

# ENVIRONMENTAL PROTECTION AGENCY

[ 42 CFR Part 410 ]

## NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS

### Notice of Proposed Standards for Sulfur Oxides, Particulate Matter, Carbon Monoxide, Photochemical Oxidants, Hydrocarbons, and Nitrogen Oxides

Section 109 of the Clean Air Act, as amended December 31, 1970 (Public Law 91-640), directs the Administrator of the Environmental Protection Agency to publish, no later than January 30, 1971, proposed national primary and secondary ambient air quality standards for each pollutant for which air quality criteria were issued prior to enactment of the amendments. The section also provides that after December 31, 1970, the Administrator shall, simultaneously with his issuance of air quality criteria and information on control techniques for a pollutant, publish proposed national primary and secondary ambient air quality standards for that pollutant. Primary ambient air quality standards define levels of air quality which the Administrator judges necessary, based on the air quality criteria and allowing an adequate margin of safety, to protect the public health. Secondary ambient air quality standards define levels of air quality which the Administrator judges necessary, based on the air quality criteria to protect the public welfare from any known or anticipated adverse effects of an air pollutant.

Prior to December 31, 1970, air quality criteria had been issued for these five pollutants: Sulfur oxides and particulate matter (34 F.R. 1988); carbon monoxide, photochemical oxidants, and hydrocarbons (35 F.R. 4768). The Administrator has determined that nitrogen oxides, which are present in the ambient air as a result of emissions from numerous and diverse mobile and stationary sources and for which air quality criteria were not issued prior to December 31, 1970, are air pollutants which adversely affect public health and welfare. In accordance with section 108 of the Act, the following are published in a notice in this issue of the FEDERAL REGISTER:

1. A list of air pollutants, required to be published no later than January 30, 1971, which identifies nitrogen oxides as air pollutants for which air quality criteria will be issued and for which national primary and secondary ambient air quality standards will be promulgated, and

2. An announcement of the issuance of air quality criteria for nitrogen oxides.

Pursuant to section 109 of the Clean Air Act, notice is hereby given of proposed national primary and secondary ambient air quality standards as set forth in Part 410 below, which would be added to Chapter IV of Title 42, Code of Fed-

eral Regulations. With respect to carbon monoxide, hydrocarbons, photochemical oxidants, and nitrogen oxides, adverse welfare effects have not been observed to occur at levels below the levels of the proposed primary standards. For each of those pollutants, therefore, the proposed secondary standard has been specified at the level of the proposed primary standard.

The characteristics of the six air pollutants named above are, briefly, as follows:

**Sulfur oxides.** Sulfur oxides, which arise primarily from the combustion of sulfur-containing fossil fuels, are prevalent in polluted air. Their presence in the ambient air has been associated with a variety of respiratory diseases and increased mortality rates. They represent a significant economic burden and have a nuisance impact. Sulfur dioxide is an indicator of the presence of sulfur oxides in polluted air and is an important index of the effects which have been associated with these contaminants.

Detailed information on sulfur oxides is presented in the document "Air Quality Criteria for Sulfur Oxides" (NAPCA Publication No. AP-50), which provided a basis for the development of the standards set forth below.

**Particulate matter.** Particulate matter refers to any matter dispersed in the air, whether solid or liquid, in which the individual particles are larger than small molecules but smaller than 500 microns. Particles smaller than 1 micron in diameter originate in the atmosphere principally through condensation and combustion, while larger particles arise principally from erosion and abrasion. Particulate matter of technological origin is pervasive in its distribution and is associated with a variety of adverse effects on public health and welfare. Particulate matter in the respiratory tract may produce injury by itself, or it may act in conjunction with gases, altering their sites or their mode of action. Particles cleared from the respiratory tract by transfer to the lymph, blood, or gastrointestinal tract may produce effects elsewhere in the body.

Detailed information on particulate matter is presented in the document "Air Quality Criteria for Particulate Matter" (NAPCA Publication No. AP-49), which provided a basis for the development of the standards set forth below.

**Carbon monoxide.** Carbon monoxide is the product of incomplete combustion of carbonaceous fuels and is widely prevalent in ambient air. It is absorbed through the lungs and reacts primarily with the hemoglobin in red blood cells. It decreases the oxygen carrying capacity of the blood and reduces the availability of oxygen transported to vital tissues by the blood.

