ORAL ARGUMENT NOT YET SCHEDULED
No. 24-1050, -1051, -1052, -1073, -1091

IN THE
UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

COMMONWEALTH OF KENTUCKY and
STATE OF WEST VIRGINIA, *et al.,*

Petitioners,

v.

U.S. ENVIRONMENTAL PROTECTION AGENCY*, et al.,*

Respondents.

On Petitions for Judicial Review of Final Action of the United States Environmental Protection Agency, 89 Fed. Reg. 16,202 (Mar. 6, 2024)

AMICUS CURIAE BRIEF IN SUPPORT OF RESPONDENTS

Keri N. Powell
SOUTHERN ENVIRONMENTAL LAW CENTER
Ten 10th St NW, Suite 1050
Atlanta, GA 30309
(404) 678-6851
kpowell@selcga.org

Counsel for WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability

Dated: August 26, 2024

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 Briefs for Petitioners, except for the following: Midwest Ozone Group has appeared as an amicus for the Industry and Arizona Petitioners, and WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, Community Health Aligning Revitalization, Resistance & Sustainability, and National Parks Conservation Association have appeared as amiciin support of Respondents.

B. Rulings Under Review

References to the ruling at issue appear in the Briefs for Petitioners.

C. Related Cases

Aside from these consolidated petitions, there are no other related cases within the meaning of Circuit Rule 28(a)(1).

Dated: August 26, 2024

/s/ *Keri N. Powell*
Keri N. Powell
SOUTHERN ENVIRONMENTAL LAW CENTER
Ten 10th St NW, Suite 1050
Atlanta, GA 30309
(404) 678-6851
kpowell@selcga.org

Counsel for Amici Curiae

CORPORATE DISCLOSURE STATEMENT

Pursuant to Federal Rule of Appellate Procedure 26.1 and 29(a)(4)(A) and D.C. Circuit Rule 26.1, Amici Curiae WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability certify that each is a nongovernmental corporation with no parent corporation and no publicly held company holding 10 percent or more of its stock.

Dated: August 26, 2024

/s/ *Keri N. Powell*
Keri N. Powell

Keri N. Powell
SOUTHERN ENVIRONMENTAL LAW CENTER
Ten 10th St NW, Suite 1050
Atlanta, GA 30309
(404) 678-6851
kpowell@selcga.org

Counsel for Amici Curiae

D.C. CIRCUIT RULE 29(d) STATEMENT

Counsel for amici curiae WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability certify, pursuant to Circuit Rule 29(d), that a separate brief is necessary to provide the Court with the perspective and expertise held by the five organizations. These amici have particular expertise on the increased vulnerability of communities of color and low-socioeconomic-status communities to air pollution and on EPA's authority to consider the special needs of these communities when setting ambient air quality standards. Thus, amici curiae, through counsel, certify that it would not be practicable to file a joint brief with other amici curiae.

Dated: August 26, 2024

/s/ *Keri N. Powell*
Keri N. Powell

Keri N. Powell
SOUTHERN ENVIRONMENTAL LAW CENTER
Ten 10th St NW, Suite 1050
Atlanta, GA 30309
(404) 678-6851
kpowell@selcga.org

Counsel for Amici Curiae

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GLOSSARY OF ABBREVIATIONS, ACRONYMS, AND TERMS

Pursuant to Circuit Rule 28(a)(3), the following is a glossary of abbreviations, acronyms, and terms used in this brief.

Environmental justice communities	Collective reference to minority and low-socioeconomic-status communities identified by the Environmental Protection Agency as experiencing elevated $PM_{2.5}$ pollution exposure and/or increased risk of $PM_{2.5}$-related health effects as compared to the general population of the United States.
EPA	Environmental Protection Agency
$\mu g/m^3$	Micrograms per cubic meter
NAAQS	National Ambient Air Quality Standard(s)
$PM_{2.5}$	Particulate Matter with a nominal mean aerodynamic diameter less than or equal to 2.5 micrometers (μ)
Socioeconomic status	Composite measure used by EPA that includes metrics such as income, occupation, or education.

INTEREST OF AMICI CURIAE & AUTHORITY TO FILE

All parties have consented to amici curiae WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability filing an amicus brief in this case.

Amici are nonprofit organizations dedicated to achieving environmental justice in their communities, including attainment of healthy air quality. Amici regularly work with residents of communities of color and low-socioeconomic-status communities that are unequally exposed and adversely impacted by the health risks of particulate matter pollution to advocate for improved air quality. Strong national ambient air quality standards are critical to achieving healthy air quality in these communities, and Amici disagree with State Petitioners' contention that EPA lacks authority to consider environmental justice when setting these standards.

WE ACT for Environmental Justice is a 35-year-old environmental justice advocacy nonprofit with a headquarters in West Harlem and a Federal Policy Office in Washington DC. Founded in 1988, WE ACT's mission is to build healthy communities by ensuring that people of color and/or low-income residents participate meaningfully in the creation of environmental health and protection policies and practices. WE ACT develops and shares knowledge with

environmental justice constituencies and assists these constituencies in building the capacity and alliances necessary for effective advocacy and policy change.

