April 14, 2021

The Honorable Michael Regan, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
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via email and U.S. certified mail

Re: Supplemental Information in Support of Petition to Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act

Dear Administrator Regan,

This letter is in reply to Acting Administrator Jane Nishida's letter of March 4, 2021, withdrawing the January 19, 2021 denial ("Petition Denial") of our 2009 Petition to Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act ("2009 Petition"). We are pleased that the Environmental Protection Agency is "further consider[ing] the important issues raised" in the 2009 Petition.

In light of this fact and that the 2009 Petition has now been pending for more than a decade, we write to provide some additional information regarding developments in climate research and policy since 2009, and address some of the concerns raised in the Petition Denial. In brief, we highlight the following:

- The danger that greenhouse gases pose to public health and welfare has only increased over the past decade.
- New information since 2009 includes the following: the warming potential of certain short-lived climate pollutants, such as methane, has been revised upwards; information on additional and more extreme dangers of climate change to public health and the planet has been published; and limiting warming to 1.5°C with little or no overshoot requires a *more rapid* phase out of carbon dioxide emissions than would have been necessary had reductions begun sooner.
- Recent research into worldwide and nationwide carbon budgets, as well as climate policy developments since 2009 (primarily the Paris Agreement) provide an even clearer pathway to establishing a national greenhouse gas pollution cap than was evident in 2009, while case law helps indicate how these emissions reductions can be apportioned among the states.
- Listing greenhouse gases as criteria pollutants remains mandatory under the Clean Air Act.

It is imperative that the United States now take bold actions to address the climate crisis. The National Ambient Air Quality Standards ("NAAQS") program is the Clean Air Act's most far-reaching and important tool for doing so. Because it provides a national framework for addressing the most pervasive forms of air pollution emitted from "numerous or diverse"

sources,[1] the NAAQS program is best suited to regulation of greenhouse gases. The NAAQS program activates the widest possible approach to tackling greenhouse gas emissions, and offers states maximum flexibility to choose those measures, across multiple sectors, which will allow each state to achieve its emission reduction requirements.[2] The devolution of the details of emissions reduction plans to states allows them to build upon existing programs, taking advantage of expertise and familiarity with the current regulatory structure, while encouraging innovation and allowing flexibility and localized solutions. Historically, these reductions have provided large economic benefits,[3] and have been achieved during periods of rapid economic growth.[4]

The Clean Air Act is a powerful tool to address climate pollution overall. We are aware, for example, that EPA has also withdrawn the previous administration's denial of New York University School of Law Institute for Policy Integrity's February 19, 2013 petition to regulate greenhouse gases under Section 115 of the Clean Air Act. While we do not believe a greenhouse gas NAAQS is a *prerequisite* for regulation under Section 115, we do believe they are complementary regulatory approaches and urge EPA to move forward under both sections. EPA can and should simultaneously or jointly act under Section 115, along with Sections 108-110, to regulate greenhouse gases.

Other approaches like sector-by-sector policies pursuant to other Clean Air Act sections, including but not limited to Sections 111, 202, 213, and 231, have an important role to play and will be complement a national pollution standard. But incremental approaches such as the Clean Power Plan have not delivered the urgently needed pollution reductions.

Setting a national science-based standard is critical to protecting the health and welfare of the nation. As you now take the time to more fully assess the 2009 Petition, we hope you will take this information into account.

I. Background

On December 2, 2009, the Center for Biological Diversity and 350.org ("Petitioners") petitioned the Environmental Protection Agency ("EPA") requesting that the Agency establish national pollution limits for greenhouse gases, namely carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulfur hexafluoride

[1] 42 U.S.C. § 7401 et. seq.
[2] 42 U.S.C. § 7410(a).
[3] Between 1990 and 2010, the Clean Air Act produced an almost 50% reduction in volatile organic compounds and nitrogen oxides, and more than a 60% reduction in sulfur oxides, while producing economic benefits that dwarfed the costs. *See* U.S. EPA [U.S. Environmental Protection Agency], The Benefits and Costs of the Clean Air Act From 1990 TO 2020 (2011), https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-report-documents-and-graphics (last visited April 9, 2021).
[4] "From 1970 to 2015, aggregate national emissions of the six common pollutants alone dropped an average of 70 percent while gross domestic product grew by 246 percent." *See* U.S. EPA [U.S. Environmental Protection Agency], Progress Cleaning the Air and Improving People's Health, https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health (last visited April 9, 2021).

(SF_6); and nitrogen trifluoride (NF_3),[5] pursuant to the Clean Air Act. Petitioners were motivated by the increasingly severe impacts of global warming as atmospheric carbon dioxide levels approached 390 parts per million.[6] Indeed, in April 2009, EPA concluded that "[t]he evidence points ineluctably to the conclusion that climate change is upon us as a result of greenhouse gas emissions, that climate changes are already occurring that harm our health and welfare, and that the effects will only worsen over time in the absence of regulatory action."[7]

On January 19, 2021, the last day of the outgoing Trump administration, then-EPA Administrator Andrew Wheeler sent a letter to the Center and 350.org, as well as two other environmental and public policy groups that had petitioned EPA to take other actions under the Clean Air Act to address greenhouse gas emissions. The single letter denied three petitions: Petitioners' petition to regulate greenhouse gases as criteria pollutants; the Institute for Policy Integrity's petition to regulate greenhouse gas emissions as international air pollutants under section 115 (42 U.S.C. § 7415) of the Clean Air Act,[8] and Food and Water Watch's petition to regulate greenhouse gas emissions as hazardous air pollutants under section 112 (42 U.S.C. § 7412) of the Clean Air Act.[9] On March 5, 2021, Acting Administrator Jane Nishida sent a letter to the Center and 350.org, advising that she was withdrawing the denial of our petition, because EPA "did not fully and fairly assess the issues raised by the petition." She indicated that EPA intends to further consider these issues before responding.[10]

II. The danger that greenhouse gases pose to public health and welfare has only increased since the 2009 Petition was filed.

The necessary preconditions to a mandatory duty to list greenhouse gases as a criteria pollutant, and thereafter establish a NAAQS, are that emissions of the pollutant (a) cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; and (b) the presence of which in the ambient air results from numerous or diverse sources.[11] There is no reasonable dispute that greenhouse gases are emitted from numerous and diverse sources. EPA so acknowledged in its 2009 endangerment finding.[12] For more than a decade, EPA has consistently continued to take the position that, for the purposes of the Clean

[5] CTR. FOR BIOLOGICAL DIVERSITY & 350.org, PETITION TO ESTABLISH NATIONAL POLLUTANT LIMITS FOR GREENHOUSE GASES PURSUANT TO THE CLEAN AIR ACT (2009) ("2009 Petition") at iii.
[6] 2009 Petition at i.
[7] Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18,886, 19,904 (proposed Apr. 24, 2009) (to be codified 40 C.F.R. ch. 1).
[8] EPA purported to take no action with respect to the Institute for Policy Integrity's request that EPA regulate greenhouse gases under section 111, Title II and Title VI of the Clean Air Act noting that it already regulates greenhouse gases under these provisions. Petition Denial, n. 3.
[9] ANDREW R. WHEELER, U.S. ENVIRONMENTAL PROTECTION AGENCY, DENIAL OF PETITIONS TO ESTABLISH NATIONAL AMBIENT AIR QUALITY STANDARDS FOR GREENHOUSE GASES, TO REGULATE GREENHOUSE GASES UNDER CLEAN AIR ACT SECTION 115, AND TO REGULATE GREENHOUSE GASES AS HAZARDOUS AIR POLLUTANTS (2021) ("Petition Denial").
[10] Letter from Jane Nishida, Acting Administrator, Environmental Protection Agency to Kassie Siegel, Director, Climate Law Institute, Center for Biological Diversity (Mar. 4, 2021).
[11] 42 U.S.C. § 7408(a)(1).
[12] Final Rule Finding that Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 74 Fed. Reg. 66,538 (Dec. 15, 2009) ("The total emissions of greenhouse gases worldwide are from numerous sources and countries.")

