



March 2, 2021

Jane Nishida
Acting EPA Administrator
Mailcode 1101A
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Re: Petition to Designate Permian Basin of Southeast New Mexico a Nonattainment Area Due to Ongoing Violations of Ozone Health Standards; Petition to Find New Mexico's State Implementation Plan is Failing to Attain and Maintain Ambient Air Quality Standards

Dear Acting EPA Administrator Nishida:

Enclosed, please find a petition from WildEarth Guardians requesting the U.S. Environmental Protection Agency (EPA) designate the Permian Basin of southeast New Mexico, including Chaves, Eddy, Lea, and Roosevelt Counties, a nonattainment area due to ongoing and severe violations of health standards for ground-level ozone. We also request the EPA assess whether neighboring counties in Texas should be included in any nonattainment area.

As part of this petition, WildEarth Guardians also requests the EPA find that New Mexico's federally approved State Implementation Plan is failing to attain and maintain national ambient air quality standards under the Clean Air Act.

Exhibits to this petition can be downloaded from this online folder, https://drive.google.com/drive/folders/1zBrT-smNLTDGiJ_42bV810QJKPL_qvb8?usp=sharing.

This petition comes as ground-level ozone, the key ingredient of smog, is on the rise in the Permian Basin. This situation poses serious threats to public health, safety, the environment, and environmental justice. In the last five years, ozone concentrations have steadily increased as industrial activity tied to the region's oil and gas extraction boom has exploded. Ozone forming emissions, namely volatile organic compounds and nitrogen oxides, have reached unprecedented highs. The region is now violating health-based national ambient air quality standards for ground-level ozone. This pollution is disproportionately impacting people of color and low income communities.

In light of this mounting air pollution crisis, we call on the EPA to provide relief.

The need to undertake the petitioned actions is critical. Ozone is a significant threat to public health and welfare. The poisonous gas forms when two key pollutants—nitrogen oxides and volatile organic compounds—react with sunlight. Releases from smokestacks, tailpipes, and oil and gas extraction, these ozone forming emissions are considered to be primary ozone “precursors.” Although up high, ozone gas protects the Earth’s atmosphere, at ground-level, it is dangerous to human health and welfare. The current ambient air quality standards limit ozone concentrations in the ambient air to no more than 0.070 parts per million over an eight-hour period. See 40 C.F.R. § 50.19. At high levels, ozone is lethal. However, even at very small concentrations, ozone can cause myriad adverse health impacts, including:

- Increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Inflammation of airways;
- Asthma attacks; and
- Premature death.

See U.S. EPA, “Health effects of ozone pollution,” website available at <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution>. According to the EPA, people with lung disease, children, older adults, and even active adults are likely to be more sensitive to the impacts of ozone. EPA has noted that “Children are at greater risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure.”

What’s more, ozone pollution disproportionately impacts people of color and low income communities, who are more likely to live in proximity to large sources of air pollution, lack sufficient access to health care and information, and be exposed to environmental contamination at school and work.

As indicated by air quality data, ozone is a serious problem in the Permian Basin. Over the years, ozone concentrations have skyrocketed, reaching levels on par with large cities due to unchecked nitrogen oxide and volatile organic compound emissions. This rise in emissions and ozone is linked to booming oil and gas extraction. As oil and gas extraction has increased, emissions have reached new and unprecedented highs. Although the Permian Basin of southeast New Mexico may not have the population size of a big city, the health of its people is just as important.

Making the problem worse, the New Mexico Environment Department has taken the position that the State Implementation Plan prohibits the agency from denying permits for new

sources of air pollution that contribute to the region's ozone problem. Although the New Mexico State Implementation Plan prohibits the Department from approving permits that cause or contribute to violations of ambient air quality standards, the Department takes the position that this provision does not apply with regards to ozone. With the Permian Basin violating the ozone NAAQS, the State Implementation Plan is clearly failing to attain the ozone ambient air quality standards.

With the region's ozone problem persisting, the EPA must take swift action to declare the Permian Basin of southeast New Mexico a nonattainment area in order to spur greater control of air pollution in the region. We also urge the EPA to review whether neighboring counties in Texas should also be included in the nonattainment area, particularly counties that have significant oil and gas development.

Undertaking the requested actions will ensure that ozone pollution is reduced, affording greater protection to the people, particularly children, and disproportionately impacted communities, in these areas. Undertaking the requested actions will ensure that the problem is resolved, rather than continuing unabated.

Thank you for your attention to this significant matter of health, environment, and justice.

Sincerely,



Jeremy Nichols
Climate and Energy Program Director
WildEarth Guardians

Cc: Michelle Lujan Grisham, Governor of the State of New Mexico
David Gray, Acting Regional Administrator, EPA Region 6
James Kenney, Secretary, New Mexico Environment Department

In the Matter of:	)	
	)	
Designation of the New Mexico Permian Basin	)	Rulemaking petition under
Ozone Nonattainment Area and Call for the	)	the Administrative Procedure
Revision of New Mexico State Implementation	)	5 U.S.C. § 551, <i>et seq.</i> , and the Clean
Plan Over its Failure to Attain and Maintain the	)	Air Act, 42 U.S.C. § 7401, <i>et seq.</i>
National Ambient Air Quality Standards for	)	
Ground-level Ozone	)	March 2, 2021
	)	

(1) DESIGNATE THE PERMIAN BASIN OF SOUTHEASTERN NEW MEXICO AS NONATTAINMENT FOR THE OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS; AND

Ozone levels in the Permian Basin of southeast New Mexico are currently violating the National Ambient Air Quality Standards (“NAAQS”) and have been violating now for several years. Driven by unprecedented levels of oil and gas extraction in Chaves, Eddy, Lea, and Roosevelt Counties, ground-level ozone pollution, the key ingredient of smog, has increased to unhealthy levels in the Permian Basin. This dangerous pollution has been fueled by the oil and gas industry flooding the air with emissions of volatile organic compounds (“VOCs”) and nitrogen oxides (“NOx”), which react with sunlight to form ozone. It has also been fueled by the New Mexico Environment Department’s (“NMED’s”) refusal to limit this surge in emissions.

¹ Exhibits to this petition can be downloaded here, https://drive.google.com/drive/folders/1zBrT-smNLTDGiJ_42bV810QJKPL_qyb8?usp=sharing.

linked to difficulty breathing and shortness of breath, coughing and sore or scratchy throat, inflammation and damage of airways, aggravated lung diseases, severe asthma attacks, and even premature death. Children, seniors, and active adults are most vulnerable. Studies have also found that people of color and low income communities are most susceptible to ozone given that they are more likely to live near large sources of air pollution, have inconsistent access to health care and information, and generally face greater exposure to environmental contamination in the home, at work, and in schools.

To protect public health and welfare, the U.S. Environmental Protection Agency (“EPA”) has established NAAQS for ozone limiting 8-hour concentrations to no more than 0.070 parts per million (“ppm”). All ozone monitors in southeast New Mexico, including two in Eddy County and one in Lea County, show the region is violating this NAAQS.

Given this serious health and environmental justice matter, WildEarth Guardians petitions the Administrator of the EPA under the Administrative Procedure Act (“APA”), 5 U.S.C. § 551, *et seq.*, the Clean Air Act, 42 U.S.C. § 7401, *et seq.*, and EPA’s regulations implementing the Clean Air Act, to urgently designate four counties that comprise the New Mexico portion of the Permian Basin of southeast New Mexico—Chaves, Eddy, Lea, and Roosevelt—as nonattainment for ozone pursuant to Section 107(d)(3) of the Clean Air Act, 42 U.S.C. § 7407(d)(3).²

Furthermore, WildEarth Guardians also urgently petitions for the EPA to call for the revision of the New Mexico State Implementation Plan (“SIP”) pursuant to Section 110(k)(5) of

² We also request the EPA assess whether it is necessary to include all or portions of neighboring Texas counties in any nonattainment area given their likely contribution to high ozone in southeast New Mexico. These counties similarly contain large amounts of oil and gas extraction activity and are no doubt responsible for producing air pollution that contributes to ozone violations in southeast New Mexico. These counties include, but are not limited to, Andrews, Borden, Cochran, Crane, Culberson, Dawson, Ector, Edwards, Gaines, Garza, Glasscock, Hale, Hockley, Howard, Irion, Lamb, Loving, Lubbock, Lynn, Martin, Midland, Pecos, Reagan, Reeves, Schleicher, Scurry, Sterling, Sutton, Terrell, Terry, Tom Green, Upton, Val Verde, Ward, Winkler, and Yoakum.

the Clean Air Act. 42 U.S.C. § 7410(k)(5). Section 110(k)(5) requires the Administrator to direct a state to revise its SIP if it is “substantially inadequate” to attain or maintain the NAAQS. *Id.* New Mexico acknowledges that available air quality data in southeast New Mexico shows air pollution levels in violation of the NAAQS. Given this, the New Mexico’s SIP is substantially inadequate to attain, let alone maintain, the ozone NAAQS, and must be revised.

I. Petitioner

WildEarth Guardians is a Santa Fe, New Mexico-based conservation organization dedicated to protecting and restoring the wildlife, wild rivers, wild places, and health of the American West. WildEarth Guardians’ Climate and Energy Program aims to safeguard the western United States from the impacts of climate change, and to advance solutions to confront the climate crisis. On behalf of its members, supporters, and allies, Guardians works to advance policies and actions that help the American West transition away from dependence upon fossil fuel consumption and production, which is not only fueling global climate change, but causing serious air and water pollution problems, despoiling lands, and harming fish and wildlife. Guardians seeks to protect health and the climate by promoting cleaner energy, efficiency and conservation, and alternatives to fossil fuels.

