

Clean Air Decision: 2006

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The U.S. Environmental Protection Agency is on the verge of a decision that will affect the health and lives of Americans in communities across the nation.

By September 27, 2006, the EPA must issue new air quality standards for particle pollution, one of the most common and dangerous air pollutants in the U.S. Unfortunately, the agency has proposed standards that leave far too many people at risk of serious harm – even premature death – from breathing unhealthy, polluted air.

The American Lung Association and other public health and medical groups have urged EPA to set standards at levels that protect public health, including the health of susceptible populations, with an adequate margin of safety as the Clean Air Act requires.

Using EPA data from particle pollution monitors in counties nationwide from 2002-2004, this report provides a county-by-county estimate of the total number of people protected under the current standards and each of three choices for the future. The report shows clearly that standards the EPA proposed do not protect the health of the nation from deadly particle pollution.

Setting new particle standards is the most far-reaching environmental health decision the EPA will make this year. Consistent with the science and the law, the EPA should adopt the strongest standards under consideration, as the American Lung Association recommends. Anything less will leave far too many people at risk.

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Executive Summary

The U.S. Environmental Protection Agency (EPA) is on the verge of a decision that will affect the health and lives of Americans in communities across the nation. By September 27, 2006, the EPA must issue new air quality standards for particle pollution,¹ one of the most common and dangerous air pollutants in the U.S. Under the Clean Air Act, these standards are intended to be the limit of each pollutant that is safe to have in the air. The American Lung Association and other public health and medical groups have requested the EPA set standards at levels that protect public health, including the health of susceptible populations, with an adequate margin of safety as the Clean Air Act requires. Unfortunately, the agency has instead proposed standards that leave far too many people at risk of serious harm from breathing unhealthy, polluted air.

More than 2,000 peer-reviewed studies have been published since the EPA last reviewed the air quality standards for particle pollution a decade ago. These studies reconfirm prior research showing that exposure to particle pollution, whether short-term or long-term, causes illness, increases hospital admissions, and leads to premature death. Significantly, the studies also document that harm occurs even when pollution levels are well below both the current and proposed standards, showing that the EPA must set a much lower standard to truly protect public health. Those most vulnerable to particle pollution include children, the elderly, and people with certain chronic conditions such as asthma, heart disease, and diabetes.

The American Lung Association and much of the medical community are not alone in recognizing the need for the EPA to issue tighter standards. Notably, the EPA's staff scientists and an outside committee recommended substantially strengthening the standards after having extensively reviewed the science.

Despite this evidence and the support of a key advisory group and the EPA staff, last December the EPA proposed leaving the current annual standard of 15 micrograms/cubic meter ($\mu\text{g}/\text{m}^3$) in place and reducing the daily standard only to 35 $\mu\text{g}/\text{m}^3$. The American Lung Association, by contrast, recommends lowering the annual standard to 12 $\mu\text{g}/\text{m}^3$ and the daily standard to 25 $\mu\text{g}/\text{m}^3$, the strongest, most protective levels under EPA consideration. Lowering both standards substantially is critical to protecting public health, as the annual standard limits chronic, long-term exposure to particle pollution, whereas the daily standard limits short-term peaks.

Using EPA data from particle pollution monitors in counties nationwide from 2002-2004, this report analyzes the public health consequences of four different pairs of annual and daily standards. Specifically, we do a side-by-side comparison of the current standards, the EPA's proposed standards, a pair of standards drawn

from the middle of the ranges considered by the EPA, and our recommended standards. We estimate the total number of people protected on the county, state, and national levels under each of these pairings as well as the number of people protected on the state and national levels for eight sensitive groups: those under 18, those over 65, and those with pediatric asthma, adult asthma, chronic bronchitis, emphysema, heart disease, or diabetes.

Our analysis shows that both the current and proposed standards leave far too many people at risk from particle pollution. Adopting the ALA-recommended standards would double the number of people protected as compared to the proposed standards and triple the number protected as compared to the current standards—a protective pattern that holds true both for the general population and for sensitive groups. Major findings include the following:

- The Lung Association-recommended standards for particle pollution would protect 159 million people nationwide. By contrast, the current standards protect only 53 million people, and the EPA’s proposed standards would protect only 82 million people.
- Some 77 million Americans, more than a quarter of the U.S. population, would be left at risk from particle pollution under the EPA’s proposed standards as compared to the Lung Association-recommended standards.
- The Lung Association-recommended standards would protect about 40.5 million children, 18.3 million elderly, 3.4 million children with asthma, 9.7 million adults with asthma, 4.9 million people with chronic bronchitis, 1.9 million people with emphysema, 38.6 million people with heart disease, and 8.1 million people with diabetes.
- About 19.5 million children, 8.7 million elderly, 1.6 million children with asthma, 4.6 million adults with asthma, 2.4 million people with chronic bronchitis, 0.9 million people with emphysema, 18.8 million people with heart disease, and 3.9 million people with diabetes would be left at risk from particle pollution under the EPA’s proposed standards as compared to the Lung Association-recommended standards.

The EPA explored the risks in nine specific U.S. cities in its own analysis of the risk of premature death from particle pollution from the proposed standard. The EPA’s own analysis bears out the critical conclusion: the standards recommended by the Lung Association provide far more protection than the EPA’s proposal. As the risk assessment shows, the EPA’s proposed standards would reduce the death toll—more than 4,700 premature deaths per year under the current standards in these cities alone—by only 22 percent, whereas the Lung Association-recommended standards would mean 86 percent fewer deaths. Although the EPA didn’t assess the risk of early death from particle pollution nationwide, it is clear that the proposed standard would allow thousands to die prematurely.

The EPA has reviewed thousands of new scientific studies and concluded that adverse health effects are occurring at levels below the current standards. With all of this evidence, there is no room for doubt: the current particle standards are far

too weak to protect public health and the EPA's proposal would do little better. Too many Americans in communities nationwide would remain breathing dangerous levels of particle pollution, amounts that scientists have already found harmful. Setting new particle standards is the most far-reaching environmental health decision the EPA will make this year. Consistent with the science and the law, the EPA should adopt the strongest standards under consideration, as we recommend and as the nation's leading public health authorities and air pollution researchers agree. Anything less will leave far too many people at risk.

¹ For simplicity, we use the term "particle pollution" throughout this report with reference to fine particles, or PM_{2.5}. The report does not address coarse particles except as specified herein.

Health Effects of Particle Pollution

We've all had the experience of sitting in traffic or driving down a highway behind a large truck with black fumes spewing from the tailpipe. You've probably wondered just what that exhaust is doing to you. Scientists have been asking the same question for years now, and the more we learn, the more we realize the severity of the threat.

The dirty, smoky exhaust that makes us blink and cough is just one manifestation of particle pollution, one of the most common and hazardous air pollutants in the U.S. Studies conducted over the past decade confirm that exposure to particle pollution, whether short-term or long-term, causes illness, hospitalization, and premature death. Particle pollution seriously interferes with the growth and work of the lungs and is linked to a wide range of illnesses including diabetes, stroke, heart disease, lung cancer, and asthma attacks. And, most significantly, it can take years off your life.

More than 2,000 peer-reviewed studies have been published since 1996, when the EPA last reviewed the standards for particle pollution, including numerous studies that show the occurrence of harmful health effects even at levels well below the current standards. The evidence is in, and there is no room for doubt: Particle pollution can make the air unfit to breathe, posing a serious threat to the health and lives of Americans nationwide.

Background

What is particle pollution?

Particle pollution refers to a combination of fine solids and aerosols that are suspended in the air we breathe. Although we often think of particles as solids, such as dust, ash, and soot, some particles are completely liquid, and others are solids suspended in liquids. As the EPA puts it, particles are "a mixture of mixtures."¹ The mixtures differ between the eastern and western U.S. For example, eastern states have more sulfate particles than western ones, largely due to the high levels of sulfur dioxide emitted by coal-fired power plants. By contrast, in Southern California, nitrate particles from motor vehicle exhaust constitute a larger proportion of the mix.²

Researchers categorize particles of concern—those small enough to be inhaled into the lungs—according to size. Coarse particles range between 2.5 and 10 microns in diameter (PM_{10-2.5}), fine particles are 2.5 or fewer microns in diameter (PM_{2.5}), and ultrafine particles are less than .1 micron in diameter. By comparison, the average diameter of a human hair is 70 microns.

Where does particle pollution come from?

Particle pollution is generally produced through two separate processes: mechanical

and chemical. Mechanical processes, which break bigger bits of material into smaller bits, primarily form coarse particles. Major instigators include dust storms, construction and demolition, mining operations, agriculture, and coal and oil combustion.

By contrast, chemical processes in the atmosphere primarily form fine and ultrafine particles. When combustion sources burn fuels, gases are emitted that may vaporize and condense or react with other gases or particles in the atmosphere to form these particles. Burning fossil fuels in factories, power plants, steel mills, smelters, and diesel- and gasoline-powered motor vehicles and equipment generates a large part of the raw materials for fine and ultrafine particles. Other major sources are wood-burning residential fireplaces and stoves, forest fires, and the burning of agricultural fields.

Health Effects

What can particles do to your health?

Unfortunately, particle pollution is as hazardous as it is widespread. Because of their size, fine particles can evade the body's natural defenses, such as coughing and sneezing, and penetrate deep into the lungs. Ultrafine particles can enter the bloodstream via the lungs.³ Over the past decade, study upon study has shown that exposure to particle pollution, whether short-term or long-term, causes illness, hospitalization, and premature death. Exposure also worsens asthma; causes wheezing, coughing, and respiratory irritation in those with sensitive airways; and triggers both cardiac arrhythmias (irregular heartbeat) and heart attacks. Indeed, the body responds to particles much as it does to cigarette smoke, which helps explain why particle pollution can cause heart attacks and strokes.⁴

Research on particle pollution typically focuses on either “short-term” or “long-term” exposures. Short-term exposure occurs when particle levels spike over a period of a few hours to a few days due to relatively infrequent events. Long-term exposure is chronic exposure to particle levels found in the air on a routine, year-round basis.

What are the effects of short-term exposure?

Hundreds of community health studies from cities throughout the U.S. and around the world have indicated that short-term increases in particle pollution are associated with a wide range of adverse health effects, including premature death. Notably, such deaths, which can occur on the same day as the increase in particle levels or within one to two months afterwards, would not have occurred if the air were cleaner.⁵ Short-term exposure also diminishes lung function; causes greater use of asthma medications; and increases school absenteeism, emergency room visits, and hospital admissions. Other adverse effects include coughing, wheezing, cardiac arrhythmias, and heart attacks. A sampling of recent studies shows that short-term increases in particle pollution have been linked to:

- death from respiratory and cardiovascular causes, including strokes;^{6,7,8,9,10,11,12}
- increased numbers of heart attacks, especially among the elderly and in people with heart conditions;^{13,14}

- increased hospital admissions for elderly people with heart or lung disease¹⁵
- increased hospitalization for cardiovascular disease, including strokes and congestive heart failure;^{16,17,18}
- increased emergency room visits for patients suffering from acute respiratory ailments;¹⁹
- inflammation of lung tissue in young, healthy adults;²⁰
- increased hospitalization for asthma among children; and^{22,22,23}
- increased severity of asthma attacks in children.²⁴

What are the effects of long-term exposure?

A large body of scientific research shows that long-term exposure to particle pollution is associated with a wide range of adverse health effects, including premature death. Indeed, studies document the deadly impact of chronic exposure to particle pollution at levels common in the U.S. today²⁵ and show that such exposure can take one to three years off a person's life.²⁶ Other impacts range from premature births to serious respiratory disorders. A sampling of current studies shows that long-term exposure to particle pollution has been linked to:

- increased risk of death,^{27,28,29} including from lung cancer³⁰ and cardiovascular disease;³¹
- significant damage to the small airways of the lungs;³²
- slowed lung function growth in children and teenagers,^{33,34}
- increased hospital admissions for elderly people with heart or lung disease;³⁵
- increased hospitalization for asthma attacks for children living within 200 yards of roads with heavy truck or trailer traffic;³⁶ and
- increased risk of premature birth.³⁷

Moreover, the risks of long-term exposure to particle pollution may be even greater than previously thought. Earlier studies of the long-term health risks relied on estimates of the average exposure in a given community—estimates that new evidence indicates may be far too low. In a study tracking 23,000 residents of Los Angeles and using data regarding exposure from the nearest monitors rather than an average exposure estimate, researchers found that the risk of premature death from particle pollution may be three times higher than previously reported. Indeed, for *each* 10 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) increase in particle pollution, the risk of death from any cause rose by 11-17 percent, and the risk of death

from ischemic heart disease rose by 25-39 percent.³⁸

Fortunately, though, the latest research also shows that reducing particle pollution saves lives, including reducing them to levels below the current annual standard. A major long-term study published in March 2006 found that the total number of deaths from all causes decreased following reductions in particle levels, as did the risk of death from heart disease and lung disease. Indeed, for every reduction of one $\mu\text{g}/\text{m}^3$ in the annual average levels of particle pollution, an average of three percent fewer people died.³⁹

Who is at risk?

