Colorado's Ground-Level Ozone Burden

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I. INTRODUCTION

Since 1970, the federal government has been regulating ground-level ozone under the Clean Air Act ("CAA"). At the ground level, ozone is an air pollutant, which can be harmful to humans, animals, and vegetation. Ground-level ozone is, in part, created by man-made emissions from industrial processes and vehicle exhaust. In October 2015, the Environmental Protection Agency ("EPA") announced its most aggressive regulatory action ever regarding ground-level ozone. For years, Colorado has struggled with attaining the federal government's ozone requirements, and this most recent regulation will only further burden the state. Colorado has made substantial progress decreasing ground-level ozone pollution in the state; however, as the EPA continues to strengthen ground-level ozone regulations, the EPA must address the burdens background ozone places on states like Colorado. Furthermore, Colorado will continue to violate the EPA's ground-level ozone standards if it does not radically address motor vehicle emissions. By enhancing the EPA's mechanism for monitoring background ozone, adopting California's more aggressive stance on motor vehicle emissions, and modifying the Denver Metro area's gasoline supply, Colorado and the EPA can work together to effectively manage, reduce, and control ground-level ozone in Colorado.

This paper will first discuss ozone and its health effects. Next, this note will examine the CAA's history and the current state of the Act. This paper will then discuss how the EPA has and currently regulates ground-ozone pollution along with an analysis of historical and potential future judicial scrutiny concerning the agency's regulation of ground-level ozone. Colorado's history regulating ozone and the state's current issues related to ozone will then be examined. A discussion of background ozone will follow, which will address the tension between states and the federal government concerning a state's inability to conform to federal ozone standards thanks, in part to background ozone. Finally, this paper will argue that in order for Colorado to comply with the EPA's current ozone standards, the state should adopt California's mobile-source emission controls and modify the Denver Metro area's gasoline supply.

II. OZONE: DESCRIPTION AND HEALTH EFFECTS

Ozone is a colorless gas, composed of three oxygen atoms, which exist both at the ground level and in Earth's upper atmosphere[1]. Ozone at the ground level is considered an air pollutant, which is harmful to breathe, and it also damages crops, tress, and other vegetation.[2] Additionally, it is the main ingredient in urban smog.[3] Conversely, ozone high in the earth's atmosphere (the stratosphere) creates a layer that protects life on Earth from the sun's harmful ultraviolet rays.[4]

Ground-level ozone is created by chemical reactions between ozone precursors: nitrogen oxides ("NOx") and volatile organic compounds ("VOCs"), in the presence of sunlight.[5] These reactions are caused by man-made emissions from chemicals emitted from industrial processes, vehicle exhaust, and other byproducts of fossil fuel combustion. Ground-level ozone is also created by natural sources, such as wildfires and stratospheric intrusions.[6] "Fires [can] worsen [ground-level] ozone levels by releasing nitrogen oxides and hydrocarbons, which can form ozone near the fire or far downwind as a result of chemical reactions in sunlight."[7] Ozone that exists naturally in the stratosphere occasionally falls down to the ground level in quantities large enough to negatively impact life on Earth.[8] This phenomenon is called a stratospheric intrusion.[9]

Inhaling ozone can trigger a variety of dangerous health problems for humans, including chest pain, coughing, and throat irritation.[10] Furthermore, it can worsen bronchitis, emphysema, and asthma.[11] In addition, breathing ozone can reduce lung function and inflame the linings

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[1] EPA, *Smog – Who Does It Hurt?* https://cfpub.epa.gov/airnow/index.cfm?action=smog.index (last visited Mar. 18, 2016).

[2] EPA, *Good Up High Bad Nearby - What is Ozone?* http://cfpub.epa.gov/airnow/index.cfm?action=gooduphigh.index (last visited Mar. 18, 2016).

[3] *Id.*

[4] *Id.*

[5] *Id.*

[6] National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,292, 65,303 (Oct. 26, 2015).

[7] Press Release, University Corporation for Atmospheric Research, Wildires Cause Ozone Pollution to Violate Health Standards, New Study Shows (Oct. 09, 2008) *available at* https://www2.ucar.edu/atmosnews/news/916/wildfires-cause-ozone-pollution-violate-health-standards-new-study-shows.

[8] . Press Release, NASA, NASA Simulation Portrays Ozone Intrusions From Aloft, (April 10, 2014) *available at* http://www.nasa.gov/content/goddard/nasa-simulation-portrays-ozone-intrusions-from-aloft/#.VroZlVMrKRs.

[9] *Id.*

[10] *Good Up High Bad Nearby - What is Ozone? supra* note 2.

[11] *Id.*

of the lungs.[12] Children are at an increased risk from ozone exposure because their lungs are still developing.[13] Ozone may also reduce the immune system's ability to fight off bacterial infections in the respiratory system.[14] Additionally, the Integrated Science Assessment ("ISA") concluded that the relationships between short-term exposures to ground-level ozone and both mortality and cardiovascular effects are likely to be causal.[15] The ISA also determined that the currently available evidence suggests causal relationships with short-term (central nervous system effects) and long-term (cardiovascular effects, reproductive and developmental effects, central nervous system effects and total mortality) exposures to ground level ozone.[16] Studies have consistently linked short-term increases in ground-level concentrations with lung function decrements in diverse populations and life stages, including children attending summer camps, adults exercising or working outdoors, and groups with pre-existing respiratory diseases such as asthmatic children.[17]

III. THE CLEAN AIR ACT

A. The Initial Clean Air Act

Congress passed the original Clean Air Act ("CAA") in 1963.[18] Through this act, the federal government acknowledged that air pollution—thanks to urbanization, industrial development, and the increasing use of motor vehicles—was a mounting danger to the public health and welfare, including injury to agricultural crops and livestock, and damage to property.[19] Here the cooperative model of federalism, still a vital component of the CAA today, came to be: "federal…leadership is essential for the development of cooperative Federal, State, regional and local programs to prevent and control air pollution."[20]

B. The 1967 Clean Air Act Amendments

In 1967, Congress amended the CAA, focusing on the regulation of

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[12] *Id.*

[13] The National Ambient Air Quality Standards, *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone* 1, https://www.epa.gov/sites/production/files/2015-10/documents/overview_of_2015_rule.pdf. (last visited Oct. 9, 2016).

[14] *Good Up High Bad Nearby - What is Ozone?*, *supra* note 2.

[15] INTEGRATED SCIENCE ASSESSMENT FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS, U.S. EPA, 1-7-8 (2013).

[16] National Ambient Air Quality Standards for Ozone, *supra* note 5 at 65,315-16 (Oct. 26, 2015).

[17] *Id.* at 65,326.

[18] *See generally* Clean Air Act of 1963, Pub. L. 88-206, 77 Stat. 392 (1963).

[19] *Id.* at §1(a)(2).

[20] *Id.* at §1(a)(3).

ambient air quality to protect public health and welfare.[21] It established a framework for the Department of Health, Education, and Welfare's Air Quality Advisory Board ("Advisory Board") to define "air quality control regions" based on meteorological and topographical factors of air pollution.[22] The Advisory Board was charged with developing air quality "criteria" for widespread and pervasive air pollutants.[23] "The 'criteria' were to 'accurately reflect the latest scientific knowledge' on the health and welfare effects of individual pollutants, such as sulfur dioxide, nitrogen oxides ("NOx"), and particulate matter." [24] However, air quality problems were viewed as state and local concerns, so states were ultimately responsible for developing, administering, and enforcing specific standards based on the federal criteria.[25]

Conversely, Congress viewed mobile source (for example, automobile) regulation as a federal concern.[26] The 1967 Amendments charged the Advisory Board with setting technologically feasible emission standards for new automobiles.[27] Importantly, it provided states with a waiver to opt out of the applicable federal emissions standards if a state had, prior to March 30, 1966, adopted emissions standards from new motor vehicles that were more stringent than the applicable federal standards.[28] The only state that had adopted emission standards for new motor vehicles prior to March 30, 1966 was California; therefore, it was the only state that could qualify for the waiver.[29] California received special treatment from Congress because it had been aggressively regulating air pollution since the 1940s.[30] In 1947, the California governor signed into law the Air Pollution Control Act, authorizing the creation of Air Pollution Control Districts throughout the state.[31] These districts were the first of their kind in the nation – far ahead of any federal effort to regulate air pollution.[32]

C. The "California Waiver"

Crediting California with its work on automobile emission standards

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[21] F. WILLIAM BROWNELL ET AL., CLEAN AIR HANDBOOK 1 (4th ed. 2015).

