

ORAL ARGUMENT NOT YET SCHEDULED

No. 23-1157 (and consolidated cases)

**UNITED STATES COURT OF APPEALS
FOR THE D.C. CIRCUIT**

STATE OF UTAH, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, et al.,

Respondents.

On Petitions for Review of a Final Agency Action of the
U.S. Environmental Protection Agency
88 Fed. Reg. 36,654 (June 5, 2023)

**BRIEF OF AMICI CURIAE THE AMERICAN THORACIC SOCIETY
AND THE AMERICAN LUNG ASSOCIATION
IN SUPPORT OF RESPONDENTS**

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to D.C. Circuit Rule 28(a)(1)(A), the American Thoracic Society and American Lung Association submit this certificate as to parties, rulings, and related cases.

A. Parties and Amici

All parties, intervenors, and amici appearing in this Court are listed in the Opening Brief of State Petitioners and the Initial Brief of the Federal Respondents.

B. Rulings Under Review

References to the agency action under review appear in the Initial Brief of the Federal Respondents.

C. Related Cases

References to related cases appear in the Initial Brief of the Federal Respondents.

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CORPORATE DISCLOSURE STATEMENT

Pursuant to Federal Rules of Appellate Procedure 26.1 and 29(a)(4)(A), the American Thoracic Society and American Lung Association state that they do not have parent companies and that no publicly held company has a 10% or greater ownership interest in either organization.

Dated: June 24, 2024

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D.C. CIRCUIT RULE 29(d) STATEMENT

Counsel for amici curiae the American Thoracic Society and the American Lung Association certify, pursuant to Circuit Rule 29(d), that a separate brief is necessary to provide the Court with the perspective and expertise held by both organizations. These amici have particular expertise in respiratory health, which is directly relevant to the agency action under review. Thus, amici curiae, through counsel, certify that it would not be practicable to file a joint brief.

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STATEMENT OF INTEREST

The American Thoracic Society is an international non-profit organization of more than 16,000 physicians, scientists, nurses, and healthcare professionals dedicated to the detection, prevention, treatment, and cure of respiratory disease, critical care illnesses, and sleep-disordered breathing. The Society and its members lead cutting-edge scientific research, advance global health, and transform patient care through advocacy and the publication of four peer-reviewed journals on pulmonary health. The Society's members also provide direct clinical care to patients uniquely susceptible to the adverse effects of ozone pollution, including pediatric patients and patients with chronic respiratory disease.

The American Lung Association is the nation's oldest voluntary health organization, founded 120 years ago. The Lung Association works to save lives by improving lung health and preventing lung disease. This includes activities to advocate for reducing air pollution and its accompanying threats to lung health through implementation and enforcement of federal, state, and local laws protecting air quality. The Lung Association publishes many reports on air pollution, most notably its annual "State of the Air" report. The Lung Association has long advocated specifically for full implementation of the Clean Air Act and its amendments to help ensure that everyone can breathe safe and healthy air.

Amici are concerned about the danger that ozone pollution poses to public health, particularly for children, who are especially susceptible to harm from ozone pollution. Amici submit this brief to explain the serious public health implications of ozone pollution in both the short and long term, on all populations, and on specific populations who bear the greatest burden from continued ozone pollution. They also submit this brief to explain the costs that can come from failing to adequately regulate ozone pollution; to underscore that the Federal “Good Neighbor Plan” for the 2015 Ozone National Ambient Air Quality Standards, 88 Fed. Reg. 36,654 (June 5, 2023) (the “Good Neighbor Plan,” or “the Plan”), is a meaningful and important response to the ozone pollution crisis. Given amici’s medical, scientific, and policy expertise, they support implementation of the Good Neighbor Plan and urge the Court to recognize EPA’s authority under the Clean Air Act to regulate ozone emissions in this manner.¹

¹ No party’s counsel authored this brief in whole or in part, and no party nor party’s counsel contributed money that was intended to fund preparation or submission of this brief. Likewise, no other individual or organization other than amici or their counsel contributed money that was intended to fund preparation or submission of this brief. This brief is filed with a motion to participate as amicus, in compliance with Federal Rule of Appellate Procedure 29(a)(3).