Air Act, greenhouse gas emissions endanger the public health and welfare. EPA first reached such conclusion in 2009, finding that greenhouse gases from motor vehicles "contribute to the total greenhouse gas air pollution, and thus to the climate change problem, which is reasonably anticipated to endanger public health and welfare."[13]

However, the urgency of the climate crisis has only grown since 2009, when Petitioners asked EPA to act and EPA made its first endangerment finding. The on-the-ground evidence of the climate crisis is all around us. Ever more severe hurricanes, rainstorms and other extreme weather, wildfires, intense heat waves, melting ice, and other impacts are dominating headlines and devastating lives and the environment.[14] The U.S. National Climate Assessments and Intergovernmental Panel on Climate Change ("IPCC") assessments make clear that the failure to reduce greenhouse gas emissions is worsening the harms from climate change, endangering public health and welfare, and worsening environmental justice inequalities, as the most vulnerable communities experience even greater harms to their health, safety and quality of life than others. EPA should not rely on data from 2009, but instead should take into account the current state of climate change research when deciding the 2009 Petition.

The Fourth National Climate Assessment—comprised of the 2017 *Climate Science Special Report*[15] and the 2018 *Impacts, Risks, and Adaptation in the United States*,[16] prepared by hundreds of scientific experts and reviewed by the National Academy of Sciences and 13 federal agencies—provided overwhelming evidence that human-caused climate change is causing widespread and escalating harms across the country as greenhouse gas emissions continue to rise. The report concluded that "evidence of human-caused climate change is overwhelming and continues to strengthen; that the impacts of climate change are intensifying across the country; and that climate-related threats to Americans' physical, social, and economic well-being are rising."[17] Ever-worsening climate change impacts in the U.S. include rising temperatures, the increasing frequency of heat waves and other extreme weather events, the flooding of coastal regions by sea level rise and increasing storm surge, the rapid loss of Arctic sea ice, declining food and water security, increasing species extinction risk, ocean acidification, and the collapse of coral reefs.[18]

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[13] U.S. Environmental Protection Agency, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule, 74 Federal Register 66,496 (2009) (codified at 40 C.F.R.R. ch. 1). EPA made the endangerment finding for "the mix of six long-lived and directly-emitted greenhouse gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride." *Id.* In 2016, in its endangerment finding for greenhouse gas emissions from aircraft, EPA again concluded that "elevated concentrations of the six well-mixed [greenhouse gases] constitute air pollution that may reasonably be anticipated to endanger both the public health and welfare of current and future generations. 81 Fed. Reg. 54,440 (Aug. 15, 2016).

[14] *See, e.g.*, Achenbach, Joel and Angela Fritz, *Hot summers, wildfires: Scientists say it's climate change, and they predicted it*, THE WASHINGTON POST, July 27, 2018.

[15] USGCRP [U.S. Global Change Research Program], Climate Science Special Report: Fourth National Climate Assessment, Vol. I (2017), https://science2017.globalchange.gov/ ("USGCRP 2017 Vol. I").

[16] USGCRP [U.S. Global Change Research Program], Climate Science Special Report: Fourth National Climate Assessment: Impacts, Risks, and Adaptation in the United States, Vol. II (2018) ("USGCRP 2018 Vol. II."), https://www.globalchange.gov/nca4.

[17] USGCRP 2018 Vol. II at 36.

[18] USGCRP 2017 Vol. I; USGCRP 2018 Vol. II.

A 2018 study by 14 prominent scientists and former EPA policy administrator Lisa Heinzerling concluded that new scientific evidence since 2009 has only strengthened the case for endangerment.[19] For each sector addressed in EPA's endangerment finding, the amount, diversity, and sophistication of the evidence has increased dramatically.[20] Importantly, new evidence indicates that the risks of many impacts are even more severe or widespread than anticipated in 2009, including for public health, air quality, food production, water resources and sea level rise. The study recommended that several types of climate change impacts that were not addressed in the 2009 endangerment finding—ocean acidification, violence, national security, and economic well-being—are supported by overwhelming evidence and should be included in the framing of endangerment.

Adding to this evidence, the global atmospheric concentration of carbon dioxide, the most important greenhouse gas responsible for 66% of warming, continues to rise, reaching 414 parts per million (ppm) in 2020,[21] which is a level not seen for millions of years.[22] The current atmospheric carbon dioxide concentration is one and a half times greater than the pre-industrial level of 278 ppm, and much greater than levels during the past 800,000 years when the atmospheric carbon dioxide concentration fluctuated between ~174 and 280 ppm.[23] The atmospheric concentrations of methane and nitrous oxide, two other potent greenhouse gases, have increased to 260% and 123% of their pre-industrial levels, respectively.[24] In 2020 methane levels increased by 14.7 parts per billion (ppb), which is the largest annual increase recorded since measurements began in 1983.[25]

In addition, the warming potential of certain short-lived climate pollutants, such as methane, has been revised upwards since Petitioners filed their 2009 Petition.[26] According to the current state of climate change research, the properties of the pollutants the subject of the 2009 Petition are as follows:

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[19] Duffy, Philip B. et al., Strengthened scientific support for the endangerment finding for atmospheric greenhouse gases, 363 Science eeat5982 (2019) at 1.
[20] *Id.* at 1.
[21] NOAA [National Oceanic and Atmospheric Administration], Global Monitoring Laboratory, Trends in Atmospheric Carbon Dioxide, https://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/co2/co2_annmean_mlo.txt ("NOAA, Trends in Atmospheric CO2") (last visited 2/25/2021).
[22] World Meteorological Organization, WMO Greenhouse Gas Bulletin, No. 13, October 30, 2017 at 5.
[23] Intergovernmental Panel on Climate Change, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2014) at 4, 44.
[24] World Meteorological Organization, WMO Greenhouse Gas Bulletin, No. 16, November 23, 2020, at 6.
[25] NOAA, Despite pandemic shutdowns, carbon dioxide and methane surged in 2020, https://research.noaa.gov/article/ArtMID/587/ArticleID/2742/Despite-pandemic-shutdowns-carbon-dioxide-and-methane-surged-in-2020 (April 7, 2021)
[26] Myhre, G., D Shindell et al., Ch. 8: Anthropogenic and Natural Radiative Forcing, in Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change IPCC, Stocker, T.F. et al., eds. Cambridge University Press, Cambridge UK and New York USA (2013) ("Ch. 8: Anthropogenic and Natural Radiative Forcing") at Table 8.7.

Table 1: Key Properties of Petitioned Pollutants

Pollutant[a]	Atmospheric Lifetime (years)	GWP[b] 20-yr	GWP 100-yr	Pre-Industrial Concentration	Concentration at time of Petition Filing	Current Concentration
Carbon Dioxide (CO_2)	*See note c*	1	1	278 ppm[d]	385.2 ppm (2008)	414ppm (2020)[e]
Methane (CH_4)	12.4	86	34	722 ppb[f]	1797 ppb (2008)	1879 ppb (2020)[g]
Nitrous Oxide (N_2O)	121	268	298	270 ppb	321.8 ppb (2008)	332 ppb (2019)[h]
Hydrofluoro carbons (HFCs)[i]						
HFC-125	28.2	6,090	3,170	0	3.7 ppt	9.58 ppt (2011)
HFC-134a	13.4	3,710	1,300	0	35 ppt	62.7 ppt (2011)
HFC-152a	1.5	506	138	0	3.9 ppt	6.4 ppt (2011)
HFC-23	222	10,800	12,400	0	18 ppt	24.0 ppt (2011)
Perfluorocar bons (PFCs)[i]						
PFC-14	50,000	4,880	6,630	0	74 ppt	79.0 ppt (2011)
PFC-116	10,000	8,210	11,100	0	2.9 ppt	4.16 ppt (2011)
Sulfur hexafluoride (SF_6)	3,200	17,500	23,500	0	5.6 ppt	7.28 ppt (2011)

[a] Unless otherwise noted, data are from Myhre, G., D. Shindell et al., Ch. 8: Anthropogenic and Natural Radiative Forcing, in Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change IPCC, Stocker, T.F. et al., eds. Cambridge University Press, Cambridge UK and New York USA (2013).

[b] direct, global mean Global Warming Potential.