Anyone living in an area with high levels of particle pollution is at risk. People at the greatest risk from exposure to particle pollution include children; the elderly; people with heart disease; people with sensitive airways, as exposure to particle pollution can cause wheezing, coughing, and respiratory irritation; and people with lung disease such as asthma and chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema. Newer research has shown that diabetics are also at higher risk from particle pollution.⁴⁰ Furthermore, recent studies show that the health effects of particle pollution may be more far reaching than was previously understood. Studies show adverse health effects at even lower concentrations than were previously believed to be harmful, including at levels well below the current standards.

Focusing on Children's Health

Children may look like miniature adults, but they're not. Air pollution is especially dangerous to them because their lungs are growing and because they are so active.

Just like the arms and legs, the largest portion of a child's lungs grow long after birth. Eighty percent of the lung's air sacs—the alveoli, where the life-sustaining feeding of oxygen to the blood takes place—develop after birth, and neither the lungs nor alveoli finish growing until adulthood.⁴¹ In addition, the bodily defenses that help adults fight off infections are still developing in children,⁴² so they have more respiratory infections, which seems to increase their susceptibility to air pollution.⁴³

Furthermore, children do not behave like adults, which also affects their vulnerability. They are outside for longer periods and are usually more active when outdoors. Consequently, they inhale more polluted outdoor air than adults typically do.⁴⁴

In 2004, the World Health Organization (WHO) published an in-depth look at the research on children's health and air pollution. With regard to particles, the WHO concluded that particle pollution causes a host of harmful effects, including:

- infant deaths;
- decreases in short-term and long-term lung function rates and levels, critical measures of how well a child will breathe throughout his or her lifespan;

- aggravation of asthma;
- increased prevalence and incidence of cough and bronchitis; and
- increased risk of upper and lower respiratory infections.⁴⁵

Another study published in 2004, the California Children's Health Study, looked at the long-term effects of particle pollution on teenagers growing up in Southern California. Tracking 1,759 children aged 10-18, researchers found that those who grew up in more polluted areas faced an increased risk of having underdeveloped lungs. On average, lung function dropped to 20 percent below what was expected for the child's age, which is similar to the impact of growing up in a home with parents who smoked.⁴⁶

Fortunately, recent research, including two studies just published in 2005 and 2006, indicates that reducing particle pollution has tangible protective effects on children's health. In Switzerland, where particle pollution dropped during a period in the 1990s, researchers who tracked 9,000 children over a nine-year period found that the children had fewer episodes of chronic cough, bronchitis, common cold, and conjunctivitis in years of lower pollution.⁴⁷ In Germany, where reunification led to changes in the levels and sources of particles in East and West Germany, researchers studied the impact of particle pollution on the lungs of six-year olds from both parts of the country. They found that total lung capacity improved with lower particle levels but that increases in traffic-generated particles counteracted this effect for children living near busy roads.⁴⁸

Adverse Effects at Levels Below Current Standards

Notably, numerous studies have documented the occurrence of adverse health effects at levels well below the current standards. A sampling of these studies follows:

- **American Cancer Society Cohort Study: Study of long-term exposure covering** half a million people in 100 American cities over 16 years; shows increased risk of premature death at levels below current standards.⁴⁹
- **Harvard Six Cities Study:** Study of long-term exposure in six towns in the eastern U.S.; shows increased risk of premature death even at levels far below current standards.⁵⁰
- **Eight Canadian Cities Study:** Study of short-term exposure in the eight largest Canadian cities; links increased deaths to short-term particle increases at levels well below current standards.⁵¹
- **Medicare Study:** Study of 204 U.S. counties; shows increased hospital admissions for elderly people with heart or lung disease at levels below current (and proposed) short- and long-term standards.⁵²

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- ⁵²Domenici F, Peng RD, Bell ML, Pham L, McDermott A, Zeger SL, Samet JM. Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. *JAMA* 2006;10:1127-1134.

Protecting Communities from Particle Pollution

The EPA is on the verge of a decision that will affect the health and lives of Americans in every community across the nation. By September 27, 2006, the agency must issue new air quality standards for particle pollution. Under the Clean Air Act, the EPA is required to set these standards at levels that protect public health, including the health of susceptible populations, with an adequate margin of safety. Unfortunately, the EPA has instead proposed standards that leave far too many people at risk of serious harm from breathing unhealthy, polluted air.

National Ambient Air Quality Standards

The National Ambient Air Quality Standards (NAAQS), the cornerstone of our nation's efforts to achieve healthy air, are official limits on common outdoor air pollutants set by the EPA. Under the Clean Air Act, these standards must be set at levels that protect the public's health, including the health of populations at increased risk from exposure to air pollution, with an adequate margin of safety. The standards are important because they apply nationwide, driving state and local efforts to reduce harmful air pollution.

Under the Clean Air Act, the EPA must review existing air quality standards every five years to ensure that they reflect the latest scientific knowledge and update them as needed. The review process has four steps:

- First, the EPA compiles and interprets recent research on the pollutant in question in a report called "criteria document," which is reviewed by an outside panel of experts, the Clean Air Scientific Advisory Committee.
- Second, EPA staff scientists analyze the new science, prepare a risk assessment, and make policy recommendations regarding the standards for the pollutant
- Third, the EPA Administrator reviews the staff report and issues proposed standards for the pollutant.
- Fourth, following a period of public comment, the EPA Administrator issues final standards for the pollutant.

What does the standard mean for air pollution? It sets the bar that all counties in the nation must ultimately meet. The Clean Air Act requires that all areas must try to have air pollution that is at or below that amount.

Once the standard is official, the EPA then compares each counties' air pollution monitoring to the standard and formally tells the states which counties with too much air pollution, a process called "designating 'nonattainment' areas." For areas that have too much air pollution, then the states must develop workable plans to clean up the air.

Notably, air quality standards must be based solely on the health effects of a given air pollutant. Other factors, such as costs and technical feasibility, are addressed during the implementation planning process, the stage in which states develop plans for meeting the standards.

Current Standards for Particle Pollution

In 1997, after an exhaustive review of scientific studies showing that very small particles posed particularly great health risks, including premature death, the EPA adopted new air quality standards for particles 2.5 or fewer microns in diameter (fine particles, or PM_{2.5}). Specifically, the agency adopted an annual standard of 15 µg/m³ to limit chronic, long-term exposure to particle pollution and a daily standard of 65 µg/m³ to limit short-term peaks.

The EPA did not complete the next stage of the process until 2005, when it finally announced which counties were in violation of the standards. Planning to reduce the pollution levels to meet the standards must be completed by 2008 and is expected to focus on controlling combustion sources, including diesel trucks, cars, steel mills, and coal-fired power plants.

Current Review of the Particle Standards

In 1998, the EPA renewed its review of the air quality standards for particle pollution, as required by the Clean Air Act. When the agency failed to meet the Clean Air Act's five-year deadline, however, the American Lung Association (ALA) and a coalition of environmental organizations filed suit to compel the EPA to complete its review of the science and standards in a timely manner. Pursuant to a consent decree, the EPA finally issued proposed standards last December and must issue a final decision by September 27, 2006.

The EPA completed the first step of the review process when a group of outside scientists approved a formal assessment of the conclusions of the science in October 2004. This assessment, the agency's *Air Quality Criteria for Particulate Matter*, is an exhaustive 2,000-page compendium and evaluation of research since 1996 on the effects of particle pollution, and was the most extensively vetted such document in EPA history. It concluded that exposure to particle pollution, whether over a short period or day-in and day-out, causes adverse health effects, including premature death, at levels below the current standards.¹

The second step of the review process was completed on June 30, 2005, when the EPA released the formal staff policy analysis, called the Staff Paper. As the criteria document had originally stated, the Staff Paper concluded that the current standards for particle pollution do not protect public health—a conclusion endorsed by the Clean Air Scientific Advisory Committee, the independent panel charged with reviewing both the criteria document and Staff Paper. As a result, both the EPA's staff scientists and the committee recommended substantially

strengthening the standards. EPA's staff scientists put forth two options for consideration:²

- Option A: Retain the annual standard at 15 $\mu\text{g}/\text{m}^3$ and lower the daily standard to 25-30 $\mu\text{g}/\text{m}^3$ if measured at the 98th percentile, or 30-35 $\mu\text{g}/\text{m}^3$ if measured at the 99th percentile; or
- Option B: Lower the annual standard to 12-14 $\mu\text{g}/\text{m}^3$ and the daily standard to 30-40 $\mu\text{g}/\text{m}^3$.

Notably, the EPA's staff scientists recommended tying the level of the daily standard to the form of the standard—the number of high-pollution days excused from consideration when determining compliance. At the 98th percentile, the form currently used, the 21 most polluted days are excused over the three-year period used to assess compliance, whereas at the 99th percentile only 11 days are excused. Not surprisingly, the staff found that the 99th percentile better protected public health but recommended selecting a more stringent daily particle level if the EPA chose to retain the more lenient 98th percentile form.

The Clean Air Scientific Advisory Committee narrowed the range recommended by the EPA's staff scientists. Specifically, the committee recommended an annual standard of 13-14 $\mu\text{g}/\text{m}^3$ and a daily standard of 30-35 $\mu\text{g}/\text{m}^3$.

The EPA also prepared a risk assessment estimating the health impacts of the current standards as well as alternative potential combinations of annual and daily standards. Significantly, the EPA estimated that, at the level of the current standards, more than 4,700 premature deaths occur every year in nine cities alone: Detroit, Los Angeles, Philadelphia, Pittsburgh, St. Louis, Boston, Phoenix, Seattle, and San Jose. Extrapolating these data would mean many thousands of additional deaths nationwide.

EPA's Inadequate Proposal

Last December, three years late, the EPA finally proposed new standards for particle pollution. The agency's proposal fails to do what the Clean Air Act requires: protect public health with an adequate margin of safety.

Despite clear evidence of harm at levels well below both the current annual and daily standards, the EPA proposed lowering only the daily standard and leaving the current annual standard of 15 $\mu\text{g}/\text{m}^3$ in place. Moreover, with respect to the daily standard, the EPA proposed a standard of 35 $\mu\text{g}/\text{m}^3$ and retaining the 98th percentile form. Never before has the EPA proposed weaker air quality standards than those recommended by its own staff scientists and advisory committee.

Significantly, recent research clearly confirms the occurrence of harmful effects not only at the level of the current standards but also below the level of the proposed standards. For instance, a study published in the *Journal of the American Medical Association* in March 2006 documented the link between particle pollution and hospital admissions for elderly people with heart and lung disease at levels below the proposed standards. Specifically, the average annual particle level in the 204 counties encompassed by the study was 13.4 $\mu\text{g}/\text{m}^3$, and

on most days daily particle levels were below $35 \mu\text{g}/\text{m}^3$.³ Moreover, significant associations with increased admissions persisted even after excluding all days above $35 \mu\text{g}/\text{m}^3$, the level of the proposed standards.⁴ Notably, this study is the largest epidemiological study to date of the effects of contemporary concentrations of fine particle pollution.

The American Lung Association Recommendation

Given the evidence of adverse health effects at levels well below both the current and proposed standards, the American Lung Association recommends an annual standard of $12 \mu\text{g}/\text{m}^3$ and a daily standard of $25 \mu\text{g}/\text{m}^3$, measured at the 99th percentile. Significantly, these standards are endorsed by an unprecedented coalition of the nation's leading public health authorities, including the American Medical Association, the American Cancer Society, the American Diabetes Association, and the American Nurses Association,⁵ as well as by more than 100 of the nation's leading air pollution researchers.⁶ Moreover, these levels are consistent with the standards adopted (in the case of the annual standard) or proposed (in the case of the daily standard) by the California Air Resources Board in 2002.

