2018 New Jersey Air Quality Report

New Jersey Department of Environmental Protection

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List of Contents

Cover photo: Brigantine HazeCam, https://hazecam.net/archive.aspx?site=brigantine&h=8, 4/11/19.

EXECUTIVE SUMMARY

This report presents the New Jersey Department of Environmental Protection (NJDEP) air quality monitoring data for 2018, collected from NJDEP's extensive air monitoring network. The state of New Jersey has been monitoring air quality since 1965. During that time, as a result of state, regional and national air pollution reduction efforts, pollution levels have improved significantly.

The chapter on the Air Quality Index (AQI), a national air quality rating system based on the National Ambient Air Quality Standards (NAAQS), describes the overall quality of New Jersey's air in 2018, and lists the days on which the AQI was over 100 (meaning the NAAQS were exceeded). Nineteen days were classified as "Unhealthy for Sensitive Groups" in 2018, because their numerical AQI ratings were greater than 100. Three days were classified as "Unhealthy," with AQI ratings greater than 150.

This report also includes detailed chapters for ozone, sulfur dioxide, nitrogen dioxide, particulate matter, and carbon monoxide. These are the criteria pollutants, that is, those for which NAAQS (or criteria) have been set. Other measurements made at our air monitoring stations include levels of air toxics and particulate species, and meteorology.

Figures 1-1 through 1-6 below illustrate the downward trends in concentrations of criteria pollutants in New Jersey over the past few decades by graphing the statewide design values for each pollutant. A design value is the actual statistic that is compared to a NAAQS. If this value exceeds the NAAQS at any site in the state, the state is determined to be in nonattainment. Design values for each of the criteria pollutants are described in detail in each pollutant-specific chapter of this report.

New Jersey is getting close to meeting the ozone NAAQS (Figure 1-1), and will continue to implement control strategies to reduce ambient concentrations. Because ozone is formed in the presence of sunlight and high temperatures, the highest levels occur in the summer months. Ozone has been found to have serious health effects at lower levels than previously thought. In response, the United States Environmental Protection Agency (USEPA) periodically revises and lowers the NAAQS. USEPA lowered the ozone standard to 0.070 ppm in 2015 (effective in 2016).

Particulate air pollution less than 2.5 micrometers in diameter is referred to as fine particulate or $PM_{2.5}$. These small particles can be inhaled deep into the lungs, and are known to have a greater impact on public health than larger particles, which were the focus of previous ambient air quality standards. Monitoring data in New Jersey shows a steady decline in $PM_{2.5}$ levels that are now in compliance with the NAAQS (Figure 1-2).

Nitrogen dioxide (NO_2) is a reactive gas emitted primarily from motor vehicles. It is known to cause serious health problems, especially for sensitive individuals such as children, the elderly, and people with asthma. New Jersey has long been in compliance with the NAAQS for NO_2 (Figure 1-3), although there was one exceedance of the 1-hour standard in 2018, most likely caused by a truck idling near the monitor.

The sharp increase and subsequent decrease in sulfur dioxide (SO_2) concentrations in New Jersey shown in Figure 1-4 are attributable to a coal-burning facility across the Delaware River in Pennsylvania. NJDEP established the Columbia monitoring station in 2010 to determine the facility's impact on New Jersey's air quality. Exceedances of the SO_2 NAAQS were recorded that same year. Since the plant ceased operations under a court agreement, SO_2 levels in New Jersey have again been meeting the standard.

Outdoor concentrations of carbon monoxide can affect people with cardiovascular problems. Levels in New Jersey have been below the NAAQS for over twenty years (Figure 1-5).

Air concentrations of lead have dropped dramatically since a standard was established in 1978. The last exceedances of the NAAQS were in the early 1980s (Figure 1-6).

