March 28, 2023

Submitted via *Regulations.gov*

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-OAR-2015-0072; Review of the National Ambient Air Quality Standards for Particulate Matter

Dear Mr. Joseph Goffman,

The undersigned organizations and individuals—all advocates for increasing the pace and scale of beneficial fire use to promote public health, community safety, and ecological resilience—write regarding the U.S. Environmental Protection Agency's (EPA) proposed rule to modify the National Ambient Air Quality Standards (NAAQS) for fine particle pollution ($PM_{2.5}$).[1] We are deeply concerned about the unintended consequences of this rule on necessary efforts to increase the use of prescribed fire, cultural burning, and wildfire managed for resource benefit (herein, "beneficial fire"). We are alarmed that the EPA currently intends to adopt the proposed rule without reopening any of its implementation rules or guidance, and urge reconsideration of this position.

Nevertheless, we acknowledge that the public health data supports the EPA's proposal to reduce the annual $PM_{2.5}$ NAAQS, and generally encourage the agency to set the standard as low as 8 $\mu g/m^3$. We likewise acknowledge that the public health data supports a reduction in the 24-hour $PM_{2.5}$ NAAQS, and generally encourage the EPA to reduce the 24-hour $PM_{2.5}$ NAAQS to 25 $\mu g/m^3$. The literature suggests that such levels are necessary to protect the public health with an adequate margin of safety.[2] These reductions also appear necessary to reduce the inequitable effects of air pollution on low-income communities and people of color.[3] Additional regulation of stationary sources, tailpipe emissions, and similar anthropogenic sources are clearly warranted to protect public health. However, if EPA implements the proposed rule without providing additional

[1] Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (PM), 88 Fed. Reg. 5558, 5570, 5682 (Jan. 27, 2023) ("NPRM").

[2] 42 U.S.C. § 7409 (mandating the EPA establish NAAQS protecting the public health and welfare with an adequate margin of safety); CASAC Review of the EPA's *Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (External Review Draft - October 2021)*, EPA-CASAC-22-002, 16 (scientific literature cited by CASAC supports reduction of annual standard to 8 $\mu g/m^3$ to protect the public health, and vulnerable populations), 17 (majority of CASAC found lowering 24-hour standard to 25 $\mu g/m^3$ justified), https://casac.epa.gov/ords/sab/f?p=105:18:10792850355838:::RP,18:P18_ID:2607#report.

[3] EPA, *Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter* ("RIA"), Figure 6-19, https://www.epa.gov/system/files/documents/2023-01/naaqs-pm_ria_proposed_2022-12.pdf.

regulatory relief for beneficial fire, wildfire smoke will continue to overwhelm all other air quality-related public health gains. This result would not be in the public interest.

Our support for the referenced changes is therefore **conditional** on firm commitments from the EPA and the Biden Administration to successfully address the chilling effect that the new NAAQS will have on the use of beneficial fire. As the EPA acknowledges, wildfire smoke is one of the greatest contributors to now increasing levels of $PM_{2.5}$ emissions, posing a critical threat to public health.[4] As the Biden Administration also well knows, one of the only tools we have to reduce wildfire smoke is proactive, beneficial fire use.[5] **The EPA will not meet the directive of the Clean Air Act to protect the public health and welfare if it adopts new $PM_{2.5}$ NAAQS without meaningfully addressing the regulatory burden on beneficial fire.**

Megafires have increasingly plagued Western landscapes, greatly contributing to poor air quality and endangering our communities, wildlife, and ecosystems. These fires are the result of both climate change and decades of fire exclusion, the latter of which was led by both state and federal land managers, who at the time viewed fire as a threat rather than an ecological necessity. They are also the result of intentional efforts to eradicate cultural burning by Tribes and Indigenous fire practitioners. Increased implementation of prescribed fire, cultural burning,[6] and wildfire managed for resource benefit is essential for addressing the increase of such megafires.

The EPA, however, appears set to revise NAAQS without further action to ensure that implementation does not hobble beneficial fire activities.[7] This recalcitrance indicates to us that the agency lacks an adequate understanding of key natural resource processes and Native American cultural practices. The EPA's failure to understand how the ecological landscape operates—including the relationship between vegetation, fire, and smoke in the West and

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[4] *See, e.g.*, EPA, *Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter* (2022), https://www.epa.gov/naaqs/particulate-matter-pm-standards-policy-assessments-current-review-0, at 2-4; Fact Sheet: Wildland Fire, Air Quality and Public Health Considerations, EPA, https://www.epa.gov/pm-pollution/proposed-decision-reconsideration-national-ambient-air-quality-standards-particulate (wildland fires account for 44% of primary emissions of $PM_{2.5}$ in the US, posing significant impacts to human health nationwide); NPRM, 88 Fed. Reg. 5558, 5569-70 ("The magnitude of the public health impact of wildfires is substantial both because of the increase in PM2.5 concentrations as well as the duration of the wildfire smoke season . . . ."); Environmental Protection Agency, 2017 *National Emissions Inventory Data* (Jan. 2021) (wildfire smoke contributed approximately 30 percent of the nation's directly emitted fine particulate matter pollution in 2017). For unclear reasons, EPA's Regulatory Impact Analysis ends its evaluation of PM2.5 trends in 2017, just before wildfire emissions started to have a marked impact on overall pollution. RIA, at Figure 2-3.

5 *See* on USDA Comments on EPA Proposed Rule: "Reconsideration of the National Ambient Air Quality Standards for Particulate Matter" RIN 2060-AV52 ("USDA Comments"), at 17 ("Prescribed fire [is] one of the most important land management tools to help mitigate future catastrophic wildfires.").

[6] Tribal authority over cultural burning practices has never been ceded or relinquished. Consequently, Tribal sovereignty over cultural burning must be acknowledged and respected. Nothing in this letter is intended to imply or concede that cultural burning activities are subject to federal regulatory authority.

[7] NPRM, 88 Fed. Reg. 5558, 5563.

elsewhere—and the unintended risks posed by the proposed rule to public health and welfare is unacceptable.

Scientific and public health experts agree that a significant increase in the use of beneficial fire practices is essential to reduce $PM_{2.5}$ pollution, improve public health, and address the long-term impacts of fire exclusion on our forests and grasslands, air quality, climate, and communities, as explained further below. If we are serious about protecting public health, the federal government must enable significantly greater use of beneficial fire, rather than continuing to treat it commensurate with industrial pollution sources. Modifying the $PM_{2.5}$ NAAQS without addressing the burden of such regulation on beneficial fire use will significantly curtail our best tool to tackle wildfire emissions. Fire is a key part of our natural world, both essential for ecological resilience and, when managed appropriately, necessary to better protect public health and welfare.

Modifying the NAAQS without finding a pathway for increased beneficial fire use would put the EPA on the wrong side of policies and actions planned by federal, state, local and Tribal entities to address the wildfire crisis and ultimately, to reduce harmful $PM_{2.5}$ emissions and impacts by reducing wildfire smoke. For example, the U.S. Forest Service recently issued its Wildfire Crisis Strategy, which calls for "dramatically increasing fuels and forest health treatments [including beneficial fire] by up to four times current treatment levels in the West."[8] The Department of the Interior likewise articulated the need to increase the pace and scale of priority fuel management treatments, including beneficial fire.[9] And the Biden Administration has assembled the Wildland Fire Mitigation and Management Commission to develop strategies to better prevent and manage wildfires, including through expanded beneficial fire use.[10] All of these objectives are supported by significantly increased beneficial fire funding from the Inflation Reduction Act and bipartisan Infrastructure Investment and Jobs Act.[11] Federal agencies, and their state, local, and Tribal counterparts, however, will not be able to implement their planned actions if the $PM_{2.5}$ NAAQS are modified without consideration for beneficial fire.

Our comments today establish that the EPA has significant work ahead to fully protect public health in an era of increasing wildfire. Section I provides necessary background and context for the wildfire crisis and the resulting public health impacts. Section II explains why beneficial fire is a critical tool for addressing the crisis. Section III explores the potential impacts of the proposed rule on beneficial fire use, and Section IV explains why the current Exceptional Events

[8] USDA, *Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests* (2022), https://www.fs.usda.gov/managing-land/wildfire-crisis.

[9] U.S. Department of the Interior, *Wildfire Risk Five-Year Monitoring, Maintenance and Treatment Plan* (2022), https://www.doi.gov/sites/doi.gov/files/bil-5-year-wildfire-risk-mmt-plan.04.2022.owf_.final_.pdf.

[10] *See* USDA, *Wildland Fire Mitigation and Management Commission*, https://www.usda.gov/topics/disaster-resource-center/wildland-fire/commission.

[11] Forest Service, USDA, *Bipartisan Infrastructure Law*, https://www.fs.usda.gov/managing-land/infrastructure; National Park Service, *Bipartisan Infrastructure Law: How the Bipartisan Infrastructure Law Impacts Wildland Fire*, https://www.nps.gov/subjects/fire/bipartisan-infrastructure-law.htm.

Rule is not a panacea for these impacts. Finally, Section V offers concrete solutions. We urge the EPA to accept our invitation to work collaboratively to implement these ideas.

I. Decades of Fire Exclusion Have Left the Western United States Susceptible to Megafire and Associated Harmful Impacts to Public Health.

A. Fire History and Departure in the Western United States.

Fire restoration practitioners in the Western United States have been touting the role of beneficial fire in ecosystem function and the need for its restoration for decades.[12] The topics of historic fire frequency (i.e., the fire regime parameters for various landscapes) and the significant departure from that frequency caused by fire exclusion (known as the Fire Return Interval Departure or FRID) has been front and center in fire science discussions and research literature for over three decades. However, the on-the-ground consequences of that departure are only now coming into focus for the general public.