[c] It is not possible to give a single lifetime for carbon dioxide, but research has highlighted its long residence time. While approximately half of the carbon emitted is removed by the natural carbon cycle within a century, a substantial fraction of anthropogenic carbon dioxide will persist in the atmosphere for several millennia. *See, e.g.*, A. Montenegro et al., Long Term Fate of Atmospheric Carbon, 34 GEOPHYS. RES. LETT. L19707 (2007) (25% of emitted carbon dioxide will have an atmospheric lifetime of more than 5000 years); S. Solomon et al., Irreversible Climate Change Due to Carbon Dioxide Emissions, 106 PNAS 1704 (2009).

[d] parts per million.

[e] NOAA, Global Monitoring Laboratory, Trends in Atmospheric Carbon Dioxide, Dr. Pieter Tans, NOAA/GML (www.esrl.noaa.gov/gmd/ccgg/trends/) and Dr. Ralph Keeling, Scripps Institution of Oceanography (scrippsco2.ucsd.edu/), https://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/co2/co2_annmean_mlo.txt (last visited 4/12/2021)

[f] parts per billion.

[g] NOAA, Global Monitoring Laboratory, Trends in Atmospheric Methane, Ed Dlugokencky, NOAA/GML (www.esrl.noaa.gov/gmd/ccgg/trends_ch4/),

https://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/ch4/ch4_annmean_gl.txt ("NOAA Trends in Atmospheric Methane")

[h] NOAA, Global Monitoring Laboratory, Trends in Atmospheric Nitrous Oxide, Ed Dlugokencky, NOAA/GML (www.esrl.noaa.gov/gmd/ccgg/trends_n2o/), https://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/n2o/n2o_annmean_gl.txt

[i] Petitioners seek regulation of all hydrofluorocarbons and perfluorocarbons for which either significant concentrations or large trends in concentrations have been observed or a clear potential for future emissions has been identified. The compounds with the greatest contribution to global warming are included here for illustrative purposes.

Furthermore, the consequences of failing to control greenhouse gas pollution are now even better described. In October 2018, the IPCC issued a Special Report on the state of the climate crisis and what needs to be done.[27] The Special Report provided overwhelming evidence that climate hazards are more urgent and more severe than previously widely understood, and that deep emissions reductions within this decade are essential to avoiding the most devastating climate change harms.

The differences in harms between 1.5°C and 2°C warming are stark. According to the Special Report, the damages that would occur at 2°C warming compared with 1.5°C include significantly more deadly heatwaves, drought and flooding; 10 centimeters of additional sea level rise within this century, exposing 10 million more people to flooding; a greater risk of triggering the collapse of the Greenland and Antarctic ice sheets with resulting multi-meter sea level rise; dramatically increased species extinction risk, including a doubling of the number of vertebrate and plant species losing more than half their range, and the virtual elimination of coral reefs; 1.5 to 2.5 million more square kilometers of thawing permafrost area with the associated release of methane, a potent greenhouse gas; a tenfold increase in the probability of ice-free Arctic summers; a higher risk of heat-related and ozone-related deaths and the increased spread of mosquito-borne diseases such as malaria and dengue fever; reduced yields and lower nutritional value of staple crops like maize, rice, and wheat; a doubling of the number of people exposed to climate change-induced increases in water stress; and up to several hundred million more people exposed to climate-related risks and susceptible to poverty by 2050.[28]

The Special Report concluded that limiting warming to 1.5°C with little or no overshoot requires "a rapid phase out of CO_2 emissions and deep emissions reductions in other GHGs [greenhouse gases] and climate forcers."[29] Specifically, limiting warming to 1.5°C requires that global anthropogenic carbon dioxide emissions be cut by ~45% below 2010 levels by 2030 and reach near zero around 2050.[30]

[27] *See* IPCC, Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (October 6, 2018) ("IPCC 2018"), http://www.ipcc.ch/report/sr15/.

[28] IPCC 2018, Summary for Policymakers, at 7-11.

[29] IPCC 2018, Chapter 2 at 112.

[30] IPCC 2018, Chapter 2 at 95, Figure 2.5, Figure 2.6; also at Summary for Policymakers at 12-14.

The IPCC Special Report and the National Climate Assessment make clear that absent necessary action within this decade, it will become exponentially more difficult to keep global temperatures from rising more than 1.5°C – above which the earth will experience devastating climate change impacts.[31] The National Climate Assessment emphasized that the choices we make now on reducing greenhouse gas pollution will affect the severity of the climate change damages that will be suffered in the coming decades and centuries: "[t]he impacts of global climate change are already being felt in the United States and are projected to intensify in the future—but the severity of future impacts will depend largely on actions taken to reduce greenhouse gas emissions and to adapt to the changes that will occur."[32] Importantly, "[m]any climate change impacts and associated economic damages in the United States can be substantially reduced over the course of the 21st century through global-scale reductions in greenhouse gas emissions."[33] Similarly, a 2014 White House report found that the cost of delay in reducing emissions is not only extremely steep but also potentially irreversible, and the costs rise exponentially with continued delays.[34]

Continued failure to take effective action to reduce greenhouse gas emissions will only worsen the harms to health and welfare that will be experienced in the future. Without substantial and sustained reductions in emissions, warming on the current trajectory will cost the U.S. economy hundreds of billions of dollars each year and up to 10% of U.S. gross domestic product towards the end of the century due to damages including lost crop yields, lost labor, increased disease, property loss from sea level rise, and extreme weather damage.[35] But most importantly, the failure to reduce greenhouse gas emissions is a climate justice failure. The National Climate Assessment details how lower-income and marginalized communities in the United States are expected to experience even greater impacts to their health, safety, and quality of life than others.[36]

(a) Impacts on public health

Climate change is the biggest global health threat of the 21st century, according to the World Health Organization and prestigious Lancet Commission on Health and Climate Change.[37] The Fourth National Climate Assessment warned that the "[i]mpacts from climate

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[31] IPCC 2018, Technical Summary at TS-8.
[32] USGCRP [U.S. Global Change Research Program], Impacts, Risks, and Adaptation in the United States, Fourth National Climate Assessment Vol. II (2018) ("USGCRP 2018") at 34.
[33] USGCRP 2018 at 1347.
[34] The White House, The Cost of Delaying Action to Stem Climate Change (July 29, 2014), https://obamawhitehouse.archives.gov/the-press-office/2014/07/29/white-house-report-cost-delaying-action-stem-climate-change at 2.
[35] USGCRP 2018 Vol. II at 1358, 1360.
[36] USGCRP 2018 Vol. II at 25.
[37] World Health Organization, WHO calls for urgent action to protect health from climate change, https://www.who.int/globalchange/global-campaign/cop21/en/ (last visited 2/25/2021); Watts, Nick et al., The Lancet Countdown on Health and Climate Change (Dec. 02, 2020), *available at* https://www.thelancet.com/countdown-health-climate (last visited April 9, 2021). While the Clean Air Act does not define "public health," the Supreme Court has given the term its natural meaning: "the health of the public." *Whitman v. American Trucking Ass'n,* 531 U.S. 466 (2001). EPA has interpreted this to include morbidities

change … increasingly threaten the health and well-being of the American people, particularly populations that are already vulnerable."[38] The Assessment concluded that adverse health consequences will worsen with additional climate change.[39] The American Lung Association and 25 other national health and medical organizations declared climate change a health emergency and called upon U.S. decision-makers to take immediate action to protect public health from air pollution and climate change, prioritize the communities most impacted by pollution, include the adoption of science-based targets to prevent climate warming above 1.5°C, and reduce carbon and methane pollution.[40]

The health harms from climate change include increased exposure to extreme heat, floods, droughts, and other extreme weather events; increases in vector-, food- and waterborne infectious diseases; decreases in the quality and safety of air, food, and water including rising food insecurity and increases in air pollution; displacement; and stresses to mental health and well-being.[41] Vulnerable populations facing greater health risks from climate change include children, older adults, low-income communities, some communities of color, immigrant groups, and persons with disabilities and pre-existing medical conditions.[42]

Numerous studies have emphasized that many lives could be saved with rapid reductions in greenhouse gas pollution, both in the near and long-term. The Fourth National Climate Assessment projected that "by the end of this century, thousands of American lives could be saved and hundreds of billions of dollars in health-related economic benefits gained each year under a pathway of lower greenhouse gas emissions."[43] Another recent study concluded that more aggressive reductions in carbon pollution will prevent hundreds of thousands of premature deaths in the U.S: for example, compared with a 2°C pathway, a 1.5°C pathway is projected to result in 130,000 to 300,000 fewer premature deaths in Los Angeles and 120,000 to 340,000 premature deaths in the New York metropolitan area.[44]

(b) Impacts on welfare

The Clean Air Act defines all language referring to effects on "welfare" as including, but not limited to, "effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to

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including impairment of lung function, aggravation of respiratory and cardiovascular disease, other acute and chronic health effects, and mortality. *See* 74 Fed. Reg. 66,510 (Dec. 15, 2009) and *Final National Ambient Air Quality Standard for Ozone,* 73 Fed. Reg. 16436, (2007).