INTRODUCTION

Ozone is a dangerous ambient air pollutant. Breathing ozone-polluted air causes inflammation and injury to the lungs within days. While ozone can harm healthy people, children suffer disproportionately. Large, peer-reviewed studies, including studies based in the United States, have consistently documented the effects of even short-term ozone exposure on asthma. These effects are reflected in increases in the number of children requiring emergency department care and hospitalization, some of whom have symptoms severe enough to require treatment in an intensive care unit. Adults, too, are affected by exposure to ozone pollution. Among adults, ozone exposure is linked to development and exacerbation of asthma, acute respiratory distress syndrome, and, most seriously, death.

In promulgating the Good Neighbor Plan, EPA appropriately recognized the harms ozone pollution poses to public health and acted to better protect the health of communities downwind of ozone-producing states. The American Thoracic Society and American Lung Association submit this brief to underscore the Plan's consistency with the Clean Air Act's public health mandate, to explain the danger ozone pollution poses to human health, and to address several arguments made by Petitioners and their amici that seek to call the utility of the Plan into question. Given the dangers ozone pollution currently poses and will continue to pose without appropriate regulation, the Plan must be upheld and the pending petitions denied.

ARGUMENT

I. The Good Neighbor Plan facilitates compliance with the Clean Air Act’s public health mandate.

A. The Clean Air Act establishes a cooperative federalism scheme with a federal backstop to protect public health.

The Clean Air Act directs EPA to establish limits for pollutants that “may reasonably be anticipated to endanger public health and welfare.” 42 U.S.C. § 7408(a)(1)(A). EPA must establish national standards for six “criteria pollutants” that contain an “adequate margin of safety,” given the susceptibility of particular vulnerable groups to air pollution. *Id.* § 7409(b)(1).² These standards are to be set without regard to cost. *See Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 471 (2001). The Act’s so-called “Good Neighbor Provision” recognizes the transient nature of air pollution and requires states to ensure that their emissions do not “contribute significantly to nonattainment in” downwind states or “interfere with maintenance” of the ozone standards in other states. 42 U.S.C. § 7410(a)(2)(D)(i).

The Clean Air Act’s cooperative federalism approach generally leaves it to states to decide how best to attain and maintain compliance with the national standards and with the Good Neighbor Provision. *See id.* § 7410. But when the states fall short, EPA must step in. *Id.* § 7410(a)(1), (c)(1); *see EPA v. EME Homer City*

² *See* Michelle L. Bell et al., *Who is More Affected by Ozone Pollution? A Systematic Review and Meta-Analysis*, 180 *Am. J. Epidemiology* 15, 15–28 (2014).

Generation, L.P., 572 U.S. 489, 508 (2014) (“Once EPA has found a [state plan] inadequate, the Agency has a statutory duty to issue a [federal plan].”). In that regard, EPA acts as a backstop responsible for ensuring that the Clean Air Act’s public health mandate is carried out.

B. EPA created the Good Neighbor Plan to ensure compliance with national ozone standards.

Ground-level ozone forms when nitrogen oxides and volatile organic compounds react with heat and sunlight.³ Some of those so-called “precursor pollutants” are naturally produced,⁴ but most are human-generated—emitted by vehicles, fossil fuel power plants, and factories.⁵

Because ozone forms when precursor pollutants interact with heat and sunlight, more ozone tends to form when temperatures are warmer and during the daytime.⁶ Although precursor pollutants can sometimes be traced to particular

³ See Daniela Nuvolone et al., *The Effects of Ozone on Human Health*, 25 *Env’t Sci. & Pollution Rsch.* 8074, 8074 (2017).

⁴ See Xiao Lu et al., *Air Pollution, Climate, and Health: An Integrated Perspective on Their Interactions* 15, 15–21 (Meng Gao et al. eds., 2021).

⁵ See *What is Ozone?*, EPA, <https://www.epa.gov/ozone-pollution-and-your-patients-health/what-ozone> (last updated June 20, 2024); *2020 EPA Nat’l Emissions Inventory*, <https://enviro.epa.gov/envirofacts/embed/nei?pType=TIER&pReport=nation&pState=&pPollutant=&pPollutant=NOX&pTier=&pYear=2020&pCounty=&pSector=&pWho=NEI> (last updated Mar. 15, 2023) (filtered for nitrogen oxides); *NEI Search*, EPA, <https://enviro.epa.gov/envirofacts/nei/search/>.

