Testimony of Nancy Vehr, Administrator
Wyoming Department of Environmental Quality,
Air Quality Division
before the
United States House of Representatives,
Committee on Energy and Commerce,
Sub-Committee on Environment

H.R. 806, Ozone Standards Implementation Act of 2017

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2123 Rayburn House Office Building

Good morning Chairman Shimkus, Ranking Member Tonko, and members of the Subcommittee. My name is Nancy Vehr. I am the Air Quality Division Administrator for the Wyoming Department of Environmental Quality and am responsible for implementing the Clean Air Act and the Air Quality requirements of Wyoming's Environmental Quality Act. I thank the subcommittee for inviting the State to share its perspective on the Ozone standard. My testimony addresses five points with respect to the standard:

1) Background Ozone

2) International Transport

3) Exceptional Events

4) Permitting and Implementation Guidance

5) Interstate Transport

Introduction

In order to assist the committee with an understanding of Wyoming's perspective, I would like to share a few of the relevant key characteristics of our state.

Size: Wyoming is the 9th largest state covering 97,814 square miles, yet has the smallest population of any state at about 584,000. To put this into perspective, with respect to land mass, Wyoming is roughly 93 times the size of Rhode Island. However, Wyoming's low population

density of about six (6) people per square mile ranks at 49th in the nation. The size of Wyoming's largest county – Sweetwater County - at 10,425 square miles, ranks as the eighth largest county in the nation and by itself is roughly four times as large as the entire state of Delaware (2,489 square miles). Much of the state consists of many rural communities with large expanses in between. Wyoming has only nine "cities" with populations greater than 10,000 people. Half of Wyoming's land is owned and managed by the federal government.

Elevation: Wyoming's mean elevation of 6,700 feet above sea level places us at 2nd in height, with Colorado being the highest. Consequently, most of Wyoming's ozone monitors are sited at an elevation 1000 feet higher than the "mile high" city of Denver, Colorado. In comparison, the mean elevation of east coast states fall under 1,100 feet.

Natural Resources: Wyoming has been blessed with amazing and abundant natural resources. We are home to Yellowstone and Grand Teton national parks, and other special and scenic places. Our abundant mineral resources provide the nation, our State, and her citizens with revenue and jobs. Our leading industries are energy, tourism, and agriculture. The energy industry is the largest contributor to Wyoming's economy. In 2016, Wyoming ranked 8th in the nation for crude oil production, 4th for natural gas, and leads the nation in the production of coal, bentonite, and trona. Aggregating the production and export of all fossil-based minerals, Wyoming is the number one producer of energy to the nation. In terms of renewable energy, Wyoming also ranks at the top by having the most class 5-7 categories for wind energy resources in the continental United States.

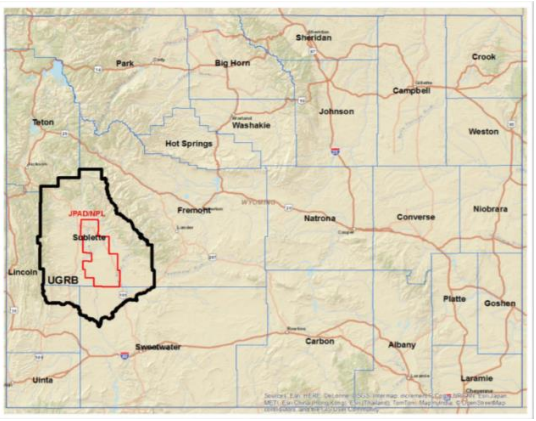
Wyoming values the protection of its natural resources. The mission of the Wyoming Department of Environmental Quality is: "To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations." As the Department

and Air Quality Division carry out this mission, we do so in a balanced manner – protecting our natural resources and providing for responsible energy production. As our governor, Matt Mead has stated, "It is a false question to ask: Do we want energy production or environmental stewardship?" In Wyoming, we must and do have both.

