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# Clean Air Act: A Summary of the Act and Its Major Requirements

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# Summary

This report summarizes the Clean Air Act and its major regulatory requirements. It excerpts, with minor modifications, the Clean Air Act chapter of CRS Report RL30798, *Environmental Laws: Summaries of Major Statutes Administered by the Environmental Protection Agency*, which summarizes a dozen environmental statutes that form the basis for the programs of the Environmental Protection Agency.

The principal statute addressing air quality concerns, the Clean Air Act was first enacted in 1955, with major revisions in 1970, 1977, and 1990. The act requires EPA to set health-based standards for ambient air quality, sets deadlines for the achievement of those standards by state and local governments, and requires EPA to set national emission standards for large or ubiquitous sources of air pollution, including motor vehicles, power plants, and other industrial sources. In addition, the act mandates emission controls for sources of 187 hazardous air pollutants, establishes a cap-and-trade program to limit acid rain, requires the prevention of significant deterioration of air quality in areas with clean air, requires a program to restore visibility impaired by regional haze in national parks and wilderness areas, and implements the Montreal Protocol to phase out most ozone-depleting chemicals.

This report describes the act's major provisions and provides tables listing all major amendments, with the year of enactment and Public Law number, and cross-referencing sections of the act with the major U.S. Code sections of the codified statute.

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# Introduction

The authorities and responsibilities of the Environmental Protection Agency (EPA) derive primarily from a dozen major environmental statutes. This report provides a concise summary of one of those statutes, the Clean Air Act. It provides a very brief history of federal involvement in air quality regulation and of the provisions added by legislation in 1970, 1977, and 1990; it explains major authorities contained in the act; it defines key terms; and it lists references for more detailed information on the act and its implementation.

While this report attempts to present the essence of the act, it is necessarily incomplete. Many details and secondary provisions are omitted. In addition, the report describes the statute largely without discussing its implementation. Statutory deadlines to control emissions and achieve particular mandates have often been missed as a result of delayed standard-setting by EPA, delayed action on implementation by states and local governments, or law suits brought by interested parties. Other CRS products, including CRS Report R44744, *Clean Air Act Issues in the 115th Congress: In Brief*, and more than a dozen other CRS reports, discuss implementation concerns and current issues. Readers interested in a more comprehensive discussion of the history of the act are referred to CRS Report 83-34, *Environmental Protection: An Historical Review of the Legislation and Programs of the Environmental Protection Agency* (available to congressional clients by request).

# Overview

The Clean Air Act, codified as 42 U.S.C. 7401 *et seq*., seeks to protect human health and the environment from emissions that pollute ambient, or outdoor, air. It requires the Environmental Protection Agency to establish minimum national standards for air quality, and assigns primary responsibility to the states to assure compliance with the standards. Areas not meeting the standards, referred to as "nonattainment areas," are required to implement specified air pollution control measures. The act establishes federal standards for mobile sources of air pollution and their fuels and for sources of 187 hazardous air pollutants, and it establishes a cap-and-trade program for the emissions that cause acid rain. It establishes a comprehensive permit system for all major sources of air pollution. It also addresses the prevention of pollution in areas with clean air and protection of the stratospheric ozone layer.

Like many other programs administered by the Environmental Protection Agency, federal efforts to control air pollution have gone through several phases, beginning with information collection, research, and technical assistance, before being strengthened to establish federal standards and enforcement. Federal legislation addressing air pollution was first passed in 1955, prior to which air pollution was the exclusive responsibility of state and local levels of government.

The federal role was strengthened in subsequent amendments, notably the Clean Air Act Amendments of 1970, 1977, and 1990. The 1970 amendments established the procedures under which EPA sets national standards for ambient air quality, required a 90% reduction in emissions from new automobiles by 1975, established a program to require the best available control technology at major new sources of air pollution, established a program to regulate air toxics, and greatly strengthened federal enforcement authority. The 1977 amendments adjusted the auto emission standards, extended deadlines for the attainment of air quality standards, and added the Prevention of Significant Deterioration program to protect air cleaner than national standards.

**Table 1. Clean Air Act and Amendments**

(codified generally as 42 U.S.C. 7401-7671)

| Year | Act | Public Law Number |
|---|---|---|
| 1955 | Air Pollution Control Act | P.L. 84-159 |
| 1959 | Reauthorization | P.L. 86-353 |
| 1960 | Motor vehicle exhaust study | P.L. 86-493 |
| 1963 | Clean Air Act Amendments | P.L. 88-206 |
| 1965 | Motor Vehicle Air Pollution Control Act | P.L. 89-272, Title I |
| 1966 | Clean Air Act Amendments of 1966 | P.L. 89-675 |
| 1967 | Air Quality Act of 1967<br>National Air Emission Standards Act | P.L. 90-148 |
| 1970 | Clean Air Act Amendments of 1970 | P.L. 91-604 |
| 1973 | Reauthorization | P.L. 93-13 |
| 1974 | Energy Supply and Environmental Coordination Act of 1974 | P.L. 93-319 |
| 1977 | Clean Air Act Amendments of 1977 | P.L. 95-95 |
| 1980 | Acid Precipitation Act of 1980 | P.L. 96-294, Title VII |
| 1981 | Steel Industry Compliance Extension Act of 1981 | P.L. 97-23 |
| 1987 | Clean Air Act 8-month Extension | P.L. 100-202 |
| 1990 | Clean Air Act Amendments of 1990 | P.L. 101-549 |
| 1991 | Technical correction to list of hazardous air pollutants | P.L. 102-187 |
| 1995-96 | Relatively minor laws amending the act | P.L. 104-6, 59, 70, 260 |
| 1998 | Amended §604 re methyl bromide | P.L. 105-277, §764 |
| 1998 | Border Smog Reduction Act of 1998 | P.L. 105-286 |
| 1999 | Chemical Safety Information, Site Security and Fuels Regulatory Relief Act | P.L. 106-40 |
| 2004 | Amendments to §209 re small engines | P.L. 108-199, Division G, Title IV, §428 |
| 2005 | Energy Policy Act of 2005 (amended §211 re fuels) | P.L. 109-58 |
| 2007 | Energy Independence and Security Act of 2007 (amended §211 re fuels) | P.L. 110-140 |
| 2011 | Amendments re Alaskan Outer Continental Shelf sources and ozone depleting substances | P.L. 112-74, §432, and P.L. 112-81, §320 |
| 2014 | Amendment to §207 re motor vehicle dealer certification | P.L. 113-109 |
| 2015 | Amendment regarding specially produced motor vehicles | P.L. 114-94, §24405 |

Changes to the act in 1990 included provisions to (1) classify most nonattainment areas according to the extent to which they exceed the standard, tailoring deadlines, planning, and controls to each area's status; (2) tighten auto and other mobile source emission standards; (3) require reformulated and alternative fuels in the most polluted areas; (4) revise the air toxics section, establishing a new program of technology-based standards and addressing the problem of sudden, catastrophic releases of air toxics; (5) establish an acid rain control program, with a marketable allowance scheme to provide flexibility in implementation; (6) require a state-run permit program

for the operation of major sources of air pollutants; (7) implement the Montreal Protocol to phase out most ozone-depleting chemicals; and (8) update the enforcement provisions so that they parallel those in other pollution control acts, including authority for EPA to assess administrative penalties.