⁶ *What is Ozone?*, *supra* note 5.

sources, wind and weather patterns can affect their dispersal, causing the pollutants and resulting ozone to travel far beyond the point of creation.⁷ This can cause elevated ozone levels even in rural areas and in the early evening or at night.⁸

As Part II of this brief explains, ground-level ozone pollution endangers public health. Ozone is one of six criteria pollutants for which EPA establishes National Ambient Air Quality Standards. *See* National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,292 (Oct. 26, 2015). Because continuing scientific research has shown greater health harms from ozone levels even lower than was previously known, national standards for ozone have become more stringent over time. In 2015, EPA revised the ozone standards to 70 parts per billion (ppb), down from the 75-ppb standards set in 2008. *Id.* at 65,292. The states were then required to prepare implementation plans that would ensure attainment with the updated federal standards and compliance with the Good Neighbor Provision. 42 U.S.C. § 7410(a)(1), (a)(2)(D)(i).

When 23 states failed to prepare adequate plans, EPA prepared a federal plan—the Good Neighbor Plan—to ensure that precursor pollution in those states would not significantly contribute to non-attainment of the federal ozone standards

⁷ *See* A.K. Gorai et al., *Influence of Local Meteorology and NO₂ Conditions on Ground-Level Ozone Concentrations in the Eastern Part of Texas, USA*, 8 Air Qual. Atmos. Health 81, 81–82 (2015).

⁸ *See What is Ozone?*, *supra* note 5.

in other states. 88 Fed. Reg. at 36,654. In issuing the Plan, EPA appropriately recognized the dangers ozone pollution poses to public health. *Id.* at 36,658. The Plan should be upheld.

II. Ground-level ozone endangers public health in the United States.

In general, “ozone is good up high, bad nearby.”⁹ Unlike ozone in the stratosphere, which blocks ultra-violet rays, ground-level ozone can seriously affect human health and well-being. It causes respiratory harm and can disturb metabolic processes, affect birth outcomes, create nervous system issues, reduce fertility, and affect heart health.¹⁰

The effects of ozone pollution on respiratory health are especially pronounced. As explained below, short-term exposure totaling eight hours or fewer can impair lung function¹¹ in otherwise healthy people and is associated with higher

⁹ *E.g.*, *Ozone*, Am. Lung Ass’n, <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/ozone> (last updated Apr. 17, 2024); *Ground-level Ozone Basics*, EPA, <https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics> (last updated May 14, 2024).

¹⁰ *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*, EPA, Table ES-1, ES-6, (Apr. 2020) <https://assessments.epa.gov/risk/document/&deid=348522#downloads> (click “Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants (Apr 2020)”).

¹¹ A person’s “lung function” reflects the amount of air they can take in on one breath, as well as the speed with which they can exhale it. *See Lung Function Tests*, Am. Lung Ass’n, <https://www.lung.org/lung-health-diseases/lung-procedures-and-tests/lung-function-tests> (last updated June 7, 2024).

rates of respiratory emergency department visits and hospitalization, especially among children.¹² Long-term exposure to ozone pollution is dangerous too and has been linked to the development of new disease, the exacerbation of existing disease, and death.

A. Short-term ozone exposure can cause immediate damage and harm children disproportionately.

Ozone is a powerful lung irritant. Upon inhalation, it interacts with cells in the respiratory system—the throat, nose, mouth, airways, and lungs—immediately causing damage and inflammation. This inflammation may result in coughing, throat irritation, pain, a sensation of burning or tightness, wheezing, or shortness of breath.¹³

Ozone pollution can affect everyone, even healthy people with no predisposition to respiratory illness. One study conducted in Galveston, Texas, tracked the lung function of healthy beach lifeguards in relation to changes in ozone

¹² Ira B. Tager et al., *Chronic Exposure to Ambient Ozone and Lung Function in Young Adults*, 16 *Epidemiology* 751, 758 (2005); see Ke Zu et al., *Concentration-Response of Short-Term Ozone Exposure and Hospital Admissions for Asthma in Texas*, 104 *Env't Int'l* 139, 142–43 (2017); Heather M. Strosnider et al., *Age-Specific Associations of Ozone and Fine Particulate Matter with Respiratory Emergency Department Visits in the United States*, 199 *Am. J. Respir. & Crit. Care Med.* 882, 887 (2019).