The name and address to whom correspondence regarding this petition should be directed is as follows:

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II. Legal Background

A. The National Ambient Air Quality Standards

Under the Clean Air Act, the Administrator identifies criteria air pollutants that may reasonably be anticipated to endanger public health and welfare. *See* 42 U.S.C. § 7408(a)(1). Once criteria air pollutants are identified, the EPA is required to promulgate NAAQS for such pollutants. *See* 42 U.S.C. § 7409(a). The EPA is obligated to establish primary NAAQS for a criteria pollutant at a level “requisite to protect the public health.” *Id.* at § (b)(1). The EPA is also obligated to establish secondary NAAQS for a criteria pollutant at a level “requisite to protect the public welfare[.]” *Id.* at § (b)(2).

Once a NAAQS is promulgated, the EPA must initially identify areas that meet or do not meet the NAAQS within two years. *See* 42 U.S.C. § 7407(d). Any area not meeting the NAAQS is considered to be in nonattainment. *Id.* at § (d)(1)(A)(i). Furthermore, any area that contributes to ambient air quality in a nearby area that does not meet the NAAQS is also considered to be in nonattainment. *Id.*

If air quality data indicates an attainment area is not meeting the NAAQS, the EPA has the responsibility to redesignate the area to nonattainment. *See* 42 U.S.C. § 7407(d)(3). To do so, the EPA must first notify the Governor of a state that available information indicates the designation of the area must be revised from attainment to nonattainment. *Id.* at § 7407(d)(3)(A).³ Such a notification triggers a 120-day deadline by which the Governor must submit a redesignation to the EPA. *Id.* at § 7407(d)(3)(B). Whether or not the Governor responds, the EPA must promulgate a redesignation within 240 days. *Id.* at § 7407(d)(3)(C).

³ Moreover, the governor may, on her own motion, request the EPA redesignate an area to nonattainment. 42 U.S.C. § 7407(d)(3)(D).

B. The 2015 Ozone NAAQS

In 1971, the EPA identified ground-level ozone as a criteria air pollutant and promulgated ozone NAAQS accordingly. *See* 36 Fed. Reg. 8,186 (Apr. 30, 1971). The EPA revised the current primary and secondary ozone NAAQS in 1997, adopting an 8-hour standard and phasing out the original 1-hour standard, and setting the threshold at 0.08 ppm. *See* 62 Fed. Reg. 38,856 (July 18, 1997). In 2008, the EPA strengthened the 1997 8-hour standard to 0.075 ppm. 73 Fed. Reg. 16436 (March 27, 2008). Responding to mounting scientific data showing a need for stronger NAAQS, in 2015 the EPA again strengthened the primary and secondary NAAQS for ozone to an 8-hour standard of no more than 0.070 ppm. 80 Fed. Reg. 65,292 (Oct. 26, 2015).

A region violates the NAAQS for ozone whenever the three-year average of the annual fourth-highest daily maximum 8-hour average concentration is greater than 0.070 ppm. *See* 40 C.F.R. § 50.19(b). The EPA refers to this three-year average as a “design value.” 40 C.F.R. § 51.1100e.

The EPA uses ozone monitors to measure compliance. Ozone monitors measure ground-level ozone in the air using scientific methods specified under 40 C.F.R. § 50.10, Appendix D. The ozone monitors measure ambient concentrations on an hourly basis to calculate the 24 separate 8-hour averages for each day. 40 C.F.R. § 50, Appendix P, at 2.1.

The Clean Air Act directs the EPA to classify redesignated ozone nonattainment areas based on the severity of the violation of the NAAQS. 42 U.S.C. § 7511(b)(1). For air quality control regions in nonattainment status with minimal severity, the Clean Air Act requires the EPA to treat these areas as “marginal.” 42 U.S.C. § 7511(a)(1); *see also* 40 C.F.R. 51.1303 (describing nonattainment classifications for 2015 Ozone NAAQS). Once the EPA designates and classifies an ozone nonattainment area, states must bring the area into attainment by a date

certain. 42 U.S.C. § 7511(a)(1); 40 C.F.R. § 51.1303. For example, an area whose 8-hour design value fell between 0.071 and 0.081 ppm for ground-level ozone would have three years to return to compliance. 40 C.F.R. § 51.1303.

Finally, where the EPA has redesignated a region to nonattainment for ozone, states must submit State Implementation Plan (“SIP”) revisions corresponding to the severity of nonattainment. 42 U.S.C. § 7511a. For example, for “marginal” nonattainment areas (i.e., areas with design values between 0.071 and 0.081 ppm for the 2015 ground-level ozone NAAQS), the SIP revisions must contain evidence of corrective measures taken with respect to control technology, vehicle inspections and emissions, enhanced permitting requirements for stationary sources, and periodic inventories. *Id.* § 5711a(a).

C. EPA must call for a revision of a SIP if it is substantially inadequate

Under the Clean Air Act, a state must prepare and submit a SIP to the EPA in order to attain and maintain the primary and secondary NAAQS, including the ozone NAAQS. 42 U.S.C. § 7410(a). The SIP is a living document that the state and the EPA can and must revise as necessary. The Clean Air Act authorizes the EPA to call for SIP revisions when a SIP is substantially inadequate to attain or maintain the NAAQS. 42 U.S.C. § 7410(k)(5). Indeed, the EPA must “require the State to revise the SIP as necessary to correct such inadequacies.” *Id.*

D. EPA has legal authority to act on a citizen rulemaking petition

Guardians petitions the EPA pursuant to the APA’s rule-making provisions. *See* 5 U.S.C. § 553 (“Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.”). Guardians’ request is that the EPA ultimately amend 40 C.F.R. § 81.332 to identify Chaves, Eddy, Lea, and Roosevelt Counties as nonattainment for the 2015 8-hour ozone NAAQS. Further, Guardians also requests that the EPA also issue a call for

New Mexico to revise its SIP. Upon promulgating a call for New Mexico to revise its SIP, EPA will review and ultimately adopt a SIP revision, which will have the effect of revising 40 C.F.R. § 51.1620, *et seq.*

Under the APA, the Administrator has a nondiscretionary duty to “conclude a matter presented to it” in “a reasonable time.” 5 U.S.C. § 555(b). A reasonable time is “is typically counted in weeks or months, not years.” *In re Am. Rivers & Idaho Rivers United*, 372 F.3d 413, 419 (D.C. Cir. 2004).

E. Environmental Justice

Environmental justice is a part of EPA’s mission. Exec. Order No. 12,898, 59 Fed. Reg. 7,629 (Feb. 16, 1994). In furtherance of this mission, President Biden directed his Administration, including the EPA, to:

[L]isten to the science; to improve public health and protect our environment; to ensure access to clean air and water; to limit exposure to dangerous chemicals and pesticides; to hold polluters accountable, including those who disproportionately harm communities of color and low-income communities; to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change; to restore and expand our national treasures and monuments; and to prioritize both environmental justice and the creation of the well-paying union jobs necessary to deliver on these goals.

Exec. Order No. 13,990, 86 Fed. Reg. 7,037 (Jan. 25, 2021). President Biden also emphasized

Agencies shall make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.

Exec. Order No. 14,008, 86 Fed. Reg. 7,619 (Feb. 1, 2021).

Taken together, the EPA has a duty to ensure its actions improve public health and the environment, ensure access to clean air, and achieve environmental justice. In the context of

ground-level ozone pollution, this means the agency must take action to address violations of the ozone NAAQS and ensure attainment and maintenance.

III. Justification for Designating the Permian Basin of New Mexico as Nonattainment for Ozone

We request the EPA designate the Permian Basin of southeast New Mexico as nonattainment for the 2015 ozone NAAQS, a region defined by its extensive oil and gas development. This region includes Chaves, Eddy, Lea, and Roosevelt Counties, which we refer to as the Permian Basin Counties. Within this region, there are ozone monitors in Eddy and Lea Counties that are currently in violation of the 2015 ozone NAAQS. Although there are no ozone monitors in Chaves or Roosevelt Counties, all indications are that air pollution from oil and gas development in these counties contributes to violations of the ozone NAAQS in Eddy and Lea Counties, meaning they should be included in the designation of any nonattainment area.



Location of Chaves, Eddy, Lea, and Roosevelt Counties, the Permian Basin Counties, in New Mexico.



Location of ozone monitors (red place-markers) in the Permian Basin of southeast New Mexico. Data from EPA.

Based on EPA design value data available online and monitor value data from the EPA's AirData website, the three primary monitors in the Permian Basin are all currently in violation of the NAAQS.⁴

Fourth Max. and Design Value Data for Eddy and Lea County Ozone Monitors.

County	Monitor ID	2017 4 th Highest	2018 4 th Highest	2019 th Highest	2017–2019 Design Value
Eddy (Carlsbad)	350151005	0.076 ppm	0.083 ppm	0.080 ppm	0.079 ppm
Eddy (Carlsbad Caverns)	350150010	0.065 ppm	0.080 ppm	0.074 ppm	0.073 ppm
Lea (Hobbs)	350250008	0.069 ppm	0.076 ppm	0.070 ppm	0.072 ppm

This elevated ozone pollution is not anomalous. The tables below show that ozone levels in Eddy and Lea Counties have steadily worsened over the last several years, with 19 exceedances of the NAAQS reported in Carlsbad in 2019 and 8-hour ozone levels as high as

⁴ Design value data is available at <https://www.epa.gov/air-trends/air-quality-design-values> (last accessed Feb. 28, 2021). Monitoring value data is available at <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report> (last accessed Feb. 24, 2021).