The 1990 amendments also authorized appropriations for clean air programs through FY1998. The act has not been reauthorized since then. House rules require enactment of an authorization before an appropriation bill can be considered; but this requirement can be waived and frequently has been. Thus, while authorization of appropriations in the Clean Air Act (and most other environmental statutes) has expired, programs have continued and have been funded. The act's other legal authorities, to issue and enforce regulations, are, for the most part, permanent and are not affected by the lack of authorization.

The remainder of this report describes major programs required by the act, with an emphasis on the changes established by the 1990 amendments.

# National Ambient Air Quality Standards

In section 109, the act requires EPA to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that endanger public health or welfare,[1] in the Administrator's judgment, and whose presence in ambient air results from numerous or diverse sources. The NAAQS must be designed to protect public health with an adequate margin of safety and to protect public welfare from any known or anticipated adverse effects. Using this authority, EPA has promulgated NAAQS for six air pollutants or groups of pollutants: sulfur dioxide ($SO_2$), particulate matter ($PM_{2.5}$ and $PM_{10}$), nitrogen dioxide ($NO_2$), carbon monoxide (CO), ozone,[2] and lead. The act requires EPA to review the scientific data upon which the standards are based every five years, and revise the standards, if necessary. More often than not, EPA has taken more than five years in reviewing the standards, but the establishment of a deadline has allowed interested parties to force review of the standards by filing suit.

Originally, the act required that the NAAQS be attained by 1977 at the latest, but the states experienced widespread difficulty in complying with this deadline. As a result, the deadlines for achieving NAAQS have been extended several times. Under the 1990 amendments, most areas not in attainment with NAAQS must meet special compliance schedules, staggered according to the severity of an area's air pollution problem. The amendments also established specific requirements for each nonattainment category, as described below.

# State Implementation Plans

While the act authorizes the EPA to set NAAQS, the states are responsible for establishing procedures to attain and maintain the standards. Under Section 110 of the act, the states adopt plans, known as State Implementation Plans (SIPs), and submit them to EPA to ensure that they are adequate to meet statutory requirements.

[1] Welfare is defined by the act to include effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

[2] Unlike most other NAAQS pollutants, ozone is not directly emitted, but rather is formed in the atmosphere by the interaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. The control of ozone is, thus, based on regulating emissions of VOCs and NOx. Many particulates also form in the atmosphere after transformation of precursor emissions.

SIPs are based on emission inventories and computer models to determine whether air quality violations will occur. If these data show that standards would be exceeded, the state must impose additional controls on existing sources to ensure that emissions do not cause "exceedances" of the standards. Proposed new and modified sources must obtain state construction permits in which the applicant shows how the anticipated emissions will not exceed allowable limits. In nonattainment areas, emissions from new or modified sources must also be offset by reductions in emissions from existing sources.

The 1990 amendments require EPA to impose sanctions in areas which fail to submit a SIP, fail to submit an adequate SIP, or fail to implement a SIP: unless the state corrects such failures, a 2-to-1 emissions offset for the construction of new polluting sources is imposed 18 months after notification to the state, and a ban on most new federal highway grants is imposed six months later. An additional ban on air quality grants is discretionary. Ultimately, a Federal Implementation Plan may be imposed if the state fails to submit or implement an adequate SIP.

The amendments also require that, in nonattainment areas, no federal permits or financial assistance may be granted for activities that do not "conform" to a State Implementation Plan. This requirement can cause a temporary suspension in funding for most new highway and transit projects if an area fails to demonstrate that the emissions caused by such projects are consistent with attainment and maintenance of ambient air quality standards. Demonstrating conformity of transportation plans and SIPs is required in nonattainment areas whenever new plans are submitted.

# Nonattainment Requirements

In a major departure from the prior law, the 1990 Clean Air Act Amendments grouped most nonattainment areas into classifications based on the extent to which the NAAQS was exceeded, and established specific pollution controls and attainment dates for each classification. These requirements are described here as spelled out in Sections 181-193 of the act.[3]

Nonattainment areas are classified on the basis of a "design value," which is derived from the pollutant concentration (in parts per million or micrograms per cubic meter) recorded by air quality monitoring devices. The design value for the one-hour ozone standard was the fourth highest hourly reading measured during the most recent three-year period. Using these design values, the act created five classes of ozone nonattainment, as shown in **Table 2**. Initially, only Los Angeles fell into the "extreme" class, but 97 other areas were classified in one of the other four ozone categories. The classification system and design values have since been adapted twice as the ozone standard has been revised. Under the 2008 standard, there are 41 nonattainment areas as of February 2017, all but seven of which are classified as "marginal" or "moderate" (see **Table 3**). A simpler classification system established moderate and serious nonattainment areas

[3] EPA modified the ozone standard, specified in the statute as 0.12 parts per million (ppm) averaged over a one-hour period, to 0.08 ppm averaged over an eight-hour period, through regulations promulgated in July 1997. In April 2004, the agency promulgated an implementation rule for the new eight-hour standard. Under this rule, the one-hour standard was revoked as of June 15, 2005, and areas that had not yet attained it were converted to new classifications depending on their eight-hour concentration of ozone. In general, the former one-hour nonattainment areas remain subject to the controls specified for their one-hour category, but most areas were given additional time to attain the new standard. The ozone standard was revised again in March 2008, to 0.075 ppm averaged over eight hours and in October 2015, to 0.070 ppm averaged over eight hours. Nonattainment areas for the 2008 standard were designated in May 2012, with deadlines to attain the standards extended again. As of March 2017, nonattainment areas for the 2015 standard had not been designated.

for carbon monoxide and particulate matter with correspondingly more stringent control requirements for the more polluted class.

**Table 2. Statutory Ozone Nonattainment Classifications**

| Class | Marginal | Moderate | Serious | Severe | Extreme |
|---|---|---|---|---|---|
| Deadline | 1993 | 1996 | 1999 | 2005-2007[a] | 2010 |
| Areas[b] | 42 areas | 32 areas | 14 areas | 9 areas | 1 area |
| Design Value | 0.121 ppm-0.138 ppm | 0.138 ppm-0.160 ppm | 0.160 ppm-0.180 ppm | 0.180 ppm-0.280 ppm | >0.280 ppm |

a. Areas with a 1988 design value between 0.190 and 0.280 ppm had 17 years to attain; others had 15 years.

b. Number of areas in each category as of the date of enactment.

As shown in **Table 2**, the statutory attainment deadlines for ozone nonattainment areas stretched from 1993 to 2010, depending on the severity of the problem. Under the current eight-hour ozone standard, shown in **Table 3**, these deadlines are changed to 2015 to 2032.

**Table 3. Ozone Nonattainment Classifications, as of March 2017**

| Class | Marginal | Moderate | Serious | Severe | Extreme |
|---|---|---|---|---|---|
| Deadline | 2015 | 2018 | 2021 | 2027-2029[a] | 2032 |
| Areas[b] | 18 areas | 16 areas | 2 areas | 3 areas | 2 areas |
| Design Value | 0.076 ppm-0.086 ppm | 0.086 ppm-0.100 ppm[c] | 0.100 ppm-0.113 ppm | 0.113 ppm-0.175 ppm | >0.175 ppm |

a. Areas with a design value between 0.119 and 0.175 ppm have 17 years to attain; others have 15 years.

b. Number of areas in each category as of February 2017.

c. Most moderate areas have design values in the marginal range, but were reclassified to moderate for failure to attain the standard by the 2015 deadline.