¹³ *Integrated Science Assessment*, *supra* note 10, at Table ES-1.

levels and found that, even in this otherwise healthy population, lung function decreased as ozone levels increased.¹⁴

The damage ozone causes to the respiratory system is akin to the damage sun causes to skin: even though exposure can cause lasting damage, acute symptoms generally resolve within a few days.¹⁵ However, short-term exposure can still cause severe effects. For example, a recent study covering 17 states and 45 percent of the U.S. population found that elevated ozone levels correlate with an increase in emergency department visits across all age groups, and particularly among people younger than 65.¹⁶

Indeed, children—and particularly children with asthma—are especially susceptible to the effects of ozone pollution. Children tend to be more susceptible because their lungs and immune systems are not yet fully developed, their smaller

¹⁴ Ephraim I. Thaller et al., *Moderate Increase in Ambient PM_{2.5} and Ozone are Associated with Lung Function Decreases in Beach Lifeguards*, 50 J. Occupational & Env't Med. 202, 209–10 (2008).

¹⁵ *Ozone Pollution and Your Patients' Health*, EPA, <https://www.epa.gov/ozone-pollution-and-your-patients-health/course-outline-and-key-points-ozone> (last updated June 20, 2024); see *infra* Part II.B (explaining that repeated exposure can cause lasting damage).

¹⁶ Strosnider et al., *supra* note 12, at 889.

respiratory systems are more affected by even marginal levels of inflammation, and they tend to be more active and spend more time outside than adults.¹⁷

Studies have demonstrated a consistent relationship between short-term ozone exposures and increases in emergency department visits for children with asthma.¹⁸ Even worse, increases in ozone levels have been associated with increased rates of admission to the intensive care unit for severe asthma exacerbations in children.¹⁹ Particularly troubling is the fact that the spikes in pediatric hospitalizations are observed even when ozone concentrations are far below the 70-ppb national standard.²⁰

Short-term ozone exposure can exacerbate existing health conditions in adults, too. Indeed, in adults with chronic obstructive pulmonary disease (“COPD”),

¹⁷ Wanting Huang et al., *Ozone Exposure and Asthma Attack in Children*, 10 *Frontiers in Pediatrics* 1, 4 (2022); Matthew J. Strickland et al., *Short-Term Associations Between Ambient Air Pollutants and Pediatric Asthma Emergency Department Visits*, 182 *Am. J. Respir. & Crit. Care Med.* 307, 307 (2010).

¹⁸ Strosnider et al., *supra* note 12, at 887.

¹⁹ Robert A. Silverman & Kazuhiko Ito, *Age-Related Association of Fine Particles and Ozone with Severe Acute Asthma in New York City*, 125 *J. Allergy & Clinical Immunology* 367, 368 (2010).

²⁰ Strickland et al., *supra* note 17, at 309 (observing increase in pediatric hospital admissions “at concentrations as low as 30 parts per billion”); *see also* Perry Elizabeth Sheffield et al., *Ambient Ozone Exposure and Children’s Acute Asthma in New York City: A Case-Crossover Analysis*, 14 *Env’t Health* 1, 1 (2015) (recognizing “growing evidence of health effects occurring below the [national] standard”).

short-term ozone exposure is associated with hospitalization for exacerbations.²¹ Studies have also charted a link between short-term ozone exposure and an increased risk of mortality.²² In a seminal study examining all deaths among Medicare participants between 2000 and 2012—a total of 22 million deaths—changes in day-to-day ozone exposure below the current ozone air quality standards were associated with death.²³

B. Long-term exposure to ozone pollution can cause lasting damage and chronic disease.

Like repeated sunburns, repeated or prolonged exposure to ground-level ozone likely is associated with lasting damage, even in otherwise healthy people. Long-term ozone exposure can also exacerbate existing disease, cause new disease, and lead to death.

Prolonged exposure to ozone pollution, even at relatively low levels, is associated with impaired lung function, even in children and adults who are otherwise healthy. Studies following participants over years have documented a link between long-term ozone exposure and chronically decreased lung function in

²¹ Hui Gao et al., *A Systematic Review and Meta-Analysis of Short-Term Ambient Ozone Exposure and COPD Hospitalizations*, 17 Int. J. Env't Res. & Pub. Health 2130, 2130 (2020).

²² Qian Di et al., *Association of Short-Term Exposure to Air Pollution With Mortality in Older Adults*, 318 J. Am. Med. Ass'n 2446, 2449 (2017).