0.095 ppm recorded.⁵ The design values at monitors in both Lea and Eddy Counties have steadily risen and now three monitors are in violation of the ozone NAAQS. As will be explained further, this worsening of ozone pollution coincides with increases in oil and gas extraction in the region, including the development of new and modified production and processing facilities.

Carlsbad, NM 8-Hour Ozone Readings (in ppm), 2015-2019

	2015	2016	2017	2018	2019
1 st Max.	0.069	0.065	0.082	0.096	0.095
2 nd Max.	0.068	0.064	0.078	0.095	0.092
3 rd Max.	0.067	0.064	0.077	0.091	0.084
4 th Max.	0.067	0.063	0.076	0.083	0.080
Number of Days Above NAAQS	0	0	10	18	19

Carlsbad Caverns National Park 8-Hour Ozone Readings, 2015-2019

	2015	2016	2017	2018	2019
1 st Max.	0.068	0.070	0.069	0.099	0.082
2 nd Max.	0.068	0.069	0.065	0.081	0.080
3 rd Max.	0.065	0.069	0.065	0.080	0.078
4 th Max.	0.065	0.069	0.065	0.080	0.074
Number of Days Above NAAQS	0	0	0	10	6

Hobbs, NM 8-Hour Ozone Readings (in ppm), 2015-2019

	2015	2016	2017	2018	2019
1 st Max.	0.070	0.069	0.080	0.083	0.082
2 nd Max.	0.069	0.066	0.074	0.078	0.075
3 rd Max.	0.069	0.065	0.072	0.077	0.073
4 th Max.	0.067	0.065	0.069	0.076	0.070
Number of Days Above NAAQS	0	0	3	6	3

The region's ozone problem persists to this day. According to monitoring value data from the EPA, 14 exceedances of the 2015 ozone NAAQS were reported in 2020, including nine at the Carlsbad Caverns National Park monitor and five at the Carlsbad monitor. The Carlsbad

⁵ Ozone monitoring data from the U.S. Environmental Protection Agency's AirData website, <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report> (last accessed Feb. 28, 2021).

monitor reported a fourth maximum of 0.073 ppm, placing the monitor’s design value at 0.078 ppm, in violation of both the 2008 and 2015 ozone NAAQS. The table below presents ozone exceedance data for the Carlsbad monitor for 2020.

Carlsbad, NM 8-Hour High Ozone Readings (in ppm) in 2020⁶

	Date	8-hour Ozone Concentration
1 st Max.	June 24	0.075
2 nd Max.	August 21	0.075
3 rd Max.	September 3	0.075
4 th Max.	August 19	0.073
5 th Max.	September 23	0.071

Given ongoing violations of the ozone NAAQS, the EPA must redesignate the Permian Basin, including Chaves, Eddy, Lea, and Roosevelt Counties to nonattainment for the 2015 8-hour ozone NAAQS. Based on quantitative monitoring data, the region is an area “that does not meet . . . the national primary or secondary ambient air quality standard for the pollutant.” 42 U.S.C. § 7407(d)(1)(A)(i). The EPA must take action accordingly.

The need for action is underscored by the fact that ground-level ozone poses significant risks to humans and to ecosystems. Ozone creates and exacerbates complications for persons with asthma and other existing respiratory ailments. It causes chronic restrictive pulmonary disease and can even lead to death.⁷ Ozone exposure is linked to low-birth weights and lung dysfunction in newborns.⁸ To illustrate, the American Lung Association (“ALA”) created the chart below to explain how dangerous ozone pollution in Eddy County affects its most vulnerable populations. The ALA gives Eddy County an “F” for its more than 10 annual days of

⁶ Ozone concentration data for 2020 obtained from EPA’s AirData website at <https://www.epa.gov/outdoor-air-quality-data/download-daily-data> (last accessed Feb. 28, 2021).

⁷ Exhibit 1, *Health Effects of Ground-Level Ozone Pollution*, ENVTL. PROT. AGENCY, <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution> (last accessed Feb. 18, 2021).

⁸ *Ozone*, AM. LUNG ASSN., <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/ozone> (last updated Apr. 20, 2020).

unhealthy ozone between 2016 and 2018 and identifies thousands at risk, including those with existing respiratory conditions, children, seniors, the impoverished, and people of color, due to unhealthy levels of air pollution.⁹

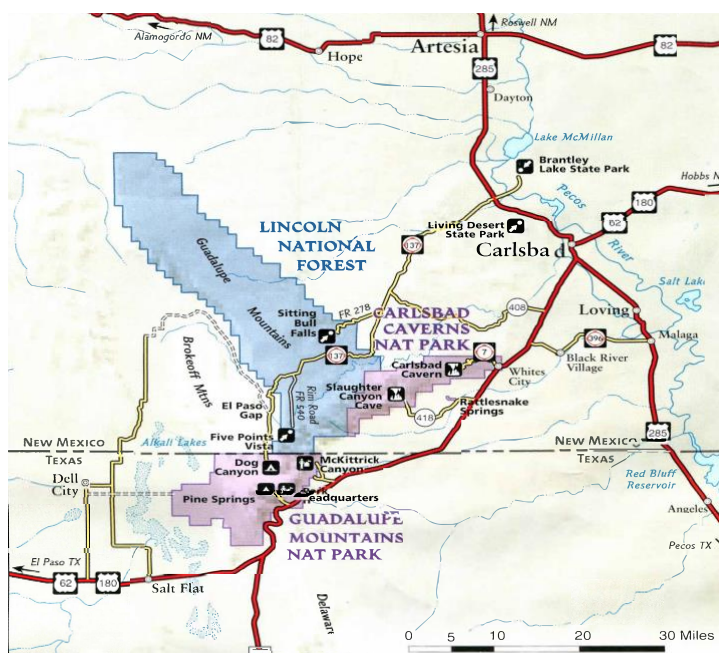
Groups At Risk		
Total Population:	57,900	Risks to the population
Pediatric Asthma:	1,154	Risks to people with Asthma
Adult Asthma:	4,180	Risks to people with Asthma
COPD:	2,558	Risks to people with COPD
Lung Cancer:	21	Risks to people with lung cancer
Cardiovascular Disease:	3,314	Risks to people with Cardiovascular Disease
Ever Smoker:	17,140	Risk to people who were Ever Smokers
Children Under 18:	15,344	Risks to children and teens
Adults 65 & Over:	8,406	Risks to older adults
Poverty Estimate:	8,981	Risks to people with low incomes
Non White:	31,228	Risks to people who are Not White

Eddy County Ozone-Specific Epidemiological Data

In addition to its insidious human health effects, ground-level ozone disrupts photosynthesis in a variety of plant species. Of particular concern in the region are the sensitive alpine Ponderosa pine (*Pinus ponderosa*) biotic communities in the surrounding “desert island” mountain ranges.¹⁰

⁹ Exhibit 2, *State of the Air: Eddy County*, AM. LUNG ASSN., <http://www.stateoftheair.org/city-rankings/states/new-mexico/eddy.html> (last accessed Feb. 28, 2021).

¹⁰ Exhibit 3, *Ecosystem Effects of Ground-Level Ozone*, ENVTL. PROT. AGENCY, <https://www.epa.gov/ground-level-ozone-pollution/ecosystem-effects-ozone-pollution> (last accessed Feb. 28, 2021); *Ozone Effects on Plants*, NAT. PARK SERV., <https://www.nps.gov/subjects/air/nature-ozone.htm> (last accessed Feb. 28, 2021).



Map of Carlsbad area, including Carlsbad Caverns and Guadalupe Mountains National Parks

These important pine communities exist within two national parks in the immediate area, both of which are famed for their sensitive and rare ecosystems—Carlsbad Caverns National Park¹¹ and Guadalupe Mountains National Park.¹² Ground-level ozone negatively impacts the viability of plant and tree species such as the Ponderosa pine by reducing the size of stomata in the leaves or needles—the microscopic boundaries where trees and plants exchange gases with the atmosphere. As the stomata close the trees experience diminished capacity to assimilate carbon.¹³ Thus, carbon dioxide levels increase which results in higher carbon dioxide

¹¹ *Vascular Plants of Carlsbad Caverns National Park*, NAT. PARK SERV., <https://www.nps.gov/cave/learn/nature/plants.htm> (last updated Dec. 17, 2017).

¹² Carlsbad Cavern National Park and Guadalupe Mountains National Park are classified as Class I air pursuant to the Clean Air Act's 1990 Amendments. See NPS Class I areas, NAT. PARK SERV., <https://www.nps.gov/subjects/air/npsclass1.htm> (last updated Mar. 13, 2018).

¹³ Exhibit 4, Silvano Fares et al., *Tropospheric Ozone Reduces Carbon Assimilation in Trees: Estimates from Analysis of Continuous Flux Measurements*, 19 GLOBAL CHANGE BIOLOGY 2427 (2013) (reporting 12–19% reduction in carbon assimilation in Ponderosa pine at ground-level ozone concentrations of between 60 and 100 ppb).

concentrations in the atmosphere. In the long run, ground-level ozone damages the needles of the Ponderosa pine, inhibiting growth, and potentially inducing a cascade of biotic shifts in the area.

