

is set at a concentration of 0.08 parts per million (ppm), and the measurement period is 8 hours. Areas are allowed to disregard their three worst measurements every year and average performance over three years to determine if they meet the standard. That is, the standard is set by the 4th highest maximum 8-hour concentration.

As shown earlier (Figure III-1) unhealthy ozone concentrations exceeding the level of the 8-hour standard (*i.e.*, not requisite to protect the public health with an adequate margin of safety) occur over wide geographic areas, including most of the nation's major population centers. These monitored areas include much of the eastern half of the U.S. and large areas of California.

Based upon data from 1999–2001, there are 291 counties where 111 million people live that are measuring values that violate the 8-hour ozone NAAQS.⁴⁴ An additional 37 million people live in 155 counties that have air quality measurements within 10 percent of the level of the standard.⁴⁵ These areas, though currently not violating the standard, would also benefit from the additional emission reductions from this proposed rule.

From air quality modeling performed for the recent Nonroad Diesel Engines and Fuel Control proposed rule,⁴⁶ we anticipate that without emission reductions beyond those already required under promulgated regulation and approved State Implementation Plans (SIPs), ozone nonattainment will likely persist into the future. With reductions from programs already in place, the number of counties violating the ozone 8-hour standard is expected to decrease in 2020 to 30 counties where 43 million people are projected to live. Thereafter, exposure to unhealthy levels of ozone is expected to begin to increase again. In 2030 the number of counties violating the ozone 8-hour NAAQS is projected to increase to 32 counties where 47 million people are projected to live. In addition, in 2030, 82 counties where 44 million people are projected to

live will be within 10 percent of violating the ozone 8-hour NAAQS.

EPA is still developing the implementation process for bringing the nation's air into attainment with the ozone 8-hour NAAQS. On June 2, 2003 (68 FR 32802), EPA issued a proposal for the implementation process to bring the nation's air into attainment with the 8-hour ozone NAAQS.⁴⁷ The proposal seeks comment on options for planning and control requirements, along with options for making the transition from the 1-hour ozone standard to the 8-hour ozone standard. The proposal does not designate nonattainment area for the 8-hour ozone NAAQS; EPA's current plans calls for designating 8-hour ozone nonattainment areas in April 2004, under a separate process. EPA has proposed that States submit SIPs that address how areas will attain the 8-hour ozone standard within 3 years after nonattainment designation for moderate and above areas classified under subpart 2 and for some areas classified under subpart 1. EPA is also proposing that marginal areas and some areas designated under subpart 1 (*i.e.*, those with early attainment dates) will not be required to submit attainment demonstrations for the 8-hour ozone standard. We therefore anticipate that States will submit their attainment demonstration SIPs by April 2007.

The Act contains two sets of requirements—subpart 1 and subpart 2—that establish requirements for State plans implementing the national ozone air quality standards in nonattainment areas. (Both are found in title I, part D.) Subpart 1 contains general requirements for SIPs for nonattainment areas for any pollutant—including ozone—governed by a NAAQS. Subpart 2 provides more specific requirements for ozone nonattainment SIPs. Under subpart 1 of part D, title I of the Act demonstrate that the nonattainment areas will attain the ozone 8-hour standard as expeditiously as practicable but no later than five years from the date that the area was designated nonattainment. However, based on the severity of the air quality problem and the availability and feasibility of control measures, the Administrator may extend the attainment date “for a period of no greater than 10 years from the date of designation as nonattainment.” Based on these provisions, we expect that most or all areas covered under subpart 1 will attain the ozone standard in the 2007 to 2014 time frame. For areas covered

under subpart 2, the maximum attainment dates provided under the Act range from 3 to 20 years after designation, depending on an area's classification. Thus, we anticipate that areas covered by subpart 2 will attain in the 2007 to 2024 time period.

Since the emission reductions expected from this proposed rule would occur during the time period when areas will need to attain the standard under either option, projected reductions in aircraft engine emissions would assist States in their effort to meet the new NAAQS. Such reductions would help them attain and maintain the 8-hour NAAQS.

2. Particulate Matter

NO_x emitted at low altitude is also a precursor in the formation of some nitrate particulate matter (PM) in the atmosphere (mostly ammonium nitrate).^{48,49} Essentially all nitrate PM is of such a diameter that it is respirable in humans. As discussed earlier, aircraft account for over 1 percent of the total U.S. mobile source NO_x emissions, and aircraft's contribution to nationwide secondary PM from U.S. mobile source NO_x is expected to be relatively similar.⁵⁰

Particulate matter represents a broad class of chemically and physically diverse substances. It can be principally characterized as discrete particles that exist in the condensed (liquid or solid) phase spanning several orders of magnitude in size. PM₁₀ refers to particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers. Fine particles refer to those particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (also known as PM_{2.5}), and coarse fraction particles are those particles with an aerodynamic diameter greater than 2.5 microns, but less than or equal to a nominal 10 micrometers. Ultrafine PM refers to particles with diameters of less than 100 nanometers (0.1 micrometers). The health and environmental effects of PM are associated with fine PM fraction and, in some cases, to the size of the particles.

⁴⁸ Secondary PM is formed when NO_x reacts with ammonia in the atmosphere to yield ammonium nitrate particulate.

⁴⁹ U.S. EPA, “Nitrogen Oxides: Impacts on Public Health and the Environment,” EPA 452/R-97-002, August 1997. A copy of this document is available in Docket No. OAR 2002-0030.

⁵⁰ “Benefits of Mobile Source NO_x Related Particulate Matter Reductions,” Systems Applications International, EPA Contract No. 68-C5-0010, WAN 1-8, October 1996. A copy of this document is available in Docket No. OAR-2002-0030. This report concluded that, as a national average, each 100 tons of NO_x emissions will result in about 4 tons of secondary PM (conversion rate was about 0.04). This conversion rate varies from region to region, and is greatest in the West.

⁴⁴ Additional counties may have levels above the NAAQS but do not currently have monitors.

⁴⁵ Memorandum to Docket A-2001-11 from Fred Dimmick, Group Leader, Air Trends Group, “Summary of Currently Available Air Quality Data and Ambient Concentrations for Ozone and Particulate Matter,” December 3, 2002. A copy of this document is available in Docket No. OAR 2002-0030.

⁴⁶ See the Regulatory Impact Analysis: “Draft Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines,” EPA420-R-03-008, April 2003. This document is available at <http://www.epa.gov/nonroad/>. A copy of this document can also be found in Docket No. A-2001-28.

⁴⁷ A copy of this proposed rule entitled, “Proposed Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard,” is available at: <http://www.epa.gov/ttn/naaqs/ozone/o3imp8hr>.