[22] California Environmental Protection Agency Air Resource Board, *Key Events in the History of Air Quality in California* (Jan. 06, 2015), http://www.arb.ca.gov/html/brochure/history.htm.

[23] BROWNELL ET AL., *supra* note 20 at 1-2.

[24] *Id.* at 2.

[25] *Id.*

[26] *Id.*

[27] R. SHEP MELNICK, REGULATION AND THE COURTS 28 (1983)

[28] 81 Stat 485 §209(b)

[29] Clean Air Act Handbook § 5:20 (2015)

[30] *Key Events in the History of Air Quality in California*, *supra* note 21.

[31] *Id.*

[32] *Id.*

since the 1940s, in 1967 Congress authorized California to set and enforce its own emissions standards for new vehicles based on that state's unique need for more stringent controls.[33] The EPA recognized that California was challenged by high levels of ozone-forming NOx pollution from transportation and freight movement thanks to the state's population of thirty nine million, ports that bring in forty percent of the nation's goods, and agricultural areas that produce nearly half the nation's produce.[34] The "EPA must grant the waiver unless it finds that: (1) the determination of the state is arbitrary and capricious; (2) the state does not need the state standards to meet a compelling and extraordinary need; or (3) the state standards and accompanying enforcement procedures are not consistent with CAA § 202(a)."[35] "Standards and enforcement procedures will be found to be inconsistent with CAA § 202(a) if: there is inadequate lead time to permit the development of the necessary technology, giving appropriate consideration to the cost of compliance within that time; and (2) the state testing procedures are inconsistent with their federal counterparts."[36]

While California had its own standard, the rest of the country was obligated to abide by the federal standards, but states were free to implement air quality programs that would achieve a higher level of ambient air quality than required by the Advisory Board. [37] Unfortunately, the focus on improving ambient air quality through state and local action via the 1967 Amendments proved unduly narrow, and more broad-based regulatory programs and control methods were needed.[38]

D. The 1970 Clean Air Act Amendments

Congress provided the federal government with a more prominent role in regulating air quality by passing the Clean Air Amendments of 1970, which remains the centerpiece of today's CAA.[39] Per the 1970 Amendments, the EPA publishes and occasionally revises a list of air pollutants which, in the EPA's judgment, has an adverse effect on public health or welfare.[40] Each pollutant is subjected to two types of national ambient air quality standards ("NAAQS").[41] "Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary

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[33] *Id.*

[34] The National Ambient Air Quality Standards, *Working to Reduce Ozone in California* 1.

[35] Clean Air Act Handbook § 5:20 (2015).

[36] 78 Fed. Reg. 2112, 2121 (Jan. 9, 2013).

[37] 81 Stat 485 §109.

[38] BROWNELL ET AL., *supra* note 20 at 2.

[39] *Id.*

[40] Clean Air Act 1970 §108(a)(a)(A).

[41] Public Law 91-604 §109(a)(2)(b)(1-2).

standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings."[42]

Upon promulgation of a NAAQS for an air pollutant by the EPA, each state is required to submit to the EPA a "state implementation plan" ("SIP") for the implementation, maintenance, and enforcement of the standard within the state.[43] Importantly, each state holds primary responsibility for assuring air quality within the entire state.[44] While states take the lead in NAAQS implementation, the EPA has the ongoing authority to review SIPs and to require states to revise their SIPs as necessary.[45] If a state fails to act promptly to revise its SIP in response to a new or revised NAAQS or to an EPA finding of SIP inadequacy, the EPA has the authority to set emission limitations for sources within that state.[46] When the EPA takes this step, it promulgates these emission limitations in the form of a federal implementation plan.[47]

E. The 1977 Clean Air Act Amendments

In 1977, Congress again passed amendments to the CAA, which created a comprehensive non-attainment program to deal with states that failed to meet NAAQS.[48] The EPA, in coordination with the states, divided the country into air quality control regions, designating areas of the states as either (1) "attainment," if the atmospheric concentration meets the NAAQS, (2) "non-attainment," if the concentration is above the NAAQS, or (3) "unclassifiable," if information regarding the NAAQS is incomplete.[49] Also, the 1977 amendments required the EPA "not later than December 31, 1980, and at five-year intervals thereafter, to complete a thorough review of the NAAQS criteria."[50]

Additionally, the 1977 Amendments created the EPA Clean Air Scientific Advisory Committee ("CASAC"), which provides independent advice to the EPA Administrator on the technical bases for EPA's NAAQS[51]. CASAC also advises the EPA on the health and environmental impacts of ozone emissions and makes recommendations to the EPA on

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[42] EPA, National Ambient Air Quality Standards (NAAQS), last updated Mar. 04, 2016, https://www3.epa.gov/ttn/naaqs/criteria.html.

[43] Public Law 91-604 §110(a)(1).

[44] *Id.* at §107(a).

[45] BROWNELL ET AL., *supra* note 20 at 21.

[46] Clean Air Act 1970 § 110(c)(1).

[47] *Id*.

[48] *See generally* Public Law 95-95 §129.

[49] *See generally* Public Law 95-95 §§ 107(d)(1), 171(2).

[50] Public Law 95-95 109(d)(1).

[51] EPA, *EPA Clean Air Scientific Advisory Committee (CASAC)*, http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommittees/CASAC (last visited Mar. 18, 2016).

changes or additions to the NAAQS. Although EPA is not bound by CASAC's recommendations, it must fully explain its reasons for any departure from them.[52] The 1977 Amendments extended the time to comply with the primary NAAQS standards until December 31, 1982, and the 1977 Amendments also gave the EPA's Administrator the discretion to extend the compliance date to December 31, 1987 for non-attainment areas without available and feasible pollution control measures.[53]

F. Clean Air Act Amendments of 1990

The CAA Amendments of 1990 created a new, balanced strategy for the country to attack the problem of ground-level ozone.[54] "[The 1990 Amendments] required the federal government to reduce emissions from cars, trucks, and buses; from consumer products such as hairspray and window washing compounds; and from ships and barges during loading and unloading of petroleum products."[55] The 1990 Amendments made major changes for addressing areas that failed to attain ozone NAAQS.[56] These changes involved classification of ozone areas as a matter of law, specification of new requirements for SIPs based on those classifications, imposition of new federal measures, and provisions for multi-state ozone transport regions. *Id*. As a result of the 1990 Amendments, non-attainment areas were classified based on the area's ozone design value.[57] At the time, a design value was a measure of a one-hour average ozone concentration in the air.[58] A design value of less than 0.120 ppm meant that the location succeeded in attaining the ozone NAAQS.[59] Locations that exceeded this 0.120 ppm design value more than once per year were designated as non-attainment status with various obligations imposed based on the severity of the location's non-attainment status.[60] Nonattainment areas with more serious air quality problems had to implement various control measures.[61] The worse the air quality, the more controls states had to implement.[62] The following is a snapshot of some of the EPA mandated control measures as a result of the 1990 Amendments. Nonattainment areas classified as "marginal" are required to conduct an inventory of their ozone-causing

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[52] Clean Air Act, § 307(d)(3), (d)(6)(A), 42 U.S.C.A. § 7607(d)(3), (d)(6)(A).