Vegetation in much of the United States has a deep, evolutionary relationship with fire that dates back thousands of years. Information on this relationship has been derived from fire scar studies, lake-bed sediment studies, historic records, and traditional ecological knowledge. We know that fire—both from lightning ignitions[13] and Indigenous burning—has influenced vegetation type and distribution, as well as the resulting ecosystems, across the country.[14] For instance, in a recent global wildfire study of Mediterranean regions, the California landscape and its Mediterranean climate was called out as one of six of the most naturally fire-prone landscapes on Earth.[15]

Cultural burning played a critical role in establishing these ecosystems and continues to play a necessary stewardship role today. Tribes and Indigenous people across the country have used fire for thousands of years, long enough to drive ecological selection for fire-associated vegetation types.[16] Cultural burning practices are essential to the stewardship of plants and animals for food, fiber, and sustenance, the provision of community safety, and Tribal ceremonial, spiritual,

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[12] *See, inter alia*, H. Biswell, *Reduction of Wildfire Hazard*, 13 CALIFORNIA AGRICULTURE 6, 5 (1959); H. Biswell, *Danger of Wildfires Reduced in Ponderosa Pine*, 4 CALIFORNIA AGRICULTURE 10, 5-6 (2960); H. Biswell & A. M. Schultz, *Reduction of Wildfire Hazard*, 10 CALIFORNIA AGRICULTURE 11, 4-5 (1956); J. R. Sweeney & H. Biswell, *Quantitative Studies on the Removal of Litter and Duff by Fire under Controlled Conditions*, 42 ECOLOGY 3, 572-75 (1961); USDA, Forest Service-RMRS (Rocky Mountain Research Station) FS 1085 May 2017.

[13] Lightning has always been a contributing factor in the ecological balance of precipitation, soils, and site quality. Fire is a critical disturbance process in many ecosystems. *See* NOAA, *New Lightning Tool Tells a Striking Story* (2022), https://www.noaa.gov/news/new-lightning-tool-tells-striking-story.

[14] R. K. Hagmann et al., Evid*ence for Widespread Changes in the Structure, Composition, and Fire Regimes of Western North American Forests*, 31 ECOLOGICAL APPLICATIONS 8, e02431 (2021).

[15] F. Moreira et al., *Wildfire Management in Mediterranean-Type Regions: Paradigm Change Needed*, 15 ENVIRON. RES. LETT. 1, 011001, (2020).

[16] F. Guterl, *The Sprawling Story of Human Evolution*, 22 SCIENTIFIC AMERICAN: SA SPECIAL EDITIONS 1s, 3 (Dec. 2012) doi:10.1038/scientificamericanhuman1112-68.

and religious practices.[17] Several studies in California and elsewhere have highlighted the beneficial role of cultural burning to the broader role of fire hazard reduction in the recent era.[18] Moreover, cultural fire practitioners have also demonstrated the *benefits* of smoke in certain ecosystems. For instance, as described in the Karuk Tribe's Climate Adaptation Plan, smoke from landscape-scale ceremonial fires can cool the Klamath River at the peak of summer temperatures, providing benefits for salmonids and other riparian species. Such fires have been lit by the Karuk, Yurok, and Hoopa people since time immemorial. These nuanced uses of both fire and smoke are part of a healthy and resilient ecosystem.[19]

After decades of fire suppression, the number of acres burned in the United States has been steadily increasing since the 1980s.[20] The last two decades have been characterized by the rise of the "megafire" or wildfires that burn with uncharacteristic severity, size, and speed. Wildfires, and

[17] C. I. Roos et al., *Native American fire management at an ancient wildland-urban interface in the Southwest United States*, 118 PNAS 4, e2018733118 (2021); C. I. Roos et al., *Indigenous fire management and cross-scale fire-climate relationships in the Southwest United States from 1500 to 1900 CE*, 8 SCI. ADV. 49, eabq3221 (2022); J. Mulhollem, *Eastern Forests Shaped More by Native Americans' Burning than Climate Change*, SCIENCE DAILY (2019); National Park Service, *Wildland Fire: Cultural Interpretations of Fire and Human Use*, https://www.nps.gov/articles/wildland-fire-human-use-and-cultural-interpretations.htm; G. W. Williams, *References on the American Indian Use of Fire in Ecosystems*, SIPNUUK (2003), https://sipnuuk.karuk.us/digital-heritage/references-american-indian-use-fire-ecosystems-0**Error! Hyperlink reference not valid.**; M. K. Anderson, *The Use of Fire by Native Americans in California*, *in* FIRE IN CALIFORNIA'S ECOSYSTEMS (Neil Sugihara ed., 2006).

[18] S. L. Stephens et al., *Prehistoric Fire Area and Emissions from California's Forests, Woodlands, Shrublands, and Grasslands*, 251 FOREST ECOLOGY & MANAGEMENT, 205-216 (2007); A. H. Taylor et al., *Sociological Transitions Trigger Fire Regime Shifts and Modulate Fire-Climate Interactions in the Sierra Nevada, USA, 1600-2015 CE*, 113 PNAS 48 (2016); M. K. Anderson, *supra*.

[19] Karuk Tribe, *Karuk Climate Adaptation Plan* (2019), at 75, https://www.karuk.us/index.php/departments/natural-resources/525-climate-adaptation; *see also* A. T. David, J. E. Asarian & F. K. Lake, *Wildfire Smoke Cools Summer River and Stream Water Temperatures* 2018. 54 WATER RESOURCES RESEARCH, 7273–7290 (2018).

[20] U.S. Government Accountability Office, *Wildfire Smoke: Opportunities to Strengthen Federal Efforts to Manage Growing Risks* (hereafter "GAO Wildfire Smoke"), at 6 ("the areas burned by wildfires each year in the United States has significantly increased since 1983").

their resulting emissions, are only projected to increase.[21] The resulting air quality and public health impacts are likely to increase accordingly.[22]

The cause of these megafires and their significant impacts are well known. Anthropogenic climate change has caused hotter temperatures (especially overnight), longer dry seasons, higher winds, more intense droughts, and increased lightning.[23] People continue to build homes and infrastructure in the wildland-urban interface, resulting in greater property damage, increased ignitions,[24] and more challenging conditions for fire management agencies. Just as critical, however, is the effect of more than a century of fire exclusion on most landscapes. In the West in particular, fire exclusion has led to increases in forest densities and fuel loads, creating a landscape that is primed to burn, especially in uncharacteristically severe megafires.[25]

A number of studies in California have evaluated the impacts of fire exclusion on the landscape, including by evaluating the Natural Range of Variation (NRV) of different vegetation types and historic versus current fire return intervals. One of the most comprehensive reviews was published in 2014.[26] The review used a Fire Return Interval Departure (FRID) Analysis to map

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[21] S. Liu et al., *Role of Emission Controls in Reducing the 2050 Climate Change Penalty for $PM_{2.5}$ in China*, 765 SCIENCE OF THE TOTAL ENVIRONMENT, 144338 (2021) (finding that fire emissions are protected to increase by 50% from 2001-2010 to 2050-59); D. V. Spracklen et al., *Impacts of Climate Change from 2000 to 2050 on Wildfire Activity and Carbonaceous Aerosol Concentrations in the Western United States*, 114 J. OF GEOPHYSICAL RESEARCH D20301 (2009); X. Yue et al., *Ensemble Projections of Wildfire Activity and Carbonaceous Aerosol Concentrations Over the Western United States in the Mid‐21st Century*, 77 ATMOSPHERIC ENVIRONMENT 767–780 (2013); B. Ford et al., *Future Fire Impacts on Smoke Concentrations, Visibility, and Health in the Contiguous United States*, 2 GEOHEALTH 8, 229–247 (2018); M. D. Hurteau et al., *Modeling Climate and Fuel Reduction Impacts on Mixed-Conifer Forest Carbon Stocks in the Sierra Nevada, California*, 315 FOREST ECOLOGY & MANAGEMENT, 30-42 (2014).

[22] *See* United Nations Environment Programme, *Spreading Like Wildfire: The Rising Threat of Extraordinary Landscape Fires*, (2022), https://www.unep.org/resources/report/spreading-wildfire-rising-threat-extraordinary-landscape-fires.

[23] D. M. Romps et al., *Projected Increase in Lightning Strikes in the United States Due to Global Warming*, 346 SCIENCE 6211, 851-54 (2014).

[24] W. M. Downing et al., *Human Ignitions on Private Lands Drive USFS Cross-Boundary Wildfire Transmission and Community Impacts in the Western US*, 12 SCI. REP., 2624 (2022); Nathan Neal, *How Lightning is Affected by Climate Change*, ENVIRONMENTAL JOURNAL (2021) (anticipating a 12% increase in lightning activity for every 1°C of warming). Lightning plays an outsized role in wildfires: More than 40% of wildfires in the West were caused by lightning, and those fires accounted for more than 70% of the acreage burned between 1992 and 2015, according to the Forest Service. Karen C. Short, *Spatial Wildfire Occurrence Data for the United States, 1992-2020 [FPA_FOD_20221014]*, U.S. Forest Service Research Data Archive (2022), https://doi.org/10.2737/RDS-2013-0009.6; Romps et al., *supra*.

[25] GAO Wildfire Smoke, at 7 ("fire management policies that suppressed fire in the past century have contributed to the increasing frequency of large fires"); U.S. Global Change Research Program, *Fourth National Climate Assessment* (2018); Hessburg et al., *Climate and Wildfire Adaptation of Inland Northwest US Forests*, 20 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT, 1-9 (2021).

[26] H. D. Safford & K. M. Van de Water, *Using Fire Return Interval Departure (FRID) Analysis to Map Spatial and Temporal Changes in Fire Frequency on National Forest Lands in California*, Res. Pap.
(footnote continued on next page)

spatial and temporal changes in fire frequency across National Forest lands. The authors concluded that much of the southern Cascades and Sierra Nevada are in near extreme to high departure from historic fire cycles.[27] The resulting increased stand density and fuel loads explain the large-scale, high-severity fires that have occurred in these areas since the time of the 2014 report.[28]

A similar 2017 study reported an "in-depth assessment of the natural range of variation (NRV) of Yellow Pine Mixed Conifer (YPMC) forests," focusing on ecosystem processes and forest structure from historical data sources, current reference forests that have retained frequent fire, and current forests subject to fire exclusion.[29] The authors concluded that "modern YPMC forests have departed from NRV conditions for a wide range of ecosystem processes and structural attributes." Like many other ecosystems responding to fire exclusion, these modern YPMC stands have much higher densities dominated by smaller trees (often of shade-tolerant species).[30] These are the very conditions that lead to higher intensity, larger-scale wildfire events with long duration and higher density smoke plumes.

B. Expansion of Beneficial Fire Use is Needed to Reach Multiple Goals.

We are in a wildfire crisis. While the EPA and Biden Administration must do all they can to halt and reverse climate change, the impacts—to temperature, droughts, wind, and lightning—are already "locked in," at least for the near-term.[31] One of the only tools available to stem the increase in megafires is to improve land management practices, especially through the wide-scale restoration of beneficial fire.