Figure 1-1
Ozone Design Value Trend in New Jersey, 1997-2018
3-Year Average of 4th-Highest Daily Maximum 8-Hour Average Concentrations
Parts per Million (ppm)

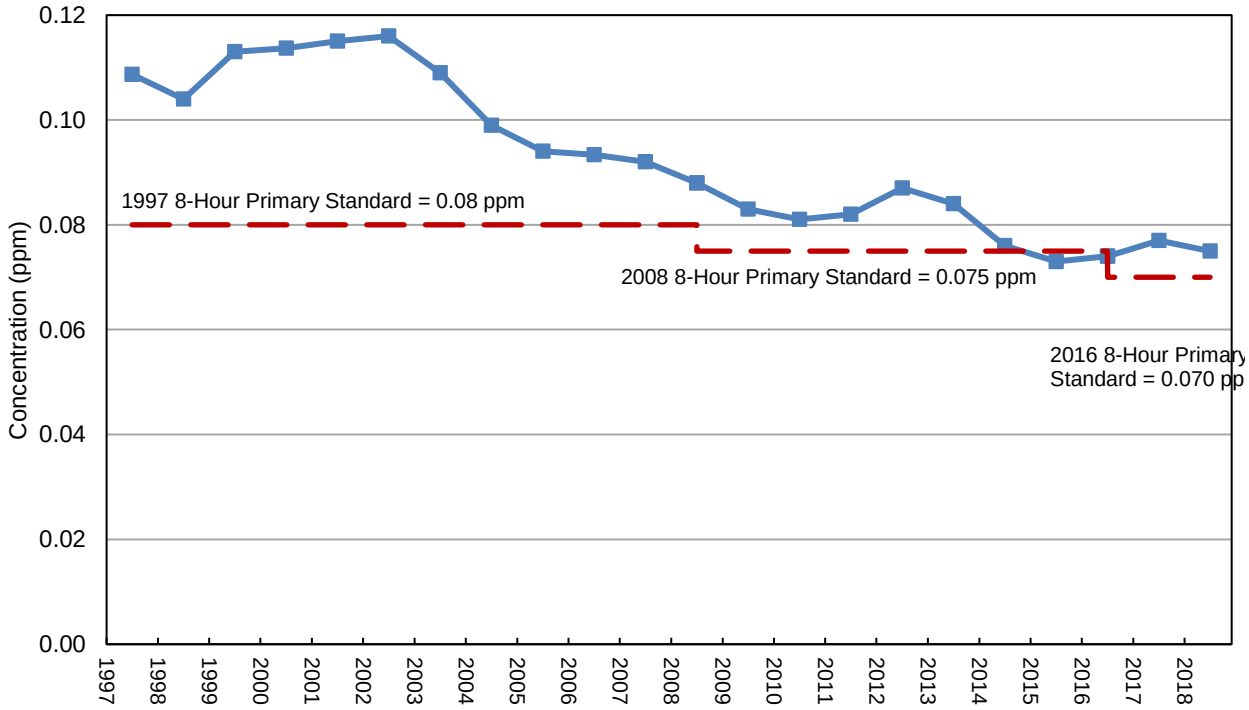

Figure 1-2

Fine Particulate ($PM_{2.5}$) 24-Hour Design Value Trend in New Jersey, 2001-2018

3-Year Average of the 98th-Percentile 24-Hour Average Concentrations

Micrograms per Cubic Meter (µg/m³)