²³ *Id.*

children, including healthy children without asthma.²⁴ Likewise, a 20-year study of middle-aged adults in Europe identified an association between higher long-term ambient ozone concentrations and lower lung function.²⁵ Even though the study documented small declines in lung function from year to year, it concluded that the “cumulative effect” of ozone exposure “over time can lead to a substantial reduction in lung function,” even accounting for age-related declines.²⁶

Ozone exposure over longer periods can also exacerbate existing disease in both children and adults. One study evaluated a cohort of more than 1,000 children with asthma over a four-year period and found that repeated exposure to ozone pollution resulted in increased airflow obstruction, rendering it even more difficult for the affected children to breathe.²⁷ Adults experience similar effects. A study of smokers, for example, found a correlation between long-term ozone exposure and

²⁴ See John R. Balmes, *Long-Term Exposure to Ozone and Small Airways: A Large Impact?*, 205 *Am. J. Resp. & Crit. Care Med.* 384, 384 (2022) (referencing existing studies).

²⁵ Tianyu Zhao et al., *Impact of Long-Term Exposure to Ambient Ozone on Lung Function Over a Course of 20 Years (The ECRHS study): A Prospective Cohort Study in Adults*, 34 *Lancet Regional Health – Europe* 1, 10 (2023).

²⁶ *Id.*; see *id.* at 8 (explaining that the documented “reduction corresponds to a . . . lung function impairment of up to 10 percent compared to the age-related decline”).

²⁷ Despo Ierodiakonou et al., *Ambient Air Pollution, Lung Function, and Airway Responsiveness in Asthmatic Children*, 137 *J. Allergy & Clin. Immunol.* 390, 397–98 (2016).

diminished lung function, accelerated emphysema, worsened COPD, and an overall deterioration in respiratory health.²⁸

Chronic exposure to ozone pollution is also associated with new disease. Here again, the harms can develop in childhood. One study observed that children who played multiple sports in high-ozone communities had a more than three-fold increased risk of developing asthma 20 years later than people who did not participate in youth sports or who played sports in areas with lower ozone concentrations.²⁹

Long-term ozone exposure in adulthood is associated with the onset of asthma, too. The risk of developing asthma as an adult is particularly high for people who spend their careers living and working in areas with higher concentrations of ground-level ozone.³⁰ Indeed, researchers have observed that “ozone was more strongly associated with” a formal diagnosis of adult-onset asthma than “any other monitored pollutant.”³¹ Once again, cumulative exposure to even relatively low

²⁸ Laura M. Paulin et al., *Association of Long-Term Ambient Ozone Exposure With Respiratory Morbidity in Smokers*, 180 *JAMA Intern. Med.* 106, 111–12 (2019).

²⁹ Rob McConnell et al., *Asthma in Exercising Children Exposed to Ozone: A Cohort Study*, 359 *Lancet* 386, 388–90 (2002).

³⁰ William F. McDonnell et al., *Long-Term Ambient Ozone Concentration and the Incidence of Asthma in Nonsmoking Adults: The AHSMOG Study*, 80 *Env't Rsch.* 110, 118 (1999).

³¹ *Id.* at 120.

levels of ozone—including levels below the national standards—correlates with diagnoses of adult-onset asthma.³² Similarly, long-term exposure to ozone pollution is associated with the development of acute respiratory distress syndrome, a serious and often fatal illness.³³

In addition to limiting lung function, exacerbating existing disease, and causing new disease, exposure to ozone pollution over longer and repeated periods can cause death. Multiple studies have identified this sort of correlation.³⁴ One study, for example, evaluated the risk of mortality among all Medicare recipients over a 12-year period and observed a “significant, linear relationship between seasonal

³² *Id.* at 118 (referring to levels above 60 ppb).

³³ Lorraine B. Ware et al., *Long-Term Ozone Exposure Increases the Risk of Developing the Acute Respiratory Distress Syndrome*, 193 *Am. J. Respir. & Crit. Care Med.* 1143, 1145 (2016); John P. Reilly et al., *Low to Moderate Air Pollutant Exposure and Acute Respiratory Distress Syndrome after Severe Trauma*, 199 *Am. J. Respir. & Crit. Care Med.* 62, 65 (2019).