Greater-Birmingham Alliance to Stop Pollution is a nonprofit health advocacy organization with a mission to enhance the health and wellbeing of communities in Birmingham and throughout Alabama by reducing air pollution, advancing environmental justice, and promoting climate solutions through education, advocacy, and collaboration. GASP strives to secure the right of Alabamians to breathe clean air and to provide communities with the tools needed to achieve that goal, including the placement of $PM_{2.5}$ air quality sensors in communities throughout the Birmingham area.

South Bronx Unite is a community-based organization dedicated to advancing environmental justice and equity in Mott Haven and Port Morris in the South Bronx, throughout New York City, New York State, and the nation. South Bronx Unite focuses on improving air quality, expanding green space equity, and fostering community land trusts to create a healthier, more sustainable environment. South Bronx Unite strives to enhance the overall well-being of community residents and build a stronger, more resilient community.

West End Revitalization Association promotes positive measurable change in communities of color, in the pursuit of climate and environmental justice, led by people of color with lived experience, through collaboration with community

members, stakeholders, and all levels of public leadership. The association supports North Carolina communities of color in Alamance, Orange, and Durham Counties and beyond through climate and environmental protection, popular education, and community leadership.

Community Health Aligning Revitalization, Resistance & Sustainability is a nonprofit environmental health organization based in Atlanta, Georgia that undertakes intergenerational and interdisciplinary work focused on equity, health, and environmental justice in African American and marginalized communities.

AUTHORSHIP AND FUNDING

Counsel for WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability authored this brief. Counsel alone funded preparation and submittal of this brief; no other person contributed money to fund preparing and submitting this brief. *See* Fed. R. App. P. 29(a)(4)(E).

INTRODUCTION

Exposure to particle pollution—especially to fine inhalable particulate matter with diameters that are 2.5 micrometers and smaller ("$PM_{2.5}$")—can lead to serious health problems. These fine particles, which are many times smaller than

the diameter of a single human hair, can lodge deep into human lungs and even enter the bloodstream. Numerous scientific studies link particle pollution exposure to an array of health problems, including aggravated asthma, decreased lung function, irregular heartbeat, heart attacks, and premature death in people with heart or lung disease. While particle pollution broadly impacts large swaths of the U.S. population, communities of color and low-socioeconomic-status populations are most likely to be adversely affected. This disproportionate impact can result because these populations are more likely to experience higher and lengthier exposures to unsafe particle pollution levels, are more sensitive to particle pollution, and often have more difficulty recovering from adverse health impacts.

The Clean Air Act instructs the U.S. Environmental Protection Agency ("EPA") to set primary National Ambient Air Quality Standards ("NAAQS") at levels that protect public health—including the health of sensitive populations—with an adequate margin of safety. 42 U.S.C. § 7409(b)(1). Thus, in determining that the existing primary annual $PM_{2.5}$ NAAQS needed to be strengthened and in establishing the new standard, EPA considered the impact of particle pollution on individuals most likely to experience adverse health impacts, including, among others, minority and low-socioeconomic-status populations. EPA identified numerous scientific studies documenting disparities in particle pollution exposure and health risks by race/ethnicity or socioeconomic status, noting that its

consideration of these studies in determining the impacts of $PM_{2.5}$ on the health of sensitive populations also supported achievement of EPA's environmental justice goals.

Without acknowledging the record evidence supporting EPA's identification of minority and low-socioeconomic-status populations as sensitive for the purpose of establishing an adequately protective $PM_{2.5}$ NAAQS, State Petitioners inexplicably allege that EPA's consideration of environmental justice is disconnected from EPA's statutory obligation to establish the primary $PM_{2.5}$ NAAQS at the level needed to protect public health. *See, e.g.*, State Pet. Br. at 23-24. To the contrary, EPA's identification of minority and low-socioeconomic-status populations as sensitive fits squarely within the plain language of the statute requiring it to set the annual $PM_{2.5}$ standard at a level that is requisite to protect public health.

ARGUMENT

I. EPA's Consideration of the Increased Vulnerability of Minority and Low-Socioeconomic-Status Populations in Deciding to Strengthen the $PM_{2.5}$ NAAQS is Required by the Plain Statutory Language Requiring It to Establish a NAAQS That is Requisite to Protect Public Health.

