 standard of 50 $\mu g/m^3$ nine-hundred and one-times, and consistently exceeded the State annual standard of 20 $\mu g/m^3$. PM10 levels also exceeded both of the national PM10 standards, the 24-hour standard of 150 $\mu g/m^3$ and the annual standard of 50 $\mu g/m^3$. During windy conditions, dust can produce very high episodic PM10 concentrations. Frequent high concentrations on windy days can also result in high annual average concentrations. In 2002, PM2.5 levels also exceeded the State annual PM2.5 standard of 12 $\mu g/m^3$.

Table J-4. PM10 and PM2.5 Air Quality in the Imperial County APCD.

Year	PM10 (ug/m^3)			PM2.5 (ug/m^3)	
	Calculated Days over State Std.	Max 24-hour (Std.=50)	Max Annual Average (Std.=20)	Max 24-hour*	Max Annual Average (Std.=12)
2001	312	634**	87	60	Incomplete Data
2002	305	361	81	143	15
2003	284	848*	80	154**	Incomplete Data

* The maximum 24-hour PM2.5 values are provided for information only.
*These values were excluded for determining attainment status. See text.

Table J-5 provides the 24-hour and annual designation values for the State standards for the 2001-2003 period. Designation values represent the highest 24-hour PM10 concentration measured during the three year period, after concentrations measured during highly irregular and infrequent events have been excluded, and the highest estimated PM10 and PM2.5 annual average in the same period. For example, the high 24-hour PM10 concentration in 2001 shown in Table J-4 was identified as an extreme concentration event, and the high PM10 and PM2.5 24-hour concentrations in 2003 were due to wildfires. These values were therefore excluded in determining the designation values shown in Table J-5. The designation values are determined for each site, and the highest site is used for determining an area's designation. Based on these data, the Imperial County APCD currently is nonattainment for both the State 24-hour and annual average PM10 standards. The City of Calexico is also designated as nonattainment for the State annual PM2.5 standard.

Table J-5. Air District Level Designation Values* for the State PM10 and PM2.5 Standards (2001-2003 Period).

	PM10 (ug/m^3)		PM2.5 (ug/m^3)
	24-Hour (Std.=50)	Annual Average (Std.=20)	Annual Average (Std.=12)
Designation Value	361	87	15

* Designation value is the value used for determining attainment status. It is the highest measured value over three years after excluding highly irregular or infrequent events.

Table J-6 provides designation values for each monitoring site in the air district to provide further information on the geographic distribution of concentrations. The data show that with the exception of the monitor at Brawley-220 Main, which only began operation in late 2003, all PM10 monitors in the air district exceeded the State 24-hour and annual PM10 standards. Highest 24-hour and annual average PM10 concentrations occurred at the Calexico monitoring sites. Particulate levels at Calexico also exceeded the State annual PM2.5 standard. Calexico is located on the border with Mexico, adjacent to the large city of Mexicali.

Table J-6. Monitoring Site Level Designation Values* for State PM10 and PM2.5 Standards (2001-2003 Period).

Site	PM10 (ug/m^3)		PM2.5 (ug/m^3)
	24-Hour (Std.=50)	Annual Average (Std.=20)	Annual Average (Std.=12)
Brawley–220 Main	36	Incomplete Data	No Monitor
Brawley-Main	222	46	Incomplete Data
Calexico-Ethel	361	87	No Monitor
Calexico-Grant	224	82	15
El Centro	181	49	Incomplete Data
Niland	190	40	No Monitor
Westmorland	301	74	No Monitor

*Designation value is the value used for determining attainment status. It is the highest measured value over three years after excluding highly irregular or infrequent events.

Figure J-3 illustrates the variation in PM10 and PM2.5 levels throughout 2002 at Brawley (a), El Centro (b), and Calexico-Ethel (c). The total height of the bars represents PM10 concentrations, while the height of the black portion of the bars represents the PM2.5 fraction. Concentrations are relatively uniform throughout the year, with very high PM10 concentrations occurring sporadically throughout the air district: during the spring at Brawley; during the summer at El Centro; and during the winter, spring, and summer at Calexico. The coarse fraction (particles between PM2.5 and PM10 in size) was the major constituent of ambient PM10. The coarse fraction is primarily due to activities that resuspend dust, such as emissions from paved and unpaved roads and construction, as well as windblown dust. PM2.5 concentrations vary little throughout the year at Brawley and El Centro. However, at Calexico, PM2.5 concentrations are highest during the winter. Colder, more stagnant conditions during this time of the year are conducive to the buildup of PM. On an annual average, based on 2000-2003 monitoring data, we estimate that PM2.5 comprises approximately 20 percent of the PM10 ambient levels.