Ozone in Wyoming

Ozone is a complex air pollutant that exists naturally at high elevations in the stratosphere or can be formed at ground level by both natural and man-made sources through complex chemical reactions. EPA's study and knowledge of Ozone has focused extensively on urban areas with high population densities and high ozone levels, and mostly for summertime issues. These focus areas mainly have fairly flat terrain, and low elevations. EPA's knowledge base and understanding is far different from Wyoming's characteristics and experience.

Wyoming's characteristics as an expansive, high-elevation, sparsely populated rural state differs greatly from EPA's traditional focus. As a result, we face unique challenges in implementing the EPA's Ozone Standards in Wyoming. Wyoming's experience with ozone is also unique in other ways. Wyoming has experienced elevated ozone concentrations in the winter and early spring in its Upper Green River Basin. In the summer, Wyoming has experienced elevated ozone related to wildfires.

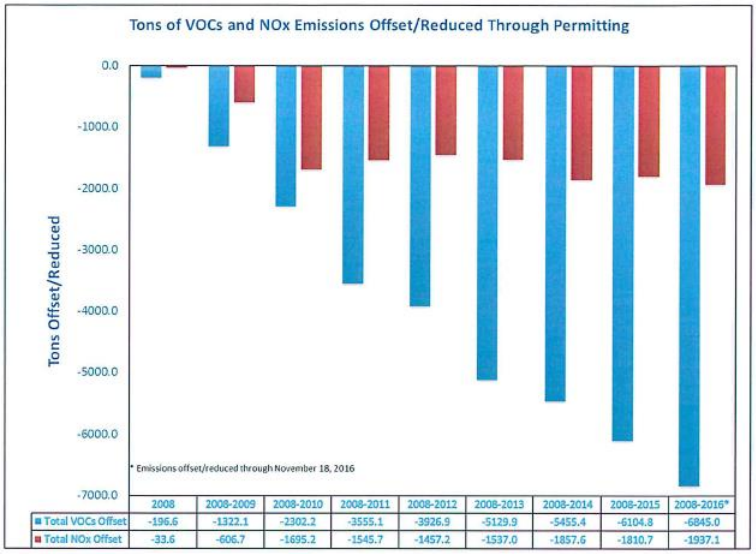


State of Wyoming
Upper Green River Basin, 2008 Ozone Non-attainment Area

In the winters of 2005 and 2006, primarily in the month of February, Wyoming measured 8-hour ozone concentrations greater than 84 ppb (parts per billion), the ozone standard at that time, at monitoring stations in the Upper Green River Basin. The population in the Upper Green River Basin is approximately 10,000. It is surrounded by mountain ranges on three sides. It is also an area with abundant oil and gas production. Given the unusual nature of those ozone events and the potential implications of concentrations that exceeded the standard, the Department proactively focused its resources towards understanding the formation of ozone in a rural high-elevation area in the winter. Since 2005, the Division has spent over $10 million and allocated over 25% of its staff to developing solutions. Less than 10% of Wyoming's funding to investigate and address this issue came from federal grants. This disparate allocation of funding sources, creates a burden on state resources, complicating the state's ability to achieve health based standards.

Wyoming's efforts have helped build a foundation for understanding how ozone is formed in the winter. Winter stagnant air mass (inversions) and enhanced solar radiation from snow cover can lead to high ozone formation in the presence of ozone precursors (volatile organic compounds and nitrogen oxides). However, the processes involved have not been fully identified or replicated in the photochemical grid models used by EPA. No currently available modeling system has proven to be effective in replicating high ozone events in the Upper Green River Basin. Wyoming's experience highlights why a one-size-fits-all approach to Ozone is not defensible. One-size-fits-all does not fit Wyoming. Alternative analytical tools and methods are critical for areas with unique characteristics or phenomena like those that we have experienced in Wyoming.

While Wyoming's early efforts led to greater understanding and a reduction in emissions, it was not enough. In 2012, Wyoming recommended that a small portion of the state known as the Upper Green River Basin be designated as not attaining the 2008 Ozone Standard of 75 ppb. EPA concurred. Since 2008, the Upper Green River Basin has achieved significant reductions of ozone precursors through the installation of controls and the centralization of gathering facilities. Wyoming's achievements reflect the significant participation and work undertaken by state and local governments, industry, citizens and the Upper Green River Task Force.