[38] USGCRP 2018 Vol. II at 27.

[39] USGCRP 2018 Vol. II at 540.

[40] American Lung Association et al, A Declaration on Climate Change and Health 2021, https://www.lung.org/getmedia/865bcc65-81a4-4f73-8207-74a9acd55c36/2021-declaration-on-climate-and-health.pdf.

[41] USGCRP 2018 Vol. II at 540; U.S. Global Change Research Program, The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment (2016).

[42] USGCRP 2018 Vol. II at 548; U.S. Global Change Research Program, The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment (2016).

[43] USGCRP 2018 Vol. II at 541.

[44] Shindell, Drew et al., Quantified, localized health benefits of accelerated carbon dioxide emissions reductions, 8 Nature Climate Change 291 (2018).

transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants."[45] Failure to effectively reduce greenhouse gas emissions is also leading to worsening harms to public welfare and the environment. Illustrating this heavy toll, 2020 set a new U.S. record of 22 weather and climate disaster events with losses exceeding $1 billion each, which cumulatively cost 262 deaths and $95 billion in damages.[46]

Temperature rise and increasing extreme weather events. Annual average temperatures in the United States have risen by 1.8°F (1.0°C) since 1901, with the most rapid warming occurring in recent decades.[47] 2020 was the second-warmest year on record, with the seven warmest years on record occurring in the past seven years.[48] Extreme weather events are striking with increasing frequency and intensity, including more heat waves,[49] more extreme rain and snowstorms,[50] intensified droughts,[51] and more area burned by wildfire and a lengthening of the wildfire season.[52] Human-caused climate change is not only intensifying extreme weather events but increasing their likelihood.[53] For example, in 2016 the severe marine heat wave off Alaska—which drove oyster farm failures, harmful algal blooms, mass seabird die offs, and failed subsistence harvests—was made up to fifty times more likely due to anthropogenic warming.[54]

Intensifying hurricanes. Warming ocean temperatures due to climate change are increasing the strength of Atlantic hurricanes[55] and allowing them to intensify more quickly.[56] During 2016 to 2019, the U.S. suffered the longest streak of Category 5 hurricanes on record: Hurricane Dorian (2019), Michael (2018), Maria (2017), Irma (2017) and Matthew (2016). Warmer air also holds more moisture, causing heavier rainfall during hurricanes. For example, research estimated that warming made Hurricane Harvey's record amounts of rainfall 3.5 times more likely and at least 19 percent more intense.[57] Rising sea levels due to climate change are also causing higher storm surge. Hurricane Katrina-magnitude storm surge events have doubled and are projected to increase by twofold to sevenfold for each degree Celsius of temperature

[45] 42 U.S.C. 42 U.S.C. § 7602(h).
[46] NOAA National Centers for Environmental Information (NCEI), U.S. Billion-Dollar Weather and Climate Disasters, doi: 10.25921/stkw-7w73 (2021) ("NOAA NCEI 2021"), https://www.ncdc.noaa.gov/billions/.
[47] USGCRP 2017 Vol. I at 17.
[48] NOAA, 2020 Was the Earth's Second Hottest Year Just Behind 2016 (January 14, 2021) ("NOAA 2020"), https://www.noaa.gov/news/2020-was-earth-s-2nd-hottest-year-just-behind-2016.
[49] USGCRP 2017 Vol. I at 17.
[50] USGCRP 2017 at 20, 214.
[51] USGCRP 2017 at 45.
[52] USGCRP 2017 at 236, 241.
[53] Herring, Stephanie C. et al., Explaining extreme events of 2016 from a climate perspective, 99 Bulletin of the American Meteorological Society S1 (2017).
[54] Oliver, Eric C. et al., Anthropogenic and natural influences on record 2016 marine heat waves, 99 Bulletin of the American Meteorological Society S44 (2017).
[55] USGCRP 2017 Vol. I at 257; USGCRP 2018 Vol. II at 74.
[56] Bhatia, Kieran T. et al., Recent increases in tropical cyclone intensification rates, 10 Nature Communication 635 (2019).
[57] Risser, Mark D. & Michael F. Wehner, Attributable human-induced changes in the likelihood and magnitude of the observed extreme precipitation during Hurricane Harvey, 44 Geophysical Research Letters 12,457 (2017).

rise.[58] During 2017 and 2018, five major hurricanes cost the U.S. at least 3,273 lost lives and $328 billion in damages.[59]

Rising seas. Global average sea level rose by seven to eight inches since 1900,[60] and sea level rise is accelerating in pace.[61] Flooding is intensifying in many Atlantic and Gulf Coast cities as sea level rise increases the frequency of high tide flooding.[62] Millions of Americans are at risk from three-feet of sea level rise, projected by the end of the century or before, which would drive mass human migration and societal disruption.[63]

Rapid Arctic warming and sea ice loss. The Alaskan Arctic has experienced some of the most severe and rapid warming from climate change, with temperatures rising at twice the rate of the rest of the globe.[64] Sea ice loss has accelerated since 2000 with Alaska's coast suffering some of the fastest losses.[65] Arctic summer sea ice extent has decreased by 40 percent during the past several decades.[66] Along Alaska's northern and western coasts, the sea ice season has already shortened by more than 90 days.[67]

Biodiversity loss. Climate change is increasing stress on species and ecosystems—causing changes in distribution, phenology, physiology, vital rates, genetics, ecosystem structure and processes—in addition to increasing species extinction risk.[68] Climate change-related local extinctions are already widespread and have occurred in hundreds of species, including almost half of the 976 species surveyed in one major study.[69]

Threats to water supplies. Climate change is altering the water cycle in ways that threaten water supplies in the United States.[70] In the western U.S. and particularly in the Colorado River Basin, climate change is causing earlier spring snowmelt, reduced snowpack, and reduced river flows,[71] decreasing and disrupting the region's water supply.[72]

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[58] Grinsted, Aslak et al., Homogeneous record of Atlantic hurricane surge threat since 1923, 109 PNAS 19601 (2012); Grinsted, Aslak et al., Projected hurricane surge threat from rising temperatures, 110 PNAS 5369 (2013).
[59] NOAA NCEI 2021.
[60] USGCRP 2018 Vol. II at 74.
[61] USGCRP 2018 Vol. II at 74, 339.
[62] USGCRP 2018 Vol. II at 98-99.
[63] Hauer, Matthew E. et al., Millions projected to be at risk from sea-level rise in the continental United States, 6 Nature Climate Change 691 (2016); Hauer, Mathew E., Migration induced by sea-level rise could reshape the US population landscape, 7 Nature Climate Change 321 (2017).
[64] USGCRP 2018 Vol. II at 92.
[65] USGCRP 2017 Vol. I at 305.
[66] USGCRP 2018 Vol. II at 1192-1193.
[67] USGCRP 2017 Vol. I at 307.
[68] Warren, Rachel et al., Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise, 106 Climatic Change 141 (2011).
[69] Wiens, John J., Climate-related local extinctions are already widespread among plant and animal species, 14 PLoS Biology e2001104 (2016).
[70] USGCRP 2018 Vol. II at 146.
[71] USGCRP 2017 Vol. I at 231, 236.
[72] USGCRP 2018 Vol. II at 236.