For carbon monoxide, the attainment date for moderate areas was December 31, 1995, and for serious areas, December 31, 2000. Since 2010, there have been no carbon monoxide nonattainment areas.

For particulate matter, the deadline for areas designated moderate nonattainment as of 1990 was December 31, 1994; for those areas subsequently designated as moderate, the deadline is six years after designation. For serious areas, the respective deadlines are December 31, 2001, or 10 years after designation.

## Requirements for Ozone Nonattainment Areas

Although areas with more severe air pollution problems have a longer time to meet the standards, more stringent control requirements are imposed in areas with worse pollution. A summary of the primary ozone control requirements for each nonattainment category follows.

### Marginal Areas

- Inventory emissions sources (to be updated every three years).
- Require 1.1 to 1 offsets (i.e., new major emission sources of volatile organic compounds [VOCs] must reduce VOC emissions from existing facilities in the area by 10% more than the emissions of the new facility).

- Impose reasonably available control technology (RACT) on all major sources emitting more than 100 tons per year for the nine industrial categories where EPA had already issued control technique guidelines describing RACT prior to 1990.

**Moderate Areas**

- Meet all requirements for marginal areas.
- Impose a 15% reduction in VOC emissions in six years.
- Adopt a basic vehicle inspection and maintenance program.
- Impose RACT on all major sources emitting more than 100 tons per year for all additional industrial categories where EPA will issue control technique guidelines describing RACT.
- Require vapor recovery at gas stations selling more than 10,000 gallons per month.
- Require 1.15 to 1 offsets.

**Serious Areas**

- Meet all requirements for moderate areas.
- Reduce definition of a major source of VOCs from emissions of 100 tons per year to 50 tons per year for the purpose of imposing RACT.
- Reduce VOCs 3% annually for years 7 to 9 after the 15% reduction already required by year 6.
- Improve monitoring, in order to obtain more comprehensive and representative data on ozone pollution.
- Adopt an enhanced vehicle inspection and maintenance program.
- Require fleet vehicles to use clean alternative fuels.
- Adopt transportation control measures if the number of vehicle miles traveled in the area is greater than expected.
- Require 1.2 to 1 offsets.
- Adopt contingency measures if the area does not meet required VOC reductions.

**Severe Areas**

- Meet all requirements for serious areas.
- Reduce definition of a major source of VOCs from emissions of 50 tons per year to 25 tons per year for the purpose of imposing RACT.
- Adopt specified transportation control measures.
- Implement a reformulated gasoline program.
- Require 1.3 to 1 offsets.
- Impose $5,000 per ton penalties on major sources if the area does not meet required reductions.

**Extreme Areas**

- Meet all requirements for severe areas.

- Reduce definition of a major source of VOCs from emissions of 25 tons per year to 10 tons per year for the purpose of imposing RACT.
- Require clean fuels or advanced control technology for boilers emitting more than 25 tons per year of $NO_x$.
- Require 1.5 to 1 offsets.

## Requirements for Carbon Monoxide Nonattainment Areas

As with ozone nonattainment areas, carbon monoxide (CO) nonattainment areas are subjected to specified control requirements, with more stringent requirements in Serious nonattainment areas. A summary of the primary CO control requirements for each nonattainment category follows.

**Moderate Areas**

- Conduct an inventory of emissions sources.
- Forecast total vehicle miles traveled in the area.
- Adopt an enhanced vehicle inspection and maintenance program.
- Demonstrate annual improvements sufficient to attain the standard.

**Serious Areas**

- Adopt specified transportation control measures.
- Implement an oxygenated fuels program for all vehicles in the area.
- Reduce definition of a major source of CO from emissions of 100 tons per year to 50 tons per year if stationary sources contribute significantly to the CO problem.

Serious areas failing to attain the standard by the deadline had to revise their SIP and demonstrate reductions of 5% per year until the standard was attained. As stated earlier, all areas have now attained the standard.

## Requirements for Particulate Nonattainment Areas

Particulate ($PM_{10}$) nonattainment areas are also subject to specified control requirements. These are:

**Moderate Areas**

- Require permits for new and modified major stationary sources of $PM_{10}$.
- Impose reasonably available control measures (RACM).

**Serious Areas**

- Impose best available control measures (BACM).
- Reduce definition of a major source of $PM_{10}$ from 100 tons per year to 70 tons per year.

In July 1997, EPA promulgated new standards for fine particulates ($PM_{2.5}$). Implementation of the $PM_{2.5}$ standards was delayed by court challenges and by the initial absence of a monitoring network capable of measuring the pollutant. Nonattainment areas for $PM_{2.5}$ were designated on April 14, 2005. States had three years subsequent to designation to submit State Implementation

Plans. Revisions to the NAAQS promulgated in October 2006 and January 2013 strengthened the $PM_{2.5}$ standard and triggered new rounds of nonattainment area designations.

# Transported Air Pollution

Meeting the nation's clean air standards can be complicated, as air pollution is no respecter of political boundaries or subdivisions. This problem of transported air pollutants has come into particular focus as states and EPA attempt to develop effective compliance strategies to achieve both the ozone and the $PM_{2.5}$ NAAQS. Under Section 110(a)(2)(D), SIPs must include adequate provisions to prevent sources within that state from contributing significantly to nonattainment in one or more downwind states. This provision is often referred to as the act's "good neighbor" provision.

If EPA finds a SIP inadequate to achieve a NAAQS, it must require the affected state to submit a revised SIP that includes sufficient measures to bring that state into compliance. This is known as a "SIP Call." The 1990 Clean Air Act amendments provided EPA and the states with new tools to address the transport problem through this provision. One of those tools is Section 176A, a provision that permits the EPA, either on its own or by petition from any state, to establish a transport region to address regional pollution problems contributing to violations of a primary NAAQS. A commission of EPA and state officials is constituted to make recommendations to EPA on appropriate mitigation strategies. Based on the commission's findings and recommendations, EPA is then required under section 110(k)(5) to notify affected states of inadequacies in their current state implementation plans and to establish deadlines (not to exceed 18 months) for submitting necessary revisions. Besides authorizing administratively-created transport regions, the 1990 amendments statutorily created an Ozone Transport Region (OTR) in the Northeast. This provision (Section 184 of the act) required specific additional controls for all areas (not only nonattainment areas) in that region, and established the Ozone Transport Commission for the purpose of recommending to EPA regionwide controls affecting all areas in the region.

The transport issue may also be addressed by affected downwind states through a Section 126 petition. As amended by the 1990 Clean Air Act amendments, under Section 126(b) any state or political subdivision may petition EPA for a finding that a major source or group of stationary sources located in another state is emitting pollutants that "significantly contribute" to the nonattainment of a NAAQS by their state. EPA is to respond to the petition within 60 days. If the petition is granted, the offending sources must cease operations within three months unless the sources comply with emission controls and the compliance schedules as determined by EPA to bring them into compliance with the section. Section 126 has rarely been used, although it has proven useful to EPA in some cases as backup authority where there might be challenges to a SIP call.

# Emission Standards for Mobile Sources

Title II of the Clean Air Act has required emission standards for automobiles since 1968. The 1990 amendments significantly tightened these standards: for light-duty vehicles (a category that includes cars, SUVs, minivans, and most pickup trucks), the hydrocarbon standard was reduced by 40% and the nitrogen oxides ($NO_x$) standard by 50%. These standards—referred to as "Tier 1" standards—were phased in over the 1994-1996 model years.