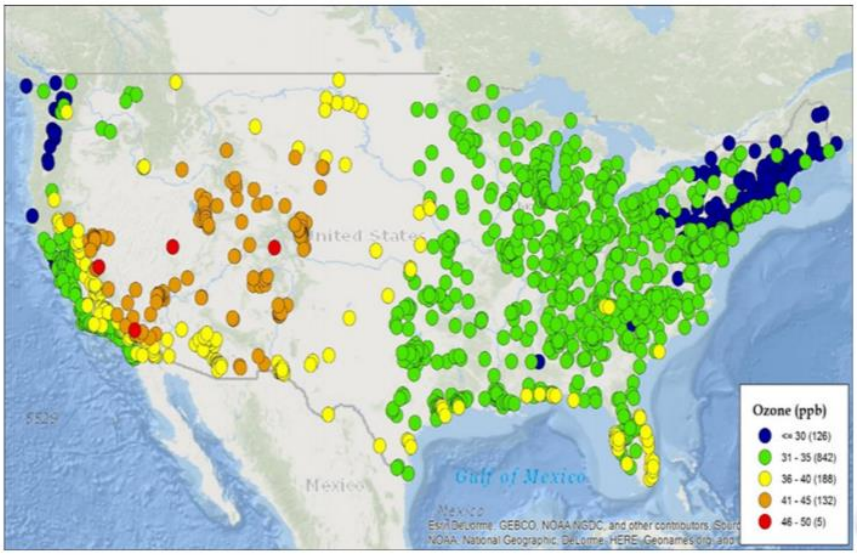
NOx and VOC Offsets/Reductions Achieved through Permitting Actions Since 2008
Upper Green River Basin

Despite the absence of federal regulatory tools to address Wyoming's situation, Wyoming's continued efforts were successful. In May 2016, the EPA declared that the Upper Green River Basin had attained the 2008 Ozone Standard. 81 Fed. Reg. 26,697. And, in October 2016, Governor Mead recommended to EPA that all counties within Wyoming be designated as attainment or unclassifiable for the even lower 2015 Ozone Standard of 70 ppb.

Background Ozone

Background Ozone in the Western United States is not well understood. When EPA proposed the Ozone Standard that was ultimately adopted in 2015, it largely dismissed the data

from the sole high-elevation site in the Denver urban area case study as an outlier, even though EPA recognized that "background concentrations are highest at high-elevation sites within the U.S." *See* State of Wyoming, Department of Environmental Quality – Air Quality Division Comments on the Proposed National Ambient Air Quality Standards for Ozone, Docket No. EPA-HQ-OAR-2008-0699 (March 17, 2015). The Denver urban area case study showed that background concentrations of ozone comprised 55-66% of the total monitored concentrations. EPA's analysis showed that the fractional contribution of background to total seasonal mean ozone is between 70-80% in Wyoming. By omitting that study, EPA failed to adequately consider or characterize background ozone conditions in higher elevations such as Wyoming. Without a better understanding of background and what the anthropogenic contribution is, it is difficult and ineffectual for rural intermountain western states to develop plans that control contributing sources. Background ozone is a reality in the mountain west and likely offsets some of the emission reductions achieved in the West. Continued research is needed in this area in order to have a better understanding of the impact of background ozone.



This map shows estimates of seasonal mean U.S. background ozone concentrations at surface monitoring locations from a 2007 CMAQ simulation. (Figure 1 in the White Paper)

Historically, ozone planning and strategies have been focused on solving urban ozone exceedances. Wyoming stresses the need for states and EPA to work collaboratively to understand the issues related to background ozone. In the meantime, however, states should not be held accountable for background ozone levels that cannot be properly characterized.

International Transport

By lowering the ozone standard without having a full understanding of the extent and magnitude of influence that internationally transported ozone and precursors has on areas in the Western US, placed an unreasonable burden on states that face impact from international pollution. International contribution also affects regions of the United States that do not directly border other countries.