Reducing surface and ladder fuels at a landscape level is the key pathway to limiting uncharacteristic megafires and their predicted expansion. The Government Accountability Office

PSW-RP-266. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 59 p (2014).

[27] *Id.*

[28] For instance, these include the King Fire (2014), Rough Fire (2015), Camp Fire (2018), North Complex (2020), and Dixie Fire (2021).

[29] H. D. Safford & J. T. Stephens, *Natural Range of Variation for Yellow Pine and Mixed-Conifer Forests in the Sierra Nevada, Southern Cascades, and Modoc and Inyo National Forests, California, USA*, General Technical Report PSW-GTR-256. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 229 p (2017).

[30] *See also* A. E. Scholl & A.H. Taylor, *Fire Regimes, Forest Change, and Self-Organization in an Old-Growth Mixed-Conifer Forest, Yosemite National Park, USA*, 20 Ecol. Appl. 2, 362-80 (2010) (finding that "fire exclusion has caused an increase in forest density and basal area and a compositional shift to shade-tolerant and fire-intolerant species" as the fire-return interval increased).

[31] *See* Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), https://www.ipcc.ch/report/ar6/wg2/.

recently noted that three primary fuel reduction methods can help mitigate wildfire risk: mechanical treatments, prescribed burns, and targeted grazing.[32]

We generally agree with the need to expand all available restoration tools to secure any meaningful increases in fire resilience (acres mitigated and maintained) into the future. However, both mechanical treatments and targeted grazing have significant limitations, especially in terms of cost, ability to scale, and feasibility. More specifically, mechanical thinning alone often does not accomplish fuel reduction and smoke mitigation objectives – thinning treatments must be followed by prescribed burning.[33] In the mountainous regions of the West, fire is often the *only* viable fuel reduction tool given topographic concerns, lack of access, and legal and administrative restrictions, such as wilderness and roadless areas. One study looking specifically at constraints on treatments in California found that across the Sierra Nevada, mechanical treatment options were possible, at most, on *half* of a given National Forest.[34] In the most constrained National Forest, less than 5 percent of the land was suitable for mechanical treatment.[35]

[32] GAO Wildfire Smoke, at 20; *see also* U.S. Global Change Research Program, *Fourth National Climate Assessment* (2018).

[33] E. Kalies & L. L. Kent, *Tamm Review: Are Fuel Treatments Effective at Achieving Ecological and Social Objectives? A Systematic Review*, 375 FOREST & ECOLOGY MANAGEMENT, 84-95 (2016); S. J. Prichard et al., *Adapting Western North American Forests to Climate Change and Wildfires: 10 Common Questions*, 31 ECOLOGICAL APPLICATIONS 8, e02433 (2021).

[34] M. P. North et al., *Reform Forest Fire Management*, 349 SCIENCE 6254, 1280-81 (2015).

[35] *Id.* The EPA's recent suggestion that air curtain incinerators should be considered a viable alternative to prescribed fire (GAO Wildfire Smoke at 41) is also not viable for this reason. While air curtain incinerators may help reduce smoke associated with burning piles near communities, they are not a viable alternative to landscape scale broadcast burning for ecological benefit, or in places where mechanical thinning is not possible.

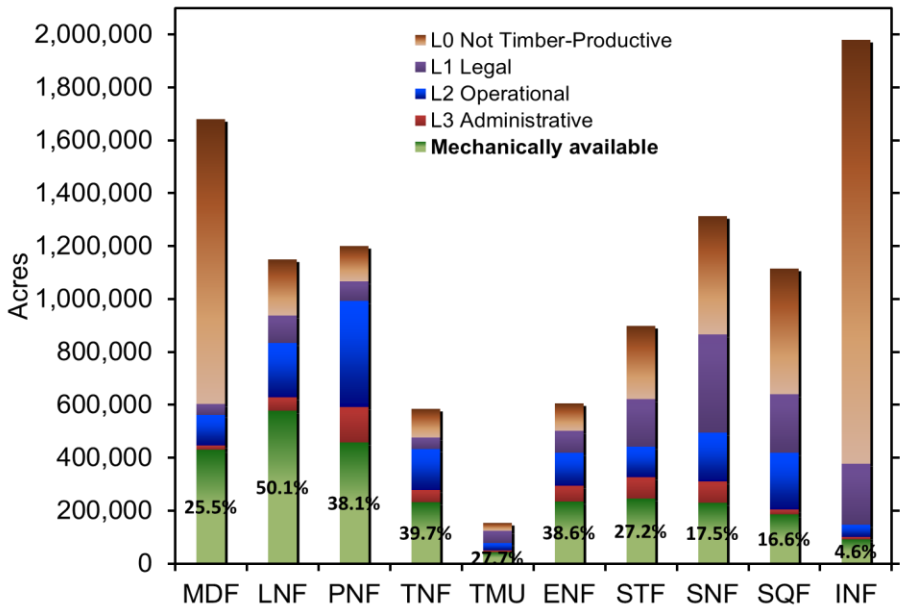

Figure 1. Constraints reduce the total acreage available to mechanical treatment in the Sierra Nevada national forests. The histogram bar heights indicate the total acreage of each national forest in the Sierra Nevada. The percentage of acreage available for mechanical treatment is indicated in green, while constraints preventing mechanical treatment are indicated in other colors.[36]

Even if mechanical treatments, herbicide, and targeted grazing were viable tools for landscape fuel management, such activities *do not* provide the same benefits as beneficial fire. As Forest Service Chief Randy Moore recently confirmed: "almost all forest and range types in the United States have evolved with (and are dependent on) fire, making recognition of fire's role in the ecosystem critically important."[37] The restoration of beneficial fire offers the following important benefits:

- Reduce the risk of crowning and tree mortality;
- Reduce the spread of pests and disease;
- Remove invasive species that threaten native ecosystems;
- Provide forage for terrestrial and avian wildlife and invertebrates;
- Improve habitat for threatened and endangered species;
- Recycle nutrients back into the soil;

[36] M. North et al., *Constraints on Mechanized Treatments Significantly Limit Mechanical Fuels Reduction Extent in the Sierra Nevada*, 113 J. OF FORESTRY 1, 40-48 (2015).

[37] Letter from Forest Service Chief Randy Moore, GAO Wildfire Smoke, at 80.

- Promote the growth of native plant species, especially those in a fire dependent ecosystem;

- Improve water retention and promote watershed health; and

- Enable cultural practices to continue.

Beneficial fire's role in supporting biodiversity and the maintenance and enhancement of ecological integrity is critically important. Federal and State agencies have multiple regulations, plans, and initiatives intended to protect and enhance biodiversity and ecological integrity. For example, the 2012 Forest Planning Rule specifically calls out "Ecosystem Integrity" as a mandatory plan component and requires the Forest Service to, "maintain and restore terrestrial and aquatic ecosystems in the watersheds of the plan area."[38] The Rule recognizes that wildland fire is a "dominant ecosystem process[]" and concludes that "restor[ation of] fire adapted ecosystems" is a key mechanism to ensure ecosystem integrity.[39]

States have likewise highlighted the need to protect biodiversity. For instance, New York, Utah, and California[40] have advanced new Pathway 30x30 proposals to protect 30 percent of their natural landscapes by 2030.[41] In many of these ecosystems, one of the key tools for "protecting" these treasured areas is beneficial fire use.

Finally, multiple Federal and State listed plant and wildlife species are dependent on fire as a key ecological process. Beneficial fire can result in seed scarification and germination, nutrient recycling, habitat creation (large and small nesting and denning cavities), provision of forage, large log creation, and other characteristics necessary for species survival. State and Federal protection and recovery programs are seriously threatened by uncharacteristic megafires, but the solution is not to remove fire entirely. Limiting beneficial fire places our native plant and wildlife communities at even greater risk.

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[38] 36 C.F.R. § 219.8(a)(1).

[39] 36 C.F.R. § 219.8(a)(1)(iv).

[40] California's commitment to biodiversity has been strengthened in recent years. *See*, e.g., California Governor's Office of Planning and Research, California Natural Resource Agency, California Dept. of Food & Agriculture, *California Biodiversity Initiative A Roadmap for Protecting the State's Natural Heritage* (2018) https://www.californiabiodiversityinitiative.org/pdf/california-biodiversity-action-plan.pdf, California Natural Resources Agency, *Protecting Biodiversity*, https://resources.ca.gov/Initiatives/Protecting-Biodiversity.

[41] T. McIntosh et al., *The Western Rad to 30: How Western States are Contributing to the Bold Campaign to Protect 20% of America by 2030* (2021), https://westernpriorities.org/wp-content/uploads/2021/04/WesternRoadTo30.pdf; Administration of Governor Gavin Newson, *Pathways to 30x30 California: Accelerating Conservation of California's Nature* (2022), available at https://www.californianature.ca.gov/; Utah Public Lands Policy Coordinating Office, *Utah's Stance on the 30x30 Initiative*, https://publiclands.utah.gov/energy-resources/utahs-30x30-initiative/; K. Clukey, *New York to Conserve 30% of State Land by 2030 Under New Law*, BLOOMBERG LAW (2022), https://news.bloomberglaw.com/environment-and-energy/new-york-to-conserve-30-of-state-land-by-2030-under-new-law.

In sum, while beneficial fire results in smoke and related impacts to public health, it is the only tool available to retain ecosystem resilience, biodiversity, watershed health, and cultural practices.[42] It is also the only tool available to reduce fuel loading and wildfire risk in many areas. Given the Clean Air Act's legal framework—wherein the EPA is directed in this rulemaking to look only at the emission levels requisite to protect public health—the agency's singular focus on potential beneficial fire emissions and their immediate public health impact is understandable. However, *outside* of the rulemaking, the need to maintain viable pathways for expanded beneficial fire use is undeniable. As Chief Moore recently wrote: "Only focusing on the effect of wildfire smoke on public health minimizes the breadth of the current crisis impacting the natural and human environment and neutralizes the most effective mitigation tool that also mimics natural processes – prescribed fire. . . ."[43]

The Government Accountability Office recently highlighted this lack of alignment between the EPA (with its singular focus on public health) and federal land managers, including the Department of Agriculture and the Department of Interior (with their broader missions, including to ensure ecosystem resilience).[44] We urge the EPA to take seriously the GAO's admonition that the agency work together with its federal partners to "better align their goals and establish joint strategies for achieving those goals."[45] We agree that only through that process can the federal government "create a whole systems approach to more effectively reduce wildfire disaster risk to air quality and public health," as well as to the ecosystems we all depend on.[46]

II. Beneficial Fire Use Is One of the Best Tools to Reduce Wildfire Smoke and its Impacts.

A. Expansion of Beneficial Fire Use Will Reduce Wildfire Impacts.

Based on a review of the comment record, we are concerned about arguments questioning whether beneficial fire activities have mitigating impacts on wildfire size and severity, including citations to a limited study on the alleged failure of prescribed fire and thinning treatments to intersect with wildfire events.[47] We actively refute this simplistic characterization of fuel treatment effectiveness, especially given the date of the study in question. Expanding beneficial fire and fuels

[42] GAO Wildfire Smoke, at 36.