Detailed information on carbon monoxide is presented in the document "Air Quality Criteria for Carbon Monoxide" (NAPCA Publication No. AP-62), which provided a basis for the development of the standards set forth below.

**Photochemical oxidants.** Photochemical oxidants are produced in the atmosphere when reactive organic substances,

principally reactive hydrocarbons, and nitrogen oxides are exposed to sunlight. Photochemical oxidants cause irritation of the mucous membranes, damage to vegetation, and deterioration of materials. They affect the clearance mechanism of the lungs and alter resistance to respiratory bacterial infection. Photochemical oxidants have been implicated as accelerators in the aging process.

Detailed information on photochemical oxidants is presented in the document "Air Quality Criteria for Photochemical Oxidants" (NAPCA Publication No. AP-63) which provided a basis for the development of the standards set forth below.

**Hydrocarbons.** Hydrocarbons are primarily associated with the processing, marketing, and use of petroleum products and are widely prevalent in the ambient air. They constitute the principal portion of these volatile reactive organic substances in the atmosphere which are the precursors of other compounds formed in the atmospheric photochemical system and which result in the manifestations of photochemical smog. Methane, which occurs naturally in the atmosphere at relatively high levels, is not considered to be involved in the photochemical reactions. The only direct effect attributable to ambient levels of hydrocarbons is the vegetation damage from ethylene.

Detailed information on hydrocarbons is presented in the document "Air Quality Criteria for Hydrocarbons" (NAPCA Publication No. AP-64) which provided a basis for the development of the standards set forth below.

**Nitrogen oxides.** Nitrogen oxides result from the fixation of nitrogen and oxygen at high temperatures and are typically associated with combustion processes. They are also related to certain chemical processes. The principal nitrogen oxide formed in the combustion process is nitric oxide. This compound has not been shown to have health or welfare effects at present or anticipated ambient concentrations. However, there are several atmospheric reactions which lead to the oxidation of nitric oxide to nitrogen dioxide, and the presence of nitrogen dioxide in ambient air has been associated with a variety of respiratory diseases. Nitrogen dioxide is essential to the production of photochemical smog. At higher concentrations, its presence has been implicated in the corrosion of electrical components as well as vegetation damage.

Detailed information on nitrogen oxides is presented in the document "Air Quality Criteria for Nitrogen Oxides" (EPA Publication No. AP-84) which provided a basis for the development of the standards set forth below.

The air quality criteria documents referred to above are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Prices are as follows:

Sulfur oxides (AP-50)-----	\$1.25
Particulate matter (AP-49)-----	1.75
Carbon monoxide (AP-62)-----	1.50
Hydrocarbons (AP-64)-----	1.25
Photochemical oxidants (AP-63)-----	1.75
Nitrogen oxides (AP-84)-----	1.50

Orders for any of the above documents should be accompanied by a check or money order payable to the Superintendent of Documents.

Copies of the summary-and-conclusions chapter of each air quality criteria document are available free of charge from the Air Pollution Control Office, Environmental Protection Agency, 5600 Fishers Lane, Rockville, MD 20852, Attention: Publications Section.

Interested persons may submit written comments in triplicate to the Office of the Acting Commissioner, Air Pollution Control Office, Environmental Protection Agency, Parklawn Building, Room 17-59, 5600 Fishers Lane, Rockville, MD 20852. All relevant comments received not later than 45 days after the publication of this proposal will be considered. The standards, modified as the Administrator deems appropriate after consideration of comments, will be promulgated no later than 90 days from the date of publication of this notice, as required by the Act.

This notice of proposed rulemaking is issued under the authority of section 4, Public Law 91-604, 84 Stat. 1679.

Dated: January 25, 1971.

WILLIAM D. RUCKELSHAUS,  
Administrator.

A new Part 410 would be added to Chapter IV, Title 42, Code of Federal Regulations, as follows:

**PART 410—NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS**

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410.1 Definitions.  
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Appendix A—Method for Determination of Sulfur Dioxide (Pararosaniline Method).  
Appendix B—Procedure for Determination of Suspended Particulates (High Volume Method).  
Appendix C—Method for Continuous Measurement of Carbon Monoxide (Nondispersive Infrared Spectrometry).  
Appendix D—Method for Determination of Oxidants (Neutral Buffered Potassium Iodide Method).  
Appendix E—Part 1: Method for Continuous Measurement of Hydrocarbons (Flame Ionization Method).  
Part 2: Method for Measurement of Methane.