Figure J-3. Seasonal Variation in PM10 and PM2.5 Concentrations.

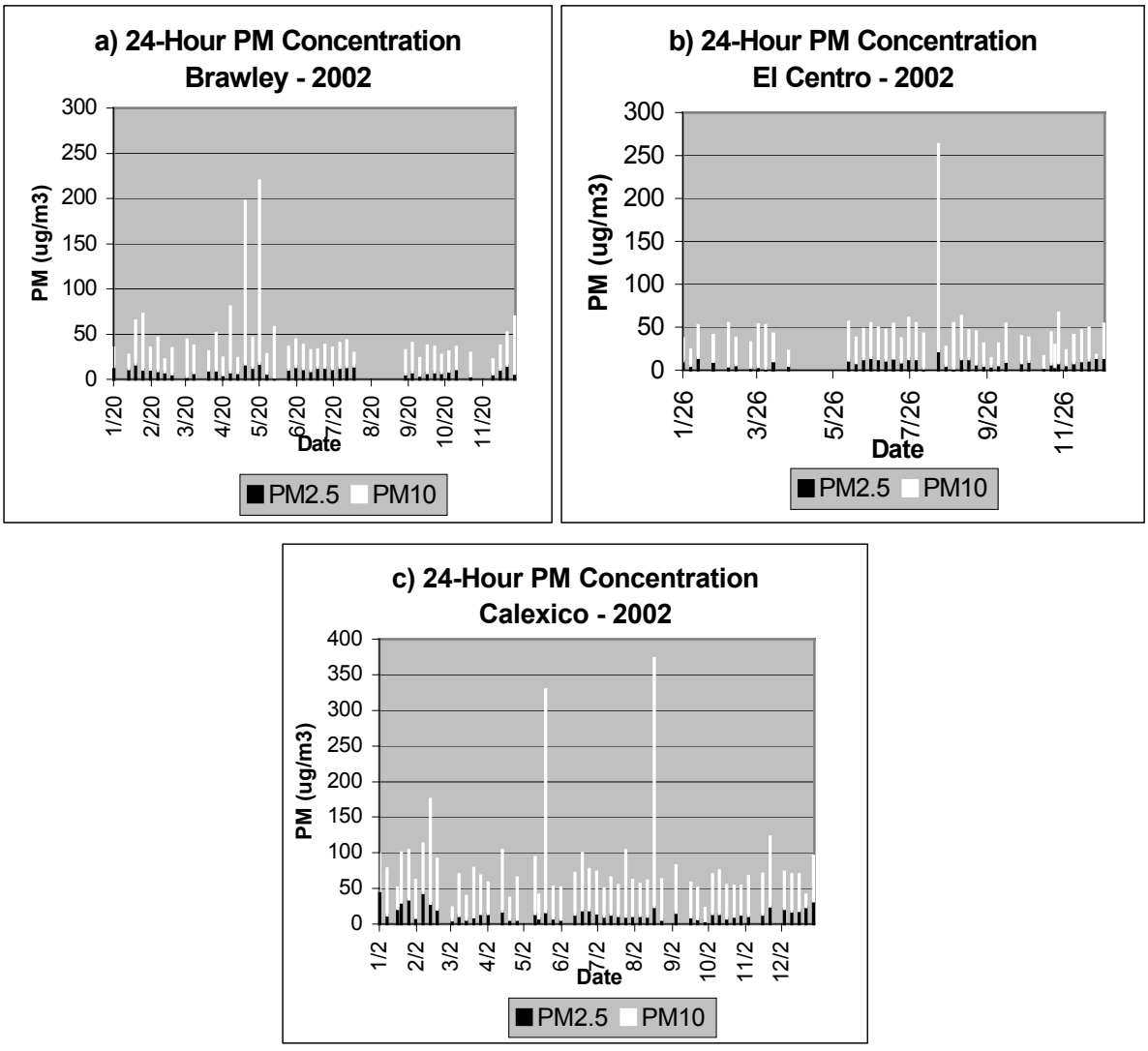


Figure J-4. Hourly Variation in PM2.5 Concentration.