Declining food security. Climate change threatens food security for millions of Americans through several pathways, including reduced crop and livestock production, contamination of food supplies, changes in land use and land availability, and decreasing access to food.[73]

Ocean warming and acidification. The oceans have absorbed more than 90 percent of the excess heat caused by greenhouse gas warming, resulting in average sea surface warming of 1.3°F (0.7°C) per century since 1900.[74] A 2019 study estimated that oceans are warming 40 percent faster than scientists projected, and that the rate of ocean warming is accelerating.[75] On top of warming, the ocean's absorption of anthropogenic carbon dioxide has resulted in more than a 30 percent increase in the acidity of ocean surface waters, at a rate likely faster than anything experienced in the past 300 million years.[76] The U.S. West Coast, Alaska, and the Gulf of Maine are experiencing the most extreme changes due to ocean acidification.[77]

Ocean acidification harms a wide range of marine species like corals, oysters, and crabs by hindering their ability to build protective shells and skeletons and by disrupting critical biological functions.[78] Ocean acidification has been documented to cause severe shell damage to pteropods (marine snails at the base of the food web) along the west coast,[79] reduced coral calcification rates of U.S. reefs,[80] and mass die-offs of larval oysters in the Pacific Northwest.[81] Ocean warming and ocean acidification are causing the global collapse of coral reefs, [82] which support one-third of marine species and the livelihoods of half a billion people. Coral scientists have warned that unless global temperature is kept under 1.5°C and atmospheric carbon dioxide concentration is restored to less than 350 ppm, coral reefs and reef-dependent marine life will be committed to a terminal and irreversible decline.[83]

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[73] Melillo, Jerry M. et al. (eds.), Climate Change Impacts in the United States: The Third National Climate Assessment, U.S. Global Change Research Program (2014) at 150.
[74] USGCRP 2017 Vol. I at 364, 367.
[75] Cheng, Lijing et al., How fast are the oceans warming?, 363 Science 128 (2019).
[76] USGCRP 2017 Vol. I at 372, 374.
[77] Chan, F. et al., The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions, California Ocean Science Trust (April 2016).
[78] Kroeker, Kristy J. et al., Impacts of ocean acidification on marine organisms: quantifying sensitivities and interactions with warming, 19 Global Change Biology 1884 (2013).
[79] Bednaršek, N. et al., *Limacina helicina* shell dissolution as an indicator of declining habitat suitability owing to ocean acidification in the California Current Ecosystem, 281 Proceedings of the Royal Society B 20140123 (2014).
[80] Albright, Rebecca et al., Reversal of ocean acidification enhances net coral reef calcification, 531 Nature 362 (2016).
[81] Barton, Alan et al., The Pacific oyster, *Crassostrea gigas*, shows negative correlation to naturally elevated carbon dioxide levels: Implications for near-term ocean acidification effects, 57 Limnology and Oceanography 698 (2012).
[82] Hoegh-Guldberg, Ove et al., Coral reefs under rapid climate change and ocean acidification, 318 Science 1737 (2007); Eakin, C. Mark et al., Caribbean corals in crisis: record thermal stress, bleaching, and mortality in 2005, 5 PLoS ONE e13969 (2010).
[83] Veron, John E.N. et al., The coral reef crisis: the critical importance of <350 ppm CO_2, 58 Marine Pollution Bulletin 1428 (2009); Frieler, Katja, et al., Limiting global warming to 2ºC is unlikely to save most coral reefs, 3 Nature Climate Change 165 (2012); van Hooidonk, Ruben et al., Opposite latitudinal gradients in projected ocean acidification and bleaching impacts on coral reefs, 20 Global Change Biology 103 (2014).

III. Developments in international law and carbon budget research since 2009 aid in setting a NAAQS.

Since the 2009 Petition was first filed, developments in relevant case law, the establishment of the Paris Agreement, and new scientific research into carbon budgets have made a greenhouse gas NAAQS only more practicable. Petitioners acknowledge the unique characteristics of greenhouse gases, particularly their broad dispersion and long life in the atmosphere.[84] Nevertheless, it remains both legally required and entirely possible from a practical perspective to address greenhouse gases under the Clean Air Act, despite these characteristics, especially in light of the Paris Agreement and recent scientific research on carbon budgets.

The attached law review article explains how a greenhouse gas NAAQS could be structured,[85] and is summarized herein. Under existing NAAQS, EPA uses compliance with "averaging times" set differently for various criteria pollutants to address specific health and welfare effects of the pollutants. Thus, for example, in setting a NAAQS for lead, EPA determined that it would allow a related loss of two IQ points. To achieve that objective, EPA established a lead air exposure level, then established that "a rolling three-month averaging period" was an appropriate averaging time, evaluated for exceedances over a period of three years (the "form" of the NAAQS, or compliance over the averaging period for a certain amount of time).[86]

Similarly, under the 2015 Paris Agreement, the United States and other signatories agreed that to protect the planet from the worst climate destruction, the nations of the world must hold "the global average temperature to well below 2° Celsius above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5° Celsius above pre-industrial levels . . . ."[87] Just as a lead NAAQS is set to prevent the loss of two IQ points, a greenhouse gas NAAQS would be set to prevent an increase in temperature of over 1.5°C.

As EPA correctly noted in the withdrawn Petition Denial, assuming the appropriate attainment level to achieve this goal is 350 parts-per-million (ppm) of CO_2 , the United States would be in nonattainment. And reducing emissions to achieve this atmospheric standard will take longer than the ten-year deadline for attainment set out in the Act.[88] But a NAAQS does not consist solely of a "level"—that is, a concentration of pollutants in the ambient air, but also an averaging time and a "form." EPA could use the averaging time of the NAAQS—which specifies the span of time across which the amount of a pollutant in the air will be averaged—and the form—which describes how compliance with the standard will be determined within the

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[84] See 2009 Petition, at 28-30.
[85] Crystal, Howard, et al., Returning to Clean Air Act Fundamentals: A Renewed Call to Regulate Greenhouse Gases Under the National Ambient Air Quality Standards (NAAQS) Program, 31 Georgetown Envtl. Law Review 233 (2019) ("Crystal et al. 2019"), at 262-266, *available at* https://www.law.georgetown.edu/environmental-law-review/wp-content/uploads/sites/18/2019/04/GT-GELR190001.pdf.
[86] Crystal et al. 2019 at 263.
[87] UNFCCC [United Nations Framework Convention on Climate Change], Paris Agreement, art. 2, Conference of the Parties Twenty-first Session (2015) ("UNFCC Paris Agreement")
[88] 42 U.S.C. § 7502(a)(2)(A).

averaging time—to "set binding benchmarks to maximize reductions and insure 'reasonable further progress' on a strict timetable toward attainment," which might not be achieved for several decades.[89] This would avoid the "regulatory morass"[90] cited in the Petition Denial. In fact, "EPA has long tailored averaging times to the effects of particular pollutants," and there is nothing in the statute preventing EPA from following the same course for greenhouse gases, "relying on a longer averaging time to reflect the necessarily slow atmospheric response of even aggressive steps to curb [greenhouse gas] emissions."[91]

Additionally, secondary standards provide a useful mechanism for regulating greenhouse gases. In addition to the primary NAAQS, set at a level to protect the public health (42. U.S.C. § 7409(b)(1)), EPA can establish secondary standards to protect public welfare, which specifically includes effects on "climate."[92] Because the secondary standard does not contain specific attainment deadlines, EPA would issue standards that will satisfy the ultimate attainment goal, and would determine a pathway toward that goal 'as expeditiously as practicable,' considering the emissions reductions necessary for the United States to make an appropriate contribution to reducing worldwide emissions over time.[93]

Under both standards, recent developments in climate science and policy provide a roadmap for setting a greenhouse gas NAAQS. Notably, in Section 179B of the Act, Congress expressly provided for EPA "to approve SIPs that would otherwise comply with the Act "'but for emissions emanating from outside of the United States.'"[94] In the withdrawn Petition Denial, EPA asserts without explanation that "no State would be able to make the required showing that its SIP 'would be adequate to attain and maintain the relevant national ambient air quality standards by the attainment date…but for emissions emanating from outside of the United States.' CAA [Clean Air Act] 179B(a)(2)."[95] This is incorrect. International climate policy and recent research into carbon budgets provide EPA, and states, the tools they need to determine the United States' responsibility and emissions levels that would achieve the Paris Agreement's objectives, taking into account emissions emanating from other countries.[96]