The EPA's own risk assessment of premature death from particle pollution in nine U.S. cities bears out the conclusion that the ALA-recommended standards provide far more protection than the agency's proposal. According to the risk assessment, the EPA's proposed standards would reduce the death toll by 22 percent, from 4,729 premature deaths per year under the current standards to 3,697. By contrast, the ALA-recommended standards would reduce premature deaths by 86 percent, to 644 per year.⁷

A Note on Coarse Particles

Air quality standards for larger particles, called coarse particles (PM_{10}) are also currently under review. Coarse particles are associated with a number of adverse health effects, including decreased lung function, increased hospitalization for respiratory infections in children, increased hospital admissions for respiratory disease in the elderly, increased hospital admissions for heart disease, and increased risk of premature death.

Unfortunately, last December, the EPA proposed a new, daily coarse particle standard ($\text{PM}_{10-2.5}$) of $70 \mu\text{g}/\text{m}^3$ that fails to protect public health as required by the Clean Air Act. In light of studies documenting harmful health effects at levels below this standard, the proposal is clearly inadequate. Moreover, the EPA improperly proposes to apply the coarse particle standard only to large urban areas and to exempt mining and agricultural sources. To protect the health of all Americans, as the law requires, the EPA must set a coarse particle standard that applies nationally and without exemptions. Finally, rather than limiting monitoring for coarse particles, the EPA needs to ensure comprehensive monitoring in both urban and rural areas.

¹ U.S. Environmental Protection Agency. Air Quality Criteria for Particulate Matter. Volume I, EPA/600/P-99/002aF, and Volume II, EPA/600/P-99/002bF. October 2004.

² U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper. EPA

452/R-05-005. June 2005.

³ Domenici F, Peng RD, Bell ML, Pham L, McDermott A, Zeger SL, Samet JM. Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. *JAMA* 2006;10:1127-1134.

⁴ Letter from Francesca Domenici to U.S. EPA, March 23, 2006. Docket ID No. EPA-HQ-OAR-2001-0017-0988.

⁵ See letters and comments available at <http://www.cleanairstandards.org/article/articleprint/472/-1/41>.

⁶ Letter to U.S. Environmental Protection Agency Administrator Stephen L. Johnson, December 5, 2005. Available at <http://www.cleanairstandards.org/article/articleview/402/1/14/>.

⁷ American Lung Association assessment drawn from U.S. Environmental Protection Agency, Particulate Matter Health Risk Assessment for Selected Urban Areas, December 2005, EPA 452/R-05-007A, Appendix A: Air Quality Assessment. Available at <http://www.cleanairstandards.org/article/articleview/402/1/14/>.

Assessing the Standards

This report analyzes the public health consequences of adopting various standards for particle pollution. Using monitoring data on particle pollution levels, this report examined both the current standards and three alternative pairs of annual and daily standards in the ranges under EPA consideration to determine how much protection each pair of standards provides.

As this analysis indicates, more than 53 million people—18% of the U.S. population—live in counties where the air fails to meet current standards for particle pollution, putting their health and lives at risk. Unfortunately, as large as this number is, it is only the tip of the iceberg. As study after study has shown, particle pollution causes harmful health effects even at levels well below the current standards.

The standards of the EPA issued will affect millions of Americans. Whether the EPA selects standards at the upper or lower end of the ranges under consideration will mean more or less illness, hospitalization, and premature death from particle pollution. **By selecting standards at the lower end, the strongest standards under consideration, the EPA can protect the greatest number of people—three times the number protected under the current standards, as this analysis shows.**

Methodology

This review analyzed four sets of standards: 1) the current standards of 15 $\mu\text{g}/\text{m}^3$ (annual) and 65 $\mu\text{g}/\text{m}^3$ (daily); 2) the EPA's proposed standards (15/35); 3) a pair of standards drawn from the middle of the annual and daily ranges considered by the EPA (13/30); and 4) the American Lung Association-recommended standards (12/25), the strongest, most protective levels under EPA consideration. Using EPA data on particle pollution levels collected and averaged over a three-year period, from 2002-2004, from all counties in the U.S. with particle monitors, the analysis determined which counties are in violation of the current standards and which would be in violation under each alternative set of standards. Then, using population estimates from the U.S. Census Bureau, the analysis estimated the total number of people protected on the county, state, and national levels under each pair of standards. Finally, using population estimates and estimates of the prevalence of various chronic diseases, the analysis estimated the number of people protected by state and nationally for eight groups at increased risk from particle pollution due to age or a chronic health condition: those under 18; those 65 and older; and those with pediatric asthma, adult asthma, chronic bronchitis, emphysema, heart disease, or diabetes.

Notably, this analysis covers only those counties with air quality monitors for particle pollution. While the monitoring network the EPA established in the late

1990s following the adoption of the current particle standards is not comprehensive, covering less than a quarter of U.S. counties (although nearly three-quarters of the U.S. population), it provides a critical window into levels of particle pollution nationwide. Air pollution, after all, does not respect political boundaries and may be a public health hazard regardless of whether a monitor is present in a given community. For 2002-2004, the time period of the analysis, there were 719 counties with particle monitors, and complete monitoring data were available for 533 of these counties. More information about this methodology is contained in Appendix A.

National and State Tables

Tables form the core of the report, with two national summary tables and two tables for each state. The first national summary table (Table 1) lists the number of people and number of counties protected nationwide under each set of standards. The second national summary table (Table 2) lists the number of people protected nationwide in each of the eight at-risk groups under each set of standards.

The first table for each state identifies the counties with particle pollution monitors, provides the total population per county, and estimates the number of people per county in the eight at-risk groups listed above. Subtotals for each state of the total population per county and the number of people per county in each at-risk group are also included.

The second table for each state identifies which counties violate the current particle pollution standards and those that would violate the potential alternative standards examined in this report. (Counties for which monitoring data were insufficient to make this determination are indicated with an asterisk.) The table also identifies the number of people per county who are protected under the current standards and the number of people per county who would be protected under each of the proposed alternative standards. Subtotals for each state of the number of people and number of counties protected under each set of standards are also included.

Findings

For the four pairs of standards analyzed in this report, it is clear that the stronger the standards, the more protection they provide. As shown in Table 1, current standards for particle pollution protect only 53 million people, 18% of the U.S. population. The American Lung Association, the American Medical Association, the American Academy of Pediatrics, the American Thoracic Society, the American College of Chest Physicians, and numerous other public health and environmental organizations have recommended that the EPA select the strongest level of the standards that the Agency considered, standards that would protect 159 million people, or 54% of the U.S. population. By contrast, the EPA's proposed standards would protect 82 million people, 28% of the U.S. population. Even if EPA only proposed standards from the middle of the ranges under consideration, such as the 13/30 pair, they would protect substantially more people: 129 million, 44% of the U.S. population.

As these findings indicate, adopting the standards recommended by Lung

Association and much of the medical community would double the number of people protected as compared to the proposed standards and triple the number protected as compared to the current standards. These differences are significant—and stark. Quite simply, adopting the EPA-proposed standards instead of those recommended by Lung Association would leave 77 million Americans, more than a quarter of the U.S. population, at risk from particle pollution.

Stronger standards also provide more protection for susceptible populations at increased risk from particle pollution. Here, too, as is the case for the general population, adopting the ALA-recommended standards doubles the number of people protected by the EPA-proposed standards and triples the number protected under the current standards. As shown in Table 2:

- *Children:* The Lung Association recommends standards that would protect about 40.5 million children under 18, whereas the proposed standards protect only 21 million and the current standards only 13.9 million. Compared to the more protective standards, the proposed standards leave 19.5 million children under 18 at risk from particle pollution.
- *Elderly:* The Lung Association recommends standards that would protect about 18.3 million people aged 65 or older, whereas the proposed standards protect only 9.6 million and the current standards only 6 million. Compared to the more protective standards, the proposed standards leave 8.7 million elderly people at risk from particle pollution.
- *Children with asthma:* The Lung Association recommends standards that would protect about 3.4 million children with asthma, whereas the proposed standards protect only 1.8 million and the current standards only 1.2 million. Compared to the more protective standards, the proposed standards leave 1.6 million children with asthma at risk from particle pollution.
- *Adult asthma:* The Lung Association recommends standards that would protect about 9.7 million adults with asthma, whereas the proposed standards protect only 5.1 million and the current standards only 3.2 million. Compared to the more protective standards, the proposed standards leave 4.6 million adults with asthma at risk from particle pollution.
- *Chronic bronchitis:* The Lung Association recommends standards that would protect about 4.9 million people with chronic bronchitis, whereas the proposed standards protect only 2.5 million and the current standards only 1.6 million. Compared to the more protective standards, the proposed standards leave 2.4 million people with chronic bronchitis at risk from particle pollution.
- *Emphysema:* The Lung Association recommends standards that would protect about 1.9 million people with emphysema, whereas the proposed standards protect only 1.0 million and the current standards only 0.6 million.

Compared to the more protective standards, the proposed standards leave 0.9 million people with emphysema at risk from particle pollution.

- *Heart disease:* The Lung Association recommends standards that would protect about 38.6 million people with heart disease, whereas the proposed standards protect only 19.8 million and the current standards only 12.7 million. Compared to the more protective standards, the proposed standards leave 18.8 million people with heart disease at risk from particle pollution.
- *Diabetes:* The Lung Association recommends standards that would protect about 8.1 million people with diabetes, whereas the proposed standards protect only 4.2 million and the current standards only 2.7 million. Compared to the more protective standards, the proposed standards leave 3.9 million people with diabetes at risk from particle pollution.

Conclusion

Setting new air quality standards for particle pollution is the most far-reaching environmental health decision the EPA will make this year. Over the past decade, study after study has shown that exposure to particle pollution causes illness, hospital admissions, and premature death. Studies have also documented the harmful health effects of particle pollution at levels well below both the current and proposed standards. Moreover, the EPA's own risk assessment shows that the agency's proposal would do much less to reduce premature deaths from particle pollution than the standards recommended by the American Lung Association and other medical and public health organizations. Finally, our analysis shows that the standards recommended by the Lung Association would triple the number of people protected as compared to the current standards and protect twice as many people as the EPA's proposal. This is also true for people at increased risk of harmful effects from particle exposure—children, the elderly, and those with heart disease, lung disease, and diabetes.

With all of this evidence, there is no room for doubt that the current standards are far too weak to protect public health. We also know that the EPA's proposal would do little better, leaving Americans in communities nationwide subject to levels of particle pollution that scientists have already found harmful. The science is in. And the law is clear: air quality standards must protect public health, including the health of susceptible populations, with an adequate margin of safety.

Consistent with the science and the law, the EPA should adopt the strongest particle standards under consideration, as we recommend and as the nation's leading public health authorities and air pollution researchers agree. Anything less would leave the health and lives of millions of Americans at risk.

State Tables

National	28	Missouri	80
Alabama	30	Montana	82
Alaska	32	Nebraska	84
Arizona	34	Nevada	86
Arkansas	36	New Hampshire	88
California	38	New Jersey	90
Colorado	40	New Mexico	92
Connecticut	42	New York	94
Delaware	44	North Carolina	96
District of Columbia	46	North Dakota	98
Florida	48	Ohio	100
Georgia	50	Oklahoma	102
Hawaii	52	Oregon	104
Idaho	54	Pennsylvania	106
Illinois	56	Rhode Island	108
Indiana	58	South Carolina	110
Iowa	60	South Dakota	112
Kansas	62	Tennessee	114
Kentucky	64	Texas	116
Louisiana	66	Utah	118
Maine	68	Vermont	120
Maryland	70	Virginia	122
Massachusetts	72	Washington	124
Michigan	74	West Virginia	126
Minnesota	76	Wisconsin	128
Mississippi	78	Wyoming	130

NATIONAL

Total Population Protected, by County

	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
National Total Population Protected	53,054,643	81,899,762	129,322,328	159,103,229
Number of US counties protected	68	126	281	425

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ²	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	53,054,643	13,856,441	6,032,060	1,173,640	3,208,987	1,628,006	627,882	12,672,297	2,665,505
EPA proposal	81,899,762	20,996,760	9,555,313	1,778,428	5,052,488	2,537,319	987,198	19,843,470	4,179,938
Mid-range	129,322,328	33,071,207	14,898,560	2,801,135	7,942,261	4,012,158	1,558,156	31,375,907	6,613,938
Lung Association Recommended	159,103,229	40,547,826	18,324,259	3,434,405	9,703,042	4,940,390	1,917,162	38,604,353	8,139,274