In setting its new, more protective primary annual $PM_{2.5}$ NAAQS, EPA observed that "this action is likely to reduce existing disproportionate and adverse

effects on communities with environmental justice concerns."[1] 89 Fed. Reg. 16,202, 16,375 (Mar. 6, 2024). Specifically, as part of its analysis of the primary particle pollution standard that is "requisite to protect public health," EPA considered the special vulnerabilities of "at-risk" populations, including, *inter alia*, "minority populations, and low-[socioeconomic-status] populations."[2] 89 Fed. Reg. at 16,266. EPA explained that "in setting the NAAQS to protect the health of at-risk groups with an adequate margin of safety, the Administrator is selecting the standard that will provide requisite protection, including for minority populations and other at-risk populations, which also generally results in protecting the public health of other populations and reducing risk disparities." *Id* at 16,267. Despite the obvious connection between the protection of public health and consideration of the special vulnerabilities of minority and low-socioeconomic-status populations to $PM_{2.5}$-related health risks, State Petitioners argue that EPA's consideration of these at-risk populations somehow involves pursuit of an "unlawful policy goal" (State

[1] EPA defines "environmental justice" as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." 88 Fed. Reg. at 5,673, n. 164. "Fair treatment," according to EPA, means that "no group of people should bear a disproportionate burden of environmental harms or risks." *Id.* (citation omitted).

[2] EPA explains that "[s]ocioeconomic status" "is a composite measure that includes metrics such as income, occupation, or education, and can play a role in access to healthy environments as well as access to healthcare." 89 Fed. Reg. at 16,375.

Pet. Br. at 29) that is "not within EPA's portfolio" (*id.* at 1).[3] State Petitioners are wrong. The Clean Air Act unambiguously requires EPA to set the primary NAAQS at a level that is sufficiently protective of all people, including "at-risk" populations that are likely to suffer health effects at lower pollution concentrations than the general population.

Not only does the Clean Air Act authorize EPA to consider evidence that some segments of the population are more likely to suffer adverse health impacts from air pollution exposure than the general population, but under the statute's plain language, EPA *must* consider such evidence. Specifically, the Clean Air Act broadly instructs EPA to set the primary NAAQS at a level that, "allowing an adequate margin of safety, [is] requisite to protect the public health." 42 U.S.C. § 7409(b)(1). The U.S. Supreme Court has interpreted this language to mean that EPA must "set air quality standards at the level that is … not lower or higher than is necessary—to protect the public health with an adequate margin of safety…." *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 475-76 (2001). To meet this standard, a NAAQS must do more than protect the average healthy person. Rather,

[3] State petitioners misleadingly refer to EPA's "Climate Policy" as driving EPA's decision to strengthen the annual primary annual $PM_{2.5}$ NAAQS. *See, e.g.,* State Pet. Br. at 1. But EPA only considered climate impacts in the context of its evaluation of the 2020 *secondary* NAAQS designed to protect against adverse effects on "welfare," which EPA decided not to revise. *See* 89 Fed. Reg. at 16,343. Thus, EPA's climate policies are entirely irrelevant EPA's decision as to the annual primary annual $PM_{2.5}$ NAAQS at issue in this proceeding.

as the 1970 Senate Report confirms, "particularly sensitive citizens" are "included among those persons whose health should be protected by the ambient standard." S. Rep. No. 91-1196 at 10 (1970). The Senate Report further elaborates that "[a]mbient air quality is sufficient to protect the health of such persons whenever there is an absence of adverse effect on the health of a statistically related sample of persons in sensitive groups from exposure to the ambient air." *Id.* Thus, "[a]n ambient standard … should be the maximum permissible ambient air level of an air pollution agent … which will protect the health of any group of the population." *Id.*

In a long line of cases beginning in the early years of Clean Air Act implementation, the D.C. Circuit has consistently affirmed EPA's obligation to set ambient standards at the level needed to protect sensitive individuals. *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1153 (D.C. Cir. 1980) (NAAQS must "be set at a level at which there is 'an absence of adverse effect' on these sensitive individuals."); *Am. Pet. Ass'n v. Costle*, 665 F.2d 1176, 1186 (D.C. Cir. 1981) ("As required by the statute, the Administrator promulgated air quality standards that are calculated to 'protect individuals who are particularly sensitive to the effects of pollution.'") (quoting *Lead Indus.,* 647 F.2d at 1153); *Am. Lung Ass'n v. EPA*, 134 F.3d 388, 389 (D.C. Cir. 1998) ("In its effort to reduce air pollution, Congress defined public health broadly. NAAQS must protect not only average healthy

individuals, but also 'sensitive citizens.'") (citation omitted); *id.* ("If a pollutant adversely affects the health of these sensitive individuals, EPA must strengthen the entire national standard."); *Murray Energy Corp. v. EPA*, 936 F.3d 597, 604 (D.C. Cir. 2019) ("'Public health' includes adverse health effects for both the population at large and sensitive populations such as children, older adults, and people with asthma or other lung diseases.") (quoting 42 U.S.C. § 7409(b)(1)); *Coal. of Battery Recyclers Ass'n v. EPA*, 604 F.3d 613, 618 (D.C. Cir. 2010); *Nat'l Env't Dev. Ass'n v. EPA*, 686 F.3d 803, 810 (D.C. Cir. 2012). In fact, in 2006, the D.C. Circuit found EPA's annual $PM_{2.5}$ standard to be "unreasonable in light of the agency's obligation to explain how the annual standard it set would protect 'not only average healthy individuals, but also 'sensitive citizens.'" *Am. Farm Bur. Fed'n v. EPA*, 559 F.3d 512, 524 (D.C. Cir. 2009) (citation omitted).