Coupled with documented violations of the ozone NAAQS, the serious health and environmental consequences should compel the EPA to act. It is imperative the agency designate the Permian Basin as nonattainment to ensure a full and effective cleanup of the region's ozone and full protection of public health and the environment.

B. Ozone is a serious environmental justice problem

High ozone in the Permian Basin of New Mexico also poses serious environmental justice concerns.

It is well established that low income and minority communities tend to experience disproportionately higher levels of air pollution.¹⁴ With regards to ozone, reports have found a high association between racial isolation and elevated pollution levels, particularly in the rural and suburban western United States.¹⁵ While ozone may disproportionately impact people of color and low income communities, other forms of air pollution also pose disproportionately impacts, heightening the dangers that ozone poses to health and welfare.

Many studies have looked at differences in the impact of air pollution on premature death. Recent studies have looked at the mortality in the Medicaid population and found that those who live in predominately black or African American communities suffered greater risk of premature death from particle pollution than those who live in communities that are

¹⁴ Exhibit 5, Miranda, M.L., S.E. Edwards, M.H. Keating, and C.J. Paul, "Making the environmental justice grade: the relative burden of air pollution exposure in the United States," *Int. J. Environ. Res. Public Health*, 2011 June; 8(6): 1755-1771.

¹⁵ Exhibit 6, Bravo, M.A., R. Anthopolos, M.L. Bell, M.L. Miranda, "Racial isolation and exposure to airborne particulate matter and ozone in understudied US populations: environmental justice applications of downscaled numerical model output," *Env. Int.*, 2016, 92-93: 247-255.

predominately white.¹⁶ Another large study found that Hispanics and Asians, but especially blacks, had a higher risk of premature death from particle pollution than whites did. This study found that income did not drive the differences. Higher-income blacks who had higher income than many whites still faced greater risk than those whites, suggesting that the impact of other factors such as chronic stress as a result of discrimination may be playing a role.¹⁷ Other researchers have found greater risk for African Americans from hazardous air pollutants, including those pollutants that also come from traffic sources.¹⁸ Due to decades of residential segregation, African Americans tend to live where there is greater exposure to air pollution.¹⁹

Socioeconomic position also appears tied to greater harm from air pollution. Multiple large studies show evidence of that link. Low socioeconomic status consistently increased the risk of premature death from fine particle pollution among 13.2 million Medicare recipients studied in the largest examination of particle pollution-related mortality nationwide.²⁰ In a 2008 study that found greater risk for premature death for communities with higher African American populations, researchers also found greater risk for people living in areas with higher unemployment.²¹ A 2008 study of Washington, DC, found that while poor air quality and worsened asthma went hand in hand in areas where Medicaid enrollment was high, the areas with the highest Medicaid enrollment did not always have the strongest association of high air

¹⁶ Kioumourtzoglou M.A., Schwartz J., James P., Dominici F., Zanobetti A. "PM2.5 and mortality in 207 us cities: Modification by temperature and city characteristics." *Epidemiology*, 2016; 27: 221-227.

¹⁷ Di, Q., Y. Wang, A. Zanobetti, Y. Wang, P. Koutrakis, C. Choirat, F. Dominici, J.D. Schwartz, "Air pollution and mortality in the Medicare population," *N. Engl. J. Med.*, 2017; 376: 2513-2522.

¹⁸ Appelberg B.J., T.J. Buckley, R.H. White, "Socioeconomic and racial disparities in cancer risk from air toxics in Maryland," *Environ. Health Perspect.* 2005; 113: 693-699.

¹⁹ Nardone A., J.A. Casey, R. Morello-Frosch, M. Mujahid, J.R. Balmes, N. Thakur, "Associations between historical residential redlining and current age-adjusted rates of emergency department visits due to asthma across eight cities in California: an ecological study," *Lancet Planet Health*. 2020;4(1):e24-e31.

²⁰ Zeger S.L., F. Dominici, A. McDermott, J. Samet, "Mortality in the Medicare population and chronic exposure to fine particulate air pollution in urban centers (2000-2005)," *Environ. Health Perspect.* 2008; 116: 1614-1619.

²¹ Bell M.L., F. Dominici, "Effect modification by community characteristics on the short-term effects of ozone exposure and mortality in 98 US communities," *Am. J. Epidemiol.* 2008; 167: 986-997

pollution and asthma attacks.²² A 2016 study of New Jersey residents found that the risk of dying early from long-term exposure to particle pollution was higher in communities with larger African American populations, lower home values and lower median income.²³ Studies of Atlanta, GA, found that particle pollution increased the risk of asthma attacks for zip codes where poverty was high and among people eligible for Medicaid.²⁴

Scientists have speculated that there are three broad reasons why disparities may exist. First, groups may face greater exposure to pollution because of factors ranging from racism to class bias to housing market dynamics and land costs. For example, pollution sources tend to be located near disadvantaged communities, increasing exposure to harmful pollutants. Second, low social position may make some groups more susceptible to health threats because of factors related to their disadvantage. Lack of access to health care, grocery stores and good jobs; poorer job opportunities; dirtier workplaces; and higher traffic exposure are among the factors that could handicap groups and increase the risk of harm. Finally, existing health conditions, behaviors or traits may predispose some groups to greater risk. For example, people of color are among the groups most at risk from air pollutants, and the elderly, African Americans, Latinos and people living near a central city have higher incidence of diabetes.

People of color also may be more likely to live in counties with higher levels of pollution. Non-Hispanic blacks and Hispanics were more likely to live in counties that had worse problems

²² Babin S., H. Burkom, R. Holtry, N. Tabernero, J. Davies-Cole, L. Stokes, K. Dehaan, D. Lee, “Medicaid patient asthma-related acute care visits and their associations with ozone and particulates in Washington, DC, from 1994-2005,” *Int. J. Environ. Health Res.* 2008; 18 (3): 209-221.

²³ Wang Y., I. Kloog, B.A. Coul, A. Kosheleva, A. Zanobetti, J.D. Schwartz, “Estimating causal effects of long-term PM2.5 exposure on mortality in New Jersey,” *Environ. Health Perspect.* 2016; 124: 1182-1188.

²⁴ O’Lenick, C.R., *et al.*, “Assessment of neighbourhood-level socioeconomic status as a modifier of air pollution-asthma associations among children in Atlanta,” *J. Epi. Comm. Health.* 2017;71(2):129-136; Strickland M.J., *et al.* “Modification of the effect of ambient air pollution on pediatric asthma emergency visits: susceptible subpopulations,” *Epidemiology.* 2014; 25: 843-850.

with particle pollution, researchers found in a 2011 analysis. Non-Hispanic blacks were also more likely to live in counties with worse ozone pollution. Income groups, by contrast, differed little in these exposures. However, since few rural counties have monitors, the primarily older, non-Hispanic white residents of those counties lack information about the air quality in their communities.²⁵

Like most anywhere else in the United States, the Permian Basin Counties of New Mexico face significant environmental justice risks from air pollution. According to the U.S. Census Bureau, within this region, there are Black people and communities, Hispanic and Latino people and communities, Indigenous people and communities, and a substantial number of people living in poverty. Given the region's high ozone pollution, there is every reason to conclude that these people and communities are experiencing disproportionate impacts, further warranting action by the EPA to designate the region as nonattainment for the 2015 ozone NAAQS.

Racial and Demographic data for the Permian Basin Counties in New Mexico.
Data from the U.S. Census Bureau.²⁶

Racial and Economic Demographic	Chaves	Eddy	Lea	Roosevelt
Black or African American	2.4%	2.0%	4.3%	2.9%
American Indian	2.4%	2.4%	2.0%	2.3%
Hispanic or Latino	57.8%	50.5%	60.1%	43.2%
Persons in poverty	18.1%	11.2%	18.2%	18.8%

C. High ozone is being fueled by a surge oil and gas extraction activity in the Permian Basin

The need to designate the Permian Basin as nonattainment is underscored by a surge in oil and gas extraction in the region, and the resulting release of ozone precursor emissions, particularly VOCs and NOx.

²⁵ *Supra* note 13.

²⁶ Data queried from the U.S. Census Bureau's "Quick Facts" website, available at <https://www.census.gov/quickfacts/fact/table/US/PST045219> (last accessed Feb. 28, 2021).

The Permian Basin of New Mexico, including Chaves, Eddy, Lea, and Roosevelt Counties, has experienced explosive growth in oil and gas production in recent years.²⁷ U.S. Energy Information Agency (“EIA”) data indicate that in December 2015, New Mexico produced 20,801 MMcf of natural gas from shale gas deposits. By December 2018, that number had climbed four-fold to more than 80,000 MMcf. The story is much the same for oil. Between December 2015 and December 2018, New Mexico’s crude oil production rose from 11,139 Mbbl annually to 33,414 Mbbl, an astonishing tripling of production. These numbers have helped propel New Mexico into the position as the country’s third leading producer of oil and gas.