[43] GAO Wildfire Smoke, at 80.

[44] GAO Wildfire Smoke, Highlights.

[45] *Id.* at 45.

[46] *Id.*

[47] Critics of beneficial fire cite to a 2022 study by Baker and Bevington that was not peer reviewed, and has been refuted by extensive evidence and peer reviewed scholarship demonstrating the effectiveness of beneficial fire in improving outcomes. *See* B. Baker & D. Bevington, *Myths of Prescribed Fire: The Watering Can that Pretends to be a River*, EARTH ISLAND JOURNAL (2022); *but see* S. T. McKinney et al., *A Systematic Review of Empirical Evidence for Landscape-Level Fuel Treatment Effectiveness*, 18 FIRE ECOLOGY 1, 21 (2022); USDA Forest Service, *Can Fuel Treatments Change How a Wildfire Burns Across a Landscape?* (2023), https://www.fs.usda.gov/research/rmrs/products/sycu/can-fuel-treatments-change-how-wildfire-burns-across-landscape.

treatments to meaningful ecological scales is necessary to address the significant departure from the resilient conditions that existed under historic fire regimes.[48] To the extent wildfire events fail to be modulated by treatments, it is because we have not been restoring fire at meaningful ecological scales; we need more beneficial fire use, not less.

Below is a short list of interventions of fuels treatments—including beneficial fire use—intersecting with wildfires with beneficial results. In many of these locations, treatments resulted in both lower tree mortality and a much lower incidence of crown fires, both of which reduce total $PM_{2.5}$ emissions.

- **Cone Fire (2002)**: The Cone Fire in the Lassen National Forest dropped from the crown to the surface within a few feet of entering the treatment units. Stands with ladder fuels reduced by thinning and a follow-up prescribed fire had the best survival and lowest occurrence of damage to boles (trunks) and crowns.

- **Camp 32 Fire (2005)**: The Forest Service completed mechanical thinning and prescribed fire treatments on 8,000 acres between 2001 and 2003, which modulated wildfire behavior 2 years later. A local forester stated: "There is no doubt that the fire transformed from a crown fire to a ground fire. If the treatment (thinning and prescribed fire) had not been done, the fire would have ended up burning over Black Butte and into the Black Lake Road area, affecting many more homes."[49]

- **Tripod Complex Fire (2006)**: When the Tripod Complex Fire in Washington spread through untreated areas and areas treated with thinning only, it killed most of the trees in its path. However, in areas treated with both thinning and recent prescribed burning of surface fuels, most of the trees survived.[50]

- **Miller Fire (2011)**: The Miller Fire in the Gila Wilderness in New Mexico was allowed to spread with minimal suppression efforts. This fire produced beneficial effects by reducing fuels and limiting the spread of subsequent wildfires.

- **Carlton Complex (2014):** The Carlton Complex fire in Washington burned across hundreds of sites that were previously thinned or burned, offering a testbed for the researchers to analyze whether the work helped reduce fire impacts in those areas during the megafire. The researchers used satellite images of burn severity to examine how past fuel treatments performed in the context of this extreme wildfire event. They found that even during the first explosive days of the Carlton Complex,

[48] S. J. Prichard et al. (2021), *supra*. *Adapting Western North American Forests to Climate Change and Wildfires: 10 Common Questions*, 31 ECOLOGICAL APPLICATIONS 8, e02433 (2021).

[49] National Fire Plan, *Hazardous Fuels and Prescribed Burn Projects, Fuel Treatment and the Camp 32 Fire: A Success Story, Montana 2005* https://www.forestsandrangelands.gov/documents/success/05_mt_nf_fule_treatment_hfr.pdf.

[50] S. J. Prichard & M. C. Kennedy, *Fuel Treatments and Landform Modify Landscape Patterns of Burn Severity in an Extreme Fire Event*, 24 ECOLOGICAL APPLICATIONS 3, 571-90 (2014).

areas that were thinned and prescribed burned had more trees survive than areas that did not receive those fuel treatments.[51]

- **San Juan Fire (2014):** The Forest Service had completed mechanical thinning, prescribed fire, and combination treatments across a series of experimental study sites in the Apache Sitgreaves National Forest. When the San Juan Fire burned through the area, the Forest Service was able to demonstrate how prior prescribed fire treatment modulated wildfire impacts, allowed for safe firefighting and improved habitat for aquatic species.[52]

- **The Lions Fire (2018)/Creek Fire (2020)**: The lightning-ignited Lions Fire in the Sierra and Inyo National Forests was managed using Minimum Impact Suppression Tactics, such as air assistance and hand construction. The fire footprint from this wildfire managed for public resource benefit was instrumental in preventing the spread of the 2020 Creek Fire toward the town of Mammoth Lakes.[53]

- **Creek Fire (2020):** The Four Corners Area prescribed burns by the Forest Service and Southern California Edison in the Dinkey Creek Watershed kept the southern run of the 2020 Creek Fire from entering the Blue Canyon area. It is anticipated that such a run would have done extensive damage to this pristine watershed.

- **Woodhead Fire (2020):** An area previously treated by mechanical thinning and prescribed fire in the Idaho-Payette National Forest was used by fire management crews for a low-intensity burnout, stopping extreme fire behavior and protecting fire management crews.[54]

- **Grizzly Creek Wildfire (2020):** Firefighters reported that a previous prescribed burn area helped them stop a section of the fire: "So, the fire was moving along it and it hit that prescribed burn area, and you could actually see it on the infrared map the next morning where it actually didn't burn where those prescribed burn units were."[55]

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[51] S. J. Prichard et al., *Fuel Treatment Effectiveness in the Context of Landform, Vegetation, and Large, Wind-Driven Wildfires*, 30 ECOLOGICAL APPLICATIONS 5, e02104 (2020).

[52] U.S. Forest Service, *San Juan Fire Fuel Treatment Effectiveness Report Apache-Sitgreaves National Forest, Arizona* (2014), https://treesource.org/wp-content/uploads/2017/08/R3_San-Juan-Fire-Fuel-Treatment-Effectiveness-Report.pdf.

[53] California's Strategic Plan for Expanding the Use of Beneficial Fire (2022), at 48, https://wildfiretaskforce.org/wp-content/uploads/2022/05/californias-strategic-plan-for-expanding-the-use-of-beneficial-fire.pdf.

[54] U.S. Forest Service – Payette National Forest, *Woodhead Wildlife and Prescribed Fire Success* [video] (2022), https://www.facebook.com/payettenationalforest/videos/680115103473864/.

[55] Grizzly Creek Fire, *Sept 8th – Prescribed Fire Benefited Tree Stands and Slowed the Spread of Grizzly Creek Fire 2020* [video] (2020), https://www.facebook.com/GrizzlyCreekFireCO/videos/706811669872195/.

- **Medio Fire (2020):** Firefighters guided a wildfire on the Santa Fe National Forest into an area the Forest Service and its partners had treated with a prescribed burn the prior year. If not for that deterrent, officials say, the Medio Fire could have swept all the way into the Santa Fe ski basin.

- **Caldor Fire (2021):** A 3,000-acre beneficial fire completed as part of the Caples Ecological Restoration Project in 2019 was credited by the California Department of Forestry and Fire Protection (CAL FIRE) as preventing a more extreme flanking run during the Caldor Fire.[56]

- **Bootleg Fire (2021):** Oregon's Bootleg fire offered new evidence that Indigenous cultural burning techniques can change how megafires behave, when the fire intersected with areas recently stewarded with cultural burning.[57]

- **The Midnight Fire (2022):** Carson National Forest's prescribed fire and managed wildfire projects slowed the progress of the Midnight Fire.[58]

As agencies, land managers, Tribes, and practitioners continue to expand the use of beneficial fire, the mediating effect of these treatments on wildfire behavior will continue to grow.

B. By Reducing Megafires, Beneficial Fire Projects Reduce Total Emissions and Allow More Effective Mitigation.

Fire ecologists and land managers are generally in consensus that our best chance to reduce $PM_{2.5}$ emissions is to restore fire as a natural process.[59] We must learn to actively work with the fire-adapted ecosystems that we depend on, to restore resilience and reduce the risk of megafires.[60] Management approaches must incorporate disturbances such as fire, to make "shifting forest conditions and wildfire regimes less disruptive to individuals and society."[61] Fire restoration, not suppression, is the recipe for rebuilding resilience and protecting public health.

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[56] California's Strategic Plan for Expanding the Use of Beneficial Fire, at 46.

[57] M. Singh, *"The Fire Moved Around It": Success Story in Oregon Fuels Calls For Prescribed Burns*, THE GUARDIAN (2021), https://www.theguardian.com/world/2021/aug/12/the-fire-moved-around-it-success-story-in-oregon-fuels-calls-for-prescribed-burns.

[58] T. Davis, *Under Control: Midnight Fire was Manageable Thanks to Prescribed Burns, Thinning*, ALBUQUERQUE JOURNAL (2022), https://www.abqjournal.com/2533079/under-control-midnight-fire-was-manageable-thanks-to-prescribed-burns.html.

[59] Hurteau et al., *supra* ("Efforts to adapt to changing climate and projected increases in large fire frequency are likely going to require the restoration of fire as a natural process in these systems.").

[60] P. F. Hessburg et al., *Climate, Environment, and Disturbance History Govern Resilience of Western North American Forests*, 7 FRONTIERS IN ECOLOGY & EVOLUTION 239 (2019), at 2 (building resilience "involves human communities actively working with the ecosystems they depend on, and the processes that shape them, to adapt landscapes, species, and human communities to climate change while maintaining core ecosystem processes and services") (emphasis added).

[61] *Id*. at 2.