[53] Public Law 95-95 § 172(a)(2).

[54] EPA, *1990 Clean Air Act Amendment Summary: Title 1*, http://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-i (last visited Mar. 18, 2016).

[55] *Id.*

[56] BROWNELL ET AL., *supra* note 20 at 26.

[57] *Id*. at 27.

[58] *Id*. Since the 1990 Amendments, the EPA has replaced the 1-hour ozone NAAQS with an 8-hour averaging time. *Id.*

[59] *Id.*

[60] *Id.*

[61] *Id.*

[62] *Id.*

emissions.[63] With regard to emission inventories, states are required to submit a comprehensive, accurate, current inventory of actual emissions of VOCs and NOx in all ozone nonattainment areas.[64] States with an ozone nonattainment area classified as "moderate" or above are required to submit a SIP revision providing for annual reductions in VOC emissions by at least fifteen percent over a six year period in order to show "reasonable further progress" toward attainment.[65] These VOC emission reductions must be "real, permanent, and enforceable" and must be the result of emission reduction strategies implemented in the designated nonattainment area.[66] States containing an ozone nonattainment area classified as "serious" or greater were also required to submit a SIP revision for the area providing for reductions in VOC emissions of at least nine percent over a three-year period.[67] A reduction of less than the nine percent requirement may be allowed for nonattainment areas (other than nonattainment areas designated as extreme) upon a demonstration that the state's plan for reaching attainment includes all measures that can feasibly be implemented in light of technological achievability.[68]

IV. OZONE NAAQS

A. 1971 Regulatory Action

Based upon the EPA's authority under the 1970 Clean Air Act Amendments, in 1971 the EPA designated six criteria air pollutants: sulfur oxides, particulate matter, carbon monoxide, photochemical oxidants (such as ground-level ozone) hydrocarbons, and nitrogen dioxide.[69] When designating photochemical oxidants as an air pollutant, the EPA also set the first NAAQS for total photochemical oxidants at a level of 0.08 ppm, one-hour average, not to be exceeded more than one hour per year.[70] The chief justification for the 0.08 standard was a study that correlated oxidant levels with the frequency of asthma attacks in Los Angeles.[71] According to the EPA, asthma attacks became more frequent when oxidant levels reached 0.10 ppm.[72] Adding a twenty percent margin of safety to 0.10

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[63] *1990 Clean Air Act Amendment Summary: Title 1*, *supra* at note 52.
[64] BROWNELL ET AL., supra note 20 at 28.
[65] *Id*. at 29.
[66] *Id*.
[67] *Id*.
[68] *Id*.
[69] National Primary and Secondary Ambient Air Quality Standards, 36 Fed. Reg. 8186, at 8187 (Apr. 30, 1971).
[70] *Id*.
[71] MELNICK, supra note 26, at 283.
[72] *Id.* at 282.

ppm, the EPA arrived at the 0.08 standard.[73] Initially however, the EPA proposed a 0.06 ppm standard, but this standard was attacked by several states.[74] The states asserted that this 0.06 ppm standard was based on flimsy evidence and, importantly, equal to or below natural background ozone levels.[75] Today, states like Colorado continue to assert similar arguments concerning natural background ozone levels.[76]

Shortly after promulgating the standard, however, EPA officials realized they had incorrectly analyzed the study.[77] A National Academy of Sciences study commissioned by Congress examined the 0.08 ppm standard and found "[t]he technical data base for the oxidant standard was inadequate, considering the implications for public health and the economic impact.[78] Opponents of EPA's 0.08 photochemical oxidant standard demanded that the EPA relax the standard, but the EPA ignored those calls for several years.[79]

B. 1979 Regulatory Action

The EPA began a review proceeding after the 1977 Amendments, which resulted in relaxing the photochemical oxidant NAAQS.[80] The standard was increased to 0.12 ppm from 0.08 ppm in 1979.[81] The EPA also changed the chemical designation of the standards from photochemical oxidants to ozone and revised the definition of the point at which the standard is attained to "when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is equal to or less than one..."[82] The number of days with maximum hourly concentrations above the standard is determined for each year and then is averaged over the preceding three years.[83] Thus, a violation occurs on the fourth day the NAAQS is exceeded over a three-year period.[84] In revising the standard, the EPA relied on several studies that rationalized a variety of standards ranging from 0.25 ppm (the petroleum industry's position) to 0.08.[85] Ultimately, the EPA drew the line at 0.12 ppm after relying on medical evidence that pointed to health risks at about 0.15

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[73] *Id.*
[74] *Id*. at n. 63.
[75] *Id*.
[76] Press Release, Colorado Department of Public Health & Environment, EPA Lowers Federal Ozone Standard; Colorado, Other States Face More Difficult Compliance, (Oct. 1, 2015), *available at* https://www.colorado.gov/cdphe/news/ozone
[77] *Id.*
[78] *Id.*
[79] *Id. at 283.*
[80] BROWNELL ET AL., *supra* note 20 at 6.
[81] 44 Fed. Reg. 8202
[82] *Id.*
[83] *Id.*
[84] *Id.*
[85] MELNICK, supra note 26, at 287.

ppm.[86]

Subsequently, in *American Petroleum Institute v. Costle* several entities brought suit against the EPA, challenging the revised primary ozone NAAQS.[87] Petitioner American Petroleum Institute, contended that the EPA erred by establishing standards that were too stringent.[88] Conversely, Petitioner National Resources Defense Council argued that the EPA erred by establishing standards that were too lenient.[89] The court upheld the primary and secondary standards because they were supported by substantial evidence.[90] The court further held that "the [EPA's] Administrator may not consider economic and technological feasibility in setting air quality standards…[because] of a deliberate decision by Congress to subordinate such concerns to the achievement of health goals."[91]

C. 1997 Regulatory Action

The ozone NAAQS were next revised on July 18, 1997[92]. The one hour primary standard was replaced with an eight hour standard at a level of 0.08 ppm with a form based on the three year average of the fourth-highest daily maximum eight hour average ozone concentrations measured at each monitor within an area.[93] The EPA alleged that the new primary standard would provide increased protection to the public, especially children and other at-risk populations against a wide range of ozone-induced health effects. After years of challenges, the courts upheld these heightened standards, finding that the 1997 ozone NAAQS were neither arbitrary nor capricious.[94]

D. 2008 Regulatory Action

The ozone NAAQS were next revised on March 27, 2008. The EPA lowered the level of the eight-hour primary and secondary ozone standards from 0.08 ppm to 0.075 ppm.[95] The 2008 revisions also modified design values and associated attainment deadlines that were modified as a result of the 1997 revisions for non-attainment areas. In 2013, the D.C. Circuit

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[86] *Id.* at 291.
[87] 665 F.2d 1176 (1981).
[88] *Id.* at 1181.
[89] *Id.*
[90] *Id.*
[91] *Id.* at 1185.
[92] EPA, *Reviewing National Ambient Air Quality Standards – Scientific and Technical Information* (Mar. 04, 2016), http://www3.epa.gov/ttn/naaqs/standards/ozone/s_o3_history.html.
[93] 40 CFR Part 50 at 38856.
[94] American Trucking Ass'ns, Inc. v EPA, 283 F.3d 355, 379 (D.C Cir., 2002).
[95] EPA, *Reviewing National Ambient Air Quality Standards – Scientific and Technical Information* (Mar. 04, 2016), http://www3.epa.gov/ttn/naaqs/standards/ozone/s_o3_history.html.