³⁴ *See, e.g.*, Michael Jerrett et al., *Long-Term Ozone Exposure and Mortality*, 360 *N.E. J. Med.* 1085, 1092 (2009); Antonella Zanobetti & Joel Schartz, *Ozone and Survival in Four Cohorts With Potentially Predisposing Diseases*, 184 *Am. J. Resp. & Crit. Care Med.* 836, 839 (2011) (identifying particular risks among people with specific chronic conditions, including congestive heart failure, a history of heart attack, COPD, and diabetes).

ozone levels” and death from all causes.³⁵ This relationship held even in regions where ozone concentrations never exceeded the 70-ppb national standard.³⁶

Other studies have highlighted that even people without a history of respiratory disease are at risk. For example, a large study with 22 years of follow-up found a significant association between long-term ozone exposure and death from respiratory causes, even among adults who had no previous history of respiratory disease at the time of study enrollment.³⁷ The study ultimately documented a significant association between long-term ozone exposure and death from a variety of causes, including pneumonia, COPD, influenza, diabetes, and harm to the cardiovascular system.³⁸ As average ozone levels increased, so did the number of documented deaths.³⁹

* * *

³⁵ Qian Di et al., *Air Pollution and Mortality in the Medicare Population*, 376 N.E. J. Med. 2513, 2520 (2017).

³⁶ *Id.*

³⁷ Michelle Turner et al., *Long-Term Ozone Exposure and Mortality in a Large Prospective Study*, 193 Am. J. Respir. & Crit. Care Med. 1134, 1139 (2016) (noting that this finding “suggest[s] a role for O₃ [ozone] in the development and exacerbation of disease”).

³⁸ *Id.* at 1138–39.

³⁹ *Id.*

The science is clear: no one is safe from ozone pollution. It can harm the young, the old, the healthy, and the sick. Short-term exposure can cause immediate inflammation and breathing difficulties, and long-term exposure can cause disease and death. These effects occur even at levels below the existing national standard. Given this scientific consensus, there is no time to wait. If states cannot prepare adequate implementation plans to mitigate ground-level ozone pollution, then EPA's plan must fill the void.

III. The continued risks to public health underscore the importance of the Good Neighbor Plan.

Arguments presented by amici in support of Petitioners—namely, that the Plan is unnecessary, that the costs of the Plan outweigh its benefits, and that the Plan is an overreach—are incorrect. At best, recent improvements in air quality show only that the Clean Air Act works and that the Good Neighbor Plan should be implemented. At worst, figures documenting improvements obscure the declines in air quality in some regions and ignore the harms suffered by the people most vulnerable to ozone pollution. Likewise, the benefits of the standards for human health far outweigh the costs in EPA's own analysis, and those benefits are likely an undercount. Finally, the Good Neighbor Plan exists to limit interference with modest, but essential, national ozone standards. This renders implementation of the Plan even more important.

A. Overall improvements in ozone levels obscure inequities and lasting danger.

To be sure, ozone concentrations have declined consistently since the 1970s thanks in part to federal regulation of precursor pollutants. Between 1980 and 2022, ground-level ozone concentrations decreased by 29 percent nationwide, from an average of 93.6 ppb to 66.7 ppb.⁴⁰ But these figures tell only half the story, and the Chamber of Commerce errs in suggesting that recent improvements render the benefits of the Good Neighbor plan “negligible.” Chamber Amicus Brief at 5–6.

For one, the figures ignore the fact that many people continue to face substantial risks from ozone pollution. More than 100 million people in the United States—nearly one third of the population—still live in counties with dangerous ozone concentrations that often exceed national standards.⁴¹ In fact, even though the number of “unhealthy” ozone days within the past few years based on the Air Quality Index fell to a 25-year low nationwide, “nearly twice as many counties worsened as improved.”⁴²

⁴⁰ *Ozone Trends*, EPA, <https://www.epa.gov/air-trends/ozone-trends> (last updated Nov. 1, 2023).

⁴¹ American Lung Association, *State of the Air: 2024 Report*, 19–20 (2024), <https://www.lung.org/getmedia/dabac59e-963b-4e9b-bf0f-73615b07bfd8/State-of-the-Air-2024.pdf>; *see id.* at 10 (explaining grading system).

⁴² *Id.* at 20.

