

CHAPTER 3 - Air Quality Index

Formerly, a Pollutant Standards Index (PSI) was published daily for monitoring sites in Pennsylvania. The PSI was a national uniform method for reporting air quality that incorporates recorded levels of five common air contaminants: carbon monoxide (CO), sulfur dioxide (SO₂), suspended particulate matter 10 microns or less in size (PM₁₀), ozone, and nitrogen dioxide (NO₂).

The PSI used a segmented linear function to convert concentration levels of these pollutants into normalized numbers based on the National Ambient Air Quality Standards (NAAQS), the various episode levels, and the significant harm levels for each pollutant.

On Oct. 4, 1999, EPA revised the PSI to update health messages for carbon monoxide, sulfur dioxide, and nitrogen dioxide. It reflects updated health information considered in the EPA proposal to revise the air quality standards for ground-level ozone (smog) and particulate matter. The revised index will ensure consistency between current science on the health effects of all of these air pollutants and the reporting of this air quality and health information to the public. The new index is called the Air Quality Index (AQI).

The AQI adds an additional air quality category to the former PSI categories just above the level of the standard. The AQI index establishes a category from 101 -150 characterized as "unhealthy for sensitive groups" and a category of 151 - 200 as "unhealthy". The AQI includes modifications to the ozone sub-index (an 8-hour sub-index) and a new sub-index for fine particulate matter. These changes to the AQI are based on health effects information from the review of the ozone and particulate matter standards.

The AQI has been adopted by DEP and is published on DEP's web site with hourly updates (DEP Keyword: Air Quality Index, Air Index). The breakpoints for the AQI in terms of pollutant concentrations are shown in Table 3-1.

TABLE 3-1. BREAKPOINTS FOR THE AIR QUALITY INDEX (AQI)

O ₃ (ppm) 8 - hour	O ₃ (ppm) 1 - hour ⁽¹⁾	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	CO (ppm)	SO ₂ (ppm) 1-Hour	NO ₂ (ppm)	AQI	Category
0.000 – 0.064	-	0.0 – 15.4	0 – 54	0.0 – 4.4	0.000 – 0.034	(²)	0 - 50	Good
0.065 – 0.084	-	15.5 – 40.4	55 – 154	4.5 – 9.4	0.035 – 0.144	(²)	51 - 100	Moderate
0.085 – 0.104	0.125 – 0.164	40.5 – 65.4	155 - 254	9.5 – 12.4	0.145 – 0.224	(²)	101 - 150	Unhealthy for sensitive groups
0.105 – 0.124	1.65 – 0.204	65.5 – 150.4	255 – 354	12.5 – 15.4	0.225 – 0.304	(²)	151 - 200	Unhealthy
0.125 – 0.374	0.205 – 0.404	150.5 – 250.4	355 – 424	15.5 – 30.4	0.305 – 0.604	0.65 – 1.24	201 - 300	Very unhealthy
(³)	0.405 – 0.504	250.5 – 350.4	425 – 504	30.5 – 40.4	0.605 – 0.804	1.25 – 1.64	301 - 400	Hazardous
(³)	0.505 – 0.604	350.5 – 500.4	505 - 604	40.5 – 50.4	0.805 – 1.004	1.65 – 2.04	401 - 500	Hazardous

¹ Agencies are generally required to report the AQI based on 8-hour ozone values. However, there are a small number of areas where an AQI based on 1-hour ozone values would be more precautionary. In these cases, in addition to calculating the 8-hour ozone index value, the 1-hour ozone index value may be calculated and the maximum of the two values is reported.

² NO₂ has no short-term NAAQS and can generate an AQI only above a AQI value of 200.

³ When 8-hour Ozone concentrations exceed 0.374 ppm, AQI values of 301 or higher must be calculated with 1-hour concentrations.

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