The Permian Basin has driven much of New Mexico’s growth in oil and gas production in recent years. The Basin contains “one of the largest hydrocarbon plays in the United States,” the Wolfcamp Play.²⁸ The United States Geological Survey (“USGS”) estimates the Wolfcamp Play contains more than 19 billion barrels of oil and 16 trillion cubic feet of natural gas. *Id.* On a wider scale, USGS’s recent 2018 report detailing the continuous oil and gas reserves in the Wolfcamp and Bone Springs formations shed some light on just what is at stake for the prospect of future oil and gas production in the region. Together, the Bone Springs and Wolfcamp plays contain about 46.3 billion barrels of oil, 281 trillion cubic feet of gas, and 20 billion barrels of natural gas liquids.²⁹

²⁷ The Permian Basin of New Mexico centers on Eddy and Lea Counties, but due to increased oil and gas production in Chaves and Roosevelt counties, and their proximity to dangerous ozone concentrations just to the south, EPA should redesignate all four counties as nonattainment as well. See Exhibit 7, Grant, J., R. Parikh, A. Bar-Ilan, *Future Year 2028 Emissions from Oil and Gas Activity in the Greater San Juan Basin and Permian Basin*, Final Report Prepared for Bureau of Land Management, Western States Air Resources Council, and Western Regional Air Partnership. (August 2018), https://www.wrapair2.org/pdf/SanJuan_Permian_Futureyear_EI_Report_21Aug2018.pdf.

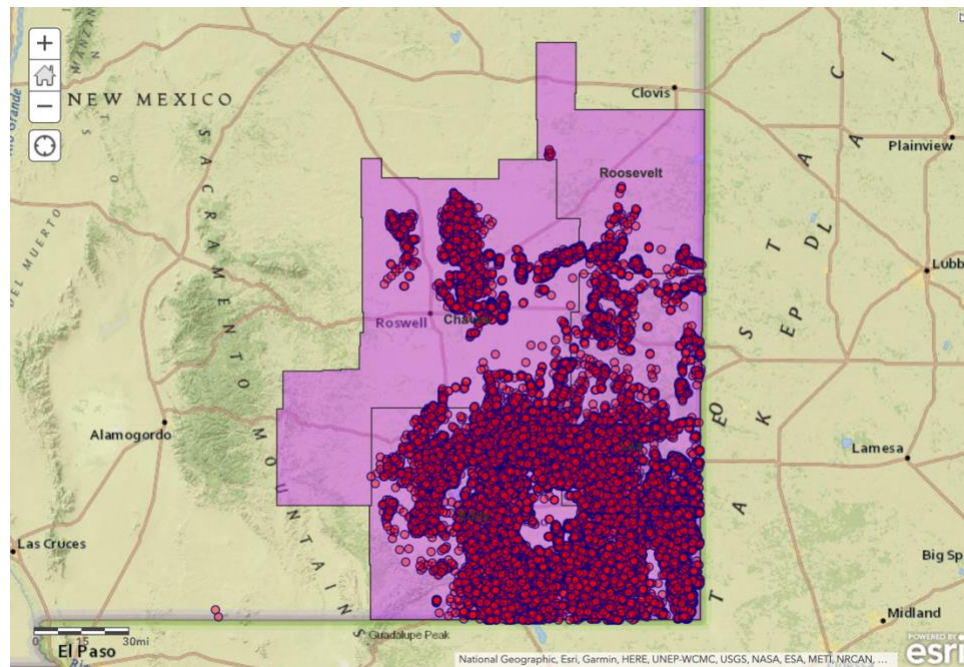
²⁸ Exhibit 8, *Permian Basin: Wolfcamp Oil Shale Play*, U.S. ENERGY INFO. ADMINISTRATION 8 (Oct. 2018).

²⁹ Exhibit 9, *Assessment of Undiscovered Continuous Oil and Gas Resources in the Wolfcamp Shale and Bone Spring Formation of the Delaware Basin, Permian Basin Province, New Mexico and Texas*, 2018, U.S. GEOLOGICAL SURVEY (Nov. 28, 2018), <https://pubs.er.usgs.gov/publication/fs20183073>.

EIA statistics show that oil and gas production in the region has grown dramatically. Tight oil production from the Wolfcamp Shale and Bone Spring Formation has risen from about 0.046 million barrels per day in January 2000, to 1.836 million barrels per day in January 2019, nearly a 40-fold increase. Since 2010, oil production in the Permian Basin has grown from less than 1 million barrels per day to 4 million barrels per day, with production nearly doubling in the past two years alone. Thousands of active wells now pockmark the region.

**Active Oil, Gas, and Injection Wells in the Permian Basin
of New Mexico as of February 2021.³⁰**

County	# Active Oil Wells	# Active Gas Wells	# Active Injection Wells
Chaves	1,062	1,263	152
Eddy	10,777	3,065	742
Lea	12,335	1,840	2,094
Roosevelt	351	53	33



**Active oil, gas, and injection wells in the Permian Basin Counties of southeast New Mexico.
Data from New Mexico Oil Conservation Division.³¹**

³⁰ Data from New Mexico Oil Conservation Division, <https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx> (last accessed Feb. 28, 2021).

³¹ Geographic data available for download from the New Mexico Oil Conservation Division's Public FTP site, <ftp://164.64.106.6/Public/OCD/OCD%20GIS%20Data/>.

The EPA has identified oil and gas production as the primary industrial producer of VOCs—one of two groups of ground-level ozone precursors.³² VOCs are not only considered ozone precursor pollutants, but they include a number of compounds known to be incredibly toxic and dangerous to human health, including benzene, formaldehyde, xylene, and toluene.³³ Moreover, the industry emits huge amounts of NOx directly from internal combustion engines involved in the transport of materials, water, and hydrocarbons, and indirectly from downstream fossil fuel combustion.³⁴ Sources of air pollution associated with oil and gas extraction do not directly emit ozone into the atmosphere. Instead, internal combustion engines, drilling, hydraulic fracturing activities, and gas and oil transport infrastructure all release VOC and NOx, which in turn react with sunlight to create ground-level ozone.

In the Permian Basin, oil and gas extraction has pushed VOC and NOx levels to dangerous highs. Based on EPA’s most recent National Emissions Inventory data, oil and gas exploration and production activities in the Permian Basin Counties were responsible for 12,793 tons of NOx and 82,442 tons of VOCs in 2017.³⁵ This makes oil and gas the single largest source of NOx and VOCs in the region. In fact, oil and gas is responsible for twice as much anthropogenic NOx pollution as all mobile sources (e.g., cars, trucks, trains, planes, etc.) and releases more VOCs than all other anthropogenic sources combined. To further put this into

³² Exhibit 10, *Controlling Air Pollution from the Oil and Natural Gas Industry*, ENVTL. PROT. AGENCY, <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/basic-information-about-oil-and-natural-gas> (last accessed Feb. 14, 2021).

³³ Exhibit 11, *Technical Overview of Volatile Organic Compounds*, Env’tl. Prot. Agency, <https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds> (last accessed Feb. 26, 2021).

³⁴ Exhibit 12, Allen, D.T., “Emissions from oil and gas operations in the United States and their air quality implications,” *Journal of the Air and Waste Management Association*, 66:6, 549-575 (2016), available online at <https://www.tandfonline.com/doi/pdf/10.1080/10962247.2016.1171263>.

³⁵ Emissions data queried from EPA’s 2017 National Emissions Inventory Data, available online at <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data> (last accessed Feb. 26, 2021).

comparison, this is more than eight times the total amount of VOCs released by all anthropogenic sources of air pollution in the City of Denver, Colorado, an urban area with a population of over 700,000, a major international airport, extensive industrial activity, and countless cars and trucks.³⁶ The table below compares NOx and VOCs from oil and gas with other source categories in Chaves, Eddy, Lea, and Roosevelt Counties.

2017 Emissions by Source Category in Permian Basin Counties³⁷

Source	Total NOx (tons/year)	Total VOCs (tons/year)
Non-oil and gas combustion	8,447	1,088
Electricity generating	1,014	33
Mobile source	5,744	2,471
Non-oil and gas industrial processes	259	811
Agriculture	--	638
Gas stations/terminals	--	1,089
Waste disposal	19	48
Solvent use	--	551
Oil and gas	12,793	82,443

A more recent emissions inventory prepared by the international environmental consulting firm, Ramboll, projects that by 2028, total oil and gas emissions in the region will skyrocket.³⁸ In total, oil and gas is projected to release more than 26,000 tons of NOx annually, double what was reported in 2017. And by 2028, oil and gas is projected to release more than 112,000 tons of VOCs annually, nearly a 40% increase above what was reported in 2017. The table below details projected 2028 emissions from oil and gas in the region.

³⁶ According to EPA's most recent National Emissions Inventory Data, a total of 10,898 tons of VOCs were released from anthropogenic sources of air pollution in 2017.

³⁷ *Supra* note 34.

³⁸ *Supra* note 26.

2028 Projected VOC Emissions From Oil and Gas for Permian Basin Counties

County	NOx (tons/year)	VOCs (tons/year)
Chaves	691	3,731
Eddy	11,521	52,748
Lea	14,141	56,060
Roosevelt	120	354
TOTALS	26,743	112,893

Making matters worse is that these projections are likely to represent significant underestimates of VOC emissions in the region. This is due to the fact that Ramboll presumed oil and gas operators would comply with the 2016 methane rule promulgated by the U.S. Bureau of Land Management and with the EPA's regulations at 40 C.F.R. Part 60, Subparts OOOO and OOOOa, all of which required significant control of VOC emissions from oil and gas operations. However, the Bureau's methane rule was rescinded in 2018. 83 Fed. Reg. 49,184 (Sept. 28, 2018). Further, EPA revised Subparts OOOO and OOOOa in 2020, stripping substantive requirements for oil and gas operators to curtail VOC emissions. 85 Fed. Reg. 57,018 (Sept. 14, 2020). These rollbacks mean current and projected emissions from oil and gas are likely much higher than reported.