Appendix F—Method for Determination of Nitrogen Dioxide in the Atmosphere (24-Hour Sampling Method).

**§ 410.1 Definitions.**

(a) As used in this part, all terms not defined herein shall have the meaning given them by the Act.

(b) "Act" means the Clean Air Act, as amended (Public Law 91-604).

(c) "Agency" means the Environmental Protection Agency.

(d) "Administrator" means the Administrator of the Environmental Protection Agency.

**§ 410.2 Scope.**

(a) National primary and secondary ambient air quality standards under section 109 of the Act are set forth in this part.

(b) National primary ambient air quality standards define levels of air quality which the Administrator judges are necessary, with an adequate margin of safety, to protect the public health. National secondary ambient air quality standards define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Such standards are subject to revision, and additional primary and secondary standards may be promulgated as the Administrator deems necessary to protect the public health and welfare.

(c) The promulgation of national primary and secondary ambient air quality standards shall not be considered in any manner to allow significant deterioration of existing air quality in any portion of any State.

(d) The proposal, promulgation, or revision of national primary and secondary ambient air quality standards shall not prohibit any State from establishing ambient air quality standards for that State or any portion thereof which are more stringent than the national standards.

**§ 410.3 Measurement corrections.**

All measurements of air quality are corrected to a reference temperature of 20° C. and to a reference pressure of 760 millimeters of mercury.

**§ 410.4 National primary ambient air quality standards for sulfur oxides (sulfur dioxide).**

The national primary ambient air quality standards for sulfur oxides, measured as sulfur dioxide by a method referenced to the pararosaniline method, as described in Appendix A to this part, are:

(a) 80 micrograms per cubic meter—annual arithmetic mean.

(b) 365 micrograms per cubic meter—maximum 24-hour concentration not to be exceeded more than once per year.

**§ 410.5 National secondary ambient air quality standards for sulfur oxides (sulfur dioxide).**

The national secondary ambient air quality standards for sulfur oxides, measured as sulfur dioxide by a method referenced to the pararosaniline method, as described in Appendix A to this part, are:

(a) 60 micrograms per cubic meter—annual arithmetic mean.

(b) 260 micrograms per cubic meter—maximum 24-hour concentration not to be exceeded more than once per year.

**§ 410.6 National primary ambient air quality standards for particulate matter.**

The national primary ambient air quality standards for particulate matter, measured by the high-volume sampling method, as described in Appendix B to this part, are:

(a) 75 micrograms per cubic meter—annual geometric mean.

(b) 260 micrograms per cubic meter—maximum 24-hour concentration not to be exceeded more than once per year.

**§ 410.7 National secondary ambient air quality standards for particulate matter.**

The national secondary ambient air quality standards for particulate matter, measured by the high-volume sampling method, as described in Appendix B to this part, are:

(a) 60 micrograms per cubic meter—annual geometric mean.

(b) 150 micrograms per cubic meter—maximum 24-hour concentration not to be exceeded more than once per year.

**§ 410.8 National primary and secondary ambient air quality standards for carbon monoxide.**

The national primary and secondary ambient air quality standards for carbon monoxide, measured by the nondispersive infrared method, as described in Appendix C to this part, or equivalent method, are:

(a) 10 milligrams per cubic meter—maximum 8-hour concentration not to be exceeded more than once per year.

(b) 15 milligrams per cubic meter—maximum 1-hour concentration not to be exceeded more than once per year.

**§ 410.9 National primary and secondary ambient air quality standards for photochemical oxidants.**

The national primary and secondary ambient air quality standards for photochemical oxidants, measured by a method referenced to the neutral-buffered 1 percent potassium iodide colorimetric technique and corrected for interferences due to nitrogen oxides and sulfur dioxide, as described in Appendix D to this part, are: 125 micrograms per cubic meter—maximum 1-hour concentration not to be exceeded more than once per year.

**§ 410.10 National primary and secondary ambient air quality standards for hydrocarbons.**

The national primary and secondary ambient air quality standards for hydrocarbons, measured by the flame ionization detection method, as described in Appendix E to this part (Part 1), and corrected for methane in the sampled air by the procedures described in Appendix E to this part, or by an equivalent procedure, are: 125 micrograms per cubic meter—maximum 3-hour concentration (6 to 9 a.m.) not to be exceeded more than once per year.