in *State of Mississippi v. EPA* upheld the 2008 primary ozone standard, but remanded the 2008 secondary standard to the EPA.[96] The D.C. Circuit Court remanded the secondary standard to the EPA after finding that the agency's justification for setting the secondary standard violated the CAA because the EPA had not adequately explained how the secondary standard provided the statutorily mandated public welfare protection.[97]

E. 2015 Revised Ozone NAAQS

The EPA addressed the D.C. Circuit Court's remand in *Mississippi v. EPA* in its final rule revising the ozone NAAQS, which was published on October 1, 2015.[98] Both the primary and secondary ozone standards were lowered from .075 ppm to .070 ppm.[99] The EPA Administrator concluded that a primary and secondary standard of .070 ppm would provide the adequate margin of safety the law requires.[100] "The requirement that primary standards provide an adequate margin of safety was intended to address uncertainties associated with inconclusive scientific and technical information available at the time of standard setting. It was also intended to provide a reasonable degree of protection against hazards that research has not yet identified."[101] "The CAA does not require the EPA's Administrator to establish a primary NAAQS at a zero-risk level or at background concentrations…but rather at a level that reduces risk sufficiently so as to protect public health with an adequate margin of safety."[102] This includes the need to ensure the safety of "sensitive" populations including asthmatics, children and the elderly.[103] "In setting primary and secondary standards that are "requisite" to protect public health and welfare, respectively, the EPA's task is to establish standards that are neither more nor less stringent than necessary for these purposes."[104] In so doing, the EPA may not consider the costs of implementing the standards.[105] "Likewise, '[a]ttainability and

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[96] 744 F.3d 1334 (D.C. Cir. 2013).

[97] *Id.*

[98] *National Ambient Air Quality Standards for Ozone*, *supra* note 5 at *65,299*

[99] *Id.* at 65,292

[100] EPA Overview of New Rule page 2, https://www.epa.gov/sites/production/files/2015-10/documents/overview_of_2015_rule.pdf

[101] *See* National Ambient Air Quality Standards for Ozone, *supra* note 5 at 65,303 (Oct. 26, 2015).

EPA Final Rule page 13 *citing* Mississippi v. EPA, 744 F. 3d 1334, 1353 (D.C. Cir. 2013).

[102] National Ambient Air Quality Standards for Ozone, *supra* note 5 at 65,303 (Oct. 26, 2015).

[103] EPA, National Ambient Air Quality Standards (NAAQS), last updated Mar. 04, 2016, https://www3.epa.gov/ttn/naaqs/criteria.html.

[104] National Ambient Air Quality Standards for Ozone, supra note 5 at 65,306

[105] See generally, Whitman v. American Trucking Associations, 531 U.S. 457, 465-472, 475-76 (2001)

technological feasibility are not relevant considerations in the promulgation of national ambient air quality standards."[106] While the EPA acknowledged it cannot consider costs in setting ozone NAAQS, the agency provided an analysis of the benefits and costs as required by Executive Orders 12866 and 13653 and guidance from the White House Office of Management and Budget.[107]

The EPA's Administrator concluded that the updated health standard of 0.070 ppm would significantly reduce ozone air pollution and provide an adequate margin of safety to protect at-risk groups.[108] The EPA stated that this standard is well below the ozone exposure concentration shown to cause the widest range of respiratory effects (0.080 ppm), and the standard is below the lowest ozone exposure concentration shown to cause the adverse combination of decreased lung function and increased respiratory symptoms (0.072 ppm).[109] According to the EPA, the 0.070 ppm standard essentially eliminates ozone exposures that have been shown to cause adverse health effects, protecting 99.5 percent of children from even single exposures to ozone at 0.070 ppm.[110] The 0.070 ppm standard will protect more than ninety-eight percent of school-age children from repeated exposures to ozone concentrations as low as 0.060 ppm – a sixty percent improvement over the current standard.[111] Although the EPA cites several studies that have shown effects in some adults following exposure to ozone at levels as low as 0.060 ppm, the EPA's Administrator concluded that the evidence is uncertain that those effects are harmful or adverse.[112] Given these uncertainties, the EPA concluded that the data supported setting a standard that reduces exposure to ozone concentrations as low as 0.060 ppm, but does not support a standard that eliminates them.[113]

Per Executive orders 12866 and 13563 and guidance from the White House Office of Management and Budget, the EPA created a Regulatory Impact Analysis comparing the costs and benefits of a 0.070 ppm standard with an alternative standard level of 0.065 ppm.[114] The tables below

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[106] American Petroleum Inst. v. Costle, 665 F. 2d at 1185 (1981).

[107] Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone, pp 1-2 https://www3.epa.gov/ttnecas1/docs/ria/naaqs-o3_ria_final_2015-09.pdf (September 2015)

[108] *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone supra* note 12 at 1.

[109] National Ambient Air Quality Standards for Ozone, supra note 5 at 65,300

[110] *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone supra* note 12 at 2.

[111] *Id.*

[112] *Id.*

[113] *Id.*

[114] Regulatory Impact Analysis of the Final Revisions to the National Ambient Air

summarize the EPA's findings:

Total annual cost and benefit analysis of 0.070 ppm standard compared to 0.065 ppm alternative standard for the United States, excluding California, beginning in 2025 (billions of 2011$):[115]

	0.070 ppm	0.065 ppm
Total Costs	$1.4	$16
Total Health Benefits	$2.9-$5.9	$15-$30
Net Benefits	$1.5-$4.5	-$1.0-$14

Total annual cost and benefit analysis of 0.070 ppm standard compared to 0.065 ppm alternative standard for California, after 2025 (billions of 2011$):[116]

	0.070 ppm	0.065 ppm
Total Costs	$0.80	$1.5
Total Health Benefits	$1.2-$2.1	$2.3-$4.2
Net Benefits	$0.4-$1.3	$0.8-$2.7

The EPA analyzed the benefits and costs for California separately because a number of areas in California will have longer to meet the ozone NAAQS based on their high ozone levels.[117] Importantly, the purpose of this Regulatory Impact Analysis is to inform the public about the potential costs and benefits that may result when the EPA implements the new standards.[118]Although the EPA prepared the Regulatory Impact Analysis, its findings were not considered when it issued the 2015 revised ozone NAAQS.[119]

V. JUDICIAL SCRUTINY OF THE 2015 REVISED OZONE NAAQS

The EPA uses a tool called the Air Quality Index ("AQI") to inform the public about how clean or polluted the air is and to recommend steps

Quality Standards for Ground-Level Ozone, *supra* note 96 at 1-4.

[115] Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone, *supra* note 96 at ES-15

[116] Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone, *supra* note 96 at ES-18

[117] *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone supra* note 12 at 4..