The amendments envisioned a further set of reductions ("Tier 2" standards), but not before model year 2004. For Tier 2 standards to be promulgated, the agency was first required to report to

Congress concerning the need for further emission reductions, the availability of technology to achieve such reductions, and the cost-effectiveness of such controls compared to other means of attaining air quality standards. EPA submitted this report to Congress in August 1998, concluding that further emission reductions were needed and that technology to achieve such reductions was available and cost-effective. Tier 2 standards, requiring emission reductions of 77% to 95% from cars and light trucks were promulgated in February 2000, and were phased in over the 2004-2009 model years. To facilitate the use of more effective emission controls, the standards also required a more than 90% reduction in the sulfur content of gasoline, beginning in 2004. In 2014, EPA completed a similar process to impose "Tier 3" standards on light duty vehicles and gasoline. The Tier 3 standards, which are being phased in between 2017 and 2025, will require further reductions of 70-80% in emissions, as compared to Tier 2, and have already cut the remaining sulfur in gasoline by two-thirds.

The 1990 amendments also required that oxygenated gasoline, designed to reduce emissions of carbon monoxide, be sold in the worst CO nonattainment areas and that "reformulated" gasoline (RFG), designed to reduce emissions of volatile organic compounds and toxic air pollutants, be sold in the nine worst ozone nonattainment areas (Los Angeles, San Diego, Houston, Baltimore, Philadelphia, New York, Hartford, Chicago, and Milwaukee); metropolitan Washington DC and four areas in California were added to the mandatory list later. Other ozone nonattainment areas can opt in to the RFG program; additional areas in 14 states have done so, although several subsequently opted out.

The fuels provisions were modified by the Energy Policy Act of 2005 (EPACT), removing the requirement that RFG contain oxygenates. Instead, EPACT required the use of increasing amounts of renewable fuel, most likely to be ethanol, in motor fuels, beginning in 2006. The Energy Independence and Security Act of 2007 further strengthened the renewable fuel requirements.

Use of alternative fuels and development of cleaner engines was also to be stimulated by the Clean-Fuel Fleet Program. In all of the most seriously polluted ozone and CO nonattainment areas, centrally fueled fleets of 10 or more passenger cars and light-duty trucks had to purchase at least 30% clean-fuel vehicles when they add new vehicles to existing fleets, starting in 1999. (The act originally required the program to begin in 1998, but the start was delayed by a year.) The percentage rose to 50% in 2000 and 70% in 2001. Heavy-duty fleets were required to purchase at least 50% clean-fuel vehicles annually. A clean fuel vehicle is one which meets Low Emission Vehicle (LEV) standards and operates on reformulated gasoline, reformulated diesel, methanol, ethanol, natural gas, liquefied petroleum gas, hydrogen, or electricity.

In addition to the above program, California's Zero Emission Vehicle (ZEV) program also is intended to promote the development of alternative fuels and vehicles. Section 209(b) of the Clean Air Act allows the EPA Administrator to grant California the authority to develop its own vehicle emissions standards if those standards are at least as stringent as the federal standards and if the state demonstrates that it needs the standards to meet compelling and extraordinary conditions. In addition to setting more stringent standards for all vehicles, California used this authority to establish a program requiring auto manufacturers to sell ZEVs (electric or hydrogen fuel cell vehicles) in the state beginning in 2003. This program has been substantially modified since it was enacted, and now allows credit for hybrid and partial ZEV vehicles in addition to true ZEVs, but it has served as an incubator for lower emission technologies since its adoption. Section 177 of the act allows other states to adopt California's stricter standards: 13 states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington) and the District of Columbia have adopted them.

The 1990 amendments also imposed tighter requirements on emissions allowed during refueling, on low temperature CO emissions, on in-use performance over time, on warranties for the most expensive emission control components (8 years/80,000 miles for the catalytic converter, electronic emissions control unit, and onboard emissions diagnostic unit), and on certification (an auto's useful life was defined as 100,000 miles instead of the earlier 50,000 miles—a figure since increased through regulation to 120,000 or 150,000 miles depending on the standards). Regulations were also extended to include nonroad fuels and engines.

Standards for trucks and buses using diesel engines were also strengthened. The 1990 amendments required new urban buses to reduce emissions of diesel particulates 92% by 1996, and all other heavy-duty diesel engines to achieve an 83% reduction by the same year. $NO_x$ emissions must also be reduced, 33% by 1998. Authority to further strengthen these standards led to promulgation in January 2001 of new emission standards requiring a further 90%-95% reduction in emissions phased in over the 2007-2010 model years, and a reduction of 97% in the allowable amount of sulfur in highway diesel fuel. These regulations were followed in May 2004 by similar requirements for nonroad diesel equipment, which were phased in between 2007 and 2015.

In addition to the CAA's specific requirements discussed above, Section 202 of the act requires the EPA Administrator to prescribe "standards applicable to the emission of *any air pollutant* [emphasis added] from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." Beginning in 2010, this language has been used to authorize standards for greenhouse gas (GHG) emissions from cars and trucks. EPA has promulgated two rounds of GHG standards for light duty vehicles, covering model years 2012-2025, and two rounds of GHG standards for medium- and heavy-duty trucks, covering model years 2014-2027.

# Hazardous Air Pollutants

Completely rewritten by the Clean Air Act Amendments of 1990, Section 112 of the act establishes programs for protecting public health and the environment from exposure to toxic air pollutants. As revised by the 1990 amendments, the section contains four major provisions: Maximum Achievable Control Technology (MACT) requirements; health-based standards; Generally Available Control Technology (GACT) standards for stationary "area sources" (small, but numerous sources, such as gas stations or dry cleaners, that collectively emit significant quantities of hazardous pollutants); and requirements for the prevention of catastrophic releases.

First, EPA is to establish technology-based emission standards, called MACT standards, for sources of 187 pollutants listed in the legislation, and to specify categories of sources subject to the emission standards.[4] EPA is to revise the standards periodically (at least every eight years). EPA can, on its own initiative or in response to a petition, add or delete substances or source categories from the lists.

Section 112 establishes a presumption in favor of regulation for the designated chemicals; it requires regulation of a designated pollutant unless EPA or a petitioner is able to show "that there is adequate data on the health and environmental effects of the substance to determine that emissions, ambient concentrations, bioaccumulation or deposition of the substance may not

[4] The 1990 amendments specified 189 pollutants, but P.L. 102-187, enacted on December 4, 1991, deleted hydrogen sulfide from the list of toxic pollutants, leaving only 188. On December 19, 2005, EPA removed methyl ethyl ketone (MEK) from the list of toxic air pollutants. The total number of listed air toxics is now 187.

reasonably be anticipated to cause any adverse effects to human health or adverse environmental effects."

EPA is required to set standards for sources of the listed pollutants that achieve "the maximum degree of reduction in emissions" taking into account cost and other non-air-quality factors. These MACT standards for new sources "shall not be less stringent than the most stringent emissions level that is achieved in practice by the best controlled similar source." The standards for existing sources may be less stringent than those for new sources, but must be no less stringent than the emission limitations achieved by either the best performing 12% of existing sources (if there are more than 30 such sources in the category or subcategory) or the best performing 5 similar sources (if there are fewer than 30). Existing sources are given three years following promulgation of standards to achieve compliance, with a possible one-year extension; additional extensions may be available for special circumstances or for certain categories of sources. Existing sources that achieve voluntary early emissions reductions received a six-year extension for compliance with MACT.