For instance, to achieve the Paris Agreement temperature increases limitation goal, each country has established "nationally determined contributions" ("NDCs") reflecting their

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[89] Crystal et al. 2019 at 264, *citing* 42 U.S.C. 7501(1); 7502(c)(2) (defining and applying reasonable further progress requirements).
[90] Petition Denial at 8.
[91] Crystal et al 2019 at 265.
[92] 42 U.SC. § 7602(h).
[93] *See* Crystal et al 2019 at 267, citing 42 U.S.C. § 7502(a)(2). For further discussion of EPA's authority to set a secondary standard for greenhouse gases under the NAAQS program, see Crystal et al., 266-270.
[94] Crystal et al. 2019 at 273; 42 U.S.C. § 7509a.
[95] Petition Denial at 8.
[96] Contrary to the implication in the petition denial, section 179B does not require a state to show that, if all other countries ceased emitting greenhouse gases entirely, the NAAQS would be attained by the attainment date. Rather, the obligation to show that the implementation plan would be sufficient to attain and maintain the NAAQS "but for emissions emanating from outside the United States." 42 U.S.C. § 7509(a)(2). Nothing in the language of the provision prevents historical emissions of long-lived climate pollutants from outside the United States being taken into account in making such showing.

commitment to achieving necessary to emissions reductions.[97] These commitments must become increasingly ambitious as they "ratchet" up over time in order to limit warming to the Paris Agreement target.[98] Meanwhile, scientific research has estimated the global carbon budget—the remaining amount of carbon dioxide that can be emitted—in order to meet the Paris climate target, providing clear benchmarks for United States and global climate action.[99] There are several possible ways "to determine the levels of emissions reductions the country must achieve to reach attainment, assuming each country reduces its emissions to the levels required to meet the Paris Agreement's goals."[100] For instance, the NAAQS standards could reflect the United States' NDCs and/or remaining carbon budget, which research suggests averages 25 $GtCO_2eq$ to 57 $GtCO_2eq$ from 2010 to 2100.[101] U.S. Climate Action Network, representing over 185 environmental, justice, health, and religious organizations, has proposed a "fair shares" approach based on the United States' historic responsibility for climate damaging emissions and financial capacity.[102] Under this approach, the United States would need to reduce its emissions 70% below 2005 levels (approximately 5 $GtCO_2eq$) by 2030, in addition to providing about 9 $GtCO_2eq$ of reductions through technical and financial assistance to other countries by 2030.[103]

Apportioning emissions reductions among the states is no less feasible. Recognizing that many types of air pollution are "transient, heedless of state boundaries,"[104] Congress provided that state SIPs must "address how emissions *among* the states may impact each state's ability to implement its respective SIPs" (the "Good Neighbor" Provision).[105] The Petition Denial incorrectly asserts, without any explanation, that the interstate transport and "Good Neighbor" provision "would not function as intended" in the context of a NAAQS for greenhouse gases.[106] To the contrary, these provisions can readily serve the achievement of a nationwide pollution cap in the form of a NAAQS for greenhouse gases. The Supreme Court has upheld EPA's attempt to craft emissions budgets for states contributing to at least 1% of one of the NAAQS pollutants in a downwind state "based on cost thresholds that apply uniformly across states and sources" as an "'efficient and equitable solution to the allocation problem.'"[107] Similarly, under the Clean

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[97] UNFCC Paris Agreement, art. 3.
[98] UNFCCC Paris Agreement, art. 4.
[99] The 2018 IPCC special report on *Global Warming of 1.5°C* estimated the carbon budget for a 66 percent probability of limiting warming to 1.5°C at 420 $GtCO_2$ and 570 $GtCO_2$ from January 2018 onwards, depending on the temperature dataset used. At the current emissions rate of 42 $GtCO_2$ per year, this carbon budget would be expended in just 10 to 14 years. *See* Intergovernmental Panel on Climate Change, Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (October 6, 2018), at SPM-16.
[100] Crystal et al 2019 at 275.
[101] Crystal et al 2019 at 239.
[102] For more information on the U.S. climate fair share, *see* The US Climate Fair Share, The US Climate Fair Share to Limit Global Warming to 1.5 degrees C, https://usfairshare.org/ *and* The US Climate Fair Share, Towards a USCAN Working Consensus (n.d.), http://usfairshare.org/files/US_Climate_Fair_Share_Backgrounder.pdf (*together*, "U.S. Climate Fair Share").
[103] U.S. Climate Fair Share.
[104] *EPA v. EME Homer City Generation, L.P.,* 134 S. Ct. 1584, 1593 (2014).
[105] Crystal et al 2019 at 277.
[106] Petition Denial at 9.
[107] Crystal et al 2019 at 277, citing *Homer*, 134 S. Ct. at 1606-07.

Power Plan, EPA first determined "the emissions reductions that could be achieved by implementing the Best System of Emissions Reduction for power plants," then "calculated the overall emission reductions each states must achieve."[108] Here, as but one option, EPA could craft an "efficient and equitable solution to the allocation problem" of greenhouse gas emissions "by determining the most cost-effective means [across each sector] to reduce those emissions, and using those results to develop state emissions budgets."[109]

Moreover, the nature of SIPs within the NAAQS program provides the broadest and most flexible approach to addressing greenhouse gas emissions from their "numerous" and "diverse" sources. The Clean Power Plan did not dictate *how* each state would achieve its allotted emission reductions; rather, as with a SIP, each state had "'broad flexibility' as to the manner in which it would achieve the required level of reduction."[110] Because a SIP addresses a much wider variety of sectors, it would provide each state with even more flexibility to develop measures appropriate for that state's policy priorities.

IV. EPA's denial of the 2009 Petition rests on a misinterpretation of section 108 of the Clean Air Act; EPA has a mandatory duty to list greenhouse gases.

We acknowledge that EPA has withdrawn its denial of the 2009 Petition, and understand from that withdrawal that EPA does not continue to stand behind the interpretation of the Clean Air Act upon which it based that denial. We nonetheless respectfully take this opportunity to explain why former-Administrator Wheeler's interpretation of section 108 of the Clean Air Act (42 U.S.C. § 7408) is incorrect.

Section 108(a) of the Clean Air Act provides the circumstances pursuant to which the Administrator must list a criteria pollutant:

> **(a) AIR POLLUTANT LIST; PUBLICATION AND REVISION BY ADMINISTRATOR; ISSUANCE OF AIR QUALITY CRITERIA FOR AIR POLLUTANTS**
>
> **(1)** For the purpose of establishing national primary and secondary ambient air quality standards, the Administrator shall within 30 days after December 31, 1970, publish, and shall from time to time thereafter revise, a list which includes each air pollutant—
>
> **(A)** emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare;
>
> **(B)** the presence of which in the ambient air results from numerous or diverse mobile or stationary sources; and
>
> **(C)** for which air quality criteria had not been issued before December 31, 1970 but for which he plans to issue air quality criteria under this section.

[108] Crystal et al 2019 at 278.
[109] Crystal et al. 2019 at 277-278, 279.
[110] Crystal et al. 2019 at 279, citing 80 Fed. Reg. 64,662, 64,665 (Oct. 23, 2015).

42 U.S.C. § 7408(a).

In the Petition Denial, EPA relies partly on the argument that because the Administrator does not plan to issue air quality criteria under section 108 for greenhouse gases (i.e., because section 108(a)(1)(C) is not met), there is no obligation to list the pollutant.[111] But EPA errs in reading section 108(a)(1)(C) ("subpart C") as granting deference to EPA when listing criteria pollutants for the following two reasons. First, contrary to the contention in the Petition Denial, *NRDC v. Train* is still good law, and the Second Circuit's analysis of section 108(a)(1) is applicable today. Second, EPA's erroneous reading of the phrase "for which [the Administrator] plans to issue air quality criteria under this section" would allow EPA to sit on its hands and avoid judicial review in light of scientifically proven harms. The reading of section 108(a)(1) that is consistent with the statutory text, legislative history, and broader aims of the statute, and thus, the correct interpretation of the statute, is that satisfaction of the conditions in section 108(a)(1)(A) and (B) establish a mandatory obligation to list greenhouse gases as a criteria pollution for the purpose of establishing primary and secondary NAAQS.