[118] Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone, *supra* note 96 at ES-1-2

[119] *Supra* note 5 at Page 65,444

the public can take to reduce daily exposure to ozone.[120] The AQI converts ozone concentrations to a number on a scale from zero to five hundred, zero meaning air quality that is considered satisfactory, and five hundred meaning air quality that poses serious health effects to everyone. Interestingly, the .070 ppm health standard set by the EPA is considered to pose a moderate level of health concern according to the AQI.[121] At this level, there is a moderate health concern for a very small number of people who are unusually sensitive to ozone pollution.[122]

Based on the language in *Mississippi v. EPA*, the EPA's judgment to revise the primary NAAQS to 0.070 ppm will probably withstand judicial scrutiny even if the standard poses moderate health concerns for sensitive populations. Here, the EPA complied with the CAA's requirement to build in an adequate margin of safety, the agency considered its rules on sensitive populations, and acknowledged that some of these populations are more likely to experience adverse effects at all levels of exposure.[123] The EPA also documented clinical studies showing effects in some adults following exposure to ozone at levels as low as 0.060 ppm. CASAC recommended that the EPA choose a new standard in the range of 0.060 to 0.070 ppm, and CASAC further noted that it preferred a new standard near the lower end of the range.[124] In its final recommendations, CASAC noted that the decision about what standard provides the adequate margin of safety required by the CAA is a policy judgment left to the Administrator of the EPA.[125] Ultimately, the EPA noted that the evidence is uncertain that those effects in some adults following exposure to ozone at levels as low as 0.060 ppm are harmful or "adverse."[126] The EPA, in the revised standard, acknowledged CASAC's recommendation and agreed with CASAC that the standard needed to be revised downward to the range of 0.060 to 0.070 ppm, but it did not agree to set the standard below 0.070 ppm.[127] Per the CAA, given the scientific uncertainties documented by the EPA, the EPA's decision about the appropriate NAAQS level must necessarily rest largely on policy judgments. [128] Here, the EPA's

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[120] The National Ambient Air Quality Standards, *Updates to the Air Quality Index (AQI) for Ozone and Ozone Monitoring Requirements 1*.

[121] *Id.* at 2.

[122] EPA, *Air Quality Guide for Ozone*, (Sept. 10, 2015), https://www.airnow.gov/index.cfm?action=pubs.aqiguideozone

[123] Clean Air Act, § 109(b)(1), 42 U.S.C.A. § 7409(b)(1).

[124] Amanda Reilly, *EPA Defends New Ozone Standard as Green Allies Fume*, Environment & Energy Publishing, Oct. 2, 2015, *available at* http://www.eenews.net/stories/1060025767.

[125] *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone supra* note 12 at 3.

[126] *Id.* at 2.

[127] *Id.*

[128] Clean Air Act, § 108(a)(1)(A), 42 U.S.C.A. § 7408(a)(1)(A).

Administrator acknowledged and incorporated CASAC's recommendations into the final rule, and used her statutorily authorized judgment to set the ozone standard within the adequate margin of safety as required by the CAA. Given the aforementioned considerations, the EPA's rule would probably withstand judicial scrutiny if parties bring suit alleging that the EPA failed to protect the public with an adequate margin of safety as required by the CAA.

VI. NON-ATTAINMENT STATUS IN COLORADO

In Colorado, the Denver Metro North Front Range has a long history of violating ozone NAAQS.[129] The EPA first designated the Denver Metro Area as non-attainment in March 1979 based on the 1979 Ozone NAAQS.[130] The Denver Metro Area has since attained the 1979 standard and has not violated this standard since 1987.[131] In November 2007, the Denver Metro Area was designated as "marginal" non-attainment by the EPA based on the 1997 ozone NAAQS.[132] The region has not violated the 1997 standard since 2008.[133] Since 2012, the Denver Metro North Front Range has been designated as "marginal" non-attainment under the 2008 ozone NAAQS.[134] The area was given an initial attainment deadline of July 2015 to attain the 2008 ozone NAAQS, which it subsequently failed (the Denver Metro North Front Range Area's ozone reading was 0.077 ppm, 0.002 ppm shy of achieving attainment status under the 2008 ozone NAAQS).[135] Consequently, the Denver Metro North Front Range Area was reclassified from "marginal" to "moderate" nonattainment on May 4, 2016.[136] Colorado must now submit a revised SIP to the EPA that meets the statutory and regulatory requirements that apply to 2008 ozone nonattainment areas classified as "moderate" by January 1, 2017.[137] The Denver Metro North Front Range Area must also attain the statutory and regulatory requirements that apply to 2008 ozone nonattainment areas classified as "moderate" as expeditiously as practicable, but in any event

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[129] Colorado Department of Public Health, *Ozone Information*, https://www.colorado.gov/pacific/cdphe/ozone-information, (last visited Mar. 18, 2016).

[130] The SIP Planning Process: An Overview of The Clean Air Act's (CAA) Requirements for Colorado State Implementation Plan (SIP) Development & Approval O3-1, (Aug. 27, 2014).

[131] *Id.*

[132] *Id.*

[133] *Id.*

[134] *Id.*

[135] Fed Reg Vol. 80, No. 166 at 5192, Fed Reg Vol. 81, No. 86 at 26,699

[136] Fed Reg Vol. 81, No. 86 at 26,699

[137] Fed Reg Vol. 81, No. 86 at 26,697

no later than July 20, 2018.[138]

Until the EPA states otherwise, states must continue to adhere to the 2008 ozone NAAQS and must prepare to adhere to the 2015 ozone NAAQS.[139] Eventually, the EPA will announce the process to transition from the 2008 standard to the 2015 standard.[140] The EPA expects to revoke the 2008 ozone NAAQS in 2018 or 2019.[141] In 2017, the EPA will likely designate the Denver Metro North Front Range Area as non-attainment for the 2015 standard.[142] Colorado will then have three years from the date of designation to submit a plan to the EPA showing how it will meet the new standard.[143] Unfortunately, while the state must abide by the 2015 standard, it does not have many tools to reduce its ozone pollution, thanks in part to background ozone. [144]

VII. BACKGROUND OZONE

Background ozone is ozone that forms from pollution from natural sources, such as wildfires, lightning, vegetation, and stratospheric intrusions.[145] Man-made pollution from sources outside the U.S. is also considered background ozone.[146] Ozone exists in large quantities in the stratosphere and natural atmospheric exchange processes can transport stratospheric air to the ground-level (this process is called a stratospheric intrusion), negatively impacting ground-level ozone concentrations.[147] The EPA notes that background ozone concentrations within the U.S. and globally have been increasing over the past two decades at a rate of approximately 0.04 ppm per year.[148] Yet, the EPA has concluded that background ozone will not prevent areas from meeting the updated ozone standard of 0.70 ppm.[149] The Colorado Department of Public Health

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[138] Fed Reg Vol. 81, No. 86 at 26,698

[139] JANET G. MCCABE, EPA MEMORANDUM: IMPLEMENTING THE 2015 NATIONAL AMBIENT AIR QUALITY STANDARDS ATTACHMENT PAGE 3, Oct. 1, 2015.

[140] *Id.*

[141] 2015 Ozone NAAQS Timelines, https://www.epa.gov/ozone-pollution/2015-ozone-naaqs-timelines (last updated March 4, 2016)

[142] Colorado Department of Public Health, *Ozone Information*, https://www.colorado.gov/pacific/cdphe/ozone-information, (last visited Oct. 9, 2016).

[143] Colorado Department of Public Health, *Ozone Information*, https://www.colorado.gov/pacific/cdphe/ozone-information, (last visited Mar. 18, 2016).

[144] Telephone Interview with Chris Colclasure, Deputy Director Air Pollution Control Division, Colorado Department of Public Health (Feb. 4, 2016).

[145] EPA, *Implementation of the 2015 Ozone NAAQS: Issues Associated with Background Ozone White Paper for Discussion* 3.

[146] *Id.*

[147] *Id.*

[148] *Id.* at 8.