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

ALABAMA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Baldwin	156,701				156,701
Clay	14,092			14,092	14,092
Colbert	54,824			54,824	54,824
DeKalb	66,935			66,935	66,935
Escambia	38,336				38,336
Etowah	103,250			103,250	103,250
Houston	92,947	ND	ND	ND	ND
Jefferson	658,495	658,495	658,495	658,495	658,495
Madison	293,072			293,072	293,072
Mobile	400,526				400,526
Montgomery	222,559			222,559	222,559
Morgan	113,211				113,211
Russell	49,262	49,262	49,262	49,262	49,262
Shelby	165,677			165,677	165,677
Sumter	14,141				14,141
Talladega	80,277			80,277	80,277
Tuscaloosa	167,104	ND	ND	ND	ND
Walker	70,005	ND	ND	ND	ND
Alabama total population protected		707,757	707,757	1,708,443	2,431,358
Number of Alabama counties protected		2	2	10	15

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	707,757	170,863	95,114	14,472	46,391	22,873	9,434	185,317	39,315
EPA proposal	707,757	170,863	95,114	14,472	46,391	22,873	9,434	185,317	39,315
Mid-range	1,708,443	415,223	217,526	35,170	111,394	54,734	22,122	437,251	92,894
Lung Association Recommended	2,431,358	596,706	313,557	50,543	158,200	77,815	31,651	623,266	132,611

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

ALASKA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Anchorage	272,687				
Fairbanks North Star	85,930		85,930	85,930	85,930
Juneau	31,118	ND	ND	ND	ND
Matanuska-Susitna	72,278	ND	ND	ND	ND
Skagway-Hoonah-Angoon	3,136	ND	ND	ND	ND
Yukon-Koyukuk	6,334	ND	ND	ND	ND
Alaska total population protected		0	85,930	85,930	85,930
Number of Alaska counties protected		0	1	1	1

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	85,930	25,131	4,574	2,129	5,515	2,385	735	16,579	3,433
Mid-range	85,930	25,131	4,574	2,129	5,515	2,385	735	16,579	3,433
Lung Association Recommended	85,930	25,131	4,574	2,129	5,515	2,385	735	16,579	3,433

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

ARIZONA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Cochise	124,013				
Coconino	122,754	ND	ND	ND	ND
Gila	51,422				
Maricopa	3,501,001				3,501,001
Pima	907,059				
Pinal	214,359				
Santa Cruz	40,784				40,784
Arizona total population protected		0	0	0	3,541,785
Number of Arizona counties protected		0	0	0	2

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	3,541,785	981,517	394,693	83,134	180,482	105,601	40,291	815,358	170,696

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

ARKANSAS

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Arkansas	20,130				20,130
Ashley	23,687				
Craighead	86,191	ND	ND	ND	ND
Crittenden	51,488			51,488	51,488
Faulkner	95,113				95,113
Garland	92,141	ND	ND	ND	ND
Jefferson	82,656	ND	ND	ND	ND
Marion	16,383	ND	ND	ND	ND
Miller	42,468	ND	ND	ND	ND
Mississippi	48,485				48,485
Phillips	24,309				24,309
Polk	20,092				
Pope	55,933				55,933
Pulaski	365,913			365,913	365,913
Sebastian	117,786				
Union	44,595				44,595
Washington	174,077	ND	ND	ND	ND
White	70,658				
Arkansas total population protected		0	0	417,401	705,966
Number of Arkansas counties protected		0	0	2	8

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	417,401	107,846	47,782	9,135	22,580	13,002	5,107	102,768	21,727
Lung Association Recommended	705,966	181,851	83,658	15,404	38,208	22,007	8,696	173,687	36,784

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

CALIFORNIA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Alameda	1,455,235		1,455,235	1,455,235	1,455,235
Butte	212,968		212,968	212,968	212,968
Calaveras	45,939				
Colusa	20,339		20,339	20,339	20,339
Contra Costa	1,009,144		1,009,144	1,009,144	1,009,144
El Dorado	172,889	ND	ND	ND	ND
Fresno	866,772	866,772	866,772	866,772	866,772
Humboldt	128,529				128,529
Imperial	152,448		152,448	152,448	152,448
Inyo	18,244			18,244	18,244
Kern	734,846	734,846	734,846	734,846	734,846
Kings	142,561	142,561	142,561	142,561	142,561
Lake	64,446				
Los Angeles	9,937,739	9,937,739	9,937,739	9,937,739	9,937,739
Mendocino	88,551				
Merced	237,005	237,005	237,005	237,005	237,005
Modoc	9,599	ND	ND	ND	ND
Mono	12,766	ND	ND	ND	ND
Monterey	414,629				
Nevada	97,660				
Orange	2,987,591	2,987,591	2,987,591	2,987,591	2,987,591
Placer	307,004			307,004	307,004
Plumas	21,359	ND	ND	ND	ND
Riverside	1,871,950	1,871,950	1,871,950	1,871,950	1,871,950
Sacramento	1,352,445		1,352,445	1,352,445	1,352,445
San Bernardino	1,921,131	1,921,131	1,921,131	1,921,131	1,921,131
San Diego	2,931,714		2,931,714	2,931,714	2,931,714
San Francisco	744,230		744,230	744,230	744,230
San Joaquin	649,868		649,868	649,868	649,868
San Luis Obispo	254,566				
San Mateo	699,216			699,216	699,216
Santa Barbara	401,851				
Santa Clara	1,685,188			1,685,188	1,685,188
Santa Cruz	250,633				
Shasta	177,816				
Solano	412,970		412,970	412,970	412,970

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Analysis based on 2002-2004 design values for PM_{2.5} (continued)

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Sonoma	468,450			468,450	468,450
Stanislaus	498,355	498,355	498,355	498,355	498,355
Sutter	86,760			86,760	86,760
Tulare	401,502	401,502	401,502	401,502	401,502
Ventura	797,699			797,699	797,699
Yolo	184,364				184,364
California total population protected		19,599,452	28,540,813	32,603,374	32,916,267
Number of California counties protected		10	20	27	29

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	19,599,452	5,540,171	1,942,289	469,252	1,077,572	573,762	210,465	4,338,392	906,435
EPA proposal	28,540,813	7,803,364	2,942,830	660,945	1,590,653	850,234	315,985	6,479,501	1,356,122
Mid-range	32,603,374	8,815,851	3,404,276	746,702	1,826,145	977,761	365,526	7,480,813	1,567,394
Lung Association Recommended	32,916,267	8,888,501	3,437,537	752,856	1,844,566	987,575	369,133	7,554,540	1,582,926

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

COLORADO

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Adams	389,857				
Arapahoe	522,812				
Archuleta	11,615				
Boulder	278,917				
Delta	29,774				
Denver	556,835				
El Paso	554,574				
Elbert	22,488				
Gunnison	14,166				
La Plata	46,468	ND	ND	ND	ND
Larimer	268,872				
Mesa	127,253	ND	ND	ND	ND
Pueblo	150,171				
Routt	21,012				
San Miguel	7,116				
Weld	219,257				
Colorado total population protected		0	0	0	0
Number of Colorado counties protected		0	0	0	0

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	0	0	0	0	0	0	0	0	0

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

CONNECTICUT

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Fairfield	903,291		903,291	903,291	903,291
Hartford	875,602			875,602	875,602
New Haven	845,694		845,694	845,694	845,694
New London	266,466			266,466	266,466
Connecticut total population protected		0	1,748,985	2,891,053	2,891,053
Number of Connecticut counties protected		0	2	4	4

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	1,748,985	430,632	235,533	36,475	127,513	56,393	23,431	458,691	97,617
Mid-range	2,891,053	701,579	395,788	59,424	211,582	93,779	39,134	764,358	162,745
Lung Association Recommended	2,891,053	701,579	395,788	59,424	211,582	93,779	39,134	764,358	162,745

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

DELAWARE

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Kent	138,752			138,752	138,752
New Castle	519,396	519,396	519,396	519,396	519,396
Sussex	172,216		172,216	172,216	172,216
Delaware total population protected		519,396	691,612	830,364	830,364
Number of Delaware counties protected		1	2	3	3

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	519,396	122,744	59,241	10,396	39,561	16,516	6,359	128,712	27,149
EPA proposal	691,612	158,595	92,264	13,433	52,583	22,593	9,206	181,464	38,473
Mid-range	830,364	193,506	108,961	16,390	62,937	26,930	10,908	215,475	45,654
Lung Association Recommended	830,364	193,506	108,961	16,390	62,937	26,930	10,908	215,475	45,654

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

DISTRICT OF COLUMBIA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Washington	553,523	553,523	553,523	553,523	553,523
District of Columbia Total Population Protected		553,523	553,523	553,523	553,523
Number of District of Columbia counties protected		1	1	1	1

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	553,523	109,547	67,171	9,279	40,361	18,237	6,886	140,637	29,238
EPA proposal	553,523	109,547	67,171	9,279	40,361	18,237	6,886	140,637	29,238
Mid-range	553,523	109,547	67,171	9,279	40,361	18,237	6,886	140,637	29,238
Lung Association Recommended	553,523	109,547	67,171	9,279	40,361	18,237	6,886	140,637	29,238

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

FLORIDA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Alachua	223,090				
Bay	157,949				157,949
Brevard	519,387				
Broward	1,754,893				
Citrus	130,465				
Duval	821,338				
Escambia	298,859				298,859
Hillsborough	1,101,261				
Lee	514,295				
Leon	243,867				243,867
Manatee	296,385	ND	ND	ND	ND
Marion	291,322				
Miami-Dade	2,363,600				
Orange	989,926				
Palm Beach	1,243,230				
Pinellas	928,537				
Polk	524,389				
Santa Rosa	138,276	ND	ND	ND	ND
Sarasota	355,477				
Seminole	391,449				
St. Lucie	226,816				
Volusia	478,670				
Florida total population protected		0	0	0	700,675
Number of Florida counties protected		0	0	0	3

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	700,675	159,870	85,062	13,541	39,541	22,572	8,811	176,011	37,307

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

GEORGIA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Bibb	155,170	155,170	155,170	155,170	155,170
Chatham	238,518			238,518	238,518
Clarke	103,951			103,951	103,951
Clayton	264,951	264,951	264,951	264,951	264,951
Cobb	654,005	654,005	654,005	654,005	654,005
DeKalb	675,725	675,725	675,725	675,725	675,725
Dougherty	95,681			95,681	95,681
Floyd	94,009	94,009	94,009	94,009	94,009
Fulton	814,438	814,438	814,438	814,438	814,438
Glynn	71,357				
Gwinnett	700,794	700,794	700,794	700,794	700,794
Hall	160,925			160,925	160,925
Houston	123,753			123,753	123,753
Lowndes	95,787				95,787
Muscogee	182,850			182,850	182,850
Paulding	105,936			105,936	105,936
Richmond	196,265			196,265	196,265
Walker	63,379	63,379	63,379	63,379	63,379
Washington	21,061			21,061	21,061
Wilkinson	10,191			10,191	10,191
Georgia total population protected		3,422,471	3,422,471	4,661,602	4,757,389
Number of Georgia counties protected		8	8	18	19

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	3,422,471	905,696	268,489	76,713	187,330	100,823	34,150	737,137	152,637
EPA proposal	3,422,471	905,696	268,489	76,713	187,330	100,823	34,150	737,137	152,637
Mid-range	4,661,602	1,233,713	398,629	104,495	255,001	138,034	47,909	1,018,739	211,562
Lung Association Recommended	4,757,389	1,258,682	407,563	106,610	260,273	140,861	48,888	1,039,359	215,825

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

HAWAII

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Honolulu	899,593				
Maui	138,221				
Hawaii total population protected		0	0	0	0
Number of Hawaii counties protected		0	0	0	0

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	0	0	0	0	0	0	0	0	0

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Ada	332,523				332,523
Bannock	75,672				75,672
Benewah	8,961	ND	ND	ND	ND
Boise	7,362	ND	ND	ND	ND
Bonner	39,872	ND	ND	ND	ND
Bonneville	89,653	ND	ND	ND	ND
Boundary	10,396	ND	ND	ND	ND
Canyon	158,038			158,038	158,038
Caribou	7,213	ND	ND	ND	ND
Franklin	12,199	ND	ND	ND	ND
Gem	15,963	ND	ND	ND	ND
Idaho	15,616	ND	ND	ND	ND
Kootenai	122,350	ND	ND	ND	ND
Latah	35,169	ND	ND	ND	ND
Lemhi	7,820	ND	ND	ND	ND
Nez Perce	37,823	ND	ND	ND	ND
Power	7,483			7,483	7,483
Shoshone	12,827		12,827	12,827	12,827
Twin Falls	67,935	ND	ND	ND	ND
Valley	7,970	ND	ND	ND	ND
Idaho total population protected		0	12,827	178,348	586,543
Number of Idaho counties protected		0	1	3	5