The second major provision of Section 112 directs EPA to set health-based standards to address situations in which a significant residual risk of adverse health effects or a threat of adverse environmental effects remains after installation of MACT. This provision requires that EPA, after consultation with the Surgeon General of the United States, submit a report to Congress on the public health significance of residual risks, and recommend legislation regarding such risks. If Congress does not legislate in response to EPA's recommendations, then EPA is required to issue standards for categories of sources of hazardous air pollutants as necessary to protect the public health with an ample margin of safety or to prevent an adverse environmental effect. A residual risk standard is required for any source emitting a cancer-causing pollutant that poses an added risk to the most exposed person of more than one-in-a-million. Residual risk standards are due eight years after promulgation of MACT for the affected source category. Existing sources have 90 days to comply with a residual risk standard, with a possible two-year extension. In general, residual risk standards do not apply to area sources.

The law directed EPA to contract with the National Academy of Sciences (NAS) for a study of risk assessment methodology, and created a Risk Assessment and Management Commission to investigate and report on policy implications and appropriate uses of risk assessment and risk management. In 1994 NAS published its report, *Science and Judgment in Risk Assessment*. The Commission study, *Framework for Environmental Health Risk Management*, was released in 1997.

Third, in addition to the technology-based and health-based programs for major sources of hazardous air pollution, EPA is to establish standards for stationary "area sources" determined to present a threat of adverse effects to human health or the environment. The provision requires EPA to regulate the stationary area sources responsible for 90% of the emissions of the 30 hazardous air pollutants that present the greatest risk to public health in the largest number of urban areas. In setting the standard, EPA can impose less stringent "generally available" control technologies, rather than MACT.

Finally, Section 112 addresses prevention of sudden, catastrophic releases of air toxics by establishing an independent Chemical Safety and Hazard Investigation Board. The Board is responsible for investigating accidents involving releases of hazardous substances, conducting studies, and preparing reports on the handling of toxic materials and measures to reduce the risk of accidents.

EPA is also directed to issue prevention, detection, and correction requirements for catastrophic releases of air toxics by major sources. Section 112(r) requires owners and operators to prepare

risk management plans including hazard assessments, measures to prevent releases, and a response program.

# New Source Performance Standards

Section 111 of the act requires EPA to establish nationally uniform, technology-based standards (called New Source Performance Standards, or NSPS) for categories of new industrial facilities. These standards accomplish two goals: first, they establish a consistent baseline for pollution control that competing firms must meet, and thereby remove any incentive for states or communities to weaken air pollution standards in order to attract polluting industry; and second, they preserve clean air to accommodate future growth, as well as for its own benefits.

NSPS establish maximum emission levels for new major stationary sources—power plants, steel mills, and smelters, for example—with the emission levels determined by the best system of emission reduction (BSER) "adequately demonstrated," taking costs into account. At least every eight years, EPA must review and, if appropriate, revise NSPS applicable to designated sources, since the goal is to prevent new pollution problems from developing and to force the installation of new control technology.

The standards also apply to modifications of existing facilities, through a process called New Source Review (NSR). The law's ambiguity regarding what constitutes a modification (subject to NSR) as opposed to routine maintenance of a facility has led to litigation, with EPA proposing in recent years to modify its interpretation of the requirements of this section.

Section 111 can also be used to set standards for existing stationary sources of pollution. Under Section 111(d), EPA is to require the states to submit plans establishing standards of performance for existing sources that would be subject to NSPS if they were new, unless the sources or the pollutants regulated by the NSPS are already subject to standards under other sections of the act. This authority has rarely been used, because most pollutants and sources are subject to regulation under other sections of the act; but it served as the basis of EPA's Clean Power Plan for greenhouse gas emissions from existing fossil-fueled power plants, promulgated in 2015.

# Solid Waste Incinerators

Prior to 1990, solid waste incinerators, which emit a wide range of pollutants, were subject to varying degrees of state and federal regulation depending on their size, age, and the type of waste burned. In a new Section 129, the 1990 amendments established more consistent federal requirements specifying that emissions of 10 categories of pollutants be regulated at new and existing incinerators burning municipal solid waste, medical waste, and commercial and industrial waste. The amendments also established emissions monitoring and operator training requirements.

# Prevention of Significant Deterioration / Regional Haze

Sections 160-169 of the act establish requirements for the prevention of significant deterioration of air quality (PSD). The PSD program reflects the principle that areas where air quality is better than that required by NAAQS should be protected from significant new air pollution even if NAAQS would not be violated.

The act divides clean air areas into three classes, and specifies the increments of sulfur dioxide ($SO_2$) and particulate pollution allowed in each. Class I areas include international and national parks, wilderness and other pristine areas; allowable increments of new pollution are very small. Class II areas include all attainment and not classifiable areas, not designated as Class I; allowable increments of new pollution are modest. Class III represents selected areas that states may designate for development; allowable increments of new pollution are large (but not so large that the area would exceed NAAQS). Through an elaborate hearing and review process, a state can have regions redesignated from Class II to Class III (although no Class III areas have yet been designated).

While the 1977 amendments only stipulated PSD standards for two pollutants, $SO_2$ and particulates, EPA is supposed to establish standards for other criteria pollutants. Thus far, only one of the other four ($NO_2$) has been addressed: the agency promulgated standards for $NO_2$ in 1988.

Newly constructed polluting sources in PSD areas must install best available control technology (BACT) that may be more strict than that required by NSPS. The justifications of the policy are that it protects air quality, provides an added margin of health protection, preserves clean air for future development, and prevents firms from gaining a competitive edge by "shopping" for clean air to pollute.

In Sections 169A and B, the act also sets a national goal of preventing and remedying impairment of visibility in national parks and wilderness areas, and requires EPA to promulgate regulations to assure reasonable progress toward that goal. In the 1990 Amendments, Congress strengthened these provisions, which had not been implemented.

The amendments required EPA to establish a Grand Canyon Visibility Transport Commission, composed of Governors from each state in the affected region, an EPA designee, and a representative of each of the national parks or wilderness areas in the region. Other visibility transport commissions can be established upon EPA's discretion or upon petition from at least two states. Within 18 months of receiving a report from one of these commissions, EPA is required to promulgate regulations to assure reasonable progress toward the visibility goal, including requirements that states update their State Implementation Plans to contain emission limits, schedules of compliance, and other measures necessary to make reasonable progress. Specifically mentioned is a requirement that states impose Best Available Retrofit Technology on existing sources of emissions impairing visibility.

The Grand Canyon Commission delivered a set of recommendations to EPA in June 1996, and the agency subsequently promulgated a "regional haze" program applicable to all 50 states under this authority.

# Acid Deposition Control

The Clean Air Act Amendments of 1990 added an acid deposition control program (Title IV) to the act. It set goals for the year 2000 of reducing annual $SO_2$ emissions by 10 million tons from 1980 levels and reducing annual $NO_x$ emissions by 2 million tons, also from 1980 levels.

The $SO_2$ reductions were imposed in two steps. Under Phase 1, owners/operators of 110 high-emitting electric generating facilities listed in the law had to meet tonnage emission limitations by January 1, 1995. This would reduce $SO_2$ emissions by about 3.5 million tons. Phase 2 included facilities with a nameplate capacity greater than or equal to 75 megawatts, with a deadline of January 1, 2000. Compliance was 100%.