Beneficial fire use works to limit total public health impacts from smoke in two different ways. First, studies have demonstrated that beneficial fires produce fewer, less harmful emissions than wildfires, especially uncharacteristic megafires.[62] At a basic level, this reduction should be obvious: beneficial fires generally retain large, overstory trees and vegetation, through both initial treatment and subsequent wildfire.[63] Megafires generally consume this vegetation; one would expect this increased combustion to result in additional particulate matter pollution. Megafires also often consume homes, cars, infrastructure, and other man-made material, resulting in smoke plumes containing an array of toxic chemicals in addition to $PM_{2.5}$.[64]

Studies also support these general principles. In the 2017 "Aligning Smoke Management Goals with Ecological and Public Health Goals," researchers found that one of the first megafires of this era (the 2012 Rim Fire) had a 5.5 times greater smoke impact relative to area burned than two wildfires managed for resource benefit (i.e., beneficial fire) in the same area.[65] Had the entire area of the Rim Fire been treated with recent beneficial fire, researches estimated that emissions from a subsequent wildfire would have been reduced by 48 percent, with most of the change coming from the retention of larger trees. Thus, even when the smoke impacts from a beneficial fire and a subsequent wildfire are combined, they are significantly lower than the smoke impacts of an uncharacteristic megafire.

Similarly, Wiedinmyer and Hurteau found that replacing infrequent wildfires with lighter prescribed burns would reduce carbon dioxide emissions between 18 and 60 percent in dry forests in the Western United States.[66] This study suggests that $PM_{2.5}$ emissions would likewise be

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[62] To the extent the EPA is concerned that this tradeoff is uncertain (GAO Wildfire Smoke, at 36), we agree with the GAO that the appropriate response is to for the EPA to support and conduct *additional analysis about the tradeoffs between localized, short-term effects of beneficial fire on air quality and the long-term smoke effects of future wildfires* (*Id.*) Simply refusing to take action in the face of the wildfire crisis and ever-increasing public health impacts is not the appropriate response.

[63] Multiple studies have shown the impact of beneficial fire on subsequent wildfires. *See* L. L. Yocom et al., *Fire Severity in Reburns Depends on Vegetation Type in Arizona and New Mexico, USA*, 13 FORESTS 11, 1957 (2022); J. D. Young at al., *Strategic Application of Wildland Fire Suppression in the Southwestern United States*, 245 J. OF ENVIRONMENTAL MANAGEMENT, 504-18; L. L. Yocom et al., *Previous Fires and Roads Limit Wildfire Growth in Arizona and New Mexico, USA*, 449 FOREST ECOLOGY & MANAGEMENT, 117440 (2019); D. W. Huffman et al., *Efficacy of Resource Objective Wildfires for Restoration of Ponderosa Pine (Pinus Ponderosa) Forests in Northern Arizona*, 389 FOREST ECOLOGY & MANAGEMENT, 395-403 (2017).

[64] EPA, *Study Shows Some Household Materials Burned in Wildfires Can be More Toxic Than Others* (2022), https://www.epa.gov/sciencematters/study-shows-some-household-materials-burned-wildfires-can-be-more-toxic-others; S. Gibbens, *Wildfires Pose New Threats as Homes Burn, Releasing Toxic Fumes*, NATIONAL GEOGRAPHIC (2019), https://www.nationalgeographic.com/science/article/airborne-health-concerns-emerge-from-california-wildfire.

[65] J. W. Long, L. W. Tarnay & M. P. North, *Aligning Smoke Management Goals with Ecological and Public Health Goals*, 116 J. OF FORESTRY 1, 76-86 (2017).

[66] C. Wiedinmyer & M. D. Hurteau, *Prescribed Fire as a Means of Reducing Forest Carbon Emissions in the Western United States*, 44 ENVIRON. SCI. TECHNOL. 6, 1926–1932 (2010); *see also* D. J. Krofcheck et al., *Optimizing Forest Management Stabilizes Carbon Under Projected Climate and Wildfires*, 1240 J. OF

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reduced. While beneficial fire use may result in more *frequent* emissions, these studies suggest that the total pollution burden is likely to be significantly less if widespread beneficial fire programs are implemented.

Second, beneficial fire use limits public health impacts because of the potential for better mitigation.[67] One of the key characteristics of all types of beneficial fire use is the potential to plan in advance to reduce exposure and community impacts. "Prescribed fires are generally conducted when meteorological conditions are favorable, smoke production (fuel consumption) is less, atmospheric conditions support adequate smoke dispersion, and wind patterns allow smoke to move away from populated areas, hospitals, schools, and roadways."[68] Moreover, air agencies generally require prescribed fire practitioners to develop strong communication and engagement strategies to ensure that communities can and do avoid smoke exposure through masking, filtration, clean air spaces, and temporary relocation.

For these reasons, public health organizations including the American Lung Association have supported expanded beneficial fire programs. ALA concludes that "[p]rescribed fire is a key fire management strategy that provides ecosystem benefits and can be used to mitigate the negative air quality, health, and safety impacts of large-scale wildfires."[69] Likewise, "while increasing prescribed fire activities may contribute to local air quality impacts, prescribed fire can be conducted in ways that minimize harmful smoke exposure potential.[70] Because of these two characteristics of beneficial fire—its ability to reduce the overall pollution burden and its ability to be implemented with meaningful mitigation programs—the EPA must ensure that it remains a viable tool with which to confront the wildfire crisis.

III. Reductions in the NAAQS, Without Accompanying Changes, Will Curtain Beneficial Fire Use.

The proposed rule, if adopted, would likely curtail beneficial fire use at the exact moment when public agencies, land managers, Tribes, and practitioners have all articulated the need to expand the practice. As stated by the USDA, "the proposed changes will potentially affect all

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GEOPHYSICAL RESEARCH: BIOGEOSCIENCES 10, 3075-87 (2019); M. D. Hurteau, *Quantifying the Carbon Balance of Forest Restoration and Wildfire under Projected Climate in the Fire-Prone Southwestern US,* 12 PLOS ONE 1. E0169275 (2017).

[67] Letter from Forest Service Chief Randy Moore, GAO Wildfire Report, at 80 ("Prescribed fires minimize impacts to public health through smoke management.").

[68] PSE Healthy Energy for the American Lung Association, *Can Prescribed Fires Mitigate Health Harm? A Review of Air Quality and Public health Implications of Wildfire and Prescribed Fire* (2022), at 4, https://www.lung.org/policy-advocacy/healthy-air-campaign/prescribed-fire-report.

[69] *Id.* at 5.

[70] *Id.*

prescribed fire across the United States, both current levels of activity as well as needed increases to address The Wildfire Crisis."[71] This curtailment would happen in two potential ways.

First, the EPA has acknowledged that reducing the annual NAAQS $PM_{2.5}$ to 9 or 10 $\mu g/m^3$ would result in a number of new nonattainment areas or an increase in the severity of nonattainment.[72] The majority of these areas are concentrated in California, where the state has identified a need to treat between 10 and 30 million acres, much of it with prescribed fire.[73] The Regulatory Impact Analysis (RIA) for the proposed rule indicates that many of these areas have not identified mechanisms for reaching the proposed standard,[74] and no analysis has been provided to determine whether beneficial fire use at the needed level can be enabled and other sources reduced to achieve attainment. If existing limitations are kept in place for certain sources, more stringent limitations will need to be imposed on other sources to ensure the total burden can be reduced below the NAAQS. USDA states that "it is unlikely that mitigation measures of primary $PM_{2.5}$ alone will be sufficient for areas designated nonattainment," so prescribed fire is likely to be "a focus of local air regulatory agencies in future control strategy demonstrations."[75] We agree with this concern.

The RIA, however, likely underestimates the number of areas that could be designated as nonattainment given its reliance on stale data. The USDA completed further analysis using 2021 $PM_{2.5}$ monitoring data, and found that "nearly 1/3 of the western United States could be declared in nonattainment."[76] Such a result—without further EPA action to enable beneficial fires—could lead to a massive curtailment in beneficial fire use in exactly the ecosystems and communities that need it most.

Second, the EPA is also taking comment on whether to reduce the 24-hour standard to 25 or 30 $\mu g/m^3$. The 24-hour standard is intended to constrain peak emissions for short-duration events, such as prescribed fire. Studies examining relatively modest prescribed fire operations show that such events can result in maximum daily $PM_{2.5}$ emissions that exceed 25 or 30 $\mu g/m^3$.[77]

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[71] USDA Comments, at 2; *see also* GAO Wildfire Smoke, at i ("land management agency officials said that EPA's air quality requirements can limit the use of certain land-management methods, such as prescribed burns, that have the potential to reduce smoke from future wildfires"), 33 (land management agency officials express concern that "air quality standards could limit their ability to make progress toward the goals for the number of acres they aim to treat with prescribed burns").

[72] RIA, at Figure ES-2.

[73] California's Strategic Plan for Expanding the Use of Beneficial Fire, at 15, 18.

[74] RIA, at Figure ES-3.

[75] *Id.* at 17, 18.

[76] *Id.* at 13; *see also* GAO Wildfire Smoke, at 34.

[77] *E.g.*, D. A. Jaffe et al., Wildfire and Prescribed Burning Impacts on Air Quality in the United States, 70 J AIR WASTE MANAG. ASSOC. 6, 583-615 (2020); R. Huang et al., *The Impacts of Prescribed Fire on $PM_{2.5}$ Air Quality and Human Health: Application to Asthma-Related Emergency Room Visits in Georgia, USA*, 29 INT. J. ENVIRON. RES. PUBLIC HEALTH 16, 2312 (2019); K. M. Navarro, *A Review of Community Smoke Exposure from Wildfire Compared to Prescribed Fire in the United States*, 9 ATMOSPHERE 5, 185 (2018).**Error! Hyperlink reference not valid.**

As such, the prescribed fire community is quite concerned that a reduction in the 24-hour standard—without additional regulatory changes to enable sufficient beneficial fire use—would result in many more "no burn" days and denials of smoke management permits by air agencies attempting to prevent exceedances or violations. This shift would perversely result in even more wildfire smoke events, with even greater impacts to public health.

In sum, changes to both the annual and 24-hour standard are likely to result in significant curtailment of beneficial fire activities, if additional changes are not made. We urge the agency to begin work now to implement such changes before the effects of any new NAAQS are felt.