[149] *Overview of EPA's Updates to the Air Quality Standards for Ground-Level Ozone*, *supra* note 12 at 5.

disagrees, and believes that Colorado's background levels reach as high as 0.65-0.74 ppm, above the EPA's new standard of 0.70 ppm.[150] The EPA admits that there can be infrequent events where ozone concentrations approach or exceed 0.70 ppm in the inter-mountain west.[151] But, the EPA states that its policies allow for the exclusion of background ozone via its Exceptional Events Rule.[152] The Exceptional Events Rule provides a mechanism by which background ozone can be excluded from regulatory decisions and actions.[153] "Air monitoring data that would otherwise indicate an exceedance of the ozone standards and lead to a non-attainment designation may be excluded from designation determinations, if the data is determined to be affected by exceptional events."[154] The criteria to be an exceptional event is 1) that the event affects air quality, 2) the event is not reasonably controllable or preventable, 3) the event is caused by human activity that is unlikely to recur at that location or is a natural event, and 4) there would have been no exceedance or violation of the ozone standard but for that event.[155] However, Colorado's experience has revealed that the planning process to put together these exceptional event applications require significant resources that often exceed the resources available to states and the EPA.[156] The EPA sometimes takes years to act on exceptional event application requests. It appears that some areas are in violation of the ozone standard when in reality, if the EPA acted on and concurred with a state's exceptional event application, the area would attain the ozone standard.[157] As it currently stands, there are no set timeframes for the EPA to respond to a state's exceptional event application.[158] The EPA should implement a rule requiring the agency to review states' exceptional events applications within a given timeframe. In addition, both states and the EPA must allocate more resources in preparing and reviewing exceptional event applications in order to isolate

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[150] Press Release, Colorado Department of Public Health & Environment, EPA Lowers Federal Ozone Standard; Colorado, Other States Face More Difficult Compliance, (Oct. 1, 2015), *available at* https://www.colorado.gov/cdphe/news/ozone

[151] EPA, *Implementation of the 2015 Ozone NAAQS: Issues Associated with Background Ozone White Paper for Discussion* 7.

[152] *Id.*

[153] EPA, *Exceptional Events Rule Revisions Notice of Proposed Rulemaking and Draft Wildfire/Ozone Guidance Notice of Availability* 4, (November 2015).

[154] EPA, *Implementation of the 2015 Ozone NAAQS: Issues Associated with Background Ozone White Paper for Discussion* 12.

[155] EPA, *Exceptional Events Rule Revisions Notice of Proposed Rulemaking and Draft Wildfire/Ozone Guidance Notice of Availability* 5, (November 2015).

[156] William C. Allison V, Director Air Pollution Control Division, Colorado Department of Public Health & environment, State of Colorado Comments, Docket ID EPA-HQ-OAR-2008-0699; FRL-9918-43- OAR, March 17, 2015, *available at* https://www.colorado.gov/pacific/sites/default/files/AP-PO-ColoradoCommentsOzoneNAAQS.pdf

[157] *Id.*

[158] *Id.*

background ozone from air monitoring data. The EPA confesses that background ozone levels in the U.S. are rising, while the agency continues to aggressively regulate ground-level ozone at the state-level. At what point does background ozone impair the states' ability to control ground-level ozone below EPA standards? By more effectively accounting for background ozone, states and the EPA can develop regional, national, and perhaps even global approaches to regulate and reduce manmade emissions that contribute to ground-level ozone.

VIII. MOBILE SOURCE EMISSIONS AND GASOLINE

According to the Regional Air Quality Council ("RAQC") the lead air quality planning agency for the Denver Metro North Front Range Ozone Non-Attainment Area, the greatest opportunity for the Denver Metro North Front Range Area to reduce its ozone pollution (aside from confronting background ozone) lies within mobile sources and modifications to the region's gasoline supply.[159] Implementing California's ZEV Mandate along with modification to Denver's gasoline supply will ensure that all automobiles, old and new, emit fewer ozone precursors and help the region obtain attainment status for ozone NAAQS.

A. California's Zero Emission Vehicles

Transportation emissions are the primary source of ozone in California.[160] To combat ozone pollution, in March 2012, the California Governor issued an executive order establishing a path toward 1.5 million zero-emission vehicles ("ZEVs") in California by 2025 ("ZEV Mandate").[161] This equates to fifteen percent of all new vehicles sold in California by model year 2025.[162] "A ZEV has no tailpipe emissions, no evaporative emissions, no emissions from gasoline refining or sales, and no onboard emission control systems that can deteriorate over time."[163] Initially, electric cars were expected to be the only cars to qualify for the ZEV Mandate, but thanks to promising technologies like fuel cells and hybrid electric vehicles, there are various new opportunities for the

[159] Regional Air Quality Council Board Meeting, Feb. 5, 2016.

[160] 2013 ZEV Action Plan, *A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025* 4, February 2014, https://www.opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[161] *Id.* at 1.

[162] Colorado Department of Public Health & Environment Presentation to Regional Air Quality Council, *Adopting California's LEV III Program, Including LEV III Certification Standards, Zero Emitting Vehicle Mandate, and Greenhouse Gas Standards* 7, January 25, 2016.

[163] Clean Air Act Handbook § 5:21 (2015)

production of ZEVs. ZEVs include fuel cell electric vehicles and plug-in electric vehicles, encompassing light-duty passenger vehicles and heavier vehicles such as freight trucks and public buses.[164] The ZEV Mandate required that by 2015, ten percent of the California government's light-duty fleet purchases must be ZEVs. By 2020, twenty-five percent of the California government's light-duty fleet purchases must be ZEVs.

This executive order also sets a longer-term goal of reducing transportation-related greenhouse gas emissions by eighty percent below 1990 levels by 2050.[165] The ZEV Mandate transfers power generation from inherently inefficient internal combustion engines to higher efficiency stationary source power generation, where criteria pollutants can be better controlled via hydroelectric, wind, solar, and geothermal power.[166] Furthermore, as power generation continues to move away from coal-fired power plants both in California and across the country, greenhouse gas, ozone criteria pollutants, and ozone levels are reduced.[167] The California ZEV Mandate has been adopted by Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont.[168]

One of the primary challenges to ZEV expansion in California is that ZEVs require new infrastructure.[169] States will need to install electric vehicle chargers in consumers' homes, public spaces, and workplaces; structure electricity rates to allow for affordable fueling; and ensure that ZEVs integrate efficiently into a state's electricity grid.[170] Furthermore, ZEVs' up-front costs still remain high compared to traditional vehicles and ZEVs are not yet commercially available for all categories of vehicles.[171] Regarding ozone NAAQS, both California and the EPA recognize that transformational change is needed in order for non-attainment areas in California to achieve attainment status.[172] The EPA explicitly notes that a transition to largely zero or near-zero emission vehicle technologies will

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[164] 2013 ZEV Action Plan, *A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025* 1, February 2014, https://www.opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[165] *Id.* at 2.

[166] Colorado Department of Public Health & Environment Presentation to Regional Air Quality Council, *Adopting California's LEV III Program, Including LEV III Certification Standards, Zero Emitting Vehicle Mandate, and Greenhouse Gas Standards* 14, January 25, 2016.

[167] *Id.*

[168] *Id.* at 7.

[169] 2013 ZEV Action Plan, *A roadmap toward 1.5 million zero-emission vehicles on California roadways by 2025* 6, February 2014, https://www.opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf.

[170] *Id.*

[171] *Id.*

[172] WORKING TO REDUCE OZONE IN CALIFORNIA, 1.

be a primary contributor to California achieving these goals.[173]

B. Implementation of California's ZEV Mandate in Colorado

California's ZEV Mandate could be an effective means for Colorado's ozone NAAQS non-attainment areas to help achieve attainment status. The Union of Concerned Scientists estimate that an average gasoline powered vehicle will emit 26.6% more greenhouse gas emissions than a dedicated battery electric vehicle.[174] Clearly, zero emission vehicles are an attractive alternative to reduce greenhouse gases, which also reduces ozone pollution, thereby helping Colorado achieve attainment status for both the 2008 and 2015 ozone NAAQS. However, if Colorado were to adopt California's ZEV Mandate, potential preemption issues could arise.