That VOC emissions from oil and gas extraction activities in the Permian Basin are likely severely underestimated has been confirmed by recent studies of methane emissions in the region. Methane, which is a potent greenhouse gas, is released together with VOCs at oil and gas production facilities, although in much larger quantities. One study using satellite observations found that overall methane emissions from oil and gas in the Permian Basin of New Mexico and Texas were two times higher than reported by traditional bottom-up inventory

estimates.³⁹ Another study specifically of oil and gas well sites in the Permian Basin of New Mexico found that methane emissions were 5.5-9.0 times greater than EPA National Emissions Inventory estimates for the region.⁴⁰ These studies strongly indicate that associated VOC emissions in the Permian Basin Counties are similarly much higher than reported.

Higher methane and VOC emissions are partly the result of industry's widespread practice of venting and flaring gas. In fact, studies have confirmed that New Mexico oil and gas producers vent or flare a significant amount of gas. In 2019, an astonishing 32,897,955 million cubic feet ("Mcf") of gas was vented.⁴¹ Indeed, according to New Mexico Oil Conservation Division data, Energen Resources Corporation—located in Lea County—vented 207,389 Mcf of natural gas in 2019 from just seven wells.⁴² In January of 2018, XTO/Bopco, L.P. reported that it vented 171,515 Mcf of natural gas in Eddy County.⁴³ Incredibly, XTO/Bopco L.P. flared nearly 4.5 million cubic feet of gas in 2019—13% of its total production.⁴⁴ And Ameredev, LLC flared fully 78% of its production in 2019.⁴⁵

Compounding the impacts of venting and flaring on air pollution levels, the oil and gas industry reports regular air emission violations from facilities in the Permian Basin. Between

³⁹ Exhibit 13, Z. Zhang, R. Gautam, S. Pandey, M. Omara, J.D Maasakkers, P. Sadaverte, D. Lyon, H. Nesser, M.P. Sulprizio, D.J. Varon, R. Zhang, S. Houweling, D. Zavala-Araiza, R.A. Alvarez, A. Lorente, S.P. Hamburg, I. Aben, D.J. Jacob, "Quantifying methane emissions from the largest oil producing basin in the United States from space," *Sci. Adv.* 6, eaaz5120 (2020), available at <https://advances.sciencemag.org/content/6/17/eaaz5120>.

⁴⁰ Exhibit 14, Robertson, A.M., R. Edie, R.A. Field, D. Lyon, R. McVay, M. Omara, D. Zavala-Araiza, and S.M. Murphy, "New Mexico Permian Basin measured well pad methane emissions are a factor of 5-9 times higher than U.S. EPA estimates," *Environ. Sci. Technol.* 2020, 54, 13926-13934.

⁴¹ Exhibit 15, *Flaring in the Oilfield: A Closer Look*, WELC (Aug. 2020), <https://westernlaw.org/wp-content/uploads/2020/08/2020.08.05-WELC-NM-Flaring-Report.pdf>.

⁴² OCD Methane Tracker Dashboard, <https://nm-emnrd.maps.arcgis.com/apps/opsdashboard/index.html#/522aee3ad2fb4758863f16269281520d> (last accessed Feb. 14, 2021).

⁴³ Exhibit 16, *Flaring and Venting Data by Operator*, New Mexico Oil Conservation Division, <http://www.emnrd.state.nm.us/OCD/documents/C-115Non-TransportedProductDispositionByOperator01282021.xls> (last updated Jan. 28, 2021).

⁴⁴ *Id.*

⁴⁵ *Id.*

December 1, 2019 and December 1, 2020, companies in Eddy and Lea Counties reported 1,454 instances where emissions exceeded legally required limits in permits or regulations.⁴⁶ This amounts to an average of nearly four excess emissions events daily in the Permian Basin. These emissions came from refineries, well sites, processing plants, compressor stations, waste disposal facilities, and more. During this time, industry reported more than 313 tons of excess NO_x emissions and 2,284 tons of excess VOC emissions.

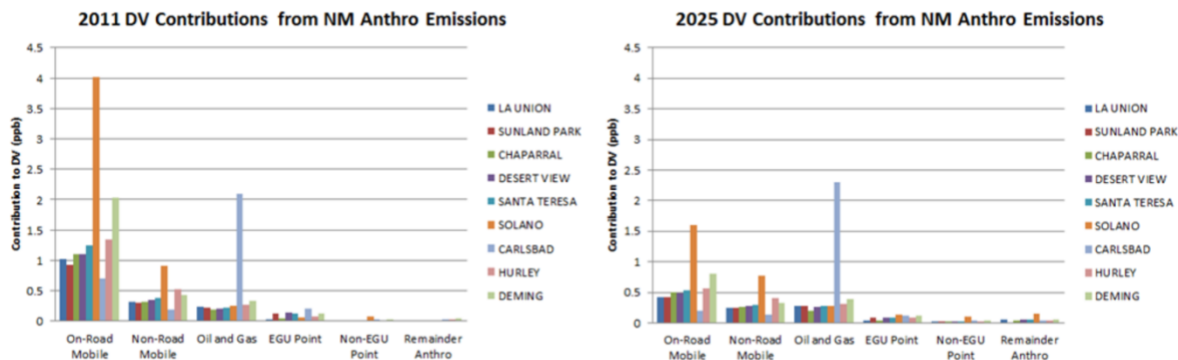
Modeling studies have, in fact, confirmed that oil and gas production activities contribute to ozone levels at monitors in southeast New Mexico. In a study of ozone in southern New Mexico, modeling confirmed that oil and gas sources of emissions were by far the biggest contributor to ozone at the Carlsbad monitor. In the *Southern New Mexico Ozone Study Technical Support Document* prepared in 2016, researchers reported, “Oil and gas sources make the largest contribution at the Carlsbad monitor, which is the monitor located closest to the Permian Basin.”⁴⁷ The report further found that “the impact of oil and gas sources increases in 2025 due to projected growth in Permian Basin emissions.”⁴⁸

The graphs below, which are excerpted from that report, illustrate the contribution from oil and gas at Carlsbad. Assessing a 2011 base year design value, which was prior to the region experiencing the current level of oil and gas development and experiencing elevated ozone, oil and gas contributed 2 parts per billion (or 0.002 ppm). For that same year’s design value, on-road mobile sources, or cars and trucks, contributed only a little more than 0.5 parts per billion at Carlsbad.

⁴⁶ Exhibit 17, Excess Emissions Report 12.1.2019 to 12.1.2020, New Mexico Environment Department, <https://www.env.nm.gov/air-quality/excess-emissions-reporting/>.

⁴⁷ Exhibit 18, Kembball-Cook, S., J. Johnson, A. Wentland, Z. Liu, R. Morris, and Z. Adelman, *Southern New Mexico Ozone Study Technical Support Document* (Oct. 19, 2016) at 70, https://www.wrapair2.org/pdf/SNMOS_TechnicalSupportDocument_19Oct2016.pdf.

⁴⁸ *Id.* at 81.

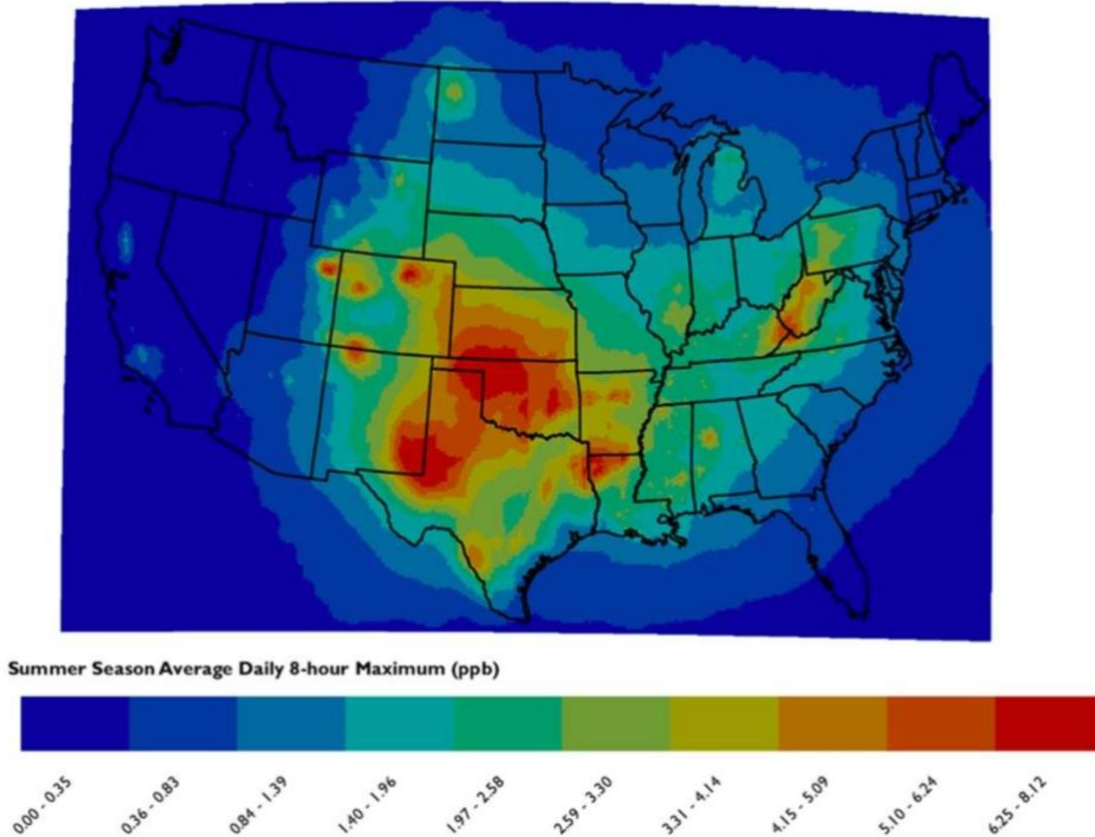


Source-specific contribution to ozone concentrations at southern New Mexico monitors, including Carlsbad.