The 1970 Senate Report reveals that Congress was aware that ethnicity and social factors could contribute "to susceptibility to air pollution agents." S. Rep. No. 91-1196 at 7 (1970) (anticipating that research relating to air pollution effects would give attention to "[t]he contribution of age, ethnic, social, occupational, smoking and other factors to susceptibility to air pollution agents."). Moreover, in requiring that a NAAQS include a "margin of safety," 42 U.S.C. § 7409(b)(1), Congress made it clear that the standards must "protect the public health from the pollutant's adverse effects—not just known adverse effects, but those of scientific

uncertainty or that 'research has not yet uncovered.'" *Am. Lung Ass'n*, 134 F.3d at 389 (quoting *Lead Indus. Ass'n*, 647 F.2d at 1153).

As shown below, the administrative record for EPA's $PM_{2.5}$ rulemaking action includes numerous studies documenting that minority and low-socioeconomic-status populations are generally more vulnerable to adverse health effects from particle pollution than the general population. *See* 88 Fed. Reg. 5,558, 5,568-69 (Jan. 27, 2023) (explaining that the Supplement to the 2019 Integrated Science Assessment prepared as part of EPA's reconsideration of the $PM_{2.5}$ NAAQS evaluates, *inter alia*, "epidemiologic or exposure studies examining potential disparities in either $PM_{2.5}$ exposures or the risk of health effects by race/ethnicity or socioeconomic status."). Accordingly, EPA's inclusion of these populations in the category of "sensitive" individuals that must be considered in setting the primary annual $PM_{2.5}$ NAAQS is reasonable and critically important to ensuring that the standard is "requisite to protect the public health," 42 U.S.C. § 7409(b)(1).

II. Environmental Justice is a Necessary and Appropriate Consideration in Setting Ambient Particle Pollution Standards Because Environmental Justice Communities Generally Suffer from Both Elevated Exposure Levels and Increased Vulnerability to Adverse Health Impacts.

Exposure to $PM_{2.5}$—the smallest and most deadly microscopic particles—is

associated with serious adverse health effects. These include asthma[4] and asthma exacerbation,[5] lung disease,[6] heart attacks and coronary heart disease,[7] depression[8] and suicide,[9] preterm births and emergency visits within a child's first year,[10] and premature death.[11] *See* 89 Fed. Reg. at 16,274. These adverse health impacts are

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[4] Corinne A. Keet, Joshua P. Keller & Roger D. Peng, *Long-Term Coarse Particulate Matter Exposure Is Associated with Asthma Among Children in Medicaid*, 197 AM. J. OF RESP. & CRIT. CARE MED. 737 (2018), https://doi.org/10.1164/rccm.201706-1267oc.

[5] Angelica I. Tiotiu et al., *Impact of Air Pollution on Asthma Outcomes*, 17 INT'L J. OF ENV'T RSCH. & PUB. HEALTH 6212 (2020), https://doi.org/10.3390/ijerph17176212.

[6] Xiaojie Wang et al., *Air Pollution Associated with Incidence and Progression Trajectory of Chronic Lung Diseases: A Population-Based Cohort Study*, 78 THORAX (2023), https://doi.org/10.1136/thorax-2022-219489.

[7] Stacey E. Alexeeff et al., *Association of Long-Term Exposure to Particulate Air Pollution with Cardiovascular Events in California*, 6 JAMA NET. OPEN (2023), https://doi.org/10.1001/jamanetworkopen.2023.0561.

[8] Xinye Qiu et al., *Association of Long-term Exposure to Air Pollution with Late-Life Depression in Older Adults in the US*, 6 JAMA NET. OPEN (2023), https://doi.org/10.1001/jamanetworkopen.2022.53668.

[9] Qisijing Liu et al., *Association Between Particulate Matter Air Pollution and Risk of Depression and Suicide: A Systematic Review and Meta-Analysis*, 28 ENV'L SCI. & POLL. RSCH. 9029 (2021), https://doi.org/10.1007/s11356-021-12357-3.

[10] Anaïs Teyton et al., *Exposure to Air Pollution and Emergency Department Visits During the First Year of Life Among Preterm and Full-term Infants*, 6 JAMA NET. OPEN (2023), https://doi.org/10.1001/jamanetworkopen.2023.0262.