IV. The EPA's Reliance on the Current Exceptional Events Rule is Misplaced.

The EPA's position appears to be that that limitations on beneficial fire use from a revised $PM_{2.5}$ NAAQS can be adequately addressed under the Exceptional Events Rule.[78] Unfortunately, the existing Exceptional Events Rule has proved incapable of providing a navigable pathway to enable expanded beneficial fire use, even under the current, higher emission standards.[79]

Under the Clean Air Act, emissions caused by "exceptional" events, such as high wind dust events and wildfires, may be excluded from air quality monitoring data.[80] In 2005, Congress authorized the EPA to adopt regulations governing the exclusion of monitoring data influenced by exceptional events, under the principle that it may not be appropriate for the EPA to consider such data when taking regulatory actions such as determining exceedances or violations of NAAQS or an area's attainment status.[81] Pursuant to this statutory authority, the EPA adopted the initial Exceptional Events Rule in 2007.[82] The Exceptional Events Rule established definitions, requirements, and procedures for air agencies (including state, local, and Tribal agencies, and in some cases, federal land managers) to make Exceptional Events demonstrations to request the EPA exclude air quality monitoring data influenced by exceptional events when taking regulatory actions.

The most recent revisions to the Exceptional Events Rule, adopted in 2016, added additional provisions governing the treatment of prescribed fire, with the intent of facilitating Exceptional Events demonstrations for prescribed burns. The 2016 Exceptional Events Rule and EPA guidance documents recognize the importance of prescribed fire for reducing wildfire smoke and protecting the public health, and the need for CAA regulations to provide tools to support, not inhibit, use of prescribed fire.[83] But despite the EPA's recognition of the benefits of prescribed fire

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[78] *See* NPRM, 88 Fed. Reg. 5558, 5570, 5682 (Jan. 27, 2023); EPA, Fact Sheet: Wildland Fire, Air Quality, and Public Health Considerations, https://www.epa.gov/pm-pollution/proposed-decision-reconsideration-national-ambient-air-quality-standards-particulate.

[79] *See* 42 U.S.C. § 7619(b); 40 C.F.R. § 50.14(b)(3).

[80] 42 U.S.C. § 7619(b).

[81] *See id.*

[82] 40 C.F.R. §§ 50.1, 50.14, 51.930.

[83] *See* EPA, *Exceptional Events Guidance: Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations* (2019), at 1, https://www.epa.gov/air-quality-analysis/exceptional-
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and EPA statements that the Exceptional Events Rule is intended to be a tool to support the use of beneficial fire, it has failed to live up to its purpose, and has instead created ongoing barriers to beneficial fire use. The USDA is correct: "The existing form of the [Exceptional Events Rule] remains both an administrative and technical burden to states to fully use this regulatory mechanism . . . ."[84] There are at least two explanations for this result.

A. Air Agencies Lack Incentives to Approve Beneficial Fire Use Because Current Regulations make it Far Easier to Deny Requested Approvals to Burn than to Agree to Preparing an Exceptional Events Demonstration.

Under the 2016 Exceptional Events Rule, air agencies may request that the EPA exclude emissions data when taking regulatory actions by demonstrating that an "exceptional event" caused those emissions. The rule defines an exceptional event as one that 1) "affects air quality," 2) "is not reasonably controllable or preventable," 3) is "caused by human activity that is unlikely to recur at a particular location or a natural event," and 4) "is determined by the Administrator through the process established in the regulations promulgated […] to be an exceptional event."[85] In 2016, the EPA established that prescribed fires could qualify as exceptional events.[86]

During the 2016 Exceptional Events Rule rulemaking process, the EPA acknowledged the importance of prescribed fire, and expressed its intention that the rule would facilitate prescribed burns.[87] But in practice, this rule has failed to live up to its goal, in part because it provides no incentives for air agencies to allow, let alone encourage, beneficial fire use. Instead, the current Exceptional Events Rule creates a perverse incentive, as it is easier for air agencies to deny requested burn permits than it is to agree to prepare a potential Exceptional Events demonstration after the burn has occurred.

The Exceptional Events Rule requires exceedingly expensive and technical submissions by air agencies, as discussed further below. As such, local air regulators simply declare burn bans or deny burn approval requests on days where beneficial fire smoke may lead to NAAQS exceedances, rather than agree to pursue an arduous Exceptional Events demonstration. Indeed, EPA staff have confirmed that in the seven years since its adoption in 2016, no air regulators have ever used the Exceptional Events Rule for prescribed fire because of these barriers.[88] As such,

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events-guidance-prescribed-fire-wildland-may-influence-ozone-and; *see also* NPRM, 88 Fed. Reg. 5558, 5569-70 ("The impacts of wildfire events can be mitigated through management of wildland vegetation, including through prescribed fire. Prescribed fire (and some wildfire) can mimic the natural processes necessary to maintain fire dependent ecosystems, minimizing catastrophic wildfires and the risks they pose to safety, property, and air quality.")

[84] USDA Comments, at 17.

[85] 42 U.S.C. § 7619(b)(1)(A); 40 C.F.R. §§ 50.1, 50.14, 51.930.

[86] 40 C.F.R. § 50.14(b)(3)(i).

[87] Treatment of Data Influenced by Exceptional Events, 81 Fed. Reg. 68216, 68223, 68250-56 (2016).

[88] GAO Wildfire Smoke, at 74.

relying on the existing Rule will not be sufficient to meet the demands of wildfire management in a changing climate.

This failure comes in part through regulatory design. Unlike Exceptional Events demonstrations for catastrophic wildfires, which states have no choice but to prepare in order to address unplanned exceedances, air agencies can and do choose to avoid preparation of Exceptional Events demonstrations for beneficial fire altogether by simply disallowing prescribed burns in the first place. So, while the Exceptional Events Rule may function as a retrospective tool to address emissions that have *already* occurred, it does not function as a prospective tool for air agencies.[89] Instead of facing the burden of preparing a demonstration and the uncertainty of whether the EPA will concur, they often avoid it altogether.[90]

This regulatory flaw is yet another example of the ways the Clean Air Act is pushing us in exactly the wrong direction when it comes to smoke. The Act currently creates a heavy regulatory burden on beneficial fire use, disincentivizing use of one of the only real tools we have to address the wildfire and wildfire smoke crisis. Wildfire smoke, however, is treated under the Exceptional Events Rule as "not reasonably preventable or controllable" and excluded from the monitoring data. The current statutory scheme is selecting for the very worst type of fire when it comes to public health.

B. The Current Requirements for Demonstrating a "Clear Causal Relationship" are Unduly Burdensome.

Among the many requirements air agencies must meet in an Exceptional Events demonstration, the requirements for demonstrating a "clear causal relationship" are among the most onerous. The Exceptional Events Rule requires that air agencies prove a "clear causal relationship […] between the measured exceedances of a [NAAQS] and the exceptional event to demonstrate that the exceptional event caused a specific air pollution concentration at a particular air quality monitoring location."[91]

Establishing a clear causal relationship is no easy feat, and is another reason the Exceptional Events Rule fails to work for beneficial fires. The technical information and analysis required can create months, if not years, of work for air agencies and cost tens of thousands of dollars to prepare.[92] Requiring beneficial fire practitioners to engage in onerous Exceptional

[89] It is not clear that the Exceptional Events Rule even works all that well for wildfires. According to the USDA, only a fraction of the monitoring days affected by wildfire events are submitted by the respective air agencies for exclusion via the Exceptional Events Rule. USDA Comments, at 15 (only 31% of wildfire affected monitoring days from the Western United States submitted for exclusion in 2021).

[90] GAO Wildfire Smoke, at 74.

[91] 42 U.S.C. § 7619(b)(3)(B)(ii); 40 C.F.R. 50.1(j).

[92] A recent Exceptional Events demonstration prepared by the California Air Resources Board ("CARB") for August 2018 wildfire events in San Luis Obispo exemplifies the onerous and time-consuming nature of Exceptional Events demonstrations. The demonstration included data from twenty-nine monitors across three air basins. Emissions analyzed included hour-by-hour data monitoring emissions trajectories over the course of more than a week, accounting for emissions measured at three different altitudes. Data
(footnote continued on next page)

Events demonstrations in response to the new NAAQS would run contrary to current efforts by State and Federal policymakers to reduce barriers to prescribed fire.

EPA guidance documents lay out the extensive evidence air agencies must provide to demonstrate the necessary clear causal relationship. In September 2016, the EPA issued *Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations*, which provided detailed technical descriptions of the requirements for establishing a clear causal relationship.[93] In August 2019, the EPA issued *Exceptional Events Guidance: Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations*,[94] which provided guidance specific to prescribed fire, and incorporated the 2016 Wildfire Ozone Guidance technical requirements.

The 2019 Prescribed Fire Guidance establishes that to support a clear causal relationship finding, air agencies should provide at least four categories of data: comparison of event-related concentrations to historical concentrations, evidence that the fire emissions affected the air quality

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from monitors was analyzed using HYSPLIT model to establish trajectories of particular matter. It took over three years to prepare: though the wildfire event occurred in August 2018, the demonstration was not completed and submitted until September 2021. CARB, *Exceptional Events Demonstration for Ozone Exceedances, Eastern Portion of San Luis Obispo County, California, August 2018 Wildfire Events*, at 53 (2021), https://ww2.arb.ca.gov/our-work/programs/state-and-federal-area-designations/exceptional-events; *see also* Arizona Department of Environmental Quality (DEQ), *Arizona's Natural and Exceptional Events Demonstration Documentation* (2020), https://www.azdeq.gov/node/4604. In another recent Exceptional Event demonstration in California for wildfires in the San Joaquin Valley in August 2020, the air agency provided over 80 pages of evidence and technical analysis. And a July 2016 Exceptional Events demonstration for wildfire smoke near Reno, Nevada, included over 90 pages of analysis, including extensive technical information, as discussed above, and well as media reports. K. M. Smith & J. Skinner-Thompson, *Addressing Pollution from More Frequent, but Still Exceptional, Wildfires*, AMERICAN BAR ASSOCIATION (2022), https://www.americanbar.org/groups/environment_energy_resources/publications/natural_resources_environment/2022-23/fall/addressing-pollution-more-frequent-still-exceptional-wildfires; *see also* GAO Wildfire Smoke, at 39-40 (noting Exceptional Events demonstrations are "extremely time consuming and resource intensive to prepare," sometimes requiring contractor assistance, and also "a significant resource investment from the EPA regional offices"), 74 (calling demonstrations "technically complicated and resource intensive"). Trent Procter, retired Air Quality Program Manager for the Forest Service Pacific Southwest Region observed that the Arizona DEQ submitted 56 Exceptional Events demonstrations from 2011 to 2018, and due to the three-year timeline and a 30% approval rate, they estimate 7,500 hours went into documentation that was not approved. *See* T. Proctor, *Pending comment Re: Review of the National Ambient Air Quality Standards for Particulate* Matter (2023). Similarly, he notes a California air district invested 3,500 staff hours in 2022 preparing Exceptional Events demonstrations for events in 2021. *Id.*

[93] Hereafter "Wildfire Ozone Guidance," https://www.epa.gov/air-quality-analysis/final-guidance-preparation-exceptional-events-demonstrations-wildfire-events.