To introduce some flexibility in the distribution and timing of reductions, the act creates a comprehensive permit and emissions allowance system. An allowance is a limited authorization to emit a ton of $SO_2$. Issued by EPA, the allowances would be allocated to Phase 1 and Phase 2 units in accordance with baseline emissions estimates. Power plants which commence operation after November 15, 1990 would not receive any allowances. These new units would have to obtain allowances (offsets) from holders of existing allowances. Allowances were allowed to be traded nationally during either phase. The law also permitted industrial sources and power plants to sell allowances to utility systems under regulations developed by EPA. Allowances were allowed to be banked by a utility for future use or sale.

The act provided for two types of sales to improve the liquidity of the allowance system and to ensure the availability of allowances for utilities and independent power producers who need them. First, a special reserve fund consisting of 2.8% of Phase 1 and Phase 2 allowance allocations was set aside for sale. Allowances from this fund (25,000 annually from 1993 to 1999 and 50,000 thereafter) were sold at a fixed price of $1,500 an allowance. Independent power producers had guaranteed rights to these allowances under certain conditions. Second, an annual, open auction sold allowances (150,000 from 1993 to 1995, and 250,000 from 1996 to 1999) with no minimum price. Utilities with excess allowances could have them auctioned off at this auction, and any person could buy allowances.

The act essentially capped $SO_2$ emissions at individual existing sources through a tonnage limitation, and at future plants through the allowance system. First, emissions from most existing sources were capped at a specified emission rate times an historic baseline level. Second, for plants commencing operation after November 15, 1990, emissions had to be completely offset with additional reductions at existing facilities beginning after Phase 2 compliance. However, as noted above, the law provided some allowances to future power plants which met certain criteria. The utility $SO_2$ emission cap was set at 8.9 million tons, with some exceptions.

The act provided that if an affected unit did not have sufficient allowances to cover its emissions, it would be subject to an excess emission penalty of $2,000 per ton of $SO_2$ and required to reduce an additional ton of $SO_2$ the next year for each ton of excess pollutant emitted.

The act also required EPA to inventory industrial emissions of $SO_2$ and to report every five years, beginning in 1995. If the inventory showed that industrial emissions may reach levels above 5.60 million tons per year, then EPA was to take action under the act to ensure that the 5.60 million ton cap would not be exceeded.

The act required EPA to set specific $NO_x$ emission rate limitations—0.45 lb. per million Btu for tangentially-fired boilers and 0.50 lb. per million Btu for wall-fired boilers—unless those rates cannot be achieved by low-$NO_x$ burner technology. Tangentially and wall-fired boilers affected by Phase 1 $SO_2$ controls must also meet $NO_x$ requirements. EPA was to set emission limitations for other types of boilers by 1997 based on low-$NO_x$ burner costs, which EPA did. In addition, EPA was to propose and promulgate a revised new source performance standard for $NO_x$ from fossil fuel steam generating units, which EPA also did, in 1998.

In 2005, 2011, and 2016, EPA used the authority described in the section on "Transported Air Pollution" to further lower the caps on $SO_2$ and $NO_x$ emissions in the eastern half of the country. As a result, $SO_2$ and $NO_x$ emissions have been reduced by at least a further 50% since 2005.

# Permits

The Clean Air Act Amendments of 1990 added a Title V to the act which requires states to administer a comprehensive permit program for the operation of sources emitting air pollutants.

These requirements are modeled after similar provisions in the Clean Water Act. Previously, the Clean Air Act contained limited provision for permits, requiring only new or modified major stationary sources to obtain construction permits (under Section 165 of the act).

Sources subject to the permit requirements generally include major sources that emit or have the potential to emit 100 tons per year of any regulated pollutant, plus stationary and area sources that emit or have potential to emit lesser specified amounts of hazardous air pollutants. However, in nonattainment areas, the permit requirements also include sources which emit as little as 50, 25, or 10 tons per year of VOCs, depending on the severity of the region's ozone nonattainment status (serious, severe, or extreme).

States were required to develop permit programs and to submit those programs for EPA approval by November 15, 1993. EPA had one year to approve or disapprove a state's submission in whole or in part. After the effective date of a state plan, sources had 12 months to submit an actual permit application.

States are to collect annual fees from sources sufficient to cover the "reasonable costs" of administering the permit program, with revenues to be used to support the agency's air pollution control program. The fee must be at least $25 per ton of regulated pollutants (excluding carbon monoxide). Permitting authorities have discretion not to collect fees on emissions in excess of 4,000 tons per year and may collect other fee amounts, if appropriate.

The permit states how much of which air pollutants a source is allowed to emit. As a part of the permit process, a source must prepare a compliance plan and certify compliance. The term of permits is limited to no more than five years; sources are required to renew permits at that time. State permit authorities must notify contiguous states of permit applications that may affect them; the application and any comments of contiguous states must be forwarded to EPA for review. EPA can veto a permit; however, this authority is essentially limited to major permit changes. EPA review need not include permits which simply codify elements of a state's overall clean air plan, and EPA has discretion to not review permits for small sources. Holding a permit to some extent shields a source from enforcement actions: the act provides that a source cannot be held in violation if it is complying with explicit requirements addressed in a permit, or if the state finds that certain provisions do not apply to that source.

# Enforcement

Section 113 of the act, which was also strengthened by the 1990 amendments, covers enforcement. The section establishes federal authority to issue agency and court orders requiring compliance and to impose penalties for violations of Act requirements. Section 114 authorizes EPA to require sources to submit reports, monitor emissions, and certify compliance with the act's requirements, and authorizes EPA personnel to conduct inspections.

Like most federal environmental statutes, the Clean Air Act is enforced primarily by states or local governments; they issue most permits, monitor compliance, and conduct the majority of inspections. The federal government functions as a backstop, with authority to review state actions. The agency may act independently or may file its own enforcement action in cases where it concludes that a state's response was inadequate.

The act also provides for citizen suits both against persons (including corporations or government agencies) alleged to have violated emissions standards or permit requirements, and against EPA in cases where the Administrator has failed to perform an action that is not discretionary under the act. Citizen groups have often used the latter provision to compel the Administrator to promulgate regulations required by the statute.

The 1990 Amendments elevated penalties for some knowing violations from misdemeanors to felonies; removed the ability of a source to avoid an enforcement order or civil penalty by ceasing a violation within 60 days of notice; gave authority to EPA to assess administrative penalties; and authorized $10,000 awards to persons supplying information leading to convictions under the act.

# Stratospheric Ozone Protection

Title VI of the 1990 Clean Air Act Amendments represents the United States' primary response on the domestic front to the stratospheric ozone depletion issue. It also implements the U.S. international responsibilities under the Montreal Protocol on Substances that Deplete the Ozone Layer (and its amendments). Indeed, Section 606(a)(3) provides that the Environmental Protection Agency shall adjust phase-out schedules for ozone-depleting substances in accordance with any future changes in Montreal Protocol schedules. As a result, the phase-out schedules contained in Title VI for various ozone-depleting compounds have now been superseded by subsequent amendments to the Montreal Protocol.

Since passage of Title VI, depleting substances such as CFCs, methyl chloroform, carbon tetrachloride, and halons (referred to as Class 1 substances) have been phased out by industrial countries, including the United States. New uses of hydrochlorofluorocarbons (HCFCs) (called Class 2 substances under Title VI) were banned beginning January 1, 2015, unless the HCFCs are recycled, used as a feedstock, or used as a refrigerant for appliances manufactured prior to January 1, 2020. Production of HCFCs is to be frozen January 1, 2015 and phased out by January 1, 2030. Exemptions consistent with the Montreal Protocol are allowed.