Recent scientific evidence suggests that the trans-Pacific transport of Asian pollution has contributed to heightening ozone levels in the Western United States. For example, a February 2015 presentation by Meiyun Lin, entitled "Key Drivers of Western U.S. Surface Ozone Variability over Recent Decades: Stratospheric Intrusions, Asian Pollution and Climate," summarized a series of studies assessing Western U.S. surface ozone variability from 1990-2012 that were collaboratively undertaken by Princeton University and the NOAA Geophysical Fluid Dynamics Laboratory. These studies demonstrated that "Asian ozone pollution can contribute 8-15 ppbv on days when observed daily max 8-hour average (MDA8) ozone at Western U.S. surface sites exceeds 65 ppb – a possible future ozone NAAQS" (Lin, February 19, 2015).

Another 2012 study, published in the *Journal of Geophysical Research,* acknowledged that "from 1995 to 2011, free tropospheric ozone above Western North America has increased significantly by 6.5 ppbv, and from 1984 to 2011 ozone increased by 14 ppbv." (Cooper et al, Long term ozone trends at rural ozone monitoring sites across the United States, 1990-2010,

November 28, 2012). The results of the study indicate that, while domestic emission reductions have resulted in corresponding ozone level reduction in the east, "the limited ozone reductions in the western U.S. suggest that increasing baseline ozone [i.e. background ozone] is counteracting domestic emission reductions. *Id.* Newer studies show that western states may have significant precursor emissions from as far away as Asia.[1]

It would be beneficial to states for EPA to conduct and review research in the area of long-range international transport and then translate those findings into the regulatory framework.

Tools that assist states with attainment of the standards should be made broadly applicable. For example, a border requirement for impacts of international pollution would not assist intermountain western states. Likewise, imposing costly controls before consideration of international transport may not make any difference if the underlying cause is pollution caused by international transport.

Exceptional Events

There are several natural sources of ozone and ozone precursors including wildfire and stratospheric intrusion. The states and EPA rely on the Exceptional Event Rule to account for these sources. The extent to which these events contribute to a measured ozone concentration on a specific day can be uncertain and requires a detailed investigation and analysis. Exceptional event demonstrations are resource intensive and costly, and place a significant burden on already strained state resources, especially when EPA unilaterally decides not to review and acknowledge exceptional event submittals by the state.

[1] Meiyun Lin, Larry W. Horowitz, Richard Payton, Arlene M. Fiore, Gail Tonnesen, "US Surface Ozone Trends and Extremes from 1980-2014: Quantifying the Roles of Rising Asian Emissions, Domestic Controls, Wildfires, and Climate," *Atmospheric Chemistry and Physics*, December 7, 2016. doi:10.5194/acp-2016-1093, 2016. Under Review.

EPA recognizes that stratospheric ozone intrusions "typically affect ozone concentrations in higher elevation areas more than area at lower elevations. Wyoming is the only state in the nation that has received EPA's concurrence for a stratospheric ozone intrusion event. In fact, Wyoming's Air Quality Division has submitted five demonstrations to EPA for stratospheric ozone intrusion causing exceedances of the Ozone standard, but EPA has acted on only one of those demonstrations. *See* https://www.epa.gov/air-quality-analysis/exceptional-events-documents-ozone-wyoming. Wyoming's demonstration took just under a year to produce; required assistance from staff with meteorological expertise, assistance from EPA's stratospheric ozone intrusion workgroup, a group of state regulators, federal regulators, and academics focused on stratospheric ozone intrusions.

Wyoming has not attempted an exceptional event demonstration that a wildfire event caused an ozone exceedance. However, Wyoming is familiar with the demonstrations that EPA has posted as examples. The Division estimates that it would take about 15 months and contractor assistance at a cost of over $150,000 to produce just one of those demonstrations. Resource and funding challenges to provide demonstrations of this complexity are simply impractical.