Further, “important socioeconomic and racial disparities in [ozone] exposure continue to be observed” in the ozone mapping data.⁴³ For example, Asian American or Pacific Islander, Black, non-Hispanic, and Hispanic people continue to be more likely than non-Hispanic white people to live in counties that do not meet national air quality standards for ozone.⁴⁴ Indeed, EPA recognized these disparities when it prepared the Good Neighbor Plan. *See* 88 Fed. Reg. at 36,845–46, 36,859. These disparities are particularly troubling because research suggests that Black people are more vulnerable to death from ozone pollution than are other subpopulations.⁴⁵ Studies also show that non-white children appear to be “more vulnerable to short-

⁴³ Heather L. Brumberg & Catherine J. Karr, *Ambient Air Pollution: Health Hazards to Children*, 147 *Pediatrics* 1, 2 (2021) (referring to disparities in exposure to particulate matter and ozone).

⁴⁴ *Id.*; *see also* *Disparities in the Impact of Air Pollution*, Am. Lung Ass’n, <https://www.lung.org/clean-air/outdoors/who-is-at-risk/disparities> (last updated Nov. 2, 2023) (referring to a 2011 study finding that “[n]on-Hispanic blacks were . . . more likely to live in counties with worse ozone pollution”); *State of the Air*, *supra* note 41, at 12 (explaining that people of color are 2.3 times as likely as white people to live in a county with a failing grade).

⁴⁵ Mercedes Medina-Ramón & Joel Schwartz, *Who is More Vulnerable to Die from Ozone Air Pollution?*, 19 *Epidemiology* 672, 678 (2008).

term increases in ambient pollution, particularly O₃ [ozone],” than white children.⁴⁶ Their symptoms are also more likely to require inpatient medical attention.⁴⁷

Finally, the declines in ozone pollution are not expected to last without intervention. As EPA recognized in the preamble to the Good Neighbor Plan, future ozone concentrations are affected by both emissions and climate conditions. 88 Fed. Reg. at 36,670. And recent assessments “project that climate change may lead to future increases in summer ozone concentrations across the contiguous U.S.” if emissions are not adequately managed. *Id.* Consistent with EPA’s findings, public health experts have warned that “the impact of continued climate change on ozone-related [emergency department] visits, a key marker for poor asthma control and a predictor of mortality, may be pronounced” in the future.⁴⁸ Given these present and future risks, full implementation of the Good Neighbor Plan is critical now.

⁴⁶ Brooke A. Alhanti et al., *Ambient Air Pollution and Emergency Department Visits for Asthma: A Multi-City Assessment of Effect Modification By Age*, 26 J. Exposure Sci. & Env’t Epidemiology 180, 184 (2015).

⁴⁷ Shao Lin et al., *Chronic Exposure to Ambient Ozone and Asthma Hospital Admissions Among Children*, 116 Env’t Health Persps. 1725, 1729 (2008) (detecting an association between elevated ozone and increased asthma hospital admissions in “young children, . . . Hispanics, [and] children living in poor communities”).

⁴⁸ Nicholas Nassikas et al., *Ozone-Related Asthma Emergency Department Visits in the US in a Warming Climate*, 183 Env’t Rsch. 1, 1 (2020).

B. Gripes about the cost of the Good Neighbor Plan ignore the substantial costs of failing to act.

The Chamber also complains that implementation of the Good Neighbor Plan “will impose significant costs on the economy.” Chamber Amicus Brief at 7 (capitalization altered). But given the harms ozone pollution causes to human health, failing to act will also impose significant costs. For example, the Centers for Disease Control has estimated the health costs of ozone pollution to be around \$6.5 billion annually nationwide.⁴⁹ Other scientists estimate that without proper management, the total annual costs of ozone-related emergency department visits alone are expected to top \$45 million per year by 2050.⁵⁰ These figures also omit the human costs of ozone exposure, including premature death, ozone-related chronic diseases, and metabolic impacts, all of which affect quality of life for patients and their families.

Further, EPA’s analysis shows that the quantifiable health benefits of the Good Neighbor Plan are greater than its costs. The agency estimates the public health benefits of the Plan to be as much as \$14 billion in 2026. 88 Fed. Reg. at 36,851

⁴⁹ *Air Pollution*, Ctrs. for Disease Control & Prevention, <https://www.cdc.gov/climate-health/php/effects/air-pollution.html> (last updated Mar. 2, 2024); *see also* Kim Knowlton, et al., *Six Climate Change-Related Events in the United States Accounted for About \$14 Billion in Lost Lives and Health Costs*, 30 Health Affairs 2167, 2170 (2011) (conducting similar analysis).