[11] C. Arden Pope et al., *Mortality Risk and Fine Particulate Air Pollution in a Large, Representative Cohort of U.S. Adults*, 127 ENV'T HEALTH PERSP. (2019), https://doi.org/10.1289/ehp4438.

not equally distributed throughout the population. Rather, minority communities and low-socioeconomic-status communities (collectively, "environmental justice communities") face a significantly higher likelihood of $PM_{2.5}$-related health effects due to both elevated exposure levels and increased sensitivity. Moreover, these communities may ultimately suffer from worse health outcomes due to a variety of socioeconomic factors. Regarding racial and ethnic disparities, EPA's 2019 Integrated Science Assessment documented "strong evidence for racial and ethnic differences in $PM_{2.5}$ exposures and $PM_{2.5}$-related health risk." 88 Fed. Reg. at 5,576. Likewise, "[s]tudies using composite measures of neighborhood [socioeconomic status] consistently demonstrated a disparity in both $PM_{2.5}$ exposure and the risk of $PM_{2.5}$-related health outcomes." 2022 Policy Assessment at 3-55 [Docket ID EPA-HQ-OAR-2015-0072-1584]. https://www.regulations.gov/document/EPA-HQ-OAR-2015-0072-1584.

A. Residents of Environmental Justice Communities Experience Disproportionate Exposure to Particulate Matter Pollution.

The most obvious reason for why residents of environmental justice communities are more likely to experience $PM_{2.5}$-related health impacts is that these individuals are more likely to be exposed to unhealthy pollution levels.[12] It is

[12] Michelle L. Bell & Keita Ebisu, *Environmental Inequality in Exposures to Airborne Particulate Matter Components in the United States*, 120 ENV'L HEALTH PERSP. 1699 (2012), https://doi.org/10.1289/ehp.1205201.

well established that racial and ethnic minorities are disproportionately exposed to $PM_{2.5}$ pollution when compared with white populations.[13] A study using cutting edge low-cost air quality monitors in Denver found that a non-White Hispanic community experiences summer $PM_{2.5}$ levels up to 2.5 times higher than primarily white communities.[14] Increased exposure to particle pollution occurs because environmental justice communities are more likely than other population groups to be located near high $PM_{2.5}$-emitting sources such as highways, industrial facilities, and ports.[15] Nationally, scientists have found higher levels of $PM_{2.5}$ exposure in ZIP codes that are home to higher proportions of Black individuals, lower education individuals, and lower income individuals.[16] This proximity to pollution sources often occurs because these communities lack the political power to

[13] Pran Kanai Saha et al., *Racial-ethnic Exposure Disparities to Airborne Ultrafine Particles in the United States*, 17 ENV'L RSCH. LETTERS 104047 (2022), https://doi.org/10.1088/1748-9326/ac95af.

[14] S. Cho et al., *Evaluation of $PM_{2.5}$ Exposures for an Environmental Justice Community Using a Low-Cost PM Sensor*, 3 ENV'L EPID. 69 (2019), https://doi.org/10.1097/01.ee9.0000606428.38783.53.

[15] Abdulrahman Jbaily et al., *Air Pollution Exposure Disparities Across US Population and Income Groups*, 601 NATURE 228 (2022), https://doi.org/10.1038/s41586-021-04190-y.

[16] Pablo Knobel et al., *Socioeconomic and Racial Disparities in Source-Apportioned $PM_{2.5}$ Levels Across Urban Areas in the Contiguous US, 2010*, 303 ATMOS. ENV'T 119753 (2023), https://doi.org/10.1016/j.atmosenv.2023.119753.

influence environmental decision-making, leading to a higher concentration of polluting facilities being sited in their neighborhoods.[17]

Racial and ethnic disparities exist even beyond the associated ZIP codes and income level. As shown by an EPA-funded 2021 analysis, Black and non-white Hispanic populations—regardless of location or income—are chronically exposed to $PM_{2.5}$ pollution from every major source including power plants, vehicles, and manufacturing.[18] On average people in poverty have 1.35 times the $PM_{2.5}$ exposure, yet Black people have 1.54 times the exposure, compared with the overall population of the United States.[19] This inequity is worsened by the fact that pollution created by white Americans' consumption of goods, services, and energy, is unequally inhaled by Black and non-white Hispanic communities. Black populations are exposed to 56% more $PM_{2.5}$ than their activities produce, and Hispanic populations are exposed to 63% more $PM_{2.5}$ than they contribute to

[17] Ihab Mikati et al., *Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status*, 108 AM. J. OF PUB. HEALTH 480 (2018), https://doi.org/10.2105/ajph.2017.304297.

[18] Christopher W. Tessum et al., *$PM_{2.5}$ Polluters Disproportionately and Systemically Affect People of Color in the United States*, 7 SCI. ADV. (2021), https://doi.org/10.1126/sciadv.abf4491.

[19] Mikati, *supra* note 17.

ambient levels.[20] In total, scientific literature reveals a serious environmental justice concern: Exposure to $PM_{2.5}$ pollution is unequitable at virtually every level of analysis, particularly by race and ethnicity.

B. Residents of Environmental Justice Communities are Likely to Experience Adverse Health Effects at Lower Levels of Particulate Matter Pollution Exposure Than the General Population.