[94] Hereafter "Prescribed Fire Guidance," https://www.epa.gov/air-quality-analysis/exceptional-events-guidance-prescribed-fire-wildland-may-influence-ozone-and.

monitors in question, evidence the emissions were transported to the monitors, and other additional evidence.[95]

Each of these evidentiary categories require extensive data and analysis. Historical data comparisons require comparison of the "event-related exceedance with historical concentration measures at the affected monitor or at other monitors in the area […] including all other 'high' values in the relevant historical record."[96] These should "ideally" include data "from at least 5 years."[97]

Evidence that emissions affected the monitor "typically include analyses to show changes in spatial or temporal patterns [of $PM_{2.5}$] concentrations or supporting ground level measurements."[98]

Evidence that emissions were transported from the site of the event to the affected monitors "will likely require a trajectory analysis or a satellite plume analysis, […] such as analyses of relevant meteorological conditions (e.g., wind speed and direction at the height of the smoke plume)."[99] To conduct trajectory analyses, EPA Guidance suggests that air agencies use sophisticated "[a]tmospheric trajectory models [that] use meteorological data and mathematical equations to simulate three-dimensional transport."[100] This analysis is often conducted using the HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory) model to show "HYSPLIT trajectories for various combinations of time, locations and plume rise."[101] This requires data from multiple monitoring sites along the trajectory paths of the emissions. In addition, the EPA suggests providing satellite imagery of smoke plumes and evidence the plume impacted the ground.[102]

The EPA evaluates the air agency's demonstrations using a "weight of the evidence" approach, subjecting demonstrations to different levels of scrutiny depending on the circumstances of the event.[103] Prescribed fires may be subject to a heightened level of scrutiny, ironically because they are generally less harmful than other exceptional events such as wildfires.[104] The EPA acknowledges that due to the relatively low impacts of prescribed fires, which "tend to be small-scape and well-defined" and "less likely than a wildfire to be severe or extreme," Exceptional Events determinations for prescribed fires may require more extensive evidence than larger and

[95] Prescribed Fire Guidance, at 7-9.

[96] *Id.* at 8.

[97] Wildfire Ozone Guidance, at 12.

[98] *Id.* at 9.

[99] *Id.* at 9.

[100] Wildfire Ozone Guidance, at 14.

[101] *Id.* at 14.

[102] *Id.* at 14-15.

[103] Prescribed Fire Guidance, at 2.

[104] *See id.* at 7.

more severe wildfires.[105] Additional required analyses may include, for example, more complex statistical modeling. This is yet another way in which the Exceptional Events Rule gets it backwards: the lower impacts of prescribed fires make it harder to prepare a successful demonstration, even though lower-impact prescribed fires reduce the risk of harmful wildfire smoke in the future. We recognize the reason for subjecting high-impact wildfires to more streamlined analysis—the causal relationship between event and exceedance is easier to show—but question the regulatory impact. Yet again, the system favors the type of fire—wildfire—that is most damaging to public health.

So long as the onerous requirements established under the Exceptional Events Rule remain in place, they will serve as a significant barrier to use of prescribed fire, and a perverse incentive to air agencies to prohibit beneficial fire in the first place.

V. The EPA Must Commit to Enabling Expanded Beneficial Fire Use in Order to Protect Public Health and Welfare.

We understand and agree with the pressing need to address the harmful health and welfare impacts associated with fine particulate matter, and to focus particularly on the disparate and cumulative impacts of such pollution on low-income communities and people of color. However, the EPA's current refusal to enable greater beneficial fire use is committing the country to a future of increasing wildfire smoke and associated health impacts, especially in rural communities adjacent to wildfire-susceptible landscapes.[106] This outcome would be contrary to the agency's very mission.

As such, we ask that the EPA, and its partners in the Biden Administration, engage with us to find a workable solution to further protect public health *by enabling state and federal agencies, Tribes, non-governmental organizations, and landowners to continue to meaningfully expand the use of beneficial fire across the United States*. We are not asking that the EPA abandon or delay its reconsideration of the $PM_{2.5}$ NAAQS,[107] and indeed urge the agency go further than currently proposed. However, we ask that EPA develop an action plan with affected communities to develop the regulatory changes necessary to ensure that nascent beneficial fire programs are not hamstrung by the revisions to the NAAQS. Below, we propose three ideas for EPA's consideration, to be implemented through further guidance or rulemaking. We look forward to working cooperatively with all stakeholders to explore and implement these changes in time for their use in implementation of any new $PM_{2.5}$ NAAQS. While any of these options would provide some relief

[105] *See id.*

[106] S. M. D'Evelyn et al., *Wildfire, Smoke Exposure, Human Health, and Environmental Justice Need to be Integrated into Forest Restoration and Management*, 9 CURRENT ENVIRONMENTAL HEALTH REPORTS 3, 366-85 (2022).

[107] We acknowledge that the EPA's scope of work in the current rulemaking is limited to setting NAAQS that are "requisite" to protect public health (42 U.S.C. § 7409), and that the agency is not permitted to look at the costs of implementation, attainability, or technological feasibility at this time. NPRM, 88 Fed. Reg. 5558, 5564. However, the agency can commit to working with affected communities on implementation, a step that the EPA has not yet taken.

from the likely regulatory impact, they are all likely necessary to fully address the new barriers, especially if the EPA reduces the 24-hour $PM_{2.5}$ NAAQS.

In the Notice of Proposed Rulemaking ("NPRM"), the EPA states that it is not planning to engage in further rulemaking related to implementation of any new $PM_{2.5}$ NAAQS.[108] We believe that these statements are premature, and show a fundamental lack of understanding about the potential adverse impacts of the proposed rule on beneficial fire use. As such, we urge the EPA to consider three possible changes related to implementation of any new $PM_{2.5}$ NAAQS.

A. Ensure that State Implementation Plans Account for Increased Beneficial Fire Use.

If the EPA reduces the $PM_{2.5}$ NAAQS as intended in the NPRM (i.e., by reducing the annual standard to 9 or 10 $\mu g/m^3$), a number of counties will fall into nonattainment status or more severe nonattainment status, necessitating the preparation of new State Implementation Plans (SIPs).[109] This result will be particularly pronounced in California, but analyses based on more recent data suggest that additional places throughout the United States will be affected as well.[110]

As a result, many air agencies in geographies with fire-dependent ecosystems will be tasked with developing new strategies for reducing the total $PM_{2.5}$ pollution burden facing communities over the course of a year. Development of such strategies necessarily involves making tradeoffs between the multiple sources of $PM_{2.5}$ pollution. If existing limitations are kept in place for certain sources, more stringent limitations will need to be imposed on other sources to ensure the total burden can be reduced below the NAAQS. We are concerned that beneficial fire use will not be given sufficient "budget" when these new SIPs are developed, despite the known need to increase the use of this tool beyond current levels.

To ensure that beneficial fire programs can continue to expand in pace and scale, the EPA should issue a revised implementation rule that ensures future SIPs will enable such programs.[111] The revised rule should address three issues in particular. First, air agencies should be required to undertake an analysis, in conjunction with land management agencies, Tribes, and beneficial fire practitioners, about the amount and location of beneficial fire programs necessary to mitigate wildfire risk. This analysis should include an assessment of the fire return interval departures; the location of homes, infrastructure, and other high-value assets; and feasibility of implementation of both beneficial fire and/or fire surrogates.[112] This information should then inform the amount of beneficial fire smoke permitted in the SIP. When considering emission reductions necessary to reach attainment, the EPA should require air agencies to look first to other anthropogenic sources, such as tailpipes, industrial facilities, and energy generation. Given the importance of beneficial

[108] NPRM, 88 Fed. Reg. 5558, 5563, 5680.

[109] RIA, at Figure ES-2.

[110] USDA Comments, at 13.

[111] *See also* GAO Wildfire Smoke, at 40.

[112] S. Elbein, *Top Wildfire Expert Prescribes Controlled Burns as Preventative Care*, THE HILL (2021), https://thehill.com/policy/equilibrium-sustainability/561178-top-wildfire-expert-prescribes-controlled-burns-as/.

fire programs to addressing wildfire smoke—one of the primary sources of $PM_{2.5}$ pollution—the EPA should review SIPs to ensure that air agencies are prioritizing implementation of beneficial fire programs.

Second, air agencies should be required to develop strategies to facilitate necessary permitting for beneficial fire programs that fall within the allocated emission budgets. Air agencies should be given leeway to design these programs, but the EPA should offer guidance and oversight to ensure that air agencies develop permitting programs that enable greater beneficial fire use, and do not curtail beneficial fire use based on nuisance complaints or political pressure. Likewise, air agencies should be required to explain how they will offer sufficient technical and administrative support to beneficial fire practitioners to enable use of Exceptional Events demonstrations, especially for beneficial fire use that happens to exceed the developed budget. To the extent the EPA can provide additional technical assistance and capacity to complete this task, it should do so as well.

Finally, while beneficial fire programs must be prioritized, it does not mean that their potential health and welfare impacts are nonexistent. We recognize that smoke exposure adversely affects human health, even when the fires are carefully planned and controlled. Therefore, the SIPs must also demonstrate that air agencies are taking all reasonable steps to mitigate risks and potential impacts, including through strong public communication and engagement strategies; provision of air filters, clean air spaces, and masks; and adequate healthcare resources, especially for sensitive receptors and those who are likely to experience disproportionate, cumulative risks and impacts.