The EPA is required to add any substance with an ozone depletion potential (ODP) of 0.2 or greater to the list of Class 1 substances and set a phase-out schedule of no more than seven years. For example, methyl bromide (ODP estimated by EPA at 0.7) was added to the list in December 1993, requiring its phaseout by January 1, 2001; this decision was altered by Congress in 1998 to harmonize the U.S. methyl bromide phase-out schedule with the 2005 deadline set by the parties to the Montreal Protocol in 1997. Also, EPA is required to add any substance that is known or may be reasonably anticipated to harm the stratosphere to the list of Class 2 substances and set a phase-out schedule of no more than ten years.

Title VI contains several implementing strategies to avoid releases of ozone-depleting chemicals to the atmosphere, including (1) for Class 1 substances used as refrigerants—lowest achievable level of use and emissions, maximum recycling, and safe disposal required by July 1, 1992; (2) for servicing or disposing refrigeration equipment containing Class 1 and 2 substances—venting banned as of July 1, 1992; (3) for motor vehicle air conditioners containing Class 1 or 2 substances—recycling required by January 1, 1992 (smaller shops by January 1, 1993); (4) sale of small containers of class 1 and 2 substances—banned within two years of enactment; and (5) nonessential products—banned within two years of enactment.

# Selected References

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Air Trends*. Compiled annually, and available at http://www.epa.gov/airtrends/.

Julie R. Domike and Alec Chatham Zacaroli (eds.), *The Clean Air Act Handbook*, 4th edition (Chicago: American Bar Association) 2016, 864 p.

CRS Report R43699, *Key Historical Court Decisions Shaping EPA's Program Under the Clean Air Act*, by Linda Tsang and Alexandra M. Wyatt.

CRS Report R44744, *Clean Air Act Issues in the 115th Congress: In Brief*, by James E. McCarthy.

**Table 4. Major U.S. Code Sections of the Clean Air Act**

(codified generally as 42 U.S.C. 7401-7671)

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| Subchapter I - | Programs and Activities | |
| Part A - | Air Quality and Emissions Limitations | |
| 7401 | Congressional findings and declaration of purpose | Sec. 101 |
| 7402 | Cooperative activities | Sec. 102 |
| 7403 | Research, investigation, training, and other activities | Sec. 103 |
| 7404 | Research relating to fuels and vehicles | Sec. 104 |
| 7405 | Grants for support of air pollution planning and control programs | Sec. 105 |
| 7406 | Interstate air quality agencies; program cost limitations | Sec. 106 |
| 7407 | Air quality control regions | Sec. 107 |
| 7408 | Air quality criteria and control techniques | Sec. 108 |
| 7409 | National primary and secondary ambient air quality standards | Sec. 109 |
| 7410 | State Implementation Plans for national primary and secondary ambient air quality standards | Sec. 110 |
| 7411 | Standards of performance for new stationary sources | Sec. 111 |
| 7412 | Hazardous air pollutants | Sec. 112 |
| 7413 | Federal enforcement | Sec. 113 |
| 7414 | Recordkeeping, inspections, monitoring, and entry | Sec. 114 |
| 7415 | International air pollution | Sec. 115 |
| 7416 | Retention of state authority | Sec. 116 |
| 7417 | Advisory committees | Sec. 117 |
| 7418 | Control of pollution from federal facilities | Sec. 118 |
| 7419 | Primary nonferrous smelter orders | Sec. 119 |
| 7420 | Noncompliance penalty | Sec. 120 |
| 7421 | Consultation | Sec. 121 |
| 7422 | Listing of certain unregulated pollutants | Sec. 122 |
| 7423 | Stack heights | Sec. 123 |
| 7424 | Assurance of adequacy of state plans | Sec. 124 |
| 7425 | Measures to prevent economic disruption or unemployment | Sec. 125 |
| 7426 | Interstate pollution abatement | Sec. 126 |
| 7427 | Public notification | Sec. 127 |
| 7428 | State boards | Sec. 128 |
| 7429 | Solid waste combustion | Sec. 129 |
| 7430 | Emission factors | Sec. 130 |

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| 7431 | Land use authority | Sec. 131 |
| Part B - Ozone Protection (repealed—new provisions related to stratospheric ozone protection are found at 42 U.S.C. 7671 et seq., below) | | |
| Part C - | Prevention of Significant Deterioration of Air Quality | |
| Subpart I - | Clean Air | |
| 7470 | Congressional declaration of purpose | Sec. 160 |
| 7471 | Plan requirements | Sec. 161 |
| 7472 | Initial classifications | Sec. 162 |
| 7473 | Increments and ceilings | Sec. 163 |
| 7474 | Area redesignation | Sec. 164 |
| 7475 | Preconstruction requirements | Sec. 165 |
| 7476 | Other pollutants | Sec. 166 |
| 7477 | Enforcement | Sec. 167 |
| 7478 | Period before plan approval | Sec. 168 |
| 7479 | Definitions | Sec. 169 |
| Subpart II - | Visibility Protection | |
| 7491 | Visibility protection for federal class I areas | Sec. 169A |
| 7492 | Visibility | Sec. 169B |
| Part D - | Plan Requirements for Nonattainment Areas | |
| Subpart 1 - | Nonattainment Areas in General | |
| 7501 | Definitions | Sec. 171 |
| 7502 | Nonattainment plan provisions in general | Sec. 172 |
| 7503 | Permit requirements | Sec. 173 |
| 7504 | Planning procedures | Sec. 174 |
| 7505 | Environmental Protection Agency grants | Sec. 175 |
| 7505a | Maintenance plans | Sec. 175A |
| 7506 | Limitations on certain federal assistance | Sec. 176 |
| 7506a | Interstate transport commissions | Sec. 176A |
| 7507 | New motor vehicle emission standards in nonattainment areas | Sec. 177 |
| 7508 | Guidance documents | Sec. 178 |
| 7509 | Sanctions and consequences of failure to attain | Sec. 179 |
| 7509a | International border areas | Sec. 179B |

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| Subpart 2 - | Additional Provisions for Ozone Nonattainment Areas | |
| 7511 | Classifications and attainment dates | Sec. 181 |
| 7511a | Plan submissions and requirements | Sec. 182 |
| 7511b | Federal ozone measures | Sec. 183 |
| 7511c | Control of interstate ozone air pollution | Sec. 184 |
| 7511d | Enforcement for Severe and Extreme Ozone Nonattainment Areas for failure to attain | Sec. 185 |
| 7511e | Transitional areas | Sec. 185A |
| 7511f | $NO_x$ and VOC study | Sec. 185B |
| Subpart 3 - | Additional Provisions for Carbon Monoxide Nonattainment Areas | |
| 7512 | Classification and attainment dates | Sec. 186 |
| 7512a | Plan submissions and requirements | Sec. 187 |
| Subpart 4 - | Additional Provisions for Particulate Matter Nonattainment Areas | |
| 7513 | Classifications and attainment dates | Sec. 188 |
| 7513a | Plan provisions and schedules for plan submissions | Sec. 189 |
| 7513b | Issuance of RACM and BACM guidance | Sec. 190 |
| Subpart 5 - | Additional Provisions for Areas Designated Nonattainment for Sulfur Oxides, Nitrogen Dioxide, or Lead | |
| 7514 | Plan submission deadlines | Sec. 191 |
| 7514a | Attainment dates | Sec. 192 |
| Subpart 6 - | Savings Provisions | |
| 7515 | General savings clause | Sec. 193 |
| Subchapter II - | Emission Standards for Moving Sources | |
| Part A - | Motor Vehicle Emission and Fuel Standards | |
| 7521 | Emission standards for new motor vehicles or new motor vehicle engines | Sec. 202 |
| 7522 | Prohibited acts | Sec. 203 |
| 7523 | Actions to restrain violations | Sec. 204 |
| 7524 | Civil penalties | Sec. 205 |
| 7525 | Motor vehicle and motor vehicle engine compliance testing and certification | Sec. 206 |
| 7541 | Compliance by vehicles and engines in actual use | Sec. 207 |
| 7542 | Information collection | Sec. 208 |