Abundant scientific evidence demonstrates that minority and low-socioeconomic-status communities are disproportionately vulnerable to the health impacts of $PM_{2.5}$ pollution compared to the general population. In other words, environmental justice communities face higher health risks and mortality rates even when exposed to the same levels of ambient $PM_{2.5}$ pollution as other groups.[21]

Several factors contribute to this heightened susceptibility. First, environmental justice communities often have higher baseline rates of pre-existing health conditions that increase sensitivity to air pollution, such as asthma, cardiovascular disease, and diabetes.[22] These underlying health disparities, rooted

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[20] Christopher W. Tessum et al., *Inequity in Consumption of Goods and Services Adds to Racial–Ethnic Disparities in Air Pollution Exposure*, 116 PROC. OF THE NAT'L ACAD. OF SCI. 6001 (2019), https://doi.org/10.1073/pnas.1818859116.

[21] Kevin P. Josey et al., *Air Pollution and Mortality at the Intersection of Race and Social Class*, 388 NEW ENGL. J. OF MED. 1396 (2023), https://doi.org/10.1056/nejmsa2300523.

[22] *Id.*

in systemic inequities, make residents more vulnerable to the adverse effects of $PM_{2.5}$ exposure.[23] Additionally, residents of environmental justice communities frequently experience higher levels of psychosocial stress due to factors like poverty, racism, and limited access to healthcare, which can exacerbate the health impacts of air pollution.[24] Further, residents of environmental justice communities are often exposed to multiple environmental hazards simultaneously, creating a cumulative burden that amplifies the effects of $PM_{2.5}$ pollution on their overall health. For example, occupational exposures are often higher in environmental justice communities, as residents may work in industries with elevated air pollution levels.[25] In addition, many environmental justice communities are located near multiple pollution sources like highways, industrial factories, and landfill sites. This co-exposure to various pollutants and health stressors can have cumulative health effects beyond what would be expected from ambient $PM_{2.5}$ levels alone.[26]

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[23] Bell, *supra* note 12.

[24] Jbaily, *supra* note 15. *See also* Lisa Patel et al., *Air Pollution as a Social and Structural Determinant of Health*, 3 J. of Climate Change & Health 100035 (2021).

[25] Busisiwe Shezi et al., *Occupational Exposure to Fine Particulate Matter (PM_4 and $PM_{2.5}$) during Hand-Made Cookware Operation: Personal, Indoor and Outdoor Levels*, 17 INT'L J. OF ENV'T RES. AND PUBLIC HEALTH 7522 (2020), https://doi.org/10.3390/ijerph17207522.

[26] Kimberly A. Terrell & Gianna St. Julien, *Discriminatory Outcomes of Industrial Air Permitting in Louisiana, United States*, 10 ENV'T CHALL. 100672 (2023), https://doi.org/10.1016/j.envc.2022.100672.

Inequities in community infrastructure (e.g., housing, green space) also can contribute to increased risk of $PM_{2.5}$-related health impacts. One recent study across eight cities concluded that neighborhoods with a history of racist redlining and homeownership segregation policies consistently had higher pollution burdens, more noise, less vegetation, and higher temperatures than the rest of the city.[27] Poor housing quality and the lack of air conditioning also can increase exposure to indoor and outdoor $PM_{2.5}$ pollution.[28] Finally, the environments themselves that minority or low-socioeconomic-status populations live in often lack trees and open greenspaces, both of which can help mitigate $PM_{2.5}$ pollution.[29] For example, it is estimated that trees in Atlanta remove more than 64.5 tons of $PM_{2.5}$ from the air each year, an impact associated with positive health outcomes and reductions in mortality.[30] Environmental justice communities are less likely to receive these tree-

[27] Cesar O. Estien et al., *Historical Redlining Is Associated with Disparities in Environmental Quality Across California*, 11 ENV'T SCI. & TECH. LETTERS 54 (2024), https://doi.org/10.1021/acs.estlett.3c00870.

[28] Tessum, *$PM_{2.5}$ Polluters, supra* note 18.

[29] K.P. Beckett, P.H. Freer-Smith & G. Taylor, *Urban Woodlands: Their Role in Reducing the Effects of Particulate Pollution*, 99 ENV'T POLL. 347 (1998), https://doi.org/10.1016/s0269-7491(98)00016-5.

[30] David J. Nowak et al., *Modeled $PM_{2.5}$ Removal by Trees in Ten U.S. Cities and Associated Health Effects*, 178 ENV'T POLL. 395 (2013), https://doi.org/10.1016/j.envpol.2013.03.050.

related health benefits because they are less likely to live in areas with tree cover or accessibility to green spaces. One recent study revealed that low-income neighborhood blocks in the US have 15% less tree cover on average because environmental investments in sustainability and beautification are overwhelmingly made in wealthier neighborhoods at the exclusion of poorer areas.[31]

C. Residents of Environmental Justice Communities Often Experience More Severe Health Outcomes from Particulate Matter Pollution Exposure Than the General Population.