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	12,827	2,672	2,395	226	843	460	218	4,045	879
Mid-range	178,348	52,194	19,350	4,420	9,920	5,202	1,981	39,984	8,403
Lung Association Recommended	586,543	159,609	58,266	13,519	33,499	17,512	6,465	133,222	27,930

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

ILLINOIS

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Adams	66,916				66,916
Champaign	184,369				184,369
Cook	5,327,777	5,327,777	5,327,777	5,327,777	5,327,777
DuPage	928,718			928,718	928,718
Jersey	22,320	ND	ND	ND	ND
Kane	472,482			472,482	472,482
La Salle	112,335	*	*	*	112,335
Lake	692,895				692,895
Macon	110,980			110,980	110,980
Madison	264,350	264,350	264,350	264,350	264,350
McHenry	296,389			296,389	296,389
McLean	158,006				158,006
Peoria	182,418			182,418	182,418
Randolph	33,360				33,360
Rock Island	147,771				147,771
Sangamon	192,042			192,042	192,042
St. Clair	259,132	259,132	259,132	259,132	259,132
Will	613,849			613,849	613,849
Winnebago	286,788				286,788
Illinois total population protected		5,851,259	5,851,259	8,648,137	10,330,577
Number of Illinois counties protected		3	3	10	18

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

*Data sufficient to determine daily levels of fine particle pollution in the county but insufficient to determine year-round levels

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

American Lung Association of Metropolitan Chicago

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 Chicago, IL 60607-1878
 (312) 243-2000 www.lungchicago.org

American Lung Association of Illinois

3000 Kelly Lane
 Springfield, IL 62711-6226
 (217) 787-5864 www.lungillia.org

At-risk Populations Protected Under Each Standard¹

Standard¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	5,851,259	1,506,676	692,317	127,616	367,618	181,177	70,818	1,420,942	299,104
EPA proposal	5,851,259	1,506,676	692,317	127,616	367,618	181,177	70,818	1,420,942	299,104
Mid-range	8,648,137	2,260,962	967,165	191,504	540,089	265,403	102,114	2,066,876	434,757
Lung Association Recommended	10,330,577	2,690,539	1,156,133	227,889	646,051	317,372	122,038	2,468,574	519,607

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

INDIANA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Allen	342,168			342,168	342,168
Clark	100,706	100,706	100,706	100,706	100,706
Delaware	117,774			117,774	117,774
Dubois	40,771	40,771	40,771	40,771	40,771
Elkhart	191,768			191,768	191,768
Floyd	71,543			71,543	71,543
Henry	47,809				47,809
Howard	84,615			84,615	84,615
Knox	38,442	ND	ND	ND	ND
La Porte	109,755			109,755	109,755
Lake	490,844	490,844	490,844	490,844	490,844
Madison	130,602			130,602	130,602
Marion	863,596	863,596	863,596	863,596	863,596
Porter	154,961			154,961	154,961
Spencer	20,310			20,310	20,310
St. Joseph	266,431			266,431	266,431
Tippecanoe	152,042	ND	ND	ND	ND
Vanderburgh	173,157		173,157	173,157	173,157
Vigo	103,195			103,195	103,195
Indiana total population protected		1,495,917	1,669,074	3,262,196	3,310,005
Number of Indiana counties protected		4	5	16	17

■ County currently is protected; clean-up measures are required because of pollution

□ County would be protected at this level; clean-up measures would be added

□ Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	1,495,917	398,517	176,184	33,755	92,377	46,008	18,161	363,720	76,705
EPA proposal	1,669,074	439,122	201,804	37,194	103,521	51,680	20,559	409,939	86,550
Mid-range	3,262,196	848,478	401,964	71,867	203,234	101,708	40,756	808,997	171,254
Lung Association Recommended	3,310,005	859,815	409,620	72,827	206,315	103,307	41,467	822,514	174,148

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Black Hawk	126,078				126,078
Cerro Gordo	45,029	ND	ND	ND	ND
Clinton	49,872			49,872	49,872
Emmet	10,604				
Johnson	116,097				116,097
Linn	197,262			197,262	197,262
Montgomery	11,398	ND	ND	ND	ND
Muscatine	42,557			42,557	42,557
Polk	393,184				393,184
Pottawattamie	89,236				89,236
Scott	160,141				160,141
Story	80,404	ND	ND	ND	ND
Van Buren	7,710	ND	ND	ND	ND
Woodbury	103,113				
Wright	13,648	ND	ND	ND	ND
Iowa total population protected		0	0	289,691	1,174,427
Number of Iowa counties protected		0	0	3	8

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	289,691	69,650	38,075	5,899	14,569	9,341	3,813	75,203	15,945
Lung Association Recommended	1,174,427	277,770	139,431	23,526	59,388	37,417	14,570	293,018	61,810

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

KANSAS

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Johnson	496,691				496,691
Linn	9,775				
Sedgwick	463,802				463,802
Shawnee	171,716				171,716
Sumner	25,272				
Wyandotte	156,487			156,487	156,487
Kansas total population protected		0	0	156,487	1,288,696
Number of Kansas counties protected		0	0	1	4

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	156,487	43,966	17,042	3,724	8,400	4,665	1,788	36,215	7,608
Lung Association Recommended	1,288,696	339,028	141,736	28,716	70,901	39,586	15,264	309,391	65,199

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

KENTUCKY

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Bell	29,672			29,672	29,672
Boyd	49,743			49,743	49,743
Bullitt	66,645			66,645	66,645
Campbell	87,256			87,256	87,256
Carter	27,459				27,459
Christian	70,649			70,649	70,649
Daviess	92,587			92,587	92,587
Edmonson	11,921	ND	ND	ND	ND
Fayette	266,358			266,358	266,358
Franklin	48,142			48,142	48,142
Hardin	96,066			96,066	96,066
Henderson	45,426	ND	ND	ND	ND
Jefferson	700,030	700,030	700,030	700,030	700,030
Kenton	152,890			152,890	152,890
Laurel	55,993				55,993
Madison	76,208			76,208	76,208
Mccracken	64,700				64,700
Perry	29,762				29,762
Pike	67,080				67,080
Warren	97,168			97,168	97,168
Kentucky total population protected		700,030	700,030	1,833,414	2,078,408
Number of Kentucky counties protected		1	1	13	18

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	700,030	167,514	93,471	14,188	43,835	22,714	9,366	184,212	39,112
EPA proposal	700,030	167,514	93,471	14,188	43,835	22,714	9,366	184,212	39,112
Mid-range	1,833,414	437,916	220,009	37,092	114,791	58,414	22,918	459,605	97,073
Lung Association Recommended	2,078,408	494,394	252,353	41,876	130,341	66,465	26,228	524,875	110,953

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

LOUISIANA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Caddo	251,506				251,506
Calcasieu	184,961				184,961
Concordia	19,724	ND	ND	ND	ND
East Baton Rouge	412,633				412,633
Iberville	32,497				32,497
Jefferson	453,590				
Lafayette	195,707				
Orleans	462,269				462,269
Ouachita	148,355				148,355
Rapides	128,013				
St. Bernard	65,554				
Tangipahoa	105,158				
Terrebonne	106,523				
West Baton Rouge	21,880				21,880
Louisiana total population protected		0	0	0	1,514,101
Number of Louisiana counties protected		0	0	0	7

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	1,514,101	387,296	176,014	32,804	68,840	47,039	18,341	367,441	77,761

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MAINE

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Androscoggin	107,022				107,022
Aroostook	73,390				73,390
Cumberland	273,505			273,505	273,505
Hancock	53,556				
Kennebec	120,645				120,645
Knox	41,008	ND	ND	ND	ND
Oxford	56,614			56,614	56,614
Penobscot	148,196				148,196
York	200,359	ND	ND	ND	ND
Maine total population protected		0	0	330,119	779,372
Number of Maine counties protected		0	0	2	6

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	330,119	71,437	45,313	6,051	24,900	11,108	4,621	90,596	19,342
Lung Association Recommended	779,372	166,357	109,882	14,091	58,962	26,357	11,037	215,235	46,019

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MARYLAND

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Anne Arundel	508,572	508,572	508,572	508,572	508,572
Baltimore	780,821		780,821	780,821	780,821
Baltimore City	636,251	636,251	636,251	636,251	636,251
Cecil	95,526	ND	ND	ND	ND
Harford	235,594			235,594	235,594
Montgomery	921,690			921,690	921,690
Prince George's	842,967	ND	ND	ND	ND
Washington	139,624		139,624	139,624	139,624
Maryland total population protected		1,144,823	2,065,268	3,222,552	3,222,552
Number of Maryland counties protected		2	4	6	6

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	1,144,823	287,140	131,703	24,320	67,071	35,906	14,017	281,884	59,638
EPA proposal	2,065,268	499,870	264,294	42,339	122,340	66,243	26,788	529,711	112,408
Mid-range	3,222,552	794,521	396,416	67,296	189,841	102,705	41,227	820,215	174,010
Lung Association Recommended	3,222,552	794,521	396,416	67,296	189,841	102,705	41,227	820,215	174,010

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MASSACHUSETTS

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Berkshire	132,486	ND	ND	ND	ND
Bristol	548,176	ND	ND	ND	ND
Essex	738,984	ND	ND	ND	ND
Hampden	461,844		461,844	461,844	461,844
Hampshire	153,894	ND	ND	ND	ND
Middlesex	1,464,628	ND	ND	ND	ND
Norfolk	653,617	ND	ND	ND	ND
Plymouth	490,655			490,655	490,655
Suffolk	666,022				666,022
Worcester	779,488	ND	ND	ND	ND
Massachusetts total population protected		0	461,844	952,499	1,618,521
Number of Massachusetts counties protected		0	1	2	3

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	461,844	113,454	64,426	9,610	33,314	14,862	6,197	115,934	25,633
Mid-range	952,499	237,303	122,067	20,100	68,484	30,396	12,397	236,294	51,981
Lung Association Recommended	1,618,521	372,679	196,247	31,566	119,775	51,650	19,957	387,056	84,335

¹ Population living where clean-up measures are or would be required


² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MICHIGAN

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Allegan	112,477			112,477	112,477
Alpena	30,739	ND	ND	ND	ND
Bay	109,480				109,480
Berrien	163,125			163,125	163,125
Chippewa	38,791				
Genesee	443,947				443,947
Grand Traverse	82,752	ND	ND	ND	ND
Ingham	280,073				280,073
Kalamazoo	240,724			240,724	240,724
Kent	593,898			593,898	593,898
Macomb	822,660			822,660	822,660
Missaukee	15,286	ND	ND	ND	ND
Monroe	152,552		152,552	152,552	152,552
Muskegon	174,401			174,401	174,401
Oakland	1,213,339	ND	ND	ND	ND
Ottawa	252,351			252,351	252,351
Saginaw	209,062				209,062
St. Clair	170,916			170,916	170,916
Washtenaw	339,191			339,191	339,191
Wayne	2,016,202	2,016,202	2,016,202	2,016,202	2,016,202
Michigan total population protected		2,016,202	2,168,754	5,038,497	6,081,059
Number of Michigan counties protected		1	2	11	15

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	2,016,202	559,268	234,849	47,370	120,639	61,309	24,356	486,553	102,901
EPA proposal	2,168,754	597,472	252,281	50,606	130,128	66,127	26,253	524,716	110,994
Mid-range	5,038,497	1,312,074	586,091	111,132	308,348	155,933	61,117	1,225,488	258,955
Lung Association Recommended	6,081,059	1,572,975	710,600	133,230	373,058	188,750	74,078	1,484,032	313,792

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MINNESOTA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Cass	28,460	ND	ND	ND	ND
Dakota	379,058				379,058
Hennepin	1,120,897				1,120,897
Mille Lacs	25,079				
Olmsted	133,283				133,283
Ramsey	499,498				499,498
Scott	114,794				
St. Louis	198,136				
Stearns	141,055				
Minnesota total population protected		0	0	0	2,132,736
Number of Minnesota counties protected		0	0	0	4

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	2,132,736	524,177	227,543	44,397	119,526	66,618	25,161	514,758	108,283