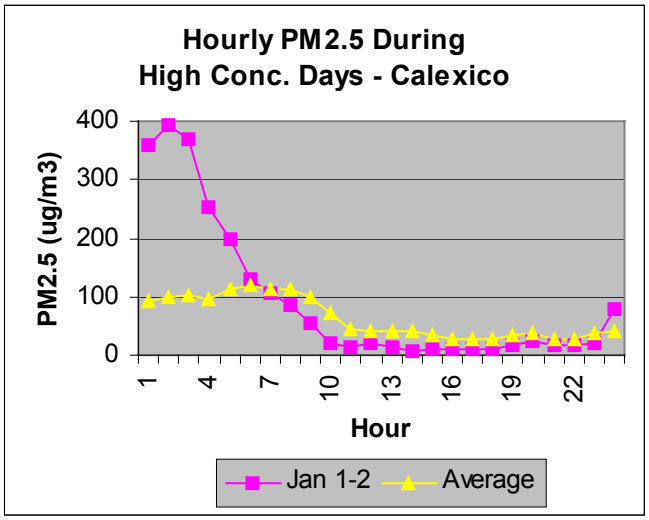
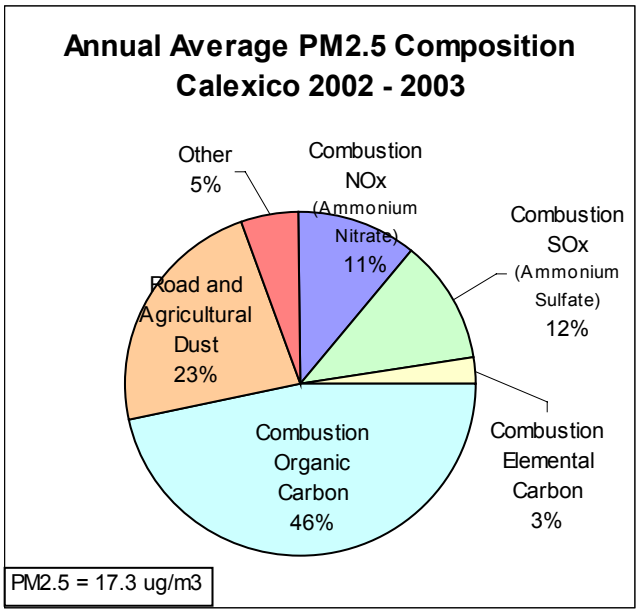


Figure J-4 presents the average hourly variation in PM2.5 levels at Calexico-Ethel for the days within the year with the highest PM2.5 concentrations. Peak evening concentrations generally reflect the influence of lowering inversion heights which trap pollutants close to the surface, as well as increased activity from home heating. On January 1st fireworks may have contributed to peak PM2.5 concentrations in the early morning hours just past midnight.

Figure J-5. Chemical Composition of Annual Average PM2.5 and Link to Emission Source Type.



Data for Figure J-5 are from analysis of ambient PM2.5 data collected at Calexico-Ethel from the State's PM2.5 speciation network. Chemical components have been associated with possible emission sources based on emission inventory information. The data in Figure J-5 show that on an annual average basis the major component of PM2.5 is organic carbon (46 percent). The majority of organic carbon is suspected to be due to directly emitted carbon from combustion sources. Key sources include vehicles, residential wood combustion, and other stationary combustion sources. However, a fraction may be due to secondary organic aerosol formation from anthropogenic and biogenic VOC emissions. Dust from roads and other dust producing activities is the second major contributor to ambient PM2.5 (23 percent).

Ammonium nitrate and ammonium sulfate - formed in the atmosphere from chemical reactions of NOx and SOx from mobile and stationary combustion sources – are also major components of PM2.5 (23 percent). The observed composition results may also reflect the influence of transported pollutants from the neighboring city of Mexicali, which has high traffic and waste combustion emissions.

Figure J-6 illustrates the quarterly variation in PM2.5 levels and its chemical components expressed in $\mu g/m^3$ (a) and as percent of PM2.5 (b) at Calexico. As in the previous figure, chemical components have been associated with possible emission sources based on emission inventory information. On average, during the 2002-2003 period, higher PM2.5 concentrations were recorded during the winter, mostly caused by a net increase in the organic carbon component. Ammonium nitrate was higher in the fall and winter, while dust and ammonium sulfate were largest in the spring and summer.

Figure J-6. Chemical Composition of Average Quarterly PM2.5 in $\mu g/m^3$ and Link to Emission Source Type.