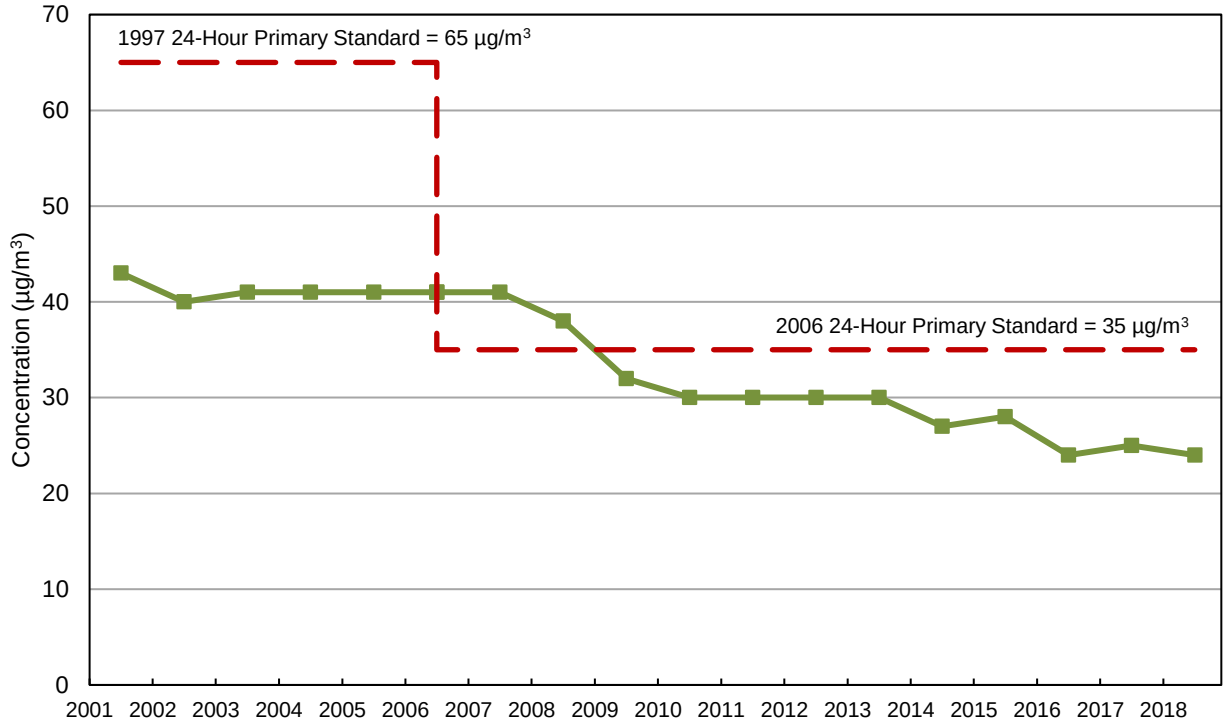

Figure 1-3

Nitrogen Dioxide (NO_2) Design Value Trend in New Jersey, 2000-2018

3-Year Average of the 98th Percentile Daily Maximum 1-Hour Average Concentration

Parts per Million (ppm)