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MISSISSIPPI

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Adams	32,591				32,591
Bolivar	38,928				38,928
Desoto	130,587				130,587
Forrest	74,469				74,469
Hancock	45,933				
Harrison	192,393				192,393
Hinds	249,987	ND	ND	ND	ND
Jackson	135,436				135,436
Jones	65,662			65,662	65,662
Lauderdale	77,449	ND	ND	ND	ND
Lee	78,102				78,102
Lowndes	60,487			60,487	60,487
Pearl River	51,835				51,835
Rankin	128,380				128,380
Scott	28,656	ND	ND	ND	ND
Warren	49,113				49,113
Mississippi total population protected		0	0	126,149	1,037,983
Number of Mississippi counties protected		0	0	2	12

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	126,149	32,695	16,386	2,769	6,616	3,957	1,615	31,719	6,731
Lung Association Recommended	1,037,983	267,042	118,220	22,617	54,631	32,150	12,474	251,312	53,032

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MISSOURI

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Boone	141,367	ND	ND	ND	ND
Buchanan	84,825	ND	ND	ND	ND
Cass	91,593	ND	ND	ND	ND
Cedar	13,894				13,894
Clay	197,588				197,588
Greene	247,932				247,932
Jackson	660,095	ND	ND	ND	ND
Jasper	109,460	ND	ND	ND	ND
Jefferson	210,397		210,397	210,397	210,397
Maries	8,877	ND	ND	ND	ND
Mercer	3,618	ND	ND	ND	ND
Monroe	9,467				9,467
St. Charles	320,734			320,734	320,734
St. Louis	1,009,235			1,009,235	1,009,235
St. Louis City	343,279			343,279	343,279
Ste. Genevieve	18,264			18,264	18,264
Missouri total population protected		0	210,397	1,901,909	2,370,790
Number of Missouri counties protected		0	1	5	9

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	210,397	53,295	20,167	4,514	14,432	6,476	2,385	49,559	10,414
Mid-range	1,901,909	466,595	237,715	39,521	131,108	60,770	24,499	486,030	103,170
Lung Association Recommended	2,370,790	574,446	297,128	48,656	164,101	75,898	30,496	605,367	128,383

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

MONTANA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Cascade	79,849				79,849
Flathead	81,217		81,217	81,217	81,217
Gallatin	75,637	ND	ND	ND	ND
Lake	27,919				27,919
Lewis & Clark	57,972	ND	ND	ND	ND
Lincoln	19,101	19,101	19,101	19,101	19,101
Missoula	99,018	ND	ND	ND	ND
Ravalli	39,376	ND	ND	ND	ND
Rosebud	9,270				
Sanders	10,945				
Silver Bow	33,093			33,093	33,093
Yellowstone	134,717	ND	ND	ND	ND
Montana total population protected		19,101	100,318	133,411	241,179
Number of Montana counties protected		1	2	3	5

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	19,101	4,042	3,262	342	1,302	679	315	5,899	1,284
EPA proposal	100,318	22,470	13,889	1,903	6,682	3,392	1,446	28,156	6,055
Mid-range	133,411	29,527	19,361	2,501	8,936	4,538	1,958	37,853	8,141
Lung Association Recommended	241,179	55,321	35,165	4,686	16,009	8,089	3,483	67,213	14,431

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEBRASKA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Cass	25,671				25,671
Cedar	9,059	ND	ND	ND	ND
Cherry	6,071	ND	ND	ND	ND
Deuel	2,019	ND	ND	ND	ND
Douglas	482,112				482,112
Hall	54,862	ND	ND	ND	ND
Lancaster	261,545				261,545
Lincoln	34,979				
Sarpy	135,973				
Scotts Bluff	36,631	ND	ND	ND	ND
Washington	19,605				
Nebraska total population protected		0	0	0	769,328
Number of Nebraska counties protected		0	0	0	3

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	769,328	192,286	81,519	16,287	40,117	23,712	8,839	181,130	37,982

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEVADA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Clark	1,650,671				
Douglas	45,394	ND	ND	ND	ND
Washoe	380,754				
Nevada total population protected		0	0	0	0
Number of Nevada counties protected		0	0	0	0

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	0	0	0	0	0	0	0	0	0

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEW HAMPSHIRE

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Belknap	60,858				
Cheshire	76,872			76,872	76,872
Coos	33,511				33,511
Grafton	84,169	ND	ND	ND	ND
Hillsborough	398,574			398,574	398,574
Merrimack	145,542	ND	ND	ND	ND
Rockingham	292,526				292,526
Sullivan	42,469				42,469
New Hampshire total population protected		0	0	475,446	843,952
Number of New Hampshire counties protected		0	0	2	5

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	475,446	116,816	52,944	9,894	36,778	15,051	5,855	118,460	25,093
Lung Association Recommended	843,952	205,454	96,778	17,401	65,340	27,002	10,681	215,039	45,653

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEW JERSEY

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Atlantic	268,693	ND	ND	ND	ND
Bergen	902,998			902,998	902,998
Camden	516,282	ND	ND	ND	ND
Essex	796,684	ND	ND	ND	ND
Gloucester	271,806			271,806	271,806
Hudson	606,240		606,240	606,240	606,240
Mercer	365,271		365,271	365,271	365,271
Middlesex	785,095		785,095	785,095	785,095
Morris	488,173			488,173	488,173
Ocean	553,251			553,251	553,251
Passaic	500,427		500,427	500,427	500,427
Union	531,957	531,957	531,957	531,957	531,957
Warren	110,018		110,018	110,018	110,018
New Jersey total population protected		531,957	2,899,008	5,115,236	5,115,236
Number of New Jersey counties protected		1	6	10	10

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	531,957	136,245	68,742	11,540	34,068	16,801	6,867	135,339	28,695
EPA proposal	2,899,008	715,754	345,817	60,624	188,712	91,060	35,559	713,709	150,353
Mid-range	5,115,236	1,240,260	686,890	105,049	333,554	164,564	67,571	1,326,704	281,337
Lung Association Recommended	5,115,236	1,240,260	686,890	105,049	333,554	164,564	67,571	1,326,704	281,337

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEW MEXICO

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Bernalillo	593,765				
Chaves	61,635				
Dona Ana	186,095		186,095	186,095	186,095
Grant	29,443				
Lea	56,231				
San Juan	124,166				
Sandoval	102,120				
Santa Fe	138,705				
New Mexico total population protected		0	186,095	186,095	186,095
Number of New Mexico counties protected		0	1	1	1

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	186,095	51,416	20,821	4,355	12,433	5,555	2,121	42,562	8,979
Mid-range	186,095	51,416	20,821	4,355	12,433	5,555	2,121	42,562	8,979
Lung Association Recommended	186,095	51,416	20,821	4,355	12,433	5,555	2,121	42,562	8,979

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NEW YORK

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Albany	298,432	ND	ND	ND	ND
Bronx	1,365,536	1,365,536	1,365,536	1,365,536	1,365,536
Broome	197,696	ND	ND	ND	ND
Chautauqua	137,267				137,267
Dutchess	293,395	ND	ND	ND	ND
Erie	936,318		936,318	936,318	936,318
Essex	38,901	ND	ND	ND	ND
Kings	2,475,290		2,475,290	2,475,290	2,475,290
Monroe	735,177	ND	ND	ND	ND
Nassau	1,339,641			1,339,641	1,339,641
New York	1,562,723	1,562,723	1,562,723	1,562,723	1,562,723
Niagara	218,060			218,060	218,060
Oneida	234,962	ND	ND	ND	ND
Onondaga	459,805				459,805
Orange	370,352				370,352
Queens	2,237,216		2,237,216	2,237,216	2,237,216
Richmond	463,314			463,314	463,314
Schenectady	148,042	ND	ND	ND	ND
St. Lawrence	111,306				111,306
Steuben	98,814			98,814	98,814
Suffolk	1,475,488			1,475,488	1,475,488
Westchester	942,444			942,444	942,444
New York total population protected		2,928,259	8,577,083	13,114,844	14,193,574
Number of New York counties protected		2	5	11	15

- County currently is protected; clean-up measures are required because of pollution
- County would be protected at this level; clean-up measures would be added
- Clean-up measures would not be required in this county to protect the public
- ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

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At-risk Populations Protected Under Each Standard¹

Standard¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	2,928,259	673,444	332,638	57,041	200,240	92,305	34,477	705,747	146,928
EPA proposal	8,577,083	2,036,815	1,064,555	172,519	580,784	272,592	106,923	2,142,319	449,820
Mid-range	13,114,844	3,146,734	1,672,167	266,529	886,423	419,414	167,943	3,338,774	704,486
Lung Association Recommended	14,193,574	3,414,570	1,807,931	289,215	958,622	453,630	181,696	3,610,422	762,240

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NORTH CAROLINA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Alamance	138,462			138,462	138,462
Buncombe	215,680				215,680
Cabarrus	146,135			146,135	146,135
Caswell	23,673			23,673	23,673
Catawba	149,466	149,466	149,466	149,466	149,466
Chatham	57,023				57,023
Cumberland	308,489			308,489	308,489
Davidson	153,775	153,775	153,775	153,775	153,775
Duplin	51,778				51,778
Durham	239,733			239,733	239,733
Edgecombe	54,713	ND	ND	ND	ND
Forsyth	320,919			320,919	320,919
Gaston	194,459			194,459	194,459
Guilford	438,795			438,795	438,795
Haywood	56,256				56,256
Jackson	34,975				34,975
Lenoir	58,424				58,424
Martin	24,796	ND	ND	ND	ND
Mc Dowell	43,285			43,285	43,285
Mecklenburg	771,617			771,617	771,617
Mitchell	15,850				15,850
Montgomery	27,501				27,501
Nash	90,710	ND	ND	ND	ND
New Hanover	173,554	ND	ND	ND	ND
Onslow	154,297				
Orange	117,515				117,515
Pasquotank	36,806	ND	ND	ND	ND
Pitt	140,587				140,587
Robeson	126,469				126,469
Swain	13,146				13,146
Wake	719,520			719,520	719,520

continued on next page

Analysis based on 2002-2004 design values for PM_{2.5} (continued)

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Watauga	42,457				42,457
Wayne	114,245			114,245	114,245
North Carolina total population protected		303,241	303,241	3,762,573	4,720,234
Number of North Carolina counties protected		2	2	14	27

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	303,241	73,977	38,732	6,266	17,411	9,700	3,922	77,845	16,455
EPA proposal	303,241	73,977	38,732	6,266	17,411	9,700	3,922	77,845	16,455
Mid-range	3,762,573	963,395	381,918	81,599	211,644	114,726	42,296	873,487	182,694
Lung Association Recommended	4,720,234	1,184,888	505,211	100,359	267,380	145,635	54,629	1,117,573	234,418

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

NORTH DAKOTA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Billings	825				
Burke	2,074				
Burleigh	72,585				
Cass	128,615				
McKenzie	5,499				
Mercer	8,434				
North Dakota total population protected		0	0	0	0
Number of North Dakota counties protected		0	0	0	0

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	0	0	0	0	0	0	0	0	0

¹ Population living where clean-up measures are or would be required


² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Athens	63,187			63,187	63,187
Butler	346,560	346,560	346,560	346,560	346,560
Clark	142,613			142,613	142,613
Cuyahoga	1,351,009	1,351,009	1,351,009	1,351,009	1,351,009
Franklin	1,088,971	1,088,971	1,088,971	1,088,971	1,088,971
Greene	152,233	ND	ND	ND	ND
Hamilton	814,611	814,611	814,611	814,611	814,611
Jefferson	71,420	71,420	71,420	71,420	71,420
Lake	232,061		232,061	232,061	232,061
Lawrence	62,705			62,705	62,705
Lorain	294,324			294,324	294,324
Lucas	450,632		450,632	450,632	450,632
Mahoning	249,755			249,755	249,755
Montgomery	550,063	550,063	550,063	550,063	550,063
Portage	154,764			154,764	154,764
Preble	42,553	ND	ND	ND	ND
Scioto	77,046			77,046	77,046
Stark	381,229	381,229	381,229	381,229	381,229
Summit	547,314	547,314	547,314	547,314	547,314
Trumbull	220,486		220,486	220,486	220,486
Ohio total population protected		5,151,177	6,054,356	7,098,750	7,098,750
Number of Ohio counties protected		8	11	18	18

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	5,151,177	1,258,788	685,971	106,619	330,769	165,436	67,924	1,333,234	283,171
EPA proposal	6,054,356	1,475,967	812,499	125,014	388,967	194,925	80,344	1,574,805	334,686
Mid-range	7,098,750	1,715,795	959,287	145,328	457,245	229,304	94,670	1,853,383	394,122
Lung Association Recommended	7,098,750	1,715,795	959,287	145,328	457,245	229,304	94,670	1,853,383	394,122