For exceptional events to provide relief under the Act, the investigation and analysis process must be streamlined, workable technical tools must be provided, and EPA must allocate resources to act on state submittals. Between 2011 and 2014, Wyoming submitted 46 exceptional event demonstrations to EPA showing that air quality standards had been affected by high winds, wildfires, and stratospheric intrusions. However, EPA ultimately elected not to act on Wyoming's demonstrations because EPA did not anticipate that the data would "be included in an attainment demonstration or involved in other regulatory decisions. *See* Letter from EPA

R8 to Wyoming DEQ re: Wyoming Department of Environmental Quality Exceptional Events Documentation Packages; 2011-2014 (April 23, 2016).

EPA's inaction is problematic. Not only does it signal the EPA's general disregard for the State's expenditure of significant time and resources, an exceedance is considered to violate the standard unless and until EPA approves an exceptional event demonstration. Not only are these values used to demonstrate compliance with the Ozone standard, the data is also included in conjunction with emission inventories and modeling that EPA uses to establish policy and develop federal regulations. When EPA disregards and fails to act on a state's demonstration, the result is inflated monitored data that misrepresents the prevailing air quality conditions included in modeling, unnecessary delays to permit actions, and inaccurate characterization of air quality to the public. Shelving these demonstrations does not align with our collective commitment to providing outstanding responsiveness on environmental policy issues.

For example, the data that EPA shelved on Wyoming's exceptional event demonstrations from the summer of 2012 is attributable to an extraordinarily active wildfire season in Wyoming or transported into Wyoming from wildfires elsewhere in the West. EPA's failure to act means that those exceedances represent violations of the air quality standards – both from a regulatory standpoint and in the eyes of the public – even though those events were beyond regulatory control. Shelving these demonstrations is unfair, unsound, and counterproductive. Ultimately, EPA's consideration of inflated monitored data results in a misrepresentation of existing state regulations and shifts state resources from addressing areas of concern to situations that are actually not problematic. In order for this mechanism to provide meaningful relief, EPA must streamline the demonstration process, provide workable technical tools, and act on state submittals.

Permitting and Timely Implementation Guidance

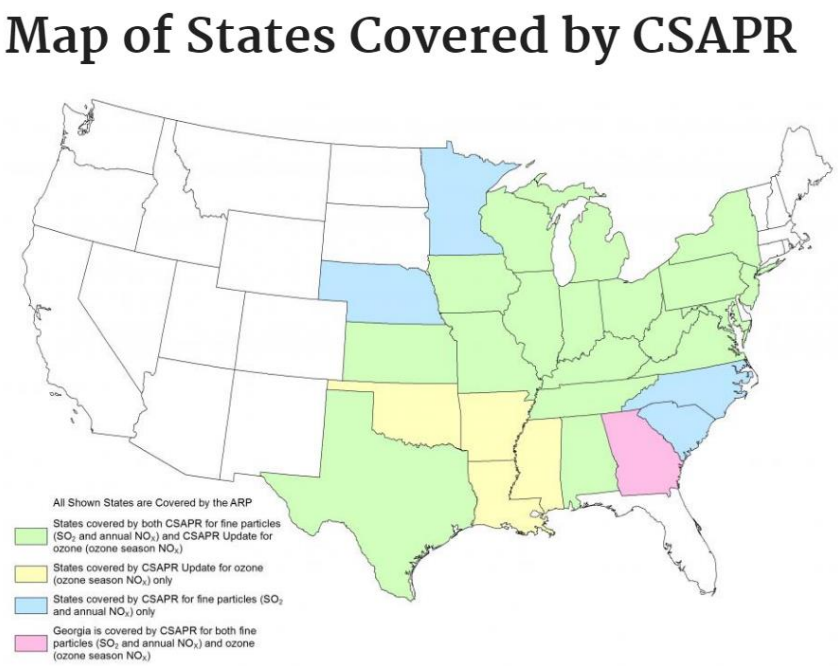
New standards may result in new or additional permit requirements, and in the development of new plans with new strategies. Grandfathering provisions that apply to pending complete permit applications and clear and timely Implementation Guidance are key to ensuring a smoother transition, providing certainty, and leading to more timely and effective implementation of new standards. A smooth, clear and certain transition benefits the public health and the environment by allowing for a clearer path forward for timely implementation of new standards. Such transition measures prevent uncertainty and retroactive application of criteria that was not in existence at the time of submittal of permits or plans. Uncertainty and retroactive application oftentimes result in delayed implementation brought on by confusion and litigation. Unclear and untimely guidance leads to varied interpretations and confusion, which ultimately lead to plan disapprovals, disputes between federal and state partners and delayed implementation of new standards.