The exposure disparities faced by environmental justice communities are further compounded by socioeconomic factors which combine to worsen the health outcomes of pollution exposure.[32] Residents often have limited access to healthcare, live in substandard housing, and face higher levels of stress due to economic and social challenges.[33] These factors can increase these communities' vulnerability to the health effects of $PM_{2.5}$ pollution, leading to worse health

[31] Robert I. McDonald et al., *The Tree Cover and Temperature Disparity in US Urbanized Areas: Quantifying the Association with Income Across 5,723 Communities*, 16 PLOS ONE (2021), https://doi.org/10.1371/journal.pone.0249715.

[32] Mikati, *supra* note 17.

[33] Ji-Young Son et al., *Health Disparities Attributable to Air Pollutant Exposure in North Carolina: Influence of Residential Environmental and Social Factors*, 62 HEALTH & PLACE 102287 (2020), https://doi.org/10.1016/j.healthplace.2020.102287.

outcomes compared to more affluent communities with similar levels of pollution exposure.[34] Research indicates that these environmental justice communities not only experience higher levels of exposure to pollution but also suffer from more severe health impacts from that exposure due to the cumulative burden of various stressors and uneven health infrastructure.[35] A national study of Medicare beneficiaries has revealed that long-term $PM_{2.5}$ exposure is associated with death from cardiovascular, respiratory, and cancer diseases, and that these effects impact Black people and low-socioeconomic-status urban populations most heavily.[36]

In sum, studies show that residents of environmental justice communities are disproportionately exposed to particulate matter pollution, suffer adverse health impacts at lower levels of pollution exposure, and experience more severe health outcomes compared to the general population. EPA's consideration of the increased vulnerability of these communities to particle pollution in setting the

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[34] Prakash Thangavel, Duckshin Park & Young-Chul Lee, *Recent Insights into Particulate Matter ($PM_{2.5}$)-Mediated Toxicity in Humans: An Overview*, 19 INT'L J. OF ENV'T RSCH. & PUB. HEALTH 7511 (2022), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9223652/.

[35] Bell, *supra* note 12.

[36] Bingyu Wang et al., *The Impact of Long-Term $PM_{2.5}$ Exposure on Specific Causes of Death: Exposure-Response Curves and Effect Modification Among 53 Million U.S. Medicare Beneficiaries*, 19 ENV'T HEALTH 20 (2020), https://doi.org/10.1186/s12940-020-00575-0.

primary annual $PM_{2.5}$ NAAQS was essential to ensuring that the NAAQS were set at a level "requisite to protect public health" with "an adequate margin of safety." 42 U.S.C. § 7409(b)(1).

III. EPA's Final $PM_{2.5}$ NAAQS is Grounded in Health Science and Based on a Reasonable Assessment of the Margin of Safety Needed to Account for Uncertainties.

Based on the abundant scientific evidence demonstrating that minority and low-socioeconomic-status populations are both disproportionately exposed to $PM_{2.5}$ pollution and generally more vulnerable to $PM_{2.5}$-related health impacts, EPA's identification of these populations as "sensitive" for purposes of establishing the $PM_{2.5}$ NAAQS was consistent with the plain statutory language requiring it to set a primary standard at the level that is "requisite to protect public health," 42 U.S.C. § 7409(b)(1). Furthermore, EPA's final determination as to the level at which the annual standard needed to be set was grounded in health science and based on a reasonable assessment of the margin of safety needed to account for uncertainties.

EPA explained that its final decision to strengthen the primary annual $PM_{2.5}$ NAAQS from 12 micrograms per cubic meter ("$\mu g/m^3$") to 9 $\mu g/m^3$ "is a public health policy judgment drawing upon scientific and technical information examining the health effects of $PM_{2.5}$ exposures, including how to consider the range and magnitude of uncertainties inherent in that information." 89 Fed. Reg. at

16,273. State Petitioners contend that EPA's action is unlawful both because of the "uncertainties" in the health data and because they believe that policy considerations have no role in NAAQS-setting. State Pet. Br. at 28-29. But regardless of scientific uncertainty, EPA must set a primary NAAQS at a level that protects public health with a margin of safety. *See, e.g., Am. Trucking Ass'n v. EPA*, 283 F.3d 355, 369 (D.C. Cir. 2002) ("The Act requires EPA to promulgate protective primary NAAQS even where, as here, the pollutant's risks cannot be quantified or 'precisely identified as to nature or degree.'") (citation omitted); *Lead Indus. Ass'n*, 647 F.2d at 1152-53. In doing so, EPA has no choice but to make policy judgments regarding how to interpret the available science and how much of a margin of safety is needed to adequately protect public health. *See, e.g., Murray Energy Corp.*, 936 F.4d at 609 ("[W]hen EPA reviews and revises the NAAQS, it does so against current policy considerations and existing scientific knowledge."); *Miss. v. EPA*, 744 F.3d 1334, 1358 (D.C. Cir. 2013) ("The task of determining what standard is 'requisite' to protect the qualitative value of public health or what margin of safety is 'adequate' to protect sensitive subpopulations necessarily requires the exercise of policy judgment.") (citations omitted).