A 2018 article published in *Environmental Science and Technology*, researchers confirmed the significant impact of oil and gas emissions in the U.S. on ozone concentrations nationwide and disclosed much a more significant contribution.⁴⁹ The modeling data revealed the summer season daily average contribution of oil and gas to 8-hour ozone concentrations to be higher than six parts per billion in the Permian Basin of New Mexico. The image below from that article confirms that emissions from oil and gas production have a major impact on southeast New Mexico, underscoring the need for redesignation to nonattainment.

⁴⁹ Exhibit 19, Fann, Neal et al. "Assessing Human Health PM_{2.5} and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025." *Environmental science & technology* vol. 52,15 (2018): 8095-8103. doi:10.1021/acs.est.8b02050, available online at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6718951/>.

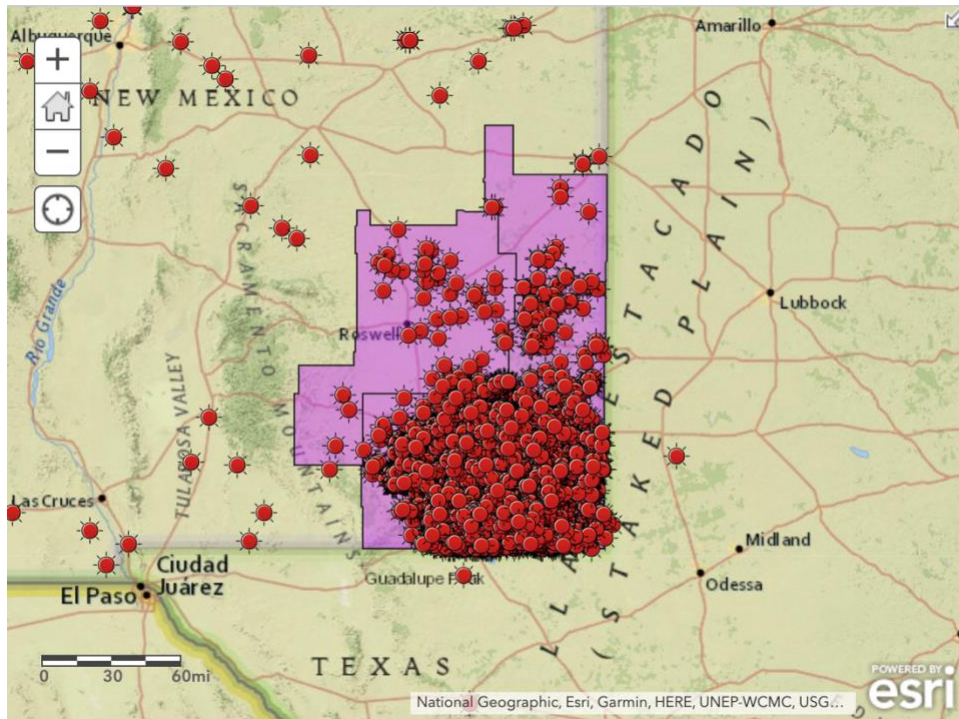
Summer Season Average Daily 8-Hour Maximum Ozone



Contribution of oil and gas emissions to ground-level ozone concentrations.

D. Permitting by the New Mexico Environment Department is worsening ozone pollution in the Permian Basin

Soaring levels of ozone pollution are also being fueled by the NMED's continued rubber-stamping of air pollution permits for new and modified oil and gas facilities in the Permian Basin, seemingly in contravention of the New Mexico SIP. Over the last several years, NMED has approved thousands of permits for new and modified sources of VOC and NO_x emissions, even in the face of rising ozone pollution, exceedances, and violations. Most problematic is NMED's reliance on a general permit that allows the oil and gas industry to undergo a streamlined registration process to obtain permit coverage.



Oil and gas facilities permitted by NMED (red dots) in Permian Basin Counties. Facility location data from NMED.

Data from NMED shows that in 2020, more than 400 new source review permits were issued authorizing the construction or modification of stationary sources of air pollution associated with the oil and gas industry in the Permian Basin.⁵⁰ In addition, more than 300 general permit registrations were approved in 2020, also authorizing the construction or modification of stationary sources of air pollution associated with the oil and gas industry in the Permian Basin.⁵¹

A recent report prepared for WildEarth Guardians confirmed that additional new sources of VOC and NOx emissions will undoubtedly contribute to violations of the ozone NAAQS in the region. In his report, Ph.D and engineer Ranajit Sahu found that, based on existing

⁵⁰ Exhibit 20, Based on NMED's January 4, 2021 NSR Issuance Report, <https://www.env.nm.gov/air-quality/wp-content/uploads/sites/2/2021/01/AQBP-NSR-Issued-Through-2021.xlsx>.

⁵¹ *Id.*

information and analysis, the NMED's permitting of new and modified oil and gas facilities in southeast New Mexico would contribute to violations.⁵² Mr. Sahu found:

[I]n the absence of modeling or analytical data demonstrating otherwise, it is my professional judgment that it is reasonable to presume that any additional emissions of VOCs or NO_x in Eddy and Lea counties, such as from the particular facilities at issue in this matter, will contribute to violations of the ozone NAAQS in the area.

Despite confirming the link between permitting new and modified sources of air pollution and the region's ozone pollution, NMED continues to issue permits.

NMED's permitting actions, which have all authorized the release of additional VOC and NO_x emissions, have been approved notwithstanding the New Mexico SIP's prohibition on approving permits or general permit registrations for stationary sources that would "cause or contribute" to violations of the NAAQS. *See* 20.2.72.208(D) NMAC. Even though any additional amounts of ozone precursor emissions would necessarily contribute to the Permian Basin's ongoing violations of the ozone NAAQS, NMED has asserted that the agency is not authorized to deny permits or otherwise ensure permits do not lead to emissions that contribute to the ozone problem. This position was unfortunately upheld by a New Mexico citizen board in a 2020 adjudicatory proceeding involving four permitting actions for oil and gas facilities.⁵³

NMED's practice of rubber-stamping new VOC and NO_x emissions from new or modified stationary source oil and gas facilities underscores the need for the EPA to take action to redesignate the Permian Basin as nonattainment for the 2015 ozone NAAQS.

⁵² Exhibit 21, Expert Report by Ranajit Sahu in support of Petitioner in EIB No. 20-33(A) and EIB No. 20-21(A), available online at <https://www.env.nm.gov/environmental-improvement/wp-content/uploads/sites/8/2020/05/2020-08-03-OPF-EIB-20-21A-and-20-33A-WildEarth-Guardians-Notice-to-Present-Testimony-small.pdf>.

⁵³ *See* Exhibit 22, In the matter of EIB No. 20-21(A) and 20-33(A), Final Order, <https://www.env.nm.gov/environmental-improvement/wp-content/uploads/sites/8/2019/09/Final-Order-EIB-20-21-and-20-33.pdf>.

E. Climate change is exacerbating ground-level ozone pollution problems.

The need to designate the Permian Basin of New Mexico is further underscored by the fact that climate change is exacerbating ground-level ozone pollution in the region.

Ozone forms when VOCs and NO_x react in the presence of sunlight and heat. VOCs consist of a wide variety of carbon-based compounds, some of which are reactive enough with oxygen to be implicated in the formation ground-level ozone pollution. A partial list of these compounds include formaldehyde, d-Limonene, toluene, acetone, ethanol (ethyl alcohol) 2-propanol (isopropyl alcohol), hexanal. Similarly, NO_x are a group of very reactive gases including NO, NO₂, and N₂O. In oil and gas production, NO_x is principally produced through the high-temperature combustion of fossil fuel.

Air stagnation plays an important role in ground-level ozone creation, but winds can carry ozone far afield. Because ozone itself is windborne, even rural areas far from oil and gas production are potential targets for unsafe ozone levels. Ozone concentrations typically spike during the summer months when long periods of sunlight and summer heat interact with VOC and NO_x. However, climate disruption will continue to raise surface mean temperatures, likely lengthening the period when ground-level ozone is readily formed. EPA itself acknowledges this frightening reality.⁵⁴ One recent study predicted heightened levels of ground-level ozone created by climate change could cause a 7.3% increase in emergency room visits related to asthma by children aged 0–17.⁵⁵ A 2011 report by the Union of Concerned Scientists surveyed the literature concerning climate change and ground-level ozone and concluded that the “ozone penalty

⁵⁴ *Climate Adaption and Outdoor Air Quality*, EPA, <https://www.epa.gov/arc-x/climate-adaptation-and-outdoor-air-quality> (last accessed Feb. 14, 2021).

