

Appendix D - Convention for Rounding Ambient Air Quality Data

Before ambient air quality measurements are used in designating areas for State standards, they are rounded to the precision of the applicable State standard. In addition, the Expected Peak Day Concentration or EPDC is also rounded to the precision of the State standard before it is used to identify and exclude measurements affected by extreme concentration events. As described below, the same rounding convention is generally used in all cases.

All raw air quality data are stored in California Air Resources Board's Aerometric Data Analysis and Management (ADAM) database, as they are reported. However, the reported values and the stored values can and do differ very slightly, because ADAM stores numbers in a floating-point format. For example, a number reported as 1.23 might actually be stored as 1.229999998 or as 1.2300000001. Nonetheless, great care is taken to ensure that these "slight" differences have no impact on calculated values used for area designations.

The precision or given number of decimal places varies for each State standard and depends on how the level of the standard is specified. The given number of decimal places for each State standard and averaging time are summarized in Table D-1.

Table D-1 Level and Precision of State Standards

Pollutant	Averaging Time	Level of Standard	Given Number of Decimal Places
Ozone	1-hour	0.09 ppm	2
Ozone	8-hour	0.070 ppm	3
Carbon Monoxide	1-hour	20 ppm	0
Carbon Monoxide	8-hour (Lake Tahoe)	6 ppm	0
Carbon Monoxide	8-hour (Rest of State)	9.0 ppm	1
PM ₁₀	24-hour	50 µg/m ³	0
PM ₁₀	Annual	20 µg/m ³	0
PM _{2.5}	Annual	12 µg/m ³	0
Nitrogen Dioxide	1-hour	0.18 ppm	2
Nitrogen Dioxide	Annual	0.030 ppm	3
Sulfur Dioxide	1-hour	0.25 ppm	2
Sulfur Dioxide	24-hour	0.04 ppm	2
Lead	30-day	1.5 µg/m ³	1
Sulfates	24-hour	25 µg/m ³	0
Hydrogen Sulfide	1-hour	0.03 ppm	2

Individual air quality measurements and statistics (air quality values) are generally rounded up or down using the digit just beyond the given number of decimal places and according to standard rounding conventions—values that are below 5 round down, while those that are equal to or greater than 5 round up. For example, if the given number of decimal places is 1, an air quality value of 2.34567 rounds to 2.3 because 0.04567 is less than 0.05. An air quality value of 2.35012 rounds to 2.4 because 0.05012 is greater than 0.05. Similarly, an air quality value of 2.35000 rounds to 2.4 because 0.05000 exactly equals 0.05.

The method used for determining area designation values is generally consistent across all pollutants. First, if there is a valid EPDC, the EPDC is rounded to the given number of decimal places (refer to Table D 1) for the applicable State standard (note: an EPDC is calculated and used in the area designation process only if the averaging time of the standard is less than or equal to 24 hours). Next, all air quality values for the three-year period used in area designations are rounded to the given number of decimal places. All rounded air quality values that are higher than the rounded EPDC are excluded as extreme concentration events and therefore, not considered in the area designation process. The air quality value used to designate an area (the designation value) is the highest rounded value for the previous three-year period that is less than or equal to the rounded EPDC. However, if this air quality value is identified as affected by an exceptional event or unusual concentration event, it is excluded from the area designation process, and the next highest air quality value becomes the designation value.