It is undisputed that scientific uncertainty exists regarding the precise $PM_{2.5}$ concentration needed to avoid all $PM_{2.5}$-related health effects. *See* 89 Fed. Reg. at 16,254 ("[T]here is no specific point in the air quality distribution of any

epidemiologic study that represents a 'bright line' at and above which effects have been observed and below which effects have not been observed."). However, Congress anticipated ongoing scientific uncertainty when it enacted the Clean Air Act in 1970, which is why Congress required EPA to add a "margin of safety" when setting a primary NAAQS. *Supra* at 9. That does not mean, however, that EPA's primary $PM_{2.5}$ NAAQS is untethered from science. Quite to the contrary, EPA carefully and extensively explained the judgments it made in interpreting the available science. *See* 89 Fed. Reg. at 16,275. These judgments necessarily entailed some consideration of policy goals, but such consideration in no way rendered EPA's judgments unreasonable or unscientific. *See, e.g., id.* at 16,278 ("The Administrator recognizes that placing weight on the information from the epidemiologic studies allows for examination of the entire population, including those that may be at comparatively higher risk of experiencing a $PM_{2.5}$-related health effects (e.g., children, older adults, minority populations)."). In fact, EPA's Clean Air Scientific Advisory Committee concluded that the prior annual standard did not adequately protect public health and needed to be strengthened, with the majority proposing a standard of 8-10 $\mu g/m^3$ based on epidemiological evidence, especially to protect vulnerable populations. 2022 Policy Assessment, *supra*, at 3-168–3-169.

Finally, in selecting 9.0 $\mu g/m^3$ as the requisite level for the primary annual

$PM_{2.5}$ NAAQS, EPA explained that it was not seeking a "zero-risk" level but was instead seeking "a level that avoids unacceptable risks to public health, including the health of sensitive … groups." *Id.* at 16,219. Furthermore, EPA acknowledged that the selected standard "must be sufficiently protective, but not more stringent than necessary." *Id.* at 16,273. In fact, EPA rejected numerous public comments, including from Amici, arguing that the available science supports setting a more protective standard of 8.0 $\mu g/m^3$. EPA Response to Comments at 46-57 [Docket ID EPA-HQ-OAR-2015-0072-6010]. Though 8.0 $\mu g/m^3$ was within the range recommended by a majority of EPA's Clean Air Scientific Advisory Committee, and EPA's 2022 Policy Assessment concluded that the available scientific information provides support for an 8.0 $\mu g/m^3$ standard, 88 Fed. Reg. at 5,561, EPA declined to set the standard that low. 89 Fed. Reg. at 16,285. In support of its decision, EPA asserted that "the extent to which lower standard levels could result in further public health improvements becomes notably less certain." *Id*. While Amici advocated for EPA to set an even more protective annual standard, EPA's refusal to do so supports the conclusion that EPA's 9.0 $\mu g/m^3$ standard is *not* lower than necessary to protect public health. *Cf. Am. Trucking Ass'n*, 283 F.3d at 369 (explaining, "EPA's rejection of lower standards [demonstrates] that the Agency not only recognized, but acted upon, its statutory obligation to set the primary NAAQS at levels no lower than necessary to reduce public health risks.").

CONCLUSION

For the foregoing reasons, the Court should deny the petitions.

Dated: August 26, 2024

Respectfully submitted,

/s/ *Keri N Powell*
Keri N. Powell

Keri N. Powell
SOUTHERN ENVIRONMENTAL LAW CENTER
Ten 10th St NW, Suite 1050
Atlanta, GA 30309
(404) 678-6851
kpowell@selcga.org

Counsel for Amici Curiae WE ACT for Environmental Justice, Greater-Birmingham Alliance to Stop Pollution, West End Revitalization Association, South Bronx Unite, and Community Health Aligning Revitalization, Resistance & Sustainability

CERTIFICATE OF COMPLIANCE

The foregoing *amicus curiae* brief complies with the type-volume limitations of Fed. R. App. P. 29(a)(5) because this brief contains 5,122 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f), as counted by counsel's word processing system.

This *amicus curiae* brief complies with the type face requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in 14-point Times New Roman font using Microsoft Word.

Dated: August 26, 2024

/s/ *Keri N. Powell*
Keri N. Powell

CERTIFICATE OF SERVICE

I hereby certify that on this 26th day of August 2024, the foregoing **AMICUS BRIEF** was filed with the Clerk of the United States Court of Appeals for the District of Columbia Circuit via the Court's CM/ECF system. Counsel for all parties are registered CM/ECF users and will be served by the appellate CM/ECF system.

Dated: August 26, 2024

/s/ *Keri N. Powell*
Keri N. Powell