⁵⁵ Exhibit 23, Perry E. Sheffield et al., *Modeling of Regional Climate Change Effects on Ground-Level Ozone and Childhood Asthma*, 41 AM. J. PREV. MED. 252 (2011).

factor”—the amount ozone levels are projected to increase for every 1 degree Fahrenheit (°F) increase in temperature—was 1.2 ppb.⁵⁶

The daily temperature in New Mexico is already 2.7 °F warmer today than it was in 1970, and estimates indicate that the Southwest could warm from 4 °F to 10 °F by 2100.⁵⁷ Thus, based solely upon the “ozone penalty factor,” global heating alone is likely to result in ground-level ozone levels in the Permian Basin between 4.8 to 12 ppb higher. This increase is separate and apart from the significant increase in ozone pollution levels driven by local and regional emissions of ozone precursors, such as NO_x and VOCs. Absent a formal nonattainment designation, climate change will continue to worsen the region’s ozone levels, likely preventing Chaves, Eddy, Lea, and Roosevelt Counties from ever achieving compliance with the ozone NAAQS.

IV. EPA has a Legal Duty to Call for the Revision of the New Mexico SIP

The Clean Air Act requires the EPA to call for a state to revise its SIP whenever the agency finds the SIP is substantially inadequate to attain and maintain ozone NAAQS. *See* 42 U.S.C. § 7410(k)(5). Given the available data presented above, there is no question the EPA must require New Mexico to revise its SIP.

A SIP revision is first and foremost called for because all three ozone monitors in the Permian Basin of New Mexico currently have recorded design values in excess of the 2015 ozone NAAQS. The fact that monitors in the region are violating the NAAQS is undeniable

⁵⁶ Exhibit 24, *Rising Temperatures, Worsening Ozone Pollution*, UNION OF CONCERNED SCIENTISTS (Aug. 2, 2011), <https://www.ucsusa.org/sites/default/files/2019-09/climate-change-and-ozone-pollution.pdf>.

⁵⁷ Exhibit 25, *Confronting Climate Change in New Mexico*, UNION OF CONCERNED SCIENTISTS (May 2, 2016), <https://www.ucsusa.org/resources/confronting-climate-change-new-mexico>; Exhibit 26, *Fourth National Climate Assessment, Chapter 25: Southwest*, U.S. Global Change Research Program (2018), <https://nca2018.globalchange.gov/chapter/25/>.

proof that the New Mexico SIP failing to attain and maintain the NAAQS. Under the Clean Air Act, a SIP must provide for the implementation, maintenance, and enforcement of the NAAQS, and must assure attainment and maintenance of the NAAQS. *See* 42 U.S.C. § 7410(a)(1) and 40 C.F.R. § 51.112(a). If the New Mexico SIP was legally adequate, the Permian Basin would not be violating the 2015 ozone NAAQS.

However, a SIP revision is also necessary in light of the fact that it is clearly failing to ensure that NMED does not permit stationary sources that cause or contribute to violations of the NAAQS.

Under the Clean Air Act, SIPs must set forth “legally enforceable procedures” that enable a state to determine whether the permitting of a new source or modification will interfere with attainment or maintenance of a NAAQS and to prevent the construction or modification of a stationary source that will interfere with attainment or maintenance of the NAAQS. *See* 40 C.F.R. § 51.60(a)(2) and (b)(2).

By NMED’s own admissions, the New Mexico SIP neither contains legally enforceable procedures enabling the state to determine whether the permitting of a new source or modification will interfere with attainment or maintenance of the ozone NAAQS nor does it prevent the construction or modification of a source that would interfere with attainment or maintenance of the ozone NAAQS. Even in the Permian Basin, where air quality is in nonattainment of the ozone NAAQS and the permitting of new ozone precursor emissions would contribute to this nonattainment, NMED admits that the New Mexico SIP both prohibits the agency from determining whether a source will interfere with attainment or maintenance and from denying permits.

As the agency asserted in a recent adjudicatory hearing before the New Mexico Environmental Improvement Board, NMED is both unable to gather data necessary to determine whether emissions from a source would cause or contribute to violations of the ozone NAAQS and is legally barred from denying a permit that would interfere with attainment or maintenance of the ozone NAAQS.⁵⁸ Officials with NMED's Air Quality Bureau directly and clearly explained the substantial inadequacies in the SIP, including:

- The SIP does not require NMED to evaluate the impacts of permitting new and modified sources to the ozone NAAQS, even where air quality is in nonattainment of the ozone NAAQS. In testimony, NMED's Air Quality Bureau stated:

“...the Board's rules do not require the Department to evaluate ozone impacts for individual NSR minor source permit applications.”⁵⁹

The Bureau's witness also testified that 20.2.72.500 NMAC, which is part of the SIP, does not list ozone as an ambient air pollutant that requires evaluation when permitting.⁶⁰

- The SIP exempts minor sources from the Clean Air Act's requirement that NMED both determine whether new or modified sources would interfere with attainment or maintenance of the ozone NAAQS and prevent the construction of new or modified sources that would interfere with attainment or maintenance. In testimony, NMED's Air Quality Bureau explained that “there is no basis for the Department to require further analyses of ozone impacts from [minor] sources,” explaining that minor sources are presumed to not have a “significant” impact on ozone concentrations, even in areas currently violating the NAAQS.⁶¹
- The SIP does not give NMED authority to deny permits that would interfere with attainment or maintenance of the ozone NAAQS. In testimony, NMED's Air Quality Bureau Chief, Elizabeth Bisbey-Kuehn, stated that if they were to deny permits that interfere with attainment or maintenance of the ozone NAAQS, the Department “would be acting outside its authority[.]”⁶²

⁵⁸ Exhibit 27, *In the matter of EIB No. 20-21(A) and 20-33(A)*, New Mexico Environment Department's Statement of Intent to Present Direct Technical Testimony, <https://www.env.nm.gov/environmental-improvement/wp-content/uploads/sites/8/2020/06/2020-09-02-OPF-EIB-20-21A-and-20-33A-NMED-Statement-of-Intent-Rebuttal.pdf>.

⁵⁹ *Id.* at Exhibit 1 at 8.

⁶⁰ *Id.*

⁶¹ *Id.* at Exhibit 1 at 9.

⁶² *Id.* at Exhibit 5 at 10.

During this adjudicatory proceeding, these arguments and assertions were not only upheld by counsel for NMED, but ultimately adopted by the New Mexico Environmental Improvement Board. In a Final Order, the Board explicitly stated:

The Board's regulations and NMED's Modeling Guidelines [] do not require analysis of ozone impacts for minor sources...The Department does not have authority or discretion to deny a permit or require offsets for an individual new or modified minor source in a designated attainment area on the basis that the facility will 'cause or contribute' to ozone levels above the NAAQS.⁶³

While New Mexico's SIP very clearly states that NMED must deny permits for new or modified stationary sources that would "cause or contribute" to violations of the NAAQS, according to the reading of NMED and the Environmental Improvement Board, this standard does not apply with regards to the ozone NAAQS. NMED's statements demonstrate the SIP does not require any analysis of ozone impacts, exempts minor sources from review of ozone impacts, and does not authorize the Department to deny permits that would cause or contribute to violations of the NAAQS. Even in the Permian Basin, where the permitting of new or modified sources of ozone precursor emissions would automatically contribute to violations of the ozone NAAQS, NMED and the Environmental Improvement Board interpret the SIP to prohibit denial of permits.

Given this, the New Mexico SIP is substantially inadequate under the Clean Air Act. The SIP clearly fails to provide for the attainment and maintenance of the NAAQS and fails to provide legally enforceable procedures regarding the permitting of stationary sources of air pollution.

Accordingly, EPA must call for New Mexico to submit a revised SIP. See 42 U.S.C. § 7410(k)(5). While the Clean Air Act provides an 18-month deadline for a state to submit a

⁶³ *Supra* note 52 at 16 and 23.

revised SIP, because of the serious public health, welfare, and environmental consequences of ongoing ozone violations in the Permian Basin, we request the EPA call for New Mexico to submit a revision within three months.

V. Conclusion

The Permian Basin of southeast New Mexico is in violation of the 2015 ozone NAAQS, a fact confirmed by EPA design value data and the State of New Mexico. Accordingly, the region, including Chaves, Eddy, Lea, and Roosevelt Counties, must be redesignated from attainment to nonattainment. This redesignation is needed to ensure full protection of public health and welfare, to acknowledge and address environmental injustices committed on New Mexican people of color and underserved communities, and to ensure this dangerous air pollution is cleaned up in a timely and effective manner.

Additionally, it is clear the New Mexico SIP is substantially inadequate to attain and maintain the 2015 ozone NAAQS in the Permian Basin. The fact that the region is in violation of the NAAQS demonstrates the SIP is substantially inadequate. However, NMED and the Environmental Improvement Board read the SIP to disallow the State to deny air pollution permits that would contribute to this violation, further demonstrating the SIP is substantially inadequate.

We request the EPA review and respond to this petition expeditiously. Ongoing violations of the ozone NAAQS in the Permian Basin is only harming peoples' health, degrading the environment, and costing the State of New Mexico dearly. For many, this is a life or death matter. The EPA must act quickly to ensure the State is brought into compliance with the Clean Air Act and compelled to address this festering air pollution. We request the EPA:

1. Provide an immediate acknowledgment that this petition has been received;
2. Notify the Governor of New Mexico, within one month of receipt of this petition, that available information indicates the designation of Chaves, Eddy, Lea, and Roosevelt Counties must be revised from attainment to nonattainment; and
3. Notify the State of New Mexico, within one month of receipt of this petition, that its SIP is substantially inadequate and must be revised within three months of notification.

Again, please direct all correspondence regarding this petition to:

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Thank you for your prompt attention to this significant problem and opportunity to restore clean air, health, and justice to New Mexico.

Submitted this 2nd day of March 2021.



Jeremy Nichols
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