⁵⁰ Nassikas et al., *supra* note 48, at 4.

(identifying range of \$3.2 billion to \$14 billion in health benefits).⁵¹ Of those, the health benefits specific to ozone reductions alone are expected to total more than \$9 billion annually. *Id.* at 36,850. And the *net* benefits of the Plan, even accounting for costs of compliance, are expected to be as much as \$14 billion in 2026. *Id.* at 36,851 (identifying range of \$3.7 billion to \$14 billion in net benefits). Of course, this analysis also does not reflect the added unquantifiable benefits that come from improved public health and welfare.

Thus, the projected benefits to public health of reducing ozone pollution exceed the Plan's costs in every respect.

C. The Good Neighbor Plan exists to prevent interference with modest, but essential, national ozone standards.

As noted above, even ozone concentrations below the existing 70-ppb national standards harm human health.⁵² Indeed, this sort of concern has been documented in study after study. One study stated that “even at low levels, well below the current EPA standard, children’s lung function may be affected adversely by ozone

⁵¹ See also EPA’s “Good Neighbor” Plan Cuts Ozone Pollution—Overview Fact Sheet, EPA, 4 (2023), https://www.epa.gov/system/files/documents/2023-03/Final%20Good%20Neighbor%20Rule%20Fact%20Sheet_0.pdf.

⁵² Di et al., *supra* note 35, at 2520 (recognizing that health risks persist at ozone levels below 70 ppb).

exposure.”⁵³ Another study found that healthy adults exposed to ozone levels of 70 ppb for 6.6 hours will experience meaningfully diminished lung function.⁵⁴ And a subsequent study reported that acute exposure to ozone for that same duration at a level of even 60 ppb—that is, a level below the national standard—resulted in inflammation and decreased lung function.⁵⁵ That study’s authors warned that if these effects were documented in otherwise healthy subjects, the effects on people with preexisting disease, particularly asthma, were bound to be more severe.⁵⁶

Given those findings, the American Thoracic Society and American Lung Association have long advocated for adoption of more protective national standards—ideally, ones more stringent than the existing 70 ppb standards.⁵⁷ This discussion is not intended to suggest that the Good Neighbor Plan is infirm. Quite

⁵³ Stephanie M. Holm & John R. Balmes, *Systematic Review of Ozone Effects on Human Lung Function, 2013 Through 2020*, 161 *Chest* 190, 198 (2022).

⁵⁴ Edward S. Schelegle et al., *6.6-Hour Inhalation of Ozone Concentrations from 60 to 86 Parts Per Billion in Healthy Humans*, 180 *Am. J. Respir. & Crit. Care Med.* 265, 269–70 (2009).

⁵⁵ Chong S. Kim et al., *Lung Function and Inflammatory Responses in Healthy Young Adults Exposed to 0.06 ppm Ozone for 6.6 Hours*, 183 *Am. J. Respir. & Crit. Care Med.* 1215, 1219 (2011).

⁵⁶ *Id.*

⁵⁷ See Comment Letter of American Lung Association and American Thoracic Society on 2015 National Standard (Mar. 17, 2015), available at <https://www.lung.org/getmedia/ffc022b1-ec37-4867-b9a2-af5d8ec578b2/national-health-and-medical.pdf.pdf>

the opposite. It means that full implementation of the Plan is crucial. The Plan must be carried out to ensure that the existing national standards for ozone are implemented effectively to benefit the health and welfare of all communities.

CONCLUSION

For all these reasons, the petitions for review should be denied.

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CERTIFICATE OF COMPLIANCE

This brief complies with the word limitation of Federal Rules of Appellate Procedure 29(a)(5) and 32(a)(7)(B). The brief contains 4,985 words, excluding the portions exempted by Federal Rule of Appellate Procedure 32(f) and D.C. Circuit Rule 32(e)(1).

This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the typestyle requirements of Federal Rule of Appellate Procedure 32(a)(6). The brief has been prepared in proportionally spaced typeface using Microsoft Word and 14-point Times New Roman font.

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CERTIFICATE OF SERVICE

I hereby certify that on June 24, 2024, I served the foregoing brief on all registered parties through the D.C. Circuit's electronic case filing (CM/ECF) system.

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