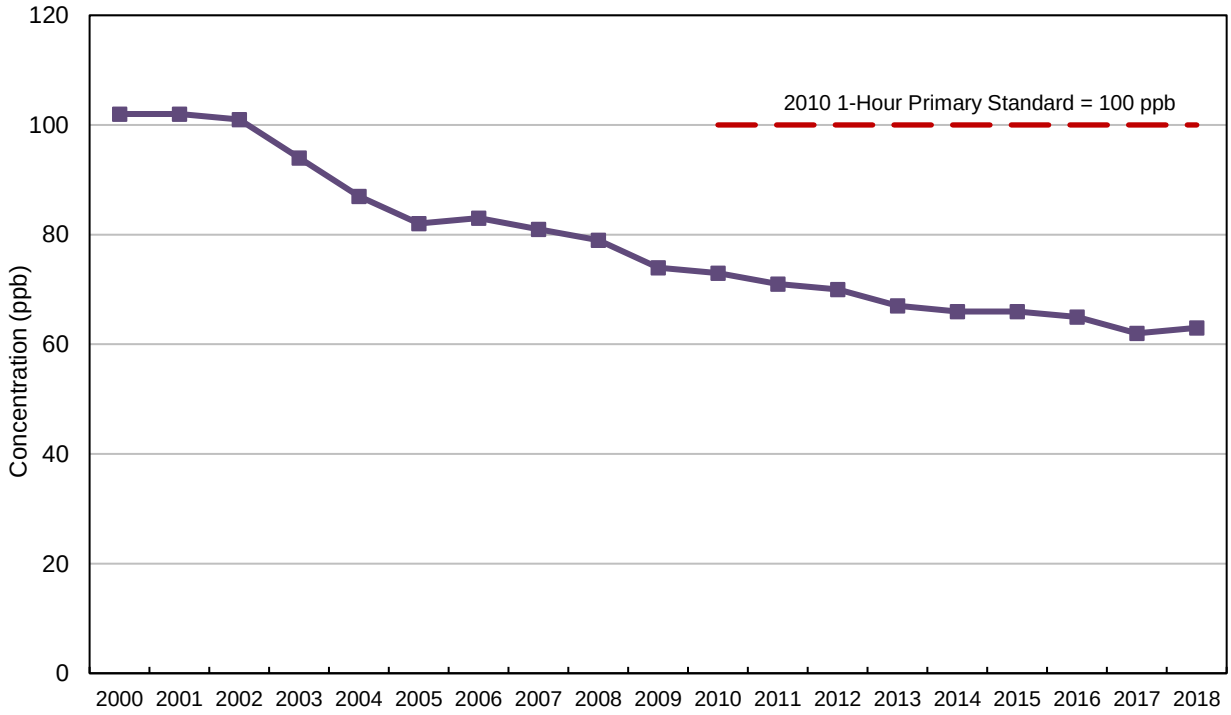

Figure 1-4

Sulfur Dioxide (SO_2) Design Value* Trend in New Jersey, 2000-2018

***3-Year Average of the 99th-Percentile of Daily Maximum 1-Hour Average Concentrations in Parts per Million (ppm)**

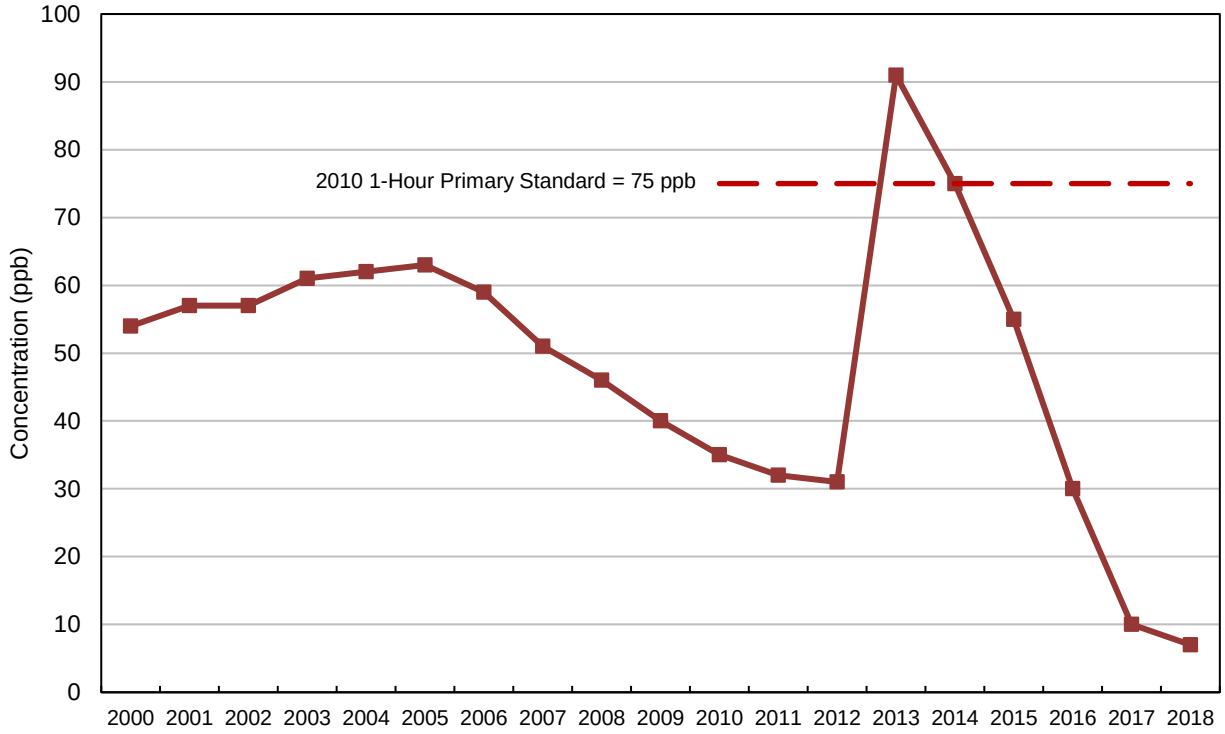

Figure 1-5