We recognize that the potential impact of the revised annual NAAQS on beneficial fire programs is largely dependent on how air agencies plan a path towards attainment. However, because beneficial fire programs play such a critical role in addressing the wildfire smoke crisis, the EPA should ensure that newly developed SIPs appropriately prioritize beneficial fire use while demonstrating a path toward attainment of the new standards.[113]

B. Reduce the Administrative and Technical Burden for Exceptional Events Demonstrations.

As noted above, the EPA took important action in 2016 to ensure that the Exceptional Events Rule can be used for beneficial fire use. In general, many of the requirements developed by the EPA—including demonstrating compliance with smoke management guidelines or basic smoke management practices and providing plans or other evidence regarding ecological need for the planned fire[114]—can be met by air agencies and practitioners without significant burden. However, the EPA's interpretation of the amount of data required to demonstrate that a "clear

[113] The EPA recently stated that "neither the Clean Air Act nor its implementation regulations require that air agencies include wildfire risk mitigation provisions in their State Implementation Plans." GAO Wildfire Smoke, at 42, 48. However, given the importance of beneficial fire programs to reducing wildfire emissions and resulting public health impacts, the implementing regulations could and should be modified to ensure that state implementation plans demonstrate how states will achieve implementation of such programs.

[114] 40 C.F.R. § 50.14(b)(3)(ii)-(iii).

causal relationship" exists between the measured exceedance and the exceptional event has rendered the Exceptional Events Rule largely ineffective for beneficial fire, as described above.

As such, the EPA should reexamine the Exceptional Events Rule specifically with respect to beneficial fire use. While we recognize that the Clean Air Act itself requires demonstration of a clear causal connection, it does *not* establish the amount or type of data required to make that demonstration.[115] The EPA has discretion to reduce the administrative and technical burden created by the 2016 Exceptional Events Rule. It should do this in three ways.

First, the EPA should work with air agencies and beneficial fire practitioners to establish some basic models that could be used to determine how much smoke to exclude from ambient air quality compliance assessments when beneficial fire is used. Ideally, regulators should develop a model with basic inputs (such as acres burned, forest type, percent fuel consumption, prevailing wind, distance from monitor, etc.), which could be completed by beneficial fire practitioners and/or air agencies with relatively minimal investments. Maximum total cost and time to complete benchmarks should be established to ensure that Exceptional Events demonstrations are not so onerous as to prevent their use. If used, these models should create a presumption in favor of finding a clear, causal connection, which can only be rebutted by specific, substantial evidence.

Second, the EPA should work with air agencies and beneficial fire practitioners to establish mechanisms to allow Exceptional Events demonstrations for entire beneficial fire programs. The 2016 Exceptional Events Rule allows air agencies to combine multiple events in one demonstration,[116] though the Rule lacks clarity on when and how this can be accomplished. The Agency should take advantage of efficiencies of scale—for both the submitter and the EPA—by allowing beneficial fire practitioners to complete one regional or program-based demonstration rather than several.

Third, the EPA should take advantage of speciated particulate monitoring. Such technology can provide valuable information about the composition, and ultimately the sources, of $PM_{2.5}$ pollution.[117] The EPA should evaluate how such speciation data—particularly speciation data that shows biomass or wood as the primary component of elevated readings during beneficial fire events—could be used to quickly and reliably demonstrate the necessary "clear causal" relationship between a beneficial fire and an exceedance. The EPA should likewise evaluate the need for additional or more specific $PM_{2.5}$ speciation monitoring to support its use for beneficial fire Exceptional Events demonstrations, and implement such monitoring accordingly.

The USDA also identified another issue that warrants reconsideration.[118] The Exceptional Events Rule currently does not permit an Exceptional Events demonstrations to be made for events that result in monitoring days that fall above the annual standard but below the 24-hour standard

[115] 42 U.S.C. § 7619(b)(3)(B)(ii).

[116] Treatment of Data Influenced by Exceptional Events, 81 Fed. Reg. 68216, 68260-62 (2016).

[117] California Air Resources Board, *Annual Report on the California Air Resources Board's Fine Particulate Matter Monitoring Program* (February 2019), https://ww2.arb.ca.gov/sites/default/files/2019-02/pm25-monitoring-2019.pdf.

[118] USDA Comments, at 13-14.

(i.e., currently between 12 to 35 $\mu g/m^3$ of $PM_{2.5}$). Thus, wildfire or prescribed fires with *moderate* impacts on air quality are taken into account when determining annual exceedances or attainment status, while fires that cause greater emissions are more easily excluded, disfavoring beneficial fire use while doing nothing to actually curtail larger and more harmful wildfires. The EPA should address this issue in subsequent guidance or rulemaking.

C. Recognize Cultural Burning as Part of Natural Background Conditions.

Tribes and Indigenous people have engaged in cultural burning since time immemorial. Vegetation and ecosystems evolved in response to these practices into the fire-dependent places we know today. Smoke from these practices is properly considered part of natural, background, or baseline conditions – they are part of the environment that existed before passage of the Clean Air Act or creation of the United States.

As such, the EPA should recognize that smoke from cultural burning is exempt from the Clean Air Act, and that states cannot exert regulatory control over cultural burning to ensure their Clean Air Act compliance. Support for this recognition comes from at least four places. First, the Clean Air Act recognizes that there may be circumstances where federal facilities should be exempt from Clean Air Act compliance for actions in the "paramount interest" of the United States.[119] Given the paramount importance of cultural burning as a matter both of cultural and environmental justice and of ecological necessary, this exemption should likewise apply.

Second, some air agencies have already recognized that cultural burning is "natural" in analogous contexts. The Fire Emissions Joint Forum of the Western Regional Air Partnership, in its 2005 Guidance for Categorizing Natural v. Anthropogenic Fire Emissions under the Regional Haze Rule, recognizes that "fire established by [a] tribal government for a traditional, religious, or ceremonial purpose" is a "natural" source, not to be regulated for Regional Haze Rule compliance.[120] While we recognize that the Regional Haze Rule has a different regulatory structure than the NAAQS, the Western Regional Air Partnership's classification of cultural burning as "natural" is appropriate and just.

Third, the EPA has recognized that the cultural importance of an activity may warrant differential treatment under the Clean Air Act. In the Exceptional Events Rule, fireworks displays may be excluded from monitoring data if the "use of fireworks is significantly integral to traditional national, ethnic, or other cultural events including, but not limited to, July Fourth celebrations . . . ."[121] In these contexts, the EPA allows fireworks to be excluded from monitoring data under the Exceptional Events Rule, even if fireworks do not meet the other statutory

[119] 42 U.S.C. § 7418(b).

[120] Natural vs Anthropogenic Task Team of the Fire Emissions Joint Forum, *Guidance for Categorizing Natural vs Anthropogenic Fire Emissions* (2005), https://www.wrapair.org/forums/fejf/documents/nbtt/WRAPFEJFNAGuidance.pdf.

[121] 40 C.F.R. § 50.14(b)(2).

definitions. The EPA should rely on similar reasoning to exempt smoke from cultural burning from the Clean Air Act.[122]

Finally, the NPRM states that the proposed rule "does not have Tribal implications, as specified in Executive Order 13175 [adopted November 6, 2000]. It does not have a substantial direct effect on one or more Indian Tribes as tribes are not obligated to adopt or implement any NAAQS."[123] This statement is only true if the proposed reductions in the NAAQS do not result in states attempting to regulate or curtail cultural burning. The EPA therefore should clarify that states cannot exert regulatory control over cultural burning to ensure their Clean Air Act compliance.

VI. Conclusion

The enactment of the modern Clean Air Act in 1970 is roughly coincident to the height of fire exclusion policies in the United States.[124] It is no surprise that the Clean Air Act fails to consider the important ecological role of fire in many ecosystems, and therefore treats related smoke as something that is "exceptional" and unlikely to reoccur. The original drafters of the Clean Air Act did not anticipate the wildfire crisis or the reality that healthy, resilient ecosystems across the country necessarily produce some smokey skies.

One of the most difficult aspects of the treatment of beneficial fire under the Clean Air Act is the failure of the existing law to fully differentiate between particulate matter that is the byproduct of natural processes and particulate matter that is the byproduct of human activities. The Clean Air Act works by establishing *ambient* air quality standards – it generally does not matter if the source of the pollution is a factory or a healthy forest or grassland. Both result in violations or exceedances.

The Exceptional Events provision was developed based on an assumption that *sometimes* forestlands burn and cause exceedances that no one expected and for which no one planned. But we now know two additional important factors. First, wildland fires are not an "exceptional" event. Indeed, in many healthy, resilient forests they are the rule, not the exception. Fire is as necessary to a functioning ecosystem as rain or sunlight.[125] Second, the severity of fire—from both ecosystem functionality and community health perspectives—can be modulated by active and effective management, including the use of prescribed fire and cultural burns. Taken together, these two realities mean that our skies will be smokier than they used to be, including when the

[122] To the extent Exceptional Events demonstrations are needed to modify monitoring data as a result of cultural burning, the burden of preparing such demonstrations should not fall on the Tribes or cultural fire practitioners.

[123] 88 Fed. Reg. 5558, 5688.

[124] *See* E. Williams, *Reimagining Exceptional Events: Regulating Wildfires Through the Clean Air Act* 6 WASH. L. REV. 2, 765 (2021).

[125] *See* Section I, *supra*.

Clean Air Act was enacted and the Exceptional Events Rule written. We no longer have control over whether we will experience smoke, only when and at what level of impact.[126]

The EPA knows that wildfire smoke is one of our greatest challenges with respect to fine particulate matter. While acknowledging this fact, the EPA proposes to move forward with a proposed rule that does nothing to address wildfire smoke, instead advancing a regulatory scheme that increases barriers to one of our few tools to reduce wildfire-generated smoke. This situation arises in part because the Clean Air Act fails to give the EPA the tools it needs to fully protect public health. Fully integrating beneficial fire smoke into the Clean Air Act would recognize that smoke has significant public health impacts, that it is the byproduct of living in fire-dependent ecosystems, and that we have the tools at our disposal to reduce smoke pollution, by enabling beneficial fire use and mitigating its impacts.

We would welcome the opportunity for further dialogue on these important issues. Please contact Sara Clark (clark@smwlaw.com or 415-552-7272) to discuss. Thank you for your consideration.

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[126] P. F. Hessburg et al., *Climate, Environment, and Disturbance History Govern Resilience of Western North American Forests*, 7 FRONTIERS IN ECOLOGY & EVOLUTION, 239 (2019); K. E. Merriam et al., *Reestablishing Natural Fire Regimes to Restore Forest Structure in California's Red Fir Forests: The Importance of Regional Context*, 503 FOREST ECOLOGY & MANAGEMENT, 119797 (2022); *see also* Letter from Forest Service Chief Randy Moore, GAO Wildfire Smoke, at 81 ("There will not be a smokeless future, whether through high severity wildfire or use of prescribed fire.")

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