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| 7543 | State standards | Sec. 209 |
| 7544 | State grants | Sec. 210 |
| 7545 | Regulation of fuels | Sec. 211 |
| 7547 | Nonroad engines and vehicles | Sec. 213 |
| 7548 | Study of particulate emissions from motor vehicles | Sec. 214 |
| 7549 | High altitude performance adjustments | Sec. 215 |
| 7550 | Definitions | Sec. 216 |
| 7552 | Motor vehicle compliance program fees | Sec. 217 |
| 7553 | Prohibition on production of engines requiring leaded gasoline | Sec. 218 |
| 7554 | Urban bus standards | Sec. 219 |
| | | |
| Part B - | Aircraft Emission Standards | |
| 7571 | Establishment of standards | Sec. 231 |
| 7572 | Enforcement of standards | Sec. 232 |
| 7573 | State standards and controls | Sec. 233 |
| 7574 | Definitions | Sec. 234 |
| | | |
| Part C - | Clean Fuel Vehicles | |
| 7581 | Definitions | Sec. 241 |
| 7582 | Requirements applicable to clean-fuel vehicles | Sec. 242 |
| 7583 | Standards for light-duty clean-fuel vehicles | Sec. 243 |
| 7584 | Administration and enforcement as per California standards | Sec. 244 |
| 7585 | Standards for heavy-duty clean-fuel vehicles | Sec. 245 |
| 7586 | Centrally fueled fleets | Sec. 246 |
| 7587 | Vehicle conversions | Sec. 247 |
| 7588 | Federal agency fleets | Sec. 248 |
| 7589 | California pilot test program | Sec. 249 |
| 7590 | General provisions | Sec. 250 |
| | | |
| Subchapter III - | General Provisions | |
| 7601 | Administration | Sec. 301 |
| 7602 | Definitions | Sec. 302 |
| 7603 | Emergency powers | Sec. 303 |
| 7604 | Citizen suits | Sec. 304 |
| 7605 | Representation in litigation | Sec. 305 |
| 7606 | Federal procurement | Sec. 306 |

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| 7607 | Administrative proceedings and judicial review | Sec. 307 |
| 7608 | Mandatory licensing | Sec. 308 |
| 7609 | Policy review | Sec. 309 |
| 7610 | Other authority | Sec. 310 |
| 7611 | Records and audit | Sec. 311 |
| 7612 | Economic impact analyses | Sec. 312 |
| 7614 | Labor standards | Sec. 314 |
| 7615 | Separability | Sec. 315 |
| 7616 | Sewage treatment grants | Sec. 316 |
| 7617 | Economic impact assessment | Sec. 317 |
| 7619 | Air quality monitoring | Sec. 319 |
| 7620 | Standardized air quality modeling | Sec. 320 |
| 7621 | Employment effects | Sec. 321 |
| 7622 | Employee protection | Sec. 322 |
| 7624 | Cost of vapor recovery equipment | Sec. 323 |
| 7625 | Vapor recovery for small business marketers of petroleum products | Sec. 324 |
| 7625-1 | Exemptions for certain territories | Sec. 325 |
| 7625a | Statutory construction | Sec. 326 |
| 7626 | Authorization of appropriations | Sec. 327 |
| 7627 | Air pollution from Outer Continental Shelf activities | Sec. 328 |
| | | |
| Subchapter IV-A | Acid Deposition Control | |
| 7651 | Findings and purposes | Sec. 401 |
| 7651a | Definitions | Sec. 402 |
| 7651b | Sulfur dioxide allowance program for existing and new units | Sec. 403 |
| 7651c | Phase I sulfur dioxide requirements | Sec. 404 |
| 7651d | Phase II sulfur dioxide requirements | Sec. 405 |
| 7651e | Allowances for states with emissions rates at or below 0.80 lbs./mmBtu | Sec. 406 |
| 7651f | Nitrogen oxides emission reduction program | Sec. 407 |
| 7651g | Permits and compliance plans | Sec. 408 |
| 7651h | Repowered sources | Sec. 409 |
| 7651i | Election for additional sources | Sec. 410 |
| 7651j | Excess emissions penalty | Sec. 411 |
| 7651k | Monitoring, reporting, and recordkeeping requirements | Sec. 412 |
| 7651l | General compliance with other provisions | Sec. 413 |
| 7651m | Enforcement | Sec. 414 |

| 42 U.S.C. | Section Title | Clean Air Act, as amended |
|---|---|---|
| 7651n | Clean coal technology regulatory incentives | Sec. 415 |
| 7651o | Contingency guarantee, auctions, reserve | Sec. 416 |
| | | |
| Subchapter V - | Permits | |
| 7661 | Definitions | Sec. 501 |
| 7661a | Permit programs | Sec. 502 |
| 7661b | Permit applications | Sec. 503 |
| 7661c | Permit requirements and conditions | Sec. 504 |
| 7661d | Notification to administrator and contiguous states | Sec. 505 |
| 7661e | Other authorities | Sec. 506 |
| 7661f | Small business stationary source technical and environmental compliance assistance program | Sec. 507 |
| | | |
| Subchapter VI - | Stratospheric Ozone Protection | |
| 7671 | Definitions | Sec. 601 |
| 7671a | Listing of class I and class II substances | Sec. 602 |
| 7671b | Monitoring and reporting requirements | Sec. 603 |
| 7671c | Phase-out of production and consumption of class I substances | Sec. 604 |
| 7671d | Phase-out of production and consumption of class II substances | Sec. 605 |
| 7671e | Accelerated schedule | Sec. 606 |
| 7671f | Exchange authority | Sec. 607 |
| 7671g | National recycling and emission reduction program | Sec. 608 |
| 7671h | Servicing of motor vehicle air conditioners | Sec. 609 |
| 7671i | Nonessential products containing chlorofluorocarbons | Sec. 610 |
| 7671j | Labeling | Sec. 611 |
| 7671k | Safe alternatives policy | Sec. 612 |
| 7671l | Federal procurement | Sec. 613 |
| 7671m | Relationship to other laws | Sec. 614 |
| 7671n | Authority of Administrator | Sec. 615 |
| 7671o | Transfers among parties to Montreal Protocol | Sec. 616 |
| 7671p | International cooperation | Sec. 617 |
| 7671q | Miscellaneous provisions | Sec. 618 |
| | | |
| [29 U.S.C. 655] | Chemical Process Safety Management | Sec. 304 of CAA of 1990 |
| [29 U.S.C. 1662e] | Clean Air Employment Transition Assistance | Sec.1101 of CAA of 1990 |

**Note:** This table shows only the major U.S. Code sections. For more detail and to determine when a section was added, the reader should consult the official printed version of the U.S. Code.

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