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

OKLAHOMA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Caddo	30,167				
Canadian	95,505				
Carter	47,087				
Cherokee	44,106				44,106
Comanche	110,514	ND	ND	ND	ND
Custer	25,230	ND	ND	ND	ND
Garfield	57,282				
Kay	46,761				46,761
Lincoln	32,386				32,386
Mayes	39,274				39,274
Muskogee	70,626				70,626
Oklahoma	680,815				680,815
Ottawa	32,737				32,737
Pawnee	16,834	ND	ND	ND	ND
Payne	69,675	ND	ND	ND	ND
Pittsburg	43,950				43,950
Seminole	24,679				
Tulsa	569,148				569,148
Oklahoma total population protected		0	0	0	1,559,803
Number of Oklahoma counties protected		0	0	0	9

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	1,559,803	391,642	197,053	33,172	96,031	49,234	19,786	391,871	82,952

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

OREGON

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Benton	79,357	ND	ND	ND	ND
Columbia	46,971				
Deschutes	134,479	ND	ND	ND	ND
Harney	7,132	ND	ND	ND	ND
Jackson	192,992		192,992	192,992	192,992
Josephine	79,920	ND	ND	ND	ND
Klamath	65,098		65,098	65,098	65,098
Lake	7,382	ND	ND	ND	ND
Lane	331,594		331,594	331,594	331,594
Linn	107,410				107,410
Marion	301,841	ND	ND	ND	ND
Multnomah	672,161				672,161
Umatilla	73,436	ND	ND	ND	ND
Union	24,406	ND	ND	ND	ND
Wasco	23,669				23,669
Washington	488,253				488,253
Oregon total population protected		0	589,684	589,684	1,881,177
Number of Oregon counties protected		0	3	3	7

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	589,684	130,731	85,941	11,073	43,604	19,737	8,344	161,698	34,515
Mid-range	589,684	130,731	85,941	11,073	43,604	19,737	8,344	161,698	34,515
Lung Association Recommended	1,881,177	444,744	220,771	37,670	138,015	60,076	23,420	472,354	99,611

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

PENNSYLVANIA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Adams	98,322		98,322	98,322	98,322
Allegheny	1,250,867	1,250,867	1,250,867	1,250,867	1,250,867
Beaver	178,601	178,601	178,601	178,601	178,601
Berks	391,640	391,640	391,640	391,640	391,640
Bucks	617,558		617,558	617,558	617,558
Cambria	148,496	148,496	148,496	148,496	148,496
Centre	140,476	ND	ND	ND	ND
Chester	465,795	ND	ND	ND	ND
Cumberland	221,397		221,397	221,397	221,397
Dauphin	253,282	253,282	253,282	253,282	253,282
Delaware	555,040	555,040	555,040	555,040	555,040
Erie	282,355	ND	ND	ND	ND
Lackawanna	209,932		209,932	209,932	209,932
Lancaster	487,332	487,332	487,332	487,332	487,332
Lehigh	326,050		326,050	326,050	326,050
Luzerne	313,431			313,431	313,431
Mercer	119,797		119,797	119,797	119,797
Montgomery	774,029	ND	ND	ND	ND
Northampton	282,554		282,554	282,554	282,554
Perry	44,652			44,652	44,652
Philadelphia	1,470,151	1,470,151	1,470,151	1,470,151	1,470,151
Washington	205,738		205,738	205,738	205,738
Westmoreland	368,660	368,660	368,660	368,660	368,660
York	401,613	401,613	401,613	401,613	401,613
Pennsylvania total population protected		5,505,682	7,587,030	7,945,113	7,945,113
Number of Pennsylvania counties protected		10	18	20	20

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	5,505,682	1,291,342	836,062	109,377	372,892	182,149	78,503	1,506,609	321,681
EPA proposal	7,587,030	1,761,107	1,149,782	149,166	515,682	251,980	108,575	2,085,274	445,447
Mid-range	7,945,113	1,834,657	1,213,848	155,396	540,526	264,538	114,293	2,192,469	468,456
Lung Association Recommended	7,945,113	1,834,657	1,213,848	155,396	540,526	264,538	114,293	2,192,469	468,456

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

RHODE ISLAND

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Kent	172,120				172,120
Providence	641,883			641,883	641,883
Washington	128,637	ND	ND	ND	ND
Rhode Island total population protected		0	0	641,883	814,003
Number of Rhode Island counties protected		0	0	1	2

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	641,883	149,861	87,217	12,693	47,378	20,704	8,388	165,032	34,833
Lung Association Recommended	814,003	187,568	112,519	15,887	60,247	26,523	10,873	213,431	45,123

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

SOUTH CAROLINA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Aiken	148,960	ND	ND	ND	ND
Beaufort	135,725				
Berkeley	149,668	ND	ND	ND	ND
Charleston	326,762				326,762
Chesterfield	43,289				43,289
Edgefield	24,794			24,794	24,794
Florence	129,679				129,679
Georgetown	59,790				59,790
Greenville	401,174	401,174	401,174	401,174	401,174
Greenwood	67,519				67,519
Horry	217,608				217,608
Lexington	231,057			231,057	231,057
Oconee	69,057				69,057
Orangeburg	90,779	ND	ND	ND	ND
Richland	334,609			334,609	334,609
Spartanburg	264,230			264,230	264,230
South Carolina total population protected		401,174	401,174	1,255,864	2,169,568
Number of South Carolina counties protected		1	1	5	12

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	401,174	97,533	47,271	8,261	23,173	12,733	4,997	100,441	21,220
EPA proposal	401,174	97,533	47,271	8,261	23,173	12,733	4,997	100,441	21,220
Mid-range	1,255,864	305,619	140,502	25,886	72,497	39,572	15,208	308,255	65,046
Lung Association Recommended	2,169,568	518,717	265,098	43,936	125,900	69,385	27,491	549,318	116,192

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

SOUTH DAKOTA

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Brookings	28,159				
Brown	34,812				
Codington	25,914	ND	ND	ND	ND
Jackson	2,900				
Meade	24,856				
Minnehaha	157,366				
Pennington	92,631				
South Dakota total population protected		0	0	0	0
Number of South Dakota counties protected		0	0	0	0

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	0	0	0	0	0	0	0	0	0
Lung Association Recommended	0	0	0	0	0	0	0	0	0

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

TENNESSEE

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Blount	113,744			113,744	113,744
Davidson	572,475	ND	ND	ND	ND
Dyer	37,621				37,621
Hamilton	310,371	310,371	310,371	310,371	310,371
Knox	400,061	400,061	400,061	400,061	400,061
Lawrence	40,864				40,864
Loudon	42,237	ND	ND	ND	ND
Madison	94,397	ND	ND	ND	ND
Maury	74,692				74,692
Mc Minn	50,981			50,981	50,981
Montgomery	142,204			142,204	142,204
Putnam	65,963				65,963
Roane	52,920			52,920	52,920
Shelby	908,175			908,175	908,175
Sullivan	152,498			152,498	152,498
Sumner	141,611				141,611
Tennessee total population protected		710,432	710,432	2,130,954	2,491,705
Number of Tennessee counties protected		2	2	8	13

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	710,432	155,550	94,410	13,175	49,665	23,521	9,549	188,529	40,036
EPA proposal	710,432	155,550	94,410	13,175	49,665	23,521	9,549	188,529	40,036
Mid-range	2,130,954	523,012	252,628	44,300	143,717	67,494	26,575	532,765	112,705
Lung Association Recommended	2,491,705	609,242	297,024	51,603	168,262	79,052	31,174	624,469	132,122

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

TEXAS

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Bexar	1,493,965	ND	ND	ND	ND
Bowie	90,248				90,248
Brazoria	271,130	ND	ND	ND	ND
Brewster	9,226				
Caldwell	36,498	ND	ND	ND	ND
Cameron	371,825				371,825
Collin	627,938	ND	ND	ND	ND
Dallas	2,294,706			2,294,706	2,294,706
Ector	124,488				
El Paso	713,126	ND	ND	ND	ND
Ellis	128,710	ND	ND	ND	ND
Galveston	271,743				
Gregg	115,035			115,035	115,035
Harris	3,644,285			3,644,285	3,644,285
Harrison	62,727				62,727
Hidalgo	658,248				658,248
Jeff Davis	2,253	ND	ND	ND	ND
Jefferson	248,223				248,223
Kaufman	85,377	ND	ND	ND	ND
Kleberg	31,357	ND	ND	ND	ND
Lubbock	251,018	ND	ND	ND	ND
McLennan	222,439	ND	ND	ND	ND
Montgomery	362,382				362,382
Nueces	317,513				
Orange	84,873				84,873
Potter	118,410	ND	ND	ND	ND
Tarrant	1,588,088			1,588,088	1,588,088
Travis	869,868	ND	ND	ND	ND
Webb	219,464	ND	ND	ND	ND
Texas total population protected		0	0	7,642,114	9,520,640
Number of Texas counties protected		0	0	4	11

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	7,642,114	2,188,070	609,229	185,329	391,817	219,062	75,141	1,608,686	333,719
Lung Association Recommended	9,520,640	2,768,015	806,070	234,451	484,675	272,537	95,421	2,018,848	419,858

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

UTAH

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Box Elder	44,810		44,810	44,810	44,810
Cache	97,467		97,467	97,467	97,467
Davis	261,208	ND	ND	ND	ND
Salt Lake	935,295	935,295	935,295	935,295	935,295
Tooele	49,688	ND	ND	ND	ND
Utah	403,352		403,352	403,352	403,352
Weber	208,633		208,633	208,633	208,633
Utah total population protected		935,295	1,689,557	1,689,557	1,689,557
Number of Utah counties protected		1	5	5	5

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	935,295	277,596	76,966	23,512	52,612	26,269	8,986	191,326	39,595
EPA proposal	1,689,557	522,567	136,362	44,261	93,462	46,148	15,477	330,539	68,099
Mid-range	1,689,557	522,567	136,362	44,261	93,462	46,148	15,477	330,539	68,099
Lung Association Recommended	1,689,557	522,567	136,362	44,261	93,462	46,148	15,477	330,539	68,099

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

VERMONT

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Addison	36,865	ND	ND	ND	ND
Bennington	36,956	ND	ND	ND	ND
Chittenden	149,286			149,286	149,286
Rutland	63,616	ND	ND	ND	ND
Washington	59,068	ND	ND	ND	ND
Vermont total population protected		0	0	149,286	149,286
Number of Vermont counties protected		0	0	1	1

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	149,286	32,369	14,856	2,742	9,902	4,813	1,765	36,523	7,720
Lung Association Recommended	149,286	32,369	14,856	2,742	9,902	4,813	1,765	36,523	7,720

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

VIRGINIA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Arlington	186,117		186,117	186,117	186,117
Bristol City	17,308			17,308	17,308
Charles City	7,120			7,120	7,120
Chesapeake City	214,725	ND	ND	ND	ND
Chesterfield	282,925			282,925	282,925
Fairfax	1,003,157			1,003,157	1,003,157
Hampton City	145,951				145,951
Henrico	276,479			276,479	276,479
Loudoun	239,156			239,156	239,156
Lynchburg City	64,932	ND	ND	ND	ND
Newport News City	181,913	ND	ND	ND	ND
Norfolk City	237,835				237,835
Page	23,730			23,730	23,730
Richmond City	192,494	ND	ND	ND	ND
Roanoke City	92,352			92,352	92,352
Salem City	24,347			24,347	24,347
Virginia Beach City	440,098				440,098
Virginia total population protected		0	186,117	2,152,691	2,976,575
Number of Virginia counties protected		0	1	10	13

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	186,117	33,552	17,427	2,842	11,086	6,136	2,118	45,592	9,379
Mid-range	2,152,691	535,395	200,018	45,349	118,082	66,898	24,622	514,459	108,187
Lung Association Recommended	2,976,575	748,413	280,398	63,391	162,533	91,641	33,497	698,922	146,661

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.


Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

WASHINGTON

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Adams	16,596	ND	ND	ND	ND
Benton	155,991	ND	ND	ND	ND
Clark	392,403		392,403	392,403	392,403
Cowlitz	96,189	ND	ND	ND	ND
Grant	79,981	ND	ND	ND	ND
Grays Harbor	70,338	ND	ND	ND	ND
King	1,777,143				1,777,143
Kitsap	239,138	ND	ND	ND	ND
Lewis	71,539	ND	ND	ND	ND
Mason	53,637	ND	ND	ND	ND
Okanogan	39,444	ND	ND	ND	ND
Pierce	745,411		745,411	745,411	745,411
Skagit	111,064	ND	ND	ND	ND
Skamania	10,549	ND	ND	ND	ND
Snohomish	644,274		644,274	644,274	644,274
Spokane	435,644			435,644	435,644
Stevens	41,310	ND	ND	ND	ND
Thurston	224,673	ND	ND	ND	ND
Walla Walla	57,354	ND	ND	ND	ND
Whatcom	180,167	ND	ND	ND	ND
Whitman	40,146	ND	ND	ND	ND
Yakima	229,094		229,094	229,094	229,094
Washington total population protected		0	2,011,182	2,446,826	4,223,969
Number of Washington counties protected		0	4	5	6

 County currently is protected; clean-up measures are required because of pollution

 County would be protected at this level; clean-up measures would be added

 Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	2,011,182	528,524	199,997	44,766	134,738	61,105	22,692	467,644	98,310
Mid-range	2,446,826	632,713	253,770	53,591	164,877	75,042	28,229	577,793	121,674
Lung Association Recommended	4,223,969	1,014,523	440,729	85,930	291,805	132,781	49,792	1,023,271	215,271

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

WEST VIRGINIA

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Berkeley	89,362	89,362	89,362	89,362	89,362
Brooke	24,785	24,785	24,785	24,785	24,785
Cabell	94,801	94,801	94,801	94,801	94,801
Hancock	31,507	31,507	31,507	31,507	31,507
Harrison	68,303			68,303	68,303
Kanawha	195,218	195,218	195,218	195,218	195,218
Marion	56,453		56,453	56,453	56,453
Marshall	34,722	34,722	34,722	34,722	34,722
Mercer	62,070			62,070	62,070
Monongalia	83,918		83,918	83,918	83,918
Ohio	45,410			45,410	45,410
Raleigh	79,175			79,175	79,175
Summers	13,809				13,809
Wood	87,100	87,100	87,100	87,100	87,100
West Virginia total population protected		557,495	697,866	952,824	966,633
Number of West Virginia counties protected		7	9	13	14

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	557,495	119,788	87,178	10,146	44,100	19,088	8,330	159,822	34,206
EPA proposal	697,866	145,548	105,634	12,328	55,493	23,836	10,171	196,423	41,955
Mid-range	952,824	198,663	148,058	16,827	75,852	32,709	14,130	271,532	58,083
Lung Association Recommended	966,633	201,016	150,612	17,026	77,006	33,215	14,360	275,860	59,010

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

WISCONSIN

Total Population Protected, by County

Population in Counties Protected Under Each Standard

County	Total	Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Ashland	16,719	ND	ND	ND	ND
Brown	237,166			237,166	237,166
Dane	453,582			453,582	453,582
Dodge	88,057		88,057	88,057	88,057
Door	28,302	ND	ND	ND	ND
Douglas	44,045	ND	ND	ND	ND
Forest	9,950	ND	ND	ND	ND
Grant	49,647				49,647
Jefferson	78,497	ND	ND	ND	ND
Kenosha	158,435				158,435
Manitowoc	81,864				81,864
Milwaukee	928,018		928,018	928,018	928,018
Outagamie	169,337				169,337
Ozaukee	86,025	ND	ND	ND	ND
Rock	156,512	ND	ND	ND	ND
Sauk	57,119	ND	ND	ND	ND
St. Croix	74,339	ND	ND	ND	ND
Taylor	19,757	ND	ND	ND	ND
Vilas	22,230				
Waukesha	377,193			377,193	377,193
Waupaca	52,746	ND	ND	ND	ND
Winnebago	159,008	ND	ND	ND	ND
Wood	75,195	ND	ND	ND	ND
Wisconsin total population protected		0	1,016,075	2,084,016	2,543,299
Number of Wisconsin counties protected		0	2	5	9

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	1,016,075	261,346	125,046	22,136	64,219	31,622	12,549	249,550	52,700
Mid-range	2,084,016	508,946	241,121	43,108	133,986	65,681	25,467	513,207	108,319
Lung Association Recommended	2,543,299	622,351	297,842	52,714	163,351	80,224	31,257	628,288	132,702

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

WYOMING

Total Population Protected, by County

County	Total	Population in Counties Protected Under Each Standard			
		Current Standard 15/65	EPA Proposal 15/35	Mid-range Option 13/30	ALA Proposal 12/25
Campbell	36,721				
Converse	12,515				
Fremont	36,310			36,310	36,310
Laramie	85,296				
Sheridan	27,163			27,163	27,163
Teton	18,964	ND	ND	ND	ND
Wyoming total population protected		0	0	63,473	63,473
Number of Wyoming counties protected		0	0	2	2

County currently is protected; clean-up measures are required because of pollution

County would be protected at this level; clean-up measures would be added

Clean-up measures would not be required in this county to protect the public

ND Not enough data to determine how much fine particle pollution is in the county

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

At-risk Populations Protected Under Each Standard¹

Standard ¹	Total	Under 18	65+	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Heart Disease	Diabetes
Current	0	0	0	0	0	0	0	0	0
EPA proposal	0	0	0	0	0	0	0	0	0
Mid-range	63,473	14,474	9,322	1,226	3,733	2,144	930	17,884	3,854
Lung Association Recommended	63,473	14,474	9,322	1,226	3,733	2,144	930	17,884	3,854

¹ Population living where clean-up measures are or would be required

² Standard—The current standards are 15 µg/m³ for the annual average and 65 µg/m³ for the 24-hour standard. The EPA proposal is 15 µg/m³ for the annual average and 35 µg/m³ for the 24-hour standard. The most protective of the CASAC recommendations is 13 µg/m³ for the annual average and 30 µg/m³ for the 24-hour standard. The American Lung Association recommends 12 µg/m³ for the annual average and 25 µg/m³ for the 24-hour standard.

Note: All analyses based on 2002-2004 design values for PM_{2.5}. See Appendix A: Description of Methodology for more explanation.

Appendix A: Description of Methodology

Statistical Methodology: The Air Quality Data

The American Lung Association obtained the particulate matter air quality data used in this report from the U.S. Environmental Protection Agency (EPA). Specifically, the analysis used EPA's adopted design values for both the annual average and 24-hour (daily) PM_{2.5} concentrations by county for the years 2002-2004. A design value is the calculated concentration of a pollutant based on the form of the national ambient air quality standard that EPA uses to determine whether or not the air quality in a given county meets the standard. The EPA calculates the design value for the annual standard based on the three-year averages of annual mean concentrations. The EPA design value for the 24-hour standard uses the 98th percentile of daily concentrations over a three-year period.

Using the annual average and daily design values for PM_{2.5} for each of the counties in the U.S. where complete monitoring data were available for the 2002-2004 period, we determined which counties would be in violation of the current standards and which would be in violation under three alternative sets of standards. Counties with incomplete monitoring data, as determined by the EPA, are indicated in the state tables with an asterisk. (In determining design values, the EPA uses data only from monitoring stations that meet its completeness criteria—monitors that were functioning at least 75 percent of the time in each calendar quarter over the three-year period).

For comparative purposes, the report analyzed the following combinations of annual and daily standards:

- 15 µg/m³ annual and 65 µg/m³ daily: Current standards (base case)
- 15 µg/m³ annual and 35 µg/m³ daily: EPA's proposed standards
- 13 µg/m³ annual and 30 µg/m³ daily: Middle of EPA ranges under consideration for both standards
- 12 µg/m³ annual and 25 µg/m³ daily: ALA-recommended standards

Compliance with the daily standard is based on a given percentile of the daily readings. This report follows EPA's practice that uses the 98th percentile form, meaning that the top two percent of days over a three-year period, or the 18 days with the highest particle readings, are excused in determining compliance with

the standard. However, the American Lung Association recommends adopting the 99th percentile form, which excuses only the top one percent, or 9 days with the highest readings in a 3 year period. Both the 98th and 99th percentile forms of the daily standard are under EPA consideration.

Population Estimates

The analysis uses data on the total population of each county in the United States for 2004 from U.S. Census Bureau estimates. The analysis used Census Bureau estimates of the age-specific breakdown of the population by county.¹

Calculations of Populations-at-Risk

Presently, state- and county-specific measurements of the number of persons with chronic lung disease and other chronic conditions are not generally available. (The primary exception is adult asthma, for which state-specific estimates are available through the national Behavioral Risk Factor Surveillance System survey discussed below.) In order to assess the prevalence of lung disease and other chronic conditions at the national, state, and county levels, the analysis employed a synthetic estimation technique originally developed by the U.S. Census Bureau.² This method uses age-specific national estimates of self-reported chronic disease to project the prevalence of chronic disease by county.

Estimates for various populations-at-risk should be quoted individually and cannot be totaled since populations-at-risk overlap and are not mutually exclusive (for instance, individuals can be over 65 and have emphysema).

Further information on the prevalence estimates in our report for populations-at-risk due to chronic disease follows:

Chronic Bronchitis, Emphysema, Diabetes, and Pediatric Asthma. In 2004, the National Health Interview Survey (NHIS) estimated the nationwide annual prevalence of diagnosed chronic bronchitis at 9.05 million, the nationwide lifetime prevalence of emphysema at 3.57 million, the nationwide lifetime prevalence of diabetes at 15.1 million, and the prevalence of diagnosed pediatric asthma at 6.2 million under age 18.³

The analysis estimated local area prevalence of chronic bronchitis, emphysema, diabetes, and pediatric asthma by applying age-specific national prevalence rates from the 2004 NHIS to age-specific county-level resident populations obtained from the U.S. Census Bureau web site. Prevalence estimates for chronic bronchitis, emphysema, and diabetes were calculated for ages 18-44, 45-64 and 65+. The prevalence estimate for pediatric asthma was calculated for those under age 18.

Adult Asthma. In 2004, the national Behavioral Risk Factor Surveillance System (BRFSS) survey indicated that approximately 8.2% of adults residing in the U.S. reported currently having asthma. The prevalence estimate for adult asthma was calculated for those 18-44, 45-64 and 65+. The information on adult asthma obtained from the BRFSS survey cannot be compared with pediatric asthma estimates derived from the NHIS.⁴

The analysis estimated local area prevalence of adult asthma by applying age-specific state prevalence rates from the 2004 BRFSS to age-specific county-level resident populations obtained from the U.S. Census Bureau web site.

Heart Disease. National estimates for cardiovascular disease were obtained from the *American Heart Association: Heart Disease and Stroke Statistics – 2005 Update*.⁵ According to this report, 70.1 million Americans suffer from one or more types of cardiovascular disease.

This analysis estimated local area prevalence of heart disease by applying age-specific prevalence rates from the 2005 American Heart Association report to age-specific county-level resident populations obtained from the U.S. Census Bureau web site.

Limitations of Estimates. Since the NHIS and the BRFSS based their prevalence estimates of various chronic diseases on samples, they will differ (due to random sampling variability) from figures that would be derived from a complete census or case registry of people in the U.S. with these diseases. The NHIS and BRFSS estimates are also subject to reporting, non-response, and processing errors, though these errors are kept to a minimum by methods built into the survey.

Additionally, a major limitation of both surveys is that the information collected represents self-reports of medically diagnosed conditions. Prevalence estimates for the conditions may therefore vary considerably in their accuracy and completeness and may underestimate disease prevalence since not all individuals with these conditions have been properly diagnosed. However, the NHIS is the best available source for the prevalence of chronic bronchitis, emphysema, diabetes, and pediatric asthma on the national level, and the BRFSS is the best available source for state-specific adult asthma information.

The local prevalence estimates of chronic diseases were scaled in direct proportion to the base population of a given county and its age distribution. No adjustments were made for other factors that may affect local chronic disease prevalence (e.g., local rates of cigarette smoking or occupational exposures) since the health surveys that obtain such data are rarely conducted on the county level. Because the local estimates do not account for geographic differences in the prevalence of chronic diseases, the sum of the estimates for each of the counties in the U.S. may not exactly reflect the national estimate derived for a given disease by the NHIS or the state estimates derived by the BRFSS.

¹ Population Estimates Branch, U.S. Bureau of the Census. County Resident Population Estimates, by Age, Sex, and Race: July 1, 2004.

² Irwin, R. Guide to Local Area Populations U.S. Bureau of the Census Technical Paper Number 39 (1972).

³ National Center for Health Statistics. Raw Data from the National Health Interview Survey, United States, 2004. Calculations by the American Lung Association Research and Scientific Affairs Division using SPSS and SUDAAN software.

⁴ Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System, 2004.

⁵ American Heart Association: Heart Disease and Stroke Statistics – 2005 Update.