Carbon Monoxide (CO) Design Value Trend in New Jersey, 1990-2018

2nd-Highest 8-Hour Average Concentration

Parts per Million (ppm)

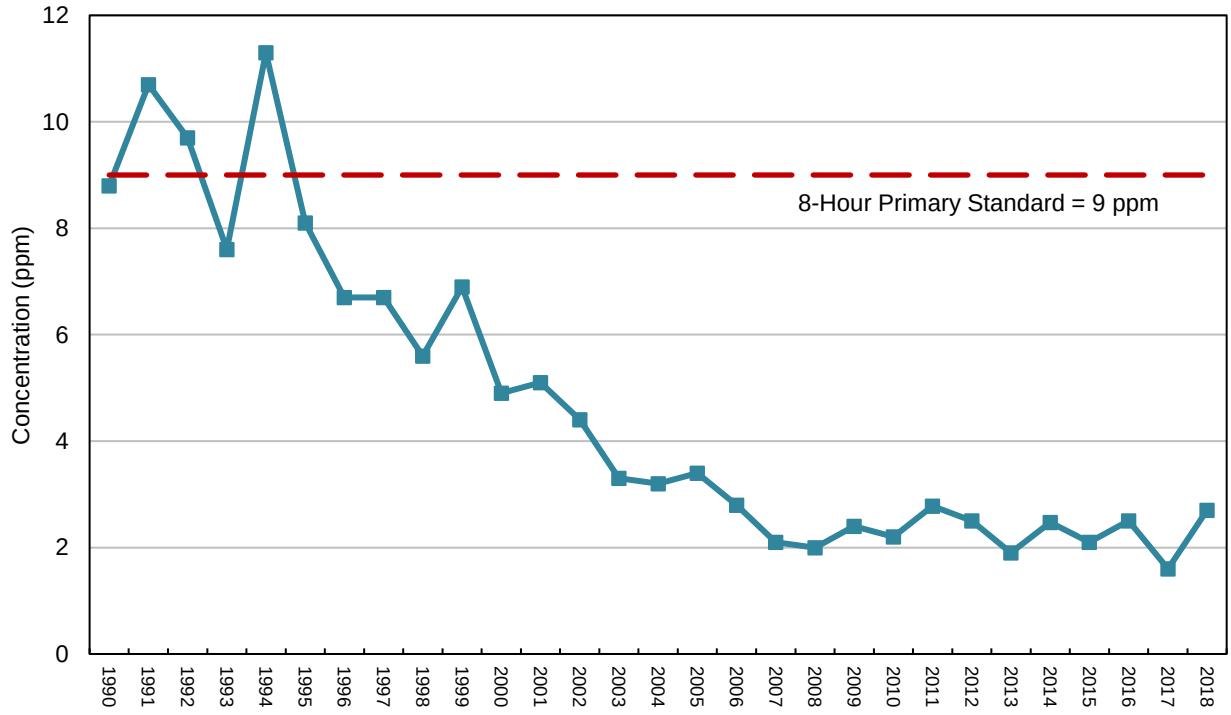

Figure 1-6
Lead Design Value Trend in New Jersey, 1983-2018
Highest 3-Month Average
Micrograms per Cubic Meter (µg/m³)