For example, in 2015, EPA promulgated the Implementation Plan Requirements Rule for the 2008 Ozone standard of 75 ppb. That Rule, issued seven years after the standard was adopted, provided states with the requirements necessary to address a range of nonattainment plan requirements for 2008 standard. However, just a few months later, EPA adopted a new 2015 Ozone standard of 70 ppb. 80 Fed. Reg. 65292 (Oct. 26, 2015). This unfortunate timing meant that in 2015 and 2016, instead of focusing state efforts on how to implement and enforce the new 2015 standard, states were finally able to begin figuring out how to implement the 2008 standard. Untimely guidance sets up states for unsuccessful and delayed implementation of newer standards, invites litigation, and leads to disputes over missed deadlines instead of focusing on the health of our citizens and the environment.

Timely and specific guidance – not one-size fits all – is critical to successful implementation of new standards. Wyoming is a high-elevation rural area. Historically, EPA guidance is aimed at high-population, low elevation urban areas and has limited use for an intermountain western rural area. Timely and specific guidance promotes the states and EPA's shared goal of successful implementation of health based standards.

Interstate Ozone Transport

Interstate transport provisions, also referred to as "Good Neighbor" provisions, require that state plans contain adequate provisions to ensure that none of its sources or emissions will contribute significantly to nonattainment or interfere with maintenance of a national standard in a downwind state. The EPA has long used a weight-of-the-evidence approach in order to evaluate western state plans. However, with respect to Wyoming's plan, EPA's approach radically changed after EPA's promulgation of its Update to the Cross State Air Pollution Rule in 2016.



EPA Clean Air Markets' Map of States Covered by Cross-State Air Pollution Rule

The Cross State Air Pollution Rule addresses pollution in eastern states. It does not apply to western states such as Wyoming.[2] In order to develop the Rule, the EPA used air quality modeling to project ozone concentrations at air quality monitoring receptor sites to 2017. 81 Fed. Reg. at 74507. The EPA then used that modeling to establish a screening threshold metric of 1% to assess contributions from upwind states to those downwind sites. *Id.* at 74508.

Wyoming submitted its Plan in 2014. EPA failed to act. The Sierra Club filed a deadline suit against EPA. In February 2017, the EPA disapproved Wyoming's interstate transport provisions relating to the 2008 Ozone standard. 82 Fed. Reg. 9142 (Feb. 3, 2017). The EPA based its disapproval in part on the modeling it conducted for the Cross State Air Pollution Rule.

Tools such as modeling are complex and must be developed to a level that assures accuracy for their intended application. Inaccurate models may result in the needless expenditure of time and resources on developing solutions for the wrong problem or on a non-existent issue. Such an approach is detrimental to public health and welfare.

My earlier testimony highlights some of Wyoming's unique characteristics that must be factored into the development and application of any model related to a health based standard, such as high elevation, unique topography and meteorological conditions, projections across long distances, influences from wildfire, rural population, and the like. Earlier and meaningful engagement with western states is critical. Failure to do so, and instead apply a one-size-fits-all approach, may otherwise adversely affect Wyoming and the health of her citizens. Inaccuracy results in the needless and wasteful expenditure of time and resources that would be better

[2] Under the Cross State Air Pollution Rule Update, the western U.S. "consists of the 11 western contiguous states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. 81 Fed. Reg. 74503, 74523 at FN 87 (Oct. 26, 2016).

directed towards implementation of appropriate solutions for the benefit of the public health of Wyoming's citizens.

Conclusion

Implementation of streamlined and technically sound measures assures that time and resources are spent towards timely air quality improvements that provide public health benefits. Thank you. It has been a privilege to testify before you today. I am happy to answer any questions.