1. Preemption Issues

The CAA generally preempts states from establishing their own mobile source tailpipe standards.[175] The Supremacy Clause "invalidates state laws that 'interfere with, or are contrary to,' federal law."[176] "Federal preemption occurs when: (1) Congress enacts a statute that explicitly pre-empts state law; (2) state law actually conflicts with federal law; or (3) federal law occupies a legislative field to such an extent that it is reasonable to conclude that Congress left no room for state regulation in that field."[177]

Thanks in part to its particularly difficult non-attainment problems, the CAA authorizes California to adopt stricter standards for mobile sources.[178] The CAA also allows other states to adopt motor vehicle standards if they are *identical* to the California standards.[179] The focus of the preemption issue has historically been in relation to mandates adopted by California requiring manufacturers to either build or sell cars that meet specific design standards, such as California's ZEV Mandate, which requires manufacturers to produce a specified number of vehicles with no or very low emissions.[180] States in the northeast facing ozone NAAQS non-attainment, like New York and Massachusetts have successfully

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[173] *Id*.

[174] Colorado Department of Public Health & Environment Presentation to Regional Air Quality Council, *Adopting California's LEV III Program, Including LEV III Certification Standards, Zero Emitting Vehicle Mandate, and Greenhouse Gas Standards* 27, January 25, 2016.

[175] CAA § 209(a), 42 U.S.C.A § 7543(a).

[176] 498 F.3d 1031.

[177] 498 F.3d 1031.

[178] *Supra* at 28.

[179] 42 U.S.C.A. § 7507 (2011).

[180] Clean Air Act Handbook § 5:20 (2015).

implemented California's ZEV Mandate by exercising their authority under the CAA.[181] These states concluded that they would be unable to meet the requirements of the ozone non-attainment program without adopting the California standards.[182] As a result, these states petitioned the EPA to require California's ZEV Mandate as part of their ozone non-attainment SIPs. [183] In 1995, the EPA agreed and promulgated a final rule approving the petition and required the ZEV Mandate in the applying states. [184] The EPA's decision was challenged, and the Court of Appeals for the District of Columbia Circuit eventually affirmed the right of each state to adopt the California ZEV program.[185]

However, in 1996 and again in 1998 California relaxed its ZEV Mandate.[186] Massachusetts and New York refused to follow suit and maintained the original California ZEV Mandate.[187] The automotive industry brought suit against New York, seeking to nullify New York's ZEV Mandate in light of California's decisions to relax its mandate.[188] In 1998, the Second Circuit Court of Appeals held that the Clean Air Act preempted New York's ZEV requirement.[189] In *American Automobile Manufacturers Association v. Cahill*, the court concluded that the ZEV requirement was a "standard relating to the control of emissions" and that states may not impose such controls on motor vehicles under the Clean Air Act.[190] The court rejected New York's argument that the ZEV sales requirement fell under the CAA's exception for states that adopt the California standards.[191] Similarly, Massachusetts' ZEV Mandate was also struck down by the courts for preemption reasons.[192] As a result of each lawsuit, both New York and Massachusetts adopted the revised California ZEV requirements, thus mirroring California's standards to remedy the aforementioned preemption issues.[193]

California's executive order directs the state to purchase ZEVs for government fleets. By 2015, the executive order mandated that ten percent of the government's light-duty fleet purchases must be ZEVs, which will increase to twenty-five percent of fleet purchases by 2020. Colorado could

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[181] *Id.* at § 5:21 (2015).
[182] *Id.*
[183] *Id.*
[184] 60 Fed. Reg. 4712 (Jan. 24, 1995).
[185] Com. of Va. v. E.P.A. 116 F.3d 499 (D.C. Cir. 1997)
[186] Clean Air Act Handbook § 5:21 (2015)
[187] *Id.*
[188] *Id.*
[189] 152 F.3d 196 (2d Cir. 1998),
[190] *Id.*
[191] *Id.*
[192] Ass'n of Int'l Auto. Mfr., Inc. v. Comm'r, Mass. Dep't of Envtl. Prot., 208 F.3d 1 (1st Cir. 2000).
[193] Clean Air Act Handbook § 5:21 (2015).

adopt a similar provision, although it need not be an exact replica of California's version. In a 2004 decision, the US Supreme Court considered whether state imposed municipal-purchasing mandates were preempted by the CAA.[194] In *Engine Mfrs. Ass'n v. SCAQMD*, a trade association representing vehicle manufacturers challenged rules adopted by a municipal district that required certain types of fleet operators to purchase vehicles that met certain emission standards.[195] On remand, the Ninth Circuit Court of Appeals affirmed a district court decision holding that fleet rules, as applied to state and local governments, were outside the scope of the preemption provision of the CAA.[196] Thus, when considering options to reduce ozone pollution, Colorado could promulgate a purchasing mandate for government fleets that satisfies the state's unique needs without concern that such a mandate would be preempted by the CAA.

According to the Regional Air Quality Council, the greatest opportunity for Colorado to reduce ozone pollution lies within mobile sources and the oil and gas sector.[197] While Colorado will face similar infrastructure burdens as California, adopting California's ZEV Mandate and imposing a mandate that state and local governments replace their fleets with ZEVs are potentially powerful options to explore to reduce ozone levels in Colorado. Fortunately, non-attainment ozone NAAQS areas in Colorado are supporting measures to help catalyze the ZEV movement. In 2016, the city of Denver mandated that single-family homes and duplexes built in the city will need to have the proper electrical writing to support electric vehicle plugs in their garages.[198] Denver is joining several cities that have electric vehicle readiness rules for single-family homes, including Boulder County, Colorado; Vancouver, British Columbia; Los Angeles; and many other California cities.[199] Furthermore, if Colorado chooses to adopt California's ZEV Mandate, Colorado should not face preemption issues if it creates an exact replica of California's ZEV Mandate. One potential consequence of this decision is that Colorado will be bound to all future amendments passed by California regarding its ZEV Mandate, whether California relaxes, strengthens, or abolishes the ZEV Mandate. However, Colorado is similarly bound to the federal emission

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[194] In Engine Mfrs. Ass'n. v. S. Coast Air Quality Mgmt. Dist., 541 U.S. 246, (2004)

[195] *Id.*

[196] Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist., 498 F.3d 1031 (9th Cir. 2007).

[197] Regional Air Quality Council Board Meeting, February 5, 2016.

[198] Jon Murray, *Denver's New Building Code Requires Garages to Support Electric Vehicles*, The Denver Post, March 9, 2016 *available at* http://www.denverpost.com/news/ci_29615729/new-garages-must-support-electric-vehicle-plugs-denver.

[199] *Id.*

standards, thus the state should be familiar with executing emission standard amendments.

C. Boutique Gasoline

1. Reid Vapor Pressure

Colorado has several options at its disposal regarding modifications to gasoline that supplies the Denver North Front Range Area. By utilizing boutique gasoline (non-conventional gasoline as discussed below) Colorado can reduce many of the primary precursor ozone pollutants that are responsible for the Denver Northern Front Range Area non-attainment status. During the summer ozone season, June 1 – September 15, the EPA regulates the vapor pressure of gasoline sold at retail stations in order to reduce evaporative emissions from gasoline that contribute to ground-level ozone.[200] "Colorado currently caps the reid vapor pressure[201] (RVP) of gasoline sold during the summer months at 7.8 psi."[202] Outside the summer ozone season, the Denver North Front Range Area must abide by a 9.0 RVP standard.[203] Altering the summer fuel standard RVP to 7.0 psi would result in ozone reduction benefits by reducing the amount of VOCs emitted.[204] In order to adopt a lower RVP fuel, Colorado must obtain EPA approval as part of the CAA SIP process.[205] The request must demonstrate that the state's adoption of the lower RVP fuel is necessary to achieve the ozone NAAQS. "'Necessary' means that no other measures exist that would bring about timely attainment or that other measures exist, but are unreasonable or impracticable."[206] Several states around the country have successfully obtained waivers from the EPA and implemented the 7.0 RVP standards in ozone non-attainment areas.[207] These states have seen significant reductions in ozone emissions at a low cost, and there is no reason to believe that Colorado would not qualify for a waiver given its

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[200] EPA, *Gasoline Reid Vapor* Pressure, Feb. 29, 2016, http://www.epa.gov/gasoline-standards/gasoline-reid-vapor-pressure.