NRDC v. Train ("*Train*") is still good law and controlling here. EPA's interpretation of section 108(a)(1)—that it would only need to list the pollutants "for which [the Administrator] plans to issue air quality criteria"[112]--has been rejected by every court to consider it.[113] Specifically, the Second Circuit categorically rejected this exact argument in *Train*, finding that EPA's interpretation would render the "shall" language in section 108(a)(1) "mere surplusage" and allow EPA to bypass the rigid Clean Air Act deadlines for attaining air quality standards.[114] In turn, the Second Circuit held that section 108(a)(1) creates a mandatory duty to list a pollutant under section 108 if and when the pollutant comes from numerous and diverse sources and is reasonably anticipated to endanger public health or welfare.[115] Though EPA attempts to dismiss the case as "a single judicial decision from the 1970s [that] overlooked the text"[116] of section 108(a)(1), *Train* remains good law and its conclusions have been adopted by several courts, a fact not acknowledged in the Petition Denial.[117] The plain language and legislative history of section 108(a)(1), in conjunction with the structure of the Clean Air Act, support the court's interpretation. Therefore, *Train*'s holding applies today.

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[111] Petition Denial at 6.
[112] Clean Air Act § 108(a)(1)(C); 42 U.S.C. § 7408(a)(1)(C)
[113] *See NRDC v. Train*, 545 F.2d 320 (2d Cir. 1976); *Indiana & Michigan Elec. Co. v. EPA*, 509 F.2d 839, 841 (7th Cir. 1975); *Kennecott Copper Corp. v. EPA*, 462 F.2d 846, 847 (D.C. Cir. 1972); *Center for Biological Diversity v. EPA*, 749 F.3d 1079, 1083 (D.C. Cir. 2014) ("EPA is required to regulate any airborne pollutant which, in the Administrator's judgment, 'may reasonably be anticipated to endanger public health or welfare,'" and "[f]or pollutants within that category— so-called 'criteria air pollutants'—EPA must promulgate national ambient air quality standards"); *Zook v. McCarthy*, 52 F. Supp. 3d 69, (D.D.C. 2014) (Section 108 "makes clear that EPA's listing duty is a nondiscretionary duty to list any pollutant that EPA has determined meets the criteria in Section 108(a)(1)(A) and (B)"); *Ethyl Corp. v. EPA*, 541 F.2d 1, 20 n. 37 (D.C. Cir. 1976) ("Sections 108 and 202 are *mandatory* in their terms; under both sections the Administrator 'shall' regulate if 'in his judgment' the pollutants warrant regulation") (emphasis added).
[114] *Train*, 545 F.2d at 325.
[115] *Train*, 545 F.2d at 325.
[116] Petition Denial at p. 5.
[117] *See Ctr. for Biological Diversity v. EPA*, 749 F.3d at 1083; *Zook*, 52 F.Supp.3d at 74.

The plain language of section 108(a)(1) indicates that EPA has a non-discretionary duty to list pollutants that satisfy subparts A and B. EPA's contention that the mandatory language "shall… revise" functions to preserve public notice and "make the listing mechanisms mandatory" has no basis in the text of the statute.[118] The term "shall" is regarded as making a provision mandatory.[119] Here, "shall… publish" and "shall… revise" cannot be separated from the action of listing criteria pollutants that meet the listing conditions. Therefore, the phrase "shall… revise" is critical to assess EPA's duties to list additional criteria pollutants and imposes a mandatory duty on EPA.

Second, as the court in *Train* noted, EPA's interpretation would render the mandatory language of section 108(a)(1) "mere surplusage."[120] Courts should "give effect, if possible, to every clause and word of a statute, avoiding … any construction which implies that the legislature was ignorant of the meaning of the language it employed."[121] Thus, a statute should be construed to give effect to all its provisions, such that no part will be inoperative or insignificant.[122] EPA's interpretation makes section 108(a)(1) completely discretionary and effectively reads out the mandatory, non-discretionary language that prefaces the entire section. EPA cannot rely on subpart C to absolve it from the mandatory language and duty that Congress enacted.

Third, EPA errs in concluding this plain language interpretation of section 108(a)(1) would render subpart C mere surplusage. Rather, as noted in *Train*, subpart C is still a relevant listing condition. In *Train*, the Second Circuit held that "it is to the initial list alone [the one required to be published soon after enactment of the 1970 Clean Air Act amendments] that the phrase 'but for which he plans to issue air quality criteria' is directed."[123] This interpretation is supported by (1) a statement from Senator Muskie, and (2) a 1970 Senate Report.[124] Senator Muskie's report notes that Congress intended EPA to list a handful of pre-prescribed pollutants[125] under section 108 within 13 months of the 1970 amendments.[126] The 1970 Senate Report further articulates that subpart C only refers to the initial list by stating, "[t]he bill require[s] air quality criteria [under section 108] for ['contaminants of broad national impact'[127]] and other pollutants be issued within 13 months from enactment. If [EPA] subsequently should find that there are other pollution agents for which the ambient air quality standards procedure is appropriate, … repeat the criteria process."[128] The Senate Report also made clear that EPA should issue NAAQS "within 30 days after enactment" for both the original five criteria pollutants and the pre-prescribed pollutants "for which air quality criteria had not been issued

[118] *See* Petition Denial at 7.
[119] *Firebaugh Canal Co. v. U.S.*, 203 F.3d 568, 573–74 (9th Cir. 2000).
[120] *Train*, 545 F.2d at 325.
[121] *Montclair v. Ramsdell*, 107 U.S. 147, 152 (1883).
[122] *Hibbs v. Winn*, 542 U.S. 88, 101 (2004).
[123] *Train*, 545 F.2d at 325.
[124] *Train*, 545 F.2d at 326.
[125] Nitrogen oxides, fluorides, lead, polynuclear organic matter, and odors.
[126] *Train*, 545 F.2d at 326.
[127] Nitrogen oxides, fluorides, lead, polynuclear organic matter, and odors.
[128] *Train*, 545 F.2d at 326.

before December 31, 1970, but for which" Congress intended to be included in the initial list.[129] This interpretation gives meaning to subpart C and does not render the provision mere surplusage. However, subpart C is immaterial to listing greenhouse gases under section 108 because greenhouse gases are not pollutants for which Congress intended to be included in the initial list. Rather, as correctly noted by the Second Circuit, EPA's duty to list a pollutant under section 108 turns on satisfying subparts A and B.[130] Here, subparts A and B have been satisfied,[131] and EPA must therefore list greenhouse gases as a criteria pollutant.[132]

That section 108(a)(1) prescribes a non-discretionary duty on EPA to list pollutants that satisfy subparts A and B is consistent with the legislative history. The 1970 Clean Air Act Amendments and section 108(a)(1) were enacted "[b]ecause state planning and implementation under the Air Quality Act of 1967 had made little progress by 1970."[133] As a result, Congress created strict and mandatory timetables throughout the NAAQS regulatory regime.[134] These timetables illustrate Congress's intent to make listing under section 108 mandatory. As noted by the court in *Train*, these timetables would be "an exercise in futility" if section 108 did not impose a non-discretionary duty once a pollutant is found to satisfy subparts A and B.[135] Construing section 108(a)(1) as awarding discretion to EPA would elicit regulatory and implementation foot-dragging, the exact result Congress intended to avoid and resolve in enacting section 108 and the 1970 Clean Air Act amendments. The interpretation of section 108(a)(1) set out in the Petition Denial therefore runs afoul of the NAAQS regulatory regime.

