

Spare the Air AQI (Air Quality Index Scale) Definition

Website February 26, 2012

AQI

The U.S. EPA developed the Air Quality Index, or AQI scale, to make the public health impacts of air pollution concentrations easily understandable.

Air Quality Index

The Air Quality Index, or AQI, much like an air quality "thermometer", translates daily air pollution concentrations into a number on a scale between 0 and 500. The numbers in this scale are divided into six color-coded ranges, with numbers 0-300 as seen below.

(0-50)

Good

No health impacts are expected when air quality is in this range.

(51-100)

Moderate

Unusually sensitive people should consider limiting prolonged outdoor exertion.

(101-150)

Unhealthy for Sensitive Groups

Active children and adults, and people with respiratory disease, such as asthma, should limit outdoor exertion.

(151-200)

Unhealthy

Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

(201-300)

Very Unhealthy

Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

The AQI numbers refer to specific amounts of pollution in the air. It's based on the [federal air quality standards](#) for six major pollutants - ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and two sizes of particulate matter.

In most cases, the federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, it can be unhealthy for the public.

When the Air District prepares its daily AQI forecast, we take the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and post the highest AQI number for each reporting zone.

Readings below 100 on the AQI scale should not affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States, and readings above 200 have not occurred in the Bay Area in decades.

Air Quality Standards and Attainment Status

Ambient air quality standards are set to protect public health. There are currently both Federal and State ambient air quality standards by USEPA and state air quality agencies, CALEPA for California. California air quality standards are generally more stringent than federal standards. Continuous air monitoring by these agencies and BAAQMD ensure that air quality standards are being met and improved.

NOTES

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.

2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³.

Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

3. National air quality standards are set by US EPA at levels determined to be protective of public health with an adequate margin of safety.

4. On September 22, 2011, the Environmental Protection Agency (EPA) announced it will implement the current 8 hour ozone standard of 75 ppb. The EPA expects to finalize initial area designations for the 2008 8-hour ozone standard by mid-2012.

5. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

7. In June 2002, CARB established new annual standards for PM2.5 and PM10.

8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.

10. U.S EPA lowered the 24-hour PM2.5 standard from 65 $\mu\text{g}/\text{m}^3$ to 35 $\mu\text{g}/\text{m}^3$ in 2006. EPA designated the Bay Area as nonattainment of the PM2.5 standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the Air District has three years to develop a plan, called a State Implementation Plan (SIP), that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. The SIP for the new PM2.5 standard must be submitted to the US EPA by December 14, 2012.

11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).

12. On June 2, 2010, the U.S. EPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO₂ NAAQS however must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO₂ NAAQS. EPA expects to designate areas by June 2012.

13. ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure below which there are no adverse health effects determined.

14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations expected October 2011.

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Pollutant	Averaging Time	California Standards ¹		National Standards ²	
		Concentration	Attainment Status	Concentration ³	Attainment Status
Ozone	8 Hour	0.070 ppm (137 µg/m ³)	N ⁹	0.075 ppm	N ⁴
	1 Hour	0.09 ppm (180 µg/m ³)	N		See footnote # 5
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m ³)	A	9 ppm (10 mg/m ³)	A ⁶
	1 Hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	A
Nitrogen Dioxide	1 Hour	0.18 ppm (339 µg/m ³)	A	0.100 ppm (see footnote 11)	U
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)		0.053 ppm (100 µg/m ³)	A
Sulfur Dioxide (See Footnote #12)	24 Hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	A
	1 Hour	0.25 ppm (655 µg/m ³)	A	0.075 ppm (196 µg/m ³)	A
	Annual Arithmetic Mean			0.030 ppm (80 µg/m ³)	A
Particulate Matter (PM10)	Annual Arithmetic Mean	20 µg/m ³	N ⁷		
	24 Hour	50 µg/m ³	N	150 µg/m ³	U
Particulate Matter - Fine (PM2.5)	Annual Arithmetic Mean	12 µg/m ³	N ⁷	15 µg/m ³	A
	24 Hour			35 µg/m ³ See Footnote 10	N
Sulfates	24 Hour	25 µg/m ³	A		
Lead (See Footnote 13)	30 day Average Calendar Quarter Rolling 3 Month	1.5 µg/m ³		-	A
		-		1.5 µg/m ³	A
		-		0.15 µg/m ³	(See Footnote 14)

Average¹⁴

Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	U
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m ³)	No information available
Visibility Reducing particles	8 Hour (10:00 to 18:00 PST)	See Footnote 10	U

A=Attainment N=Nonattainment U=Unclassified

mg/m³=milligrams per cubic
meter

ppm=parts per million

µg/m³=micrograms per cubic
meter