[201] *Id.* Reid vapor pressure (RVP) is a common measure of and generic term for gasoline volatility.

[202] A Coalition of Colorado's Local Governments and

Environmental Groups, *The Path Forward: Reducing Ozone Pollution to Protect Public Health in the Colorado Front Range*, *available at* http://ozoneaware.org/postfiles/comments/The%20Path%20Forward.pdf.

[203] EPA, *Gasoline Reid Vapor* Pressure, Feb. 29, 2016, http://www.epa.gov/gasoline-standards/gasoline-reid-vapor-pressure.

[204] A Coalition of Colorado's Local Governments and

Environmental Groups, The Path Forward: Reducing Ozone Pollution to Protect Public Health in the Colorado Front Range, available at http://ozoneaware.org/postfiles/comments/The%20Path%20Forward.pdf.

[205] *Id.* at 11.

[206] *Id.* at 11-12.

[207] *Id.* at 12.

history of ozone non-attainment.[208]

2. Reformulated Gasoline

Reformulated gasoline ("RFG") is gasoline blended to burn cleaner than conventional gasoline and to reduce smog-forming pollutants in the air and is a method that is already encouraged by the EPA.[209] Congress first created the federal RFG program in the 1990 CAA Amendments.[210] The CAA requires RFG in cities with high smog levels, as mandated by the EPA and is optional elsewhere.[211] RFG is currently used in seventeen states and the District of Columbia, accounting for about thirty percent of gasoline sold in the United States.[212] While the Denver North Front Range Area is not currently in attainment for ozone, the CAA does not mandate that the area utilize RFG.[213] Ozone non-attainment areas where the CAA does not mandate RFG (like Denver) can apply to the EPA and opt-into the RFG program.[214] RFG standards are widely recognized to provide considerable cost-effective benefits in reducing ozone pollution.[215] For example, in the Phoenix metropolitan area, RFG implementation has proven effective in cutting summertime smog.[216]

3. Boutique Gasoline Challenges

One of the primary risks in adopting one of the new fuel standards is that current refineries that supply the Denver market may elect not to incur the expense and burden of supplying the Denver market with the proposed fuel varieties mentioned above. Currently, six refineries in the region primarily supply the Denver market. Among the ozone reduction fuels strategies, the RAQC has conducted the following fuels scenarios to apply to the Denver North Front Range Area:

- Retain the current 7.8 RVP summertime standard, but eliminate the one psi ethanol waiver[217]

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[208] *Id.*

[209] EPA, *Reformulated Gasoline*, last updated April 28, 2016, http://www.epa.gov/gasoline-standards/reformulated-gasoline

[210] *Id.*

[211] *Id.*

[212] *Id.*

[213] *See id.*

[214] A Coalition of Colorado's Local Governments and Environmental Groups, The Path Forward: Reducing Ozone Pollution to Protect Public Health in the Colorado Front Range, available at http://ozoneaware.org/postfiles/comments/The%20Path%20Forward.pdf.

[215] *Id.* at 9.

[216] *Id.* at 9.

[217] *Id.* at 12. Gasoline blended with ethanol evaporates more readily than non-blended gasolines and increases the permeability of gasoline in fuel systems, resulting in higher VOC emissions, a precursor to ozone pollution.

- Adopt a 7.0 RVP summertime standard and retain the one psi ethanol waiver
- Adopt a 7.0 RVP summertime standard and eliminate the one psi ethanol waiver
- Opt-into the federal RFG[218]

In order to comply with any of the scenarios above, oil refineries supplying the Colorado Front Range would face incremental operating costs, incremental capital investments to produce the boutique fuel, and lost light end values.[219] Refineries must make expensive modifications in order to produce boutique fuels; however, neither the state nor the EPA has the power to force refineries to produce these boutique fuels.[220] In order to supply the Colorado Front Range with the proposed alternative fuels mentioned above, the total capital costs for the oil refinery industry range from $250-$710 million per refinery.[221] This equates to an 11.4 to 18.8 cent per gallon market premium (versus conventional gasoline) paid by consumers at the fuel pump.[222] Refiners will require four to five years to make the necessary adjustments to their refineries if they choose to supply the Denver North Front Range Area with boutique fuels.[223] Denver's adoption of a new fuel standard could make the market somewhat of an island during early stages of the program with the potential for significant pricing upsets.[224] Refineries may elect to exit the Denver market, refrain from making the investments required by a new fuel standard, or send their gasoline to other fuel markets.

As other nearby states with non-attainment areas seek ways to reach ozone attainment, they may consider mandating the use of boutique fuels within their borders. If Colorado and nearby states could collaborate to create a regional boutique fuel strategy, thereby increasing demand for boutique fuels, gasoline refineries would probably be more willing to make the necessary investments to produce these boutique fuels. As demand for boutique fuels increases, refineries would likely be incentivized to increase supply. Increased supply of boutique fuels, thanks to regional collaboration concerning the boutique fuel supply, should help

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[218] Executive Summary Presentation for Denver Regional Air Quality Council by Energy Analysts International, March 4, 2011.

[219] *Id.* Light end rejection represents removal of light hydrocarbons from the gasoline pool…the cost to the refiners is either lost stream value and/or additional capital and operating costs to convert these streams to lower RVP streams."

[220] *Id.*

[221] *Id.*

[222] *Id.* "There have often been 2 to 21 CPG market premiums paid for similar low RVP (7 psi/no waiver) fuels (Detroit and Kansas City) relative to conventional fuels."

[223] Executive Summary Presentation for Denver Regional Air Quality Council by Energy Analysts International, March 4, 2011.

[224] *Id.*

mitigate gasoline price volatility, reduce ozone pollution, and help states achieve ozone NAAQS attainment.

IX. CONCLUSION

Over the last three decades, Colorado has successfully reduced ground-level ozone pollution, but the EPA's new ozone NAAQS will prove to be a tremendous burden for the state. State officials believe that background ozone will prevent areas in Colorado from achieving ozone NAAQS attainment under the 2015 standard. The EPA confesses that background ozone levels in the United States are rising, yet the agency insists that background ozone will not prevent states from meeting the 2015 standard. By more effectively accounting for background ozone, states and the EPA can further develop local, regional, and national approaches to regulate and reduce manmade emissions that contribute to ground-level ozone. If Colorado is to reach attainment status for ozone NAAQS, the state must focus on mobile-source emissions. While the costs to the state, automobile industry, and oil industry may be high, there appear to be very few options left for reducing ozone emissions in the state. Due to the Denver Metro North Front Range Area's current non-attainment status, the state should seriously consider adopting California's motor vehicle emission standards, particularly the ZEV Mandate. Furthermore, modification to Denver's gasoline supply will ensure that non-ZEVs will emit fewer ozone precursors and help the region obtain attainment status for ozone NAAQS. Over the years, Colorado has made substantial progress decreasing ozone pollution across the state, but now Colorado will be hard-pressed to further reduce ozone pollution without considerable expense. By adopting California's more aggressive stance on motor vehicle emissions along with making upgrades to Denver's gasoline supply, Colorado and the EPA can work together to effectively manage, reduce, and control ground-level ozone pollution in Colorado.