Moreover, EPA's interpretation of section 108(a)(1) and subpart C would turn administrative law on its head. The Administrative Procedure Act (5 U.S.C. § 500 et seq.) embodies a basic presumption that agency action is subject to judicial review for abuse of discretion.[136] In only "very narrow" circumstances is agency action "wholly committed to agency discretion" by law.[137] This exception has only been invoked in "rare instances where statutes are drawn in such broad terms that in a given case there is no law to apply."[138] Section 108(a)(1) does not present such a circumstance: the statute lays out clear and specific instructions on how to apply the law. Under EPA's erroneous interpretation of section 108(a)(1), "all EPA would have to do under section 108(a)(1)(C) is refuse to issue a NAAQS on the grounds that the agency has 'no plans' to act, without any need to reasonably explain *why* there were no such plans."[139] This, in effect, would commit the entire NAAQS regime to EPA discretion, allow EPA

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[129] *Train*, 545 F.2d at 326.
[130] *Train*, 545 F.2d at 328.
[131] See *infra*, at V.(c) EPA has long found greenhouse gases endanger health and welfare
[132] 74 Fed. Reg. 66,495 (2009).
[133] *Train*, 545 F.2d at 325.
[134] *Train*, 545 F.2d at 325; *see* Clean Air Act §§ 108–110; 42 U.S.C. §§ 7408–7410; *see generally* CONGRESSIONAL RESEARCH SERVICE, A LEGISLATIVE HISTORY OF THE CLEAN AIR AMENDMENTS OF 1970 (1974).
[135] *Train*, 545 F.2d at 327.
[136] *Lincoln v. Vigil,* 508 U.S. 182, 190 (1993).
[137] *Hi-Tech Furnace Sys. v. FCC*, 224 F.3d 781, 788 (D.C. Cir. 2000).
[138] *Hi-Tech Furnace Sys.*, 224 F.3d at 788 (citing *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 410 (1971)).
[139] Crystal et. al. 2019 at 233, 242.

to blatantly ignore pollution that endangers the public health and public welfare, and preclude any effective judicial review of EPA's arbitrary actions. EPA must carry out its obligations under the Clean Air Act consistently with the purposes of the Act, including to protect and enhance the Nation's air resources so as to promote public health and welfare.[140] It would be unreasonable to conclude, in light of the legislative history and purposes of the Act, that Congress intended to afford EPA such unbridled discretion within a statutory and regulatory regime that is designed and dedicated to protecting public health and welfare. The principles of administrative law are not designed to ignore arbitrary agency action or confer unbounded discretion in absence of clear statutory authority. EPA's reading of section 108(a)(1) runs counter to the "very narrow" circumstances in which courts find that Congress intends to afford agencies such broad discretion and would frustrate the broader aims of the Clean Air Act.

The NAAQS program is capable of effectively controlling global, not merely local, air pollutants. According to EPA's withdrawn Petition Denial, section 110(a)(2)(B),[141] which requires each SIP to "provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to . . . monitor, compile, and analyze data on ambient air quality,"[142] has "no relevance to a global air pollutant like [a] GHG [greenhouse gas] that is dispersed around the world."[143] Yet both the statute's language and EPA's regulations demonstrate EPA's broad discretion to design monitoring programs to accommodate each pollutant's unique characteristics, including global air pollutants like greenhouse gases.

The Clean Air Act recognized that the appropriate monitoring system for each criteria pollutant would depend on the pollutant's characteristics. Therefore, the Act gave EPA discretion to choose which devices, methods, and systems of air quality monitoring are "necessary" and "appropriate."[144] EPA has used that discretion to prescribe separate regulations for monitoring each criteria pollutant.[145] For example, EPA defines seven spatial scales for monitoring air quality: microscale; middle; neighborhood; urban; regional; national; and global scales.[146] Each spatial scale refers to the parcel of air surrounding a monitoring station that is expected to have a unform concentration of the monitored criteria pollutant.[147] The appropriate scale for monitoring each criteria pollutant varies: ozone is monitored from neighborhood to regional scales while carbon monoxide is monitored from micro- to middle scales.[148] Thus, EPA already recognizes that the appropriate and necessary monitoring methods vary with each pollutant, and the Petition

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[140] 42 U.S.C. § 7401(b)
[141] EPA's denial quotes section 110(a)(2)(B) yet incorrectly cites to section 110(a)(2)(A). Section 110(a)(2)(A) requires each SIP to include emission control limitations and schedules designed to satisfy the NAAQSs, while section 110(a)(2)(B) requires each SIP to include devices, methods, and systems for monitoring, compiling, and analyzing ambient air quality. 42 U.S.C. §7410(a)(2)(A)-(B).
[142] 42 U.S.C. § 7410(a)(2)(B).
[143] Petition denial at 9.
[144] 42 U.S.C § 7410(a)(2)(B).
[145] The NAAQS regulations define different technologies, methods, systems, and schedules for monitoring each of the six currently listed criteria pollutants. See 40 C.F.R. pt. 53, 58.
[146] 40 C.F.R. pt. 58 app. D § 1.2(b).
[147] 40 C.F.R. pt. 58 app. D § 1.2(b).
[148] 40 C.F.R. pt. 58 app. D §§ 4.1(c) (ozone), 4.2.3(a) (carbon monoxide), 4.3.5(a) (nitrogen dioxide), 4.4.4(a) (sulfur dioxide), 4.5(d) (lead), 4.6(b)-(c) (particulate matter), 4.8.1 (coarse particulate matter).

Denial provides no rational explanation for why it cannot prescribe appropriate methods to monitor greenhouse gases.

The Petition Denial also cites to section 319(b)(3)(B)(ii) (42 U.S.C. § 7619(b)(3)(B)(ii)) as evidence that the NAAQS program is not designed for global pollutants. Section 319(b) directs EPA to promulgate regulations[149] governing how to handle certain "exceptional events" that release large concentrations of criteria pollutants and thereby cause ambient air quality to exceed the NAAQS.[150] In essence, the regulations allow states and EPA to focus their efforts on areas of chronic NAAQS violations by overlooking unusual NAAQS violations caused by natural events, like wildfires and dust storms, and certain uncommon human actions, like firework displays and prescribed fires.[151] According to the Petition Denial, the provisions are inapplicable to greenhouse gases, because the long term and global nature of greenhouse gases "would make it difficult if not impossible for a state to [prove] that a particular 'exceptional event caused'" a particular NAAQS violation.[152]

This reasoning is flawed. EPA's logic would also exclude from the NAAQS not just global pollutants, but any local pollutants not generated by exceptional events, an irrational limitation on the NAAQS program. Congress could not have intended this result. Furthermore, exceptional events may affect ambient greenhouse gas concentrations. Simply because greenhouse gases are well dispersed throughout the atmosphere does not mean that a locality could not experience a heightened concentration. For example, an area that was in attainment for methane might experience a NAAQS violation if a local natural gas well, pipeline, or facility suffered a massive leak, leading to a localized and temporary exceedance of the methane NAAQS. Ultimately, the claim that section 319(b)(3)(B)(ii) could never apply to a greenhouse gas NAAQS is not evidence that the NAAQS program is not suited to regulating greenhouse gases.

Thus, rather than leading to the "regulatory morass" that former-Administrator Wheeler conjures, setting a national greenhouse gas cap through a NAAQS set pursuant to section 108, and implemented pursuant to sections 109-110, would follow a clear, predictable, legal, science-based path.

V. CONCLUSION

In considering its path forward, EPA should not simply return to the Obama Administration's approach to greenhouse gas regulations. In the decade since Petitioners filed the 2009 Petition, greenhouse gas emissions and concentrations have increased while myriad climate damages have intensified. Solutions to slash greenhouse emissions are available but have not been implemented due to insufficient government policy. We are out of time. EPA must use all Clean Air Act authorities to address the climate emergency. EPA must grant the 2009 petition, designate greenhouse gases as criteria pollutants, and set national ambient air quality

[149] The regulation can be found at 40 C.F.R. § 50.14.
[150] 42 U.S.C. § 7619(b).
[151] 40 C.F.R. §§ 50.14(b)(2)-(7).
[152] Petition denial at 9.

standards to protect the public health and welfare. It can do so jointly with a rulemaking under Section 115. Such outcome is not just sound policy, it mandated by the Clean Air Act itself.

If you have any questions, please contact Maya Golden-Krasner, mgoldenkrasner@biologicaldiversity.org or 213-